John D. Vanderhoof
~~JOHN A. LOVE~~
Governor

C. J. KUIPER
State Engineer

DIVISION OF WATER RESOURCES

DEPARTMENT OF NATURAL RESOURCES
W. G. WILKINSON P.E.
IRRIGATION DIVISION ENGINEER
ROOM 208 8th AND 8th OFFICE BLDG.
GREELEY, COLORADO 80631
OFFICE: 352-8712 HOME: 484-3917

December 13, 1973

Mr. C. J. Kuiper
State Engineer of Colorado
300 Columbine Building
1845 Sherman Street
Denver, Colorado 80203

Dear Mr. Kuiper:

The Annual Report of the Division Engineer for Irrigation Division No. 1 of the State of Colorado for the 1973 water year is herewith submitted.

Included within this report is the Annual Report of Raymond Liesman on the distribution of water through the east slope facilities of the Colorado-Big Thompson Project.

As a result of time limitations and computer problems the diversion figures for the various water districts may be missing or preliminary in nature. The missing information will be entered and all figures verified as soon as possible.

The courtesy and assistance extended to me by you, your staff and the personnel of Division No. 1 over the past year has been greatly appreciated.

Respectfully submitted,

W. G. Wilkinson

W. G. Wilkinson
Division Engineer

bt

ANNUAL REPORT

DIVISION NO. I

1973 IRRIGATION YEAR

NOV. 1, 1972-OCT. 31, 1973

BY

W. G. WILKINSON, DIVISION ENGINEER

JAMES R. CLARK, ASSISTANT DIVISION ENGINEER

INDEX

1973 ANNUAL REPORT

I. INTRODUCTORY STATEMENT

Division 1 covers an area of some 28,068 square miles or approximately the northeast one-fourth of the State of Colorado. Of this, approximately 19,500 square miles is in the South Platte River Basin, 8,165 square miles in the Republican River Basin, and 403 square miles in the Laramie River Basin.

SOUTH PLATTE RIVER

The South Platte River starts at the Continental Divide, flows through South Park, down mountain canyons, out onto the plains in the Denver area, thence northeasterly and into Nebraska near the northeast corner of Colorado. The flow of the South Platte is augmented by a number of tributaries in the South Park area, the principal ones being the Middle and North Forks of the South Platte and Tarryall Creek. After leaving the mountains the South Platte is further augmented by several major tributaries arising at and east of the Continental Divide and flowing to the South Platte from the north and west. These major tributaries entering the South Platte in the Denver to Greeley area are Bear, Clear, Boulder and St. Vrain Creeks, and the Big Thompson and Cache la Poudre Rivers. Only normally minor and intermittent streams supplement the river flow from the south and east. However some of these, such as Plum, Cherry, Boxelder, Kiowa, Bijou, Badger, Beaver as well as Lone Tree, Coal, Wild Cat and Pawnee Creeks from the north and west are each capable of producing a major flood due to the extent and topography of their individual watersheds when subjected to intense precipitation.

In addition to the obvious tributary streams, the South Platte River is further supplemented very extensively, as are the tributaries themselves, by what is commonly referred to as return flow. This is water from springs, waste ditches, drains, seepage, etc., resulting generally from diversions for various uses, precipitation, and high water tables. These additional sources enter the streams in relatively small amounts at extremely numerous locations along the entire reaches of the streams.

The water supply is further supplemented by a number of diversions from transmountain sources. The water from these transmountain sources is controlled and used by specific ownership entities and, as such, the first use of it is not subject to appropriation as a part of the waters of the South Platte Basin. These transmountain diversions are treated in more detail later in this report.

The elevations in the South Platte Basin vary from 14,000 feet at points along the Continental Divide to 3,400 feet at the Colorado-Nebraska line. The western one-third of the basin is mountainous in character and provides the principal source of water as the result of precipitation.

Of the 12,481,000 acres in the South Platte Basin, 8,694,000 acres are in farms and ranches. The balance of the area is owned by federal and state governments, public agencies, or included within municipalities. Within the farm areas are 852,000 irrigated acres and 7,842,000 acres of dry land according to the 1964 Agricultural Census.

The principal use of water in the mountain valleys is for meadow irrigation. Large volumes of water are released on meadows adjacent to the streams and, of this volume, a major proportion returns to the stream for reuse at lower elevations. The largest area of mountain valley irrigation is in South Park at elevations up to 11,000 feet. Other uses in the mountain areas include those of small municipalities, domestic, stock, power, mining, commercial and recreation needs.

The greatest use of water, by far, in the South Platte Basin is for agricultural purposes in the plains area at elevations between 3,500 and 5,000 feet. The water here supports a well developed, diversified agricultural economy that ranks high nationally in productivity. Much of the demand for water in areas downstream some 40-50 miles from the mountains is supplied from wells and by return flow from uses further upstream.

POPULATION AND LAND USE

The continuing rapid rate of population growth portends some extensive changes in both water and land use. The Colorado General Assembly has passed laws, particularly in 1972, in an attempt to control the growth by requiring compliance with guidelines for water supply, sanitary systems, public access, fire protection and land use under the immediate supervision of the various county planning offices. These provisions have had a very obvious effect upon the theretofore exploding development of open land particularly along the front range during the past year.

The accompanying tabulations give an indication of the areas experiencing rapid growth as evidenced by the construction of single family residences and living units in apartment type construction since 1960. The 22 counties shown, being those which are wholly or partially within Irrigation Division No. 1, account for approximately 76% of the residential construction within Colorado during the 13 year period from 1960 to 1972 inclusive. The figures were taken from a study made by the Division of Planning, Colorado Department of Local Affairs.

Dr. David Monarchi, an Assistant Professor of Management Science and Research Specialist in the Business Research Division, College of Business and Administration, University of Colorado, has published a paper entitled COLORADO POPULATION TRENDS in which he projects the population of the Colorado counties for July 1, 1975 and 1980 from the census figures of 1970. For those counties lying totally or partially within Irrigation Division No. 1, Dr. Monarchi projects a population increase of 23.5% for 1975 and 49.8% for 1980 as compared with the 1970 census base. This study again verifies the concentration of population in Division 1 as being approximately 68.3% of that of the entire state with an expected increase to 69.9% in 1980. More significantly this growth will be concentrated in the nine front range counties of Adams, Arapahoe, Boulder, Clear Creek, Denver, Jefferson, Douglas, Larimer and Weld which are projected to have approximately 66.6% of total Colorado population in 1980. A copy of the Monarchi paper is included in the appendix of this report.

Of significant interest is the amount of rural land going into subdivision and urban development. Insight to this particular aspect is provided in a study entitled URBANIZATION OF RURAL LANDS IN THE NORTHERN COLORADO FRONT RANGE as published by the Natural Resource Economics Division, Economic Research Service, U.S.D.A. in cooperation with Colorado State University Cooperative Extension Service.

This study was authored by Dr. Raymond L. Anderson of the Natural Resources Economics Division of E.R.S. - U.S.D.A. and covers the growth of population, subdivision activity, land use changes and acreages involved for the period 1955 to 1969 with corresponding projections to 1990 for the three county area of Boulder, Larimer and Weld Counties.

The study reveals that within the three counties over the 1953-1969 period 23.1 square miles of rural land went into urban development of some type. Of this, some 10.8 square miles was irrigated land. In the 1963 to 1969 period conversion from rural to urban use was progressing at a rate of two square miles per year. Continuing population growth between 1970 and 1990 in the area of study could occupy additional rural lands of between 25 and 75 square miles. This urbanization rate is indicative of the problems facing our area in terms of water supply, agricultural production and associated administration of water rights.

Looking forward to the needs for increased urban supplies, many municipalities are making plans for expanding their diversion treatment and distribution facilities.

After an earlier defeat of a proposed plan by the electors the Denver Water Board was successful in November of this year in getting approval from the electorate for their multimillion dollar plan for upgrading their facilities and developing more west slope water for the Denver Metropolitan area use. The Bureau of Reclamation is making progress with their plans for construction of the 975,000 acre foot Two Forks Reservoir at the confluence of the North and South Forks of the South Platte River and the 5570 acre foot Turkshead Reservoir which will serve as an afterbay for the Two Forks Power Plant. These multipurpose reservoirs are designed primarily to provide municipal water.

The Six City Group, composed of Fort Collins, Greeley, Loveland, Longmont, Estes Park and Boulder are still engaged in planning for the importation of municipal water from the Colorado River. They have formed a subdistrict to the Northern Colorado Water Conservancy District and have agreed with the Bureau of Reclamation upon a carriage contract using the facilities of the Colorado-Big Thompson project.

The Narrows Project as proposed by the Bureau of Reclamation working with the Lower South Platte Water Conservancy District advanced another slow step toward realization this year with the inclusion of $1,000,000 in the federal budget for acquisition of lands and right of way for the Narrows Reservoir. Unfortunately the Lower South Platte Conservancy District lost the services of their most active and able secretary-manager, Eric Wendt, upon his sudden death November 25, 1973.

Chatfield Dam, a Corps of Engineers structure upstream from Denver at the confluence of the South Platte River and Plum Creek was dedicated on August 15 in a ceremony featuring an address by the then Vice-President, Spiro Agnew. Chatfield Dam and Reservoir will act principally as a flood control reservoir after its completion in 1974, furnishing much needed protection to the Denver area as well as downstream reaches.

Yielding to the temptation to invoke the privilege of editorial comment it is to be fervently hoped that the degree of operational integrity of the Chatfield structure will far exceed that alleged to be possessed by the dedicator.

Plans are also progressing for the construction of Bear Creek Reservoir by the Corps. This will be a flood control structure on Bear Creek downstream from the town of Morrison.

Generally speaking, the area served by water from the South Platte River and its tributaries enjoyed an ample water supply for the irrigation season as a result of a good spring snow pack, an extended snow melt season, good reservoir carryover and some timely precipitation. The year was also marked by a May flood on the South Platte, some reservoir failures and underground water litigation as discussed in greater detail in subsequent sections of this report.

BUILDING CONSTRUCTION IN DIVISION 1 COUNTIES, 1960-1972 — NUMBER OF NEW SINGLE FAMILY RESIDENCES

COUNTY	1972	1971	1970	1969	1968	1967	1966	1965	1964	1963	1962	1961	1960
Adams	1643	717	1523	857	619	564	470	674	1080	1669	2299	2437	1913
Arapahoe	5787	4128	1987	1370	1305	1090	807	938	1489	1829	2853	2312	1698
Boulder	2533	1928	1244	958	1112	1325	1266	1112	869	1247	1237	1105	977
Cheyenne			2		1	2	2	1		5	9		4
Clear Creek	91	67	44	45	31	13	26	38	19	5	1	3	
Denver	1384	1505	1570	1472	1381	1266	1090	1190	731	752	859	743	751
Douglas	667	402	215	225	151	91	66	66	112	119	123	110	60
Elbert	99	59	26	14	10			1		1	1		
Gilpin	56		33	26		38			10	12	20		
Jefferson	6008	6028	3270	2489	2682	2091	1489	1724	2074	2577	3428	3454	2862
Kit Carson	21	12	15	23	21	15	22	29	38	29	33	19	20
Larimer	2068	1470	872	618	652	515	282	475	514	507	500	403	504
Lincoln	7	3	5	1	3	3	6	7	11	13	11	11	4
Logan	18	16	19	6	11	11	10	22	63	24	37	14	5
Morgan	32	18	22	12	13	16	11	26	28	35	33	39	31
Park	201												
Phillips	8	6	5	5	10	10	4	8	11	9	11	11	7
Sedgwick	3	1	4	1	1		2	3	5	1	4	5	3
Teller	60	35	36	11	7	7	6	18	20	19	9	4	7
Washington	3	2		6	2		3	4	2	10	19	13	4
Weld	967	730	578	424	151	286	146	129	262	348	310	390	335
Yuma	20	16	11	10	8	2	5	5	7	12	14	19	15
TOTAL	21676	17143	11481	8573	8171	7345	5713	6470	7345	9223	11811	11092	9200

BUILDING CONSTRUCTION IN DIVISION 1 COUNTIES, 1960-1972 NUMBER OF APARTMENTS & DUPLEX UNITS

COUNTY	1972	1971	1970	1969	1968	1967	1966	1965	1964	1963	1962	1961	1960
Adams	4199	1970	1859	1093	550	321	64	125	132	253	579	1080	311
Arapahoe	7287	4676	1789	1064	462	187	9	93	582	487	721	1442	822
Boulder	1965	2722	964	987	1579	966	680	126	190	602	397	568	235
Cheyenne													
Clear Creek	69					2							
Denver	7153	6680	4310	4573	3705	2414	3602	1777	1898	2064	2052	3787	2375
Douglas	90	2	20	25		4		4	2		2	2	
Elbert													
Gilpin													
Jefferson	6548	3825	1595	997	782	324	194	333	164	526	1194	2845	1430
Kit Carson						2	3	5	4		2		
Larimer	1267	1113	576	527	706	423	166	1004	562	211	83	148	168
Lincoln													
Logan	58	4			4		31	56	24				5
Morgan	34			89	11	7	14	8		8	2		4
Park													
Phillips													
Sedgwick		53										2	
Teller	57							14					
Washington										2			
Weld	1166	1393	507	148	26	145	31	87	158	264	30	146	131
Yuma	28	2					50		2	14			
TOTALS	29921	22440	11620	9503	7825	4795	4244	3632	3718	4431	5062	10020	5481

REPUBLICAN RIVER

The Republican River Basin in Eastern Colorado covers 5,226,000 acres. Of this area 4,690,000 acres are in farm and ranch land with 86,000 acres under irrigation and 4,604,000 acres of dry land as reported in the 1964 Agricultural Census.

This area is relatively dry and the surface streams, many of which are intermittent, provide only enough water for some lands adjacent thereto. The normal precipitation in this area is about 17.1 inches of which 13.6 inches or 80 percent falls during the April through September period. This year November 1972 through October 1973 the precipitation was well above normal. Precipitation at Wray, Colorado was indicative of the area. That station recorded approximately 137 percent of normal with particularly heavy amounts in July and September.

During the past two decades many wells have been drilled in the designated ground water basins in the tributary area of the Republican River. Agricultural production has been greatly expanded as a result. Since these wells are in designated ground water basins they are not subject to the regulations applicable to wells drawing their supplies from the tributary alluvium. Several farmers having had wells in the so called tributary alluvium areas have moved to the designated basin areas to escape what they feel are the over restrictive regulation on ground water use. The greatest impact of groundwater development has been in the Burlington area where there is a thriving agricultural economy based mainly on irrigated row crops. The water in this area is being mined from the Ogallala Formation at the rate of 40 percent depletion in twenty-five years. The prospect of recharging this aquifer is in considerable doubt at this time. Consequently, it is unlikely that this high plains area will experience any major industrial or population change such as that in the areas closer to the mountains.

LARAMIE RIVER

The Laramie River Basin in North Central Colorado contains 258,000 acres of which 4,800 acres are irrigated and 15,000 acres are non-irrigated ranch land according to the 1964 Agricultural Census.

This basin is a mountain valley with the principal water use being for meadow irrigation and livestock purposes. There are no municipalities or villages in this basin so the domestic uses are minimal.

Under a Supreme Court decree the water in the Laramie Basin is allocated volumetrically. The irrigated acreage of each ranch has been determined and 6.0887 day second feet per acre allotted for the season of which only .3715 day second feet may be used after July 31. Further, the above mentioned decree provides for transbasin diversions of up to 19,875 acre feet annually.

The spring snow pack on the Laramie watershed was exceptionally good and was followed by reasonably good precipitation throughout the irrigation season with a result that there was more than adequate water all season to meet the irrigation needs. The full 19,875 acre feet were diverted into Water District No. 3 under transbasin rights and the meadowlands on the Laramie within Colorado diverted 19,970 acre feet of their 29,500 acre feet allocation.

The Laramie River Basin is becoming increasingly popular as a recreation area, particularly as related to fishing. Some changes of ownership to recreation interests have occurred and more are anticipated although the water use is expected to remain quite stable. The changes in ownership appear to be more concerned with control of fishing rights and public access now than in the past. Some plans are being made for subdivision development with wells as the source of domestic water. Because of the terms of the Laramie River agreement some doubt exists as to the propriety of using either surface or underground water for municipal type use.

II. PERSONNEL

There have been quite a few changes in the division staff this year. We have three new faces in the Greeley Office, Ben, Bev and Bob. Ben Saunders joined us as a 1042 Water Commissioner in June following the vacancy left by Wes Hayman when Wes returned to Fairplay as a deputy water commissioner. Beverly Thomas came to us in August to assist in the secretarial duties. Bob Cooper came to work for Division 1 in December of '72 as an Engineering and Physical Science Trainee (E & PST) in the Denver Office. He began dividing his time between Denver and Greeley in September.

Three additional E & PST positions were filled in our Denver hydrographic section during the year. Two of these men, Steve Vandiver and Larry Sanders, worked for a short time in Denver, then were transferred to Pueblo and Alamosa respectively. The third position was filled by Doug Walcher who has worked as an engineering technician for several summers. We also had two new engineering technicians in the Denver Office this past summer. They were Richard Saterdal and Jerome Mallon. George Sievers returned to work in the Greeley Office again this summer as an engineering technician. Jay Bishop terminated his employment with the State as an engineering technician in June.

Bruce Smith, a UNC student, went to work in Water District 3 as deputy water commissioner. He will be spending most of the winter traveling in Europe.

We were all saddened by the passing away of Art Wenz, Water Commissioner in District 23, in August.

The resulting vacancy was filled by Wes Hayman. Ron Roberts then went to work as deputy water commissioner to fill the vacancy left by the promotion of Wes.

Dean Thompson retired on July 31st. We understand he is having a great time.

The water commissioner positions in Water Districts 1, 2, 4, 8 and 64 were reclassified from W.C. 11 to W.C. 111 during the year as a result of the increasing complexities of administration resulting from subdivision growth, underground and surface water integration, etc.

NAME	WATER DIST.	CLASSIFICATION POSITION Oct. 31, 1973	Grade	Step	DATE OF LAST STEP CHANGE	MONTHS WORKED	1972 - '73 BUDGETED	MONTHS PER. VEH.	MONTHS STATE VEH.
W. G. Wilkinson		WRE IV	57	7	7-73	12	12		21,789
James R. Clark		WRE III	53	6	10-70	12	12	1,006	
Dorothy Wankelman		Sr.Clk.Steno.	18	4	3-73	12	12		
Robert Samples	1	WC III	35	6	4-72	12	12		24,369
Paul Meehl	2	WC III	35	6	1-69	12	12	14,653	
John Neutze	3	WC III	35	5	7-73	12	12	4,957	10,980
Lloyd Blewitt	4	WC III	35	6	12-68	12	12	11,411	
Donald Palmer	5	WC II	31	6	12-69	12	12	10,739	
Thomas Platt	6	WC II	31	7	1-66	12	12	15,472	
Arlyn Davison	7	WC II	31	6	1-70	12	12	10,082	
Joe Clayton	8	WC III	35	7	11-71	12	12	16,219	
Ralph Van Gorden	9	WC I	27	7	7-70	12	12	12,020	
Arthur Wenz	23	WC I	-	-	8-72	7	9	10,456	
Charles W. Hayman		WC I (1042)	27	1	-	5	12		
Charles W. Hayman	23	DWC	21	5	-	4	7		
Charles W. Hayman	23	WC I	27	4	6-73	3		10,668	2,577
William Gleason	48	WC I	27	7	10-69		5	5,763	
Theodore Fisher	49-65	WC I	27	4	11-71		4	2,784	
Robert Littler	64	WC III	35	7	7-70	12	12	15,777	
Donald Brazelton		WC I(1042)	27	2	9-73	11	12	2,210	1,165
Quinto A. Brunelli	1	DWC	21	4	9-73		7	13,384	
Antone C. Heit	2	DWC	21	6	7-70		6	6,942	
Bruce J. Smith	3	DWC	21	1	5-73	6	7	10,558	
Wayne Lee	4	DWC	21	1	5-72		8	6,022	
Lawrence A. Young	5	DWC	21	4	6-73		7	4,069	
Ernest L. Ward	6	DWC	21	7	8-71		7	10,605	
John T. Noonen	8	DWC	21	1	5-72		7	11,619	
Ronald Roberts	23	DWC	21	1	9-73			2,239	
Richard T. Vannorsdel	48	DWC	21	1	4-71		3	1,390	
Dean Thompson		WRE II	-	-	7-64	1	12		7,801
Theodore Bell		WRE I	43	4	7-73	12	12		11,850
Ray Liesman		WRE II	47	3	7-73	12	12		16,881
Robert E. Cooper		WRE I	43	1	1-73	12	12		11,877
Beverly Thomas		Int.Clk.Typ.	12	1	9-73	2	-		

PERSONNEL (CONTINUED)

NAME	WATER DIST.	CLASSIFICATION POSITION Oct. 31, 1973	Grade	Step	DATE OF LAST STEP CHANGE	MONTHS WORKED	1972 - '73 MONTHS BUDGETED	MONTHS PER. VEH.	MONTHS STATE VEH.
Benjamin G. Saunders		WC I (1042)	27	1	7-73	5	-		
Ahmad Andesha		WRE I	43	4	7-73	12	12		
Jay Bishop		Engr. Tech.	-	-		8		6-29-73 Quit	
George E. Sievers		Engr. Tech.	23	1	7-70	3	3		2,614
Steven Vandiver		Engr. & PST	39	1	2-73	5	12		
Raymore O. Walcher, Jr.		Engr. & PST	39	1	7-73	12	12		
Richard Saterdal		Engr. Tech.	23	1	6-73	3	3		37,194
Jerome A. Mallon, Jr.		Engr. Tech.	23	1	6-73	3	3		
Larry Sanders		Engr. & PST	39	1		1.5	12		
Jay Blum		WRE I	-	-		1	-		

III. WATER SUPPLY

A. SNOW PACK

Snow pack in the South Platte Drainage Area was generally below normal the 1st of April. The Cache la Poudre was slightly better than normal at 106 percent and the St. Vrain the poorest with only 73 percent of the 15 year average. Soil conditions were good due to an abnormal amount of low elevation snow and carryover storage in area reservoirs was good.

April precipitation continued to improve the water potential for the coming season, resulting in the figures tabulated below on May 1st.

SUMMARY OF SNOW MEASUREMENTS (MAY 1st)

WATERSHED	NO. OF COURSES AVERAGED	This Year's Snow Water as Percentage of	
		Last Year	Average+
Big Thompson	4	104	109
Boulder	3	159	132
Cache la Poudre	8	144	166
Clear Creek	6	131	106
Saint Vrain	3	183	148
South Platte	3	100	122

SUMMARY OF SOIL MOISTURE (MAY 1st)

WATERSHED	NO. OF STATIONS	This Year's Soil Moisture As Percentage of	
		Last Year	Average+
Big Thompson	2	86	83
Boulder	1	87	118
Cache la Poudre	2	71	75
Clear Creek	2	91	94
Saint Vrain	2	77	95
South Platte	2	87	87

+1953 - 1967

III. WATER SUPPLY

B. PRECIPITATION - SUMMER

The season started off with very heavy precipitation in early May which resulted in widespread flooding in the division and extensive damage. This is covered in more detail under "Flooding".

Among other storms during the season were the following:

1) June 29 - 1.30" rain and hail - Fort Morgan - Severe damage to crops.

2) July 19 - Heavy rain and hail - Fort Morgan, Brush, Hillrose - heavy crop damage.

3) July 21 - Hail - South Park.

4) July 22 - Heavy hail - Greeley to Fort Morgan - quite a bit standing on Highway 34 in afternoon.

5) July 24 - Heavy hail - Brighton, Masters, Wiggins, Byers - Considerable crop damage.

6) September 9 - Heavy rain and hail, up to 8" in some areas - Brush area - San Arroyo Reservoir filled and started causing problems; Bijou Creek flooded.

7) October 11 - 12" to 13" snow - Sterling, Brush, Fort Morgan - quite a bit of tree damage.

The months of June and August were quite dry in Division I, but surface water was available to fulfill crop needs. The remaining months of the irrigation season had more than adequate precipitation as shown in the accompanying table.

III. WATER SUPPLY

B. PRECIPITATION

STATION	APRIL PRECIP.	APRIL % OF NORMAL	MAY PRECIP.	MAY % OF NORMAL	JUNE PRECIP.	JUNE % OF NORMAL	JULY PRECIP.	JULY % OF NORMAL	AUGUST PRECIP.	AUGUST % OF NORMAL	SEPTEMBER PRECIP.	SEPTEMBER % OF NORMAL	% NORMAL FOR WATER YR 10-1	% NORMAL FOR WATER YR 9-30
BOULDER	4.42	244	4.88	155	1.75	87	1.14	58	0.32	25	2.31			
CHEESMAN	4.34	293	5.36	267	0.74	56	1.64	62	0.38	16	1.31	97		135
CHEYENNE WELLS	0.65	61	2.80		0.87		2.33	75	0.56		4.74			
DENVER WB AP	3.73	242	5.06	187	0.20	12	2.47	115	1.28	108	2.85	228		145
DENVER WB CITY	2.83	230	5.10		0.25		2.47	131	0.36		2.04			
FT. COLLINS	2.72	174	1.63	56	0.23	12	2.56	172	0.18	14	1.73	142		87
FT. MORGAN	2.32	244	2.28	86	1.22	52	1.96	81	0.56	41	4.67			
GREELEY	2.66	244	1.92		0.43	23	1.60	120	0.12	9	2.16	164		
KASSLER	4.21	231	7.96		0.39	22	1.57	87	0.10	7	3.12	205		
LAKEWOOD	3.64	226	5.88	224	2.27	132	3.82	212	0.92	72	2.01	153		184
LONGMONT	4.76	366	4.01	155	0.06	4	0.57	42	0.18		2.49	208		
PARKER	1.19	117	6.62	293	0.14		0.85	43	1.01	65	3.46	336		
RED FEATHER LAKE	2.96	182	2.07	82	0.16	8	4.28	179	0.97	45	2.50			
STERLING	2.12	206	2.17	73	2.17	77	2.57	81	0.29		3.88	373		
WRAY	2.10	159	1.58	56	1.96	56	8.13	275	0.47	19	3.33	243		137

* AVERAGES ARE FOR THE 15 YEAR PERIOD 1953 - 1967 AND ARE COMPUTED BY THE KANSAS CITY RIVER FORECAST CENTER

III. WATER SUPPLY

B. HAIL SUPPRESSION

The National Hail Research Experiment with headquarters at NCAR (National Center for Atmospheric Research) Boulder, Colorado continues.

The Hail Suppression Research is of special interest. The method proposed for suppressing the occurrence of large damaging hailstones is based on a hypothesis which, though reasonable, has little direct experimental evidence at the present time to support it.

This hypothesis is that the average size of the hailstones produced by the storm depends upon the concentration of freezing nuclei in the air feeding the storm. When these are comparatively numerous, the ensuing competition for the available supercooled water ensures the production of a large number of small hailstones. When the freezing nucleus population is small, there results a small number of large hailstones. This suggests that the way to achieve the suppression of large hailstones is to augment the naturally occurring freezing nuclei by the introduction of artificial nuclei, such as silver iodide. This procedure has been followed in the 1972 and 1973 summer field operations. There have been a total of twenty-eight (28) days on which samples have been collected over these two seasons.

It is felt that the knowledge and understanding of the microphysics and dynamics of thunderstorms will be advanced, as a result of the large amount of new observatorial data being gathered. It is still too early, however, to discuss the efficiency of cloud seeding for decreasing damages caused by hail, according to NHRE personnel.

III. WATER SUPPLY

C. FLOODS

The first flood of the year resulted from the failure of the Latham Reservoir Dam on April 12th. This flood did considerable damage to the town of Kersey and surrounding farm land. It was declared a national disaster by the President. This made those who suffured damage eligible for small loans and grants which were made available through the OEP (Office of Economic Preparedness). For more information on the dam failure see section VI A and XI B of this report.

On the 6th and 7th days of May, areas tributary to the South Platte experienced very heavy precipitation. The flooding which followed this rainfall was quite general throughout Division I. The mountains west of Denver also received heavy rain, which brought down much of the low lying snow. Extensive damage was experienced along the main stem of the South Platte. A number of bridges, ditch diversion works and small dams were victims of the high water. Substantial crop damage was also sustained in the flood plain of the South Platte and its tributaries.

The following specific instances of dam failures or damage resulting from flood water were brought to the attention of Division personnel during the period of approximately May 6-10:

1) Small dam on West Creek above Deckers failed.

2) Bijou Canal and Empire Inlet damaged by waters in Lost Creek (for most part no clearly defined channel exists in Lower Lost Creek) along with a large amount of farm land.

3) Ireland No. 5 and several small dams on Box-elder Creek failed and ran down into Klug Reservoir. Klug held nicely, passing a very high flow through the spillway.

4) Horse Creek Reservoir Dam appeared to be in danger for a while, but held.

5) South Platte gaging stations washed out at Fort Lupton and Kersey.

6) Large number of structures damaged along South Platte in Weld County. Damage estimate tabulation included in Table I.

Peak and annual flows are shown for some stations in Table II.

Table III shows the period above flood stage for some South Platte stations.

The South Platte remained at or near flood stage from May 6th until about June 20th. These high flows resulted in record high peak and annual flow figures at Kersey. The peak was 34,500 cubic feet per second and occurred about 4 a.m. on May 8th. This compared with a previous record peak of 31,000 cubic feet per second on June 7, 1921. The total flow this year (October 1, 1972-September 30, 1973) was 1,585,000 acre feet and compared with a total flow of 1,203,400 acre feet in the 1921 water year. A number of other stations in Division I also had record peaks and flows this year.

Flood water from Lost Creek and Bijou Creek hit the South Platte well ahead of the Denver crest. This resulted in considerably less flooding below the mouth of the Bijou than may have been true otherwise.

San Arroya Reservoir (aka Rosener or Williams and McCreery) which is normally dry was discovered with several thousand acre feet following heavy precipitation on September 8th. See November 1st Water News for more details. (Section XI A)

TABLE I

DAMAGE ESTIMATES FOR

DITCH AND IRRIGATION COMPANIES IN

WELD COUNTY

COUNTY	ESTIMATE	PERSON TO CALL
Bijou Irrigation Co.	$ 22,000.00	Jim Pugh 867-2222
Empire (Part of Bijou)	25,000.00	Jim Pugh 867-2222
Jackson Lake Intake	80,000.00	Cecil Osborne 867-6586
Illinois Ditch Co.	5,000.00	George Allard 353-6187
Riverside Irrigation District	50,000.00	Cecil Osborne 867-6586
Weldon Valley Ditch Co.	25,000.00	Cecil Osborne 867-6586
Farmer's Independent Ditch Co.	5,000.00	Berle Atkinson 737-2307
Farmer's Reservoir and Irrigation Co.	20,000.00	Mel Sarchet 536-4671
Godfrey Ditch Company	9,000.00	Jerome Loeffler 284-6430
Henrylyn Irrigation Dist.	60,000.00	Ralph Rouse 536-4702
Lower Latham Ditch Company	10,000.00	Victor Klein 352-5727
Lupton Bottom Ditch Co.	75,000.00*	Ray Sarchet 785-2347
Meadow Island #1 Irrigation Co.	10,000.00	William Mayer 785-2356
Meadow Island #2 Irrigation Co.	90,000.00	Johnnie Ulrich 785-2314
Platte Valley Irrigation Co.	20,000.00	Delbert Shable 284-5486
Union Ditch Co.	50,000.00	John Sitzman 353-0307
Western Mutual Ditch Co.	15,000.00	Edward Fritzler 737-2256
Delta Ditch Co.	75,000.00	Robert Davis 353-0701
Platteville Irrigation and Milling Company	40,000.00	John Kunzman 857-2135
Beeman Ditch	200,000.00	Ben Houston 785-2408
TOTAL ESTIMATED DAMAGE	$886,000.00	

*Estimate made from aerial observation

III. TABLE II

C. FLOODS (CONTINUED)

The following tabulation shows the annual flows at the major control gaging stations in the Division and the highest daily flow during that period. Note that some of the flows are for the Water Year, October 1 - September 30, and others are for the Irrigation Year, November 1 - October 31. Most figures are preliminary reports and subject to revision.

STATION	WATER YEAR OCT. 1,1972 to OCT. 1,1973	IRRIGATION YEAR NOV. 1,1972 to NOV. 1,1973	INSTANTANEOUS PEAK FLOWS DATE	C.F.S.
South Platte below Cheesman	201,900		6-27	1,450
North Fork at South Platte	179,000		5-22	1,540
South Platte at South Platte	468,900		5-22	3,450
Bear Creek at Morrison	73,250		5-6	1,360
Bear Creek at Sheridan	96,160		5-6	3,750
South Platte at Denver	590,800		5-7	18,500
Clear Creek at Golden	193,500		6-14	2,210
Clear Creek at Derby	115,000		5-6	4,700
South Platte at Henderson	766,700		5-6	24,000
Middle Boulder Creek at Ordell				
South Boulder Creek at Eldorado	42,170		5-6	430
Coal Creek at Plainview	7,480		5-6	338
St. Vrain Creek at Lyons	103,900	104,000	6-11	1,500
St. Vrain Creek at Platteville	230,300	233,500	5-7	5,620
Big Thompson at Canyon	72,420	72,030	6-27	972
Big Thompson at La Salle	109,200	111,800	5-7	1,600
Cache la Poudre at Canyon	322,200	323,500	6-14	3,780
Cache la Poudre at Greeley	156,400	162,300	5-23	1,971
South Platte at Kersey	1,585,000	1,626,000	5-8	34,500
South Platte at Balsac	1,026,000	1,085,000	5-9	20,470
South Platte at Julesburg	1,069,000	1,149,000	5-11	22,040

TABLE III

PERIOD ABOVE FLOOD STAGE SOUTH PLATTE RIVER

LOCATION	FLOOD STAGE*	PERIOD ABOVE FLOOD STAGE				
		TIME	DATE		TIME	DATE
Kersey	9.00	1230	May 7 '73	to		May 16 '73
			May 22 '73	to		May 25 '73
			June 15 '73	to		June 17 '73
Weldona	8.00	1630	May 7 '73	to	2400	May 28 '73
		0500	June 15 '73	to	2000	June 17 '73
Balzac	9.00	1400	May 7 '73	to	1800	May 11 '73
Julesburg	8.00	0100	May 10 '73	to	0800	May 29 '73

*Flood stage G.H. provided by Marshall Grace, U. S. Weather Service

III. WATER SUPPLY

D. GENERAL COMMENTS

The water supply was good throughout the irrigation season this year. There was some call for water from Districts 1 and 64 in July, but that demand was pulled off for the season on July 21st. After that there was a little demand from Districts 2 and 8, but generally for only short periods of time. As a result of the light demand, water pumped by wells whose effect reached the stream this year did not injure the stream significantly.

Another indication of the adequacy of the water supply was the light demand on Colorado Big Thompson Project water. The Northern Colorado Water Conservancy District authorized 70% delivery on CBT water this year. Of that amount, only 76% was actually called for and delivered.

Carry-over storage in area reservoirs was considerably above normal this fall. This is also an indication of an adequate water supply this season, however, this is a blessing that causes some concern. A fairly substantial number of the reservoirs in this area were designed for summer storage only. When a large amount of water is kept in them all year it tends to saturate and weaken the dikes.

The amount of precipitation and snow pack are covered elsewhere in this report.

D. GENERAL

A water budget is herewith submitted for the 1973 irrigation year. Due to the number of variables involved and the unavailability of complete and accurate data, the figures herein shown are, in many instances, estimates or approximations at best. Figures are omitted if there is no reasonable basis for making an estimate.

WATER BUDGET

DIST.	INFLOW INTO DISTRICT	YIELD OF DRAINAGE AREA	TOTAL SUPPLY	IRRIGATION DIVERSIONS	ESTIMATED DEPLETION BY IRRIGATION	MUNICIPAL DIVERSIONS	ESTIMATED DEPLETION BY MUNICIPALITIES	OTHER DIVERSIONS	ESTIMATED OTHER DEPLETIONS	RUNOFF @ STATELINE OR MOUTH
1										
2										
3										
4										
5										
6										
7										
8-80										
9										
23										
48										
49										
64										
65										

DIVERSIONS USED FOR BUDGET PURPOSES INCLUDE:

1) Diversions from Stream Sources
2) Diversions from TM Sources
3) Diversions from Storage Sources
4) Diversions from Project Sources
5) Releases from in system facilities

III. WATER SUPPLY

E. UNDERGROUND WATER

The administration of tributary alluvial wells continues to be a problem that absorbs much of the time and energy of Division I and state office personnel. It is also a subject of concern to Division I well owners. Proceedings during June, October, and November, 1973 in the Greeley Water Court concerning this matter have not, as yet, served to answer the two major questions in this dilemma. These questions are:

1) How can senior surface divertors be protected against the stream depletions caused by well pumping?

2) How can the economy that has built up as a result of the digging of wells be protected?

It is the feeling of the Division of Water Resources that this conflict can only be resolved by some method of water management. This can only happen if all parties to the conflict work together toward its resolution.

Work continues on a district by district well inventory in the Ground Water Investigations Section. The inventory for Water District No. 6 has been completed. Work on Districts 5 and 7 is now in progress, with Districts 3 and 4 to follow in the next year or two. This inventory shows the formation from which water is taken and the use to which it is put. Work also continues in the Investigation Section on a study of the main stem of the South Platte. This inventory began at the state line near Julesburg and at this point in time has worked up to Morgan County. These studies will help us to determine the total amount of water in storage in the various aquifers.

[redacted]LY

F.

TRANSMOUNTAIN DIVERSIONS

OCTOBER 1, 1972 - SEPTEMBER 30, 1973

DIVERTING STRUCTURE	SOURCE	SOURCE DISTRICT	RECEIVING DISTRICT	CONTROLLING OWNERSHIP	1ST DAY WATER DIVERTED	LAST DAY WATER DIVERTED	NO. OF DAYS WATER DIVERTED	AVG.AMT. DIVERTED C.F.S.	TOTAL AMOUNT DIVERTED AC.FT.
Wilson Supply Ditch	Sand & Deadman Creek	48	3	Divide Canal & Res. Co.	June 8	July 27	43	16	1380
Deadman Ditch	Deadman Creek	48	3	Divide Canal & Res. Co.	June 20	July 27	38	6.2	471
(Incl. in Wilson Supply)									
Bob Creek Ditch	Nunn Creek	48	3	City of Greeley					0
Columbine Ditch	Deadman Creek	48	3	City of Greeley					0
Laramie Poudre Tunnel	Laramie River	48	3	Water Supply & Storage	May 30	Sept 2	83	101	16690
Skyline Ditch	West Fork Laramie River	48	3	Water Supply & Storage	June 25	July 24	30	42	2680
Cameron Pass Ditch	Michigan River	47	3	Water Supply & Storage	June 23	Aug 6	45	4.6	407
Michigan Ditch	Michigan River	47	3	North Poudre Irr. Co.	June 4	Sept 6	82	12	1890
Grand River Ditch	Colorado River	51	3	Water Supply & Storage	June 2	Aug 24	69	108	14760
Eureka	Colorado River	51	4	City of Loveland		NO REPORT-RECORDER NOT INSTALLED			0
Alva B. Adams Tunnel	Colorado River	51	4	U.S.B.R.-N.C.C.D.	Oct 1	Sept 30	343	339	230700
Moffat Tunnel	Fraser River	51	6	City of Denver	Oct 1	Sept 30	345	49	33170
Jones Pass Tunnel	Williams Fork	51	6	City of Denver	Oct 1	May 8	220	2.2	970
AKA August P. Gumlick	(Incl. in Moffat Tunnel)								
or Williams Fork Tunnel									
Berthoud Pass Ditch	Fraser River	51	7	Farmers Res. & Highline	June 18	Sept 9	87	4.5	784
Vidler Tunnel	Montezuma Creek	36	7	Hebert Young	July 24	Aug 10	18	1.6	55
Roberts Tunnel	Blue River	36	23-8	City of Denver	Dec 7	Jan 21	52	22	2250
					Apr 11	Apr 16			0
Boreas Pass Ditch	Indiana Creek	36	23	City of Aurora					0
Hoosier Pass Tunnel	Blue River	36	23	City of Colo. Springs	May 21	Sept 30	123	23	5710
Aurora Homestake	Homestake Creek	37	23	City of Aurora	Nov 16	Nov 25	109	30	6480
					Jan 3	Jan 18			
					Feb 23	Mar 20			
					July 6	Sept 30			

ANNUAL REPORT
COLORADO-BIG THOMPSON PROJECT
1973

Water supply outlook was increased with above average precipitation during January in the mountain tributaries.

Carry-over reservoir storage was above normal and early forecasts indicated above average run-off.

Lower Latham Reservoir failed April 12, 1973. The following day, surveys were conducted three to four miles below the failure. The results of these surveys indicated a peak flow of 12,000 to 13,000 cubic feet per second at that point.

Normal or better runoff was experienced at all stations resulting in subnormal irrigation deliveries and much surplus water.

STREAM FLOWS
(1973 Water Year)

STATION		
St. Vrain at Lyons	103,900.	acre-ft.
Big Thompson at Canyon	*72,420.	
Cache La Poudre at Canyon	322,250.	
St. Vrain at Mouth	230,300.	
Big Thompson at Mouth	72,420.	
South Platte at Kersey	1,585,000.	
South Platte at Balzac	1,026,000.	
South Platte at Julesburg	1,069,000.	

Above figures are preliminary and subject to revision.

*Big Thompson "Skim" and Dille Tunnel diverted above station and returned to river below station totalled 43,590 acre feet.

ACTIVE PROJECT STORAGE

Western Slope	Nov. 1, 1972	Nov. 1, 1973	Diff.
Willow Creek	8,308.	7,631.	-677.
Granby	417,363.	449,640.	+32277.
Total Acre Feet	425,671.	457,271.	+31600.
Eastern Slope			
Carter	48,721.	51,367.	+2,646.
Horsetooth	51,402.	86,716.	+35,314.
Boulder	2,890.	6,746.	+3,856.
Total Acre Feet	103,013.	144,829.	+41,816.

DISTRIBUTION OF PROJECT WATER

Water District	Carrier	Total Acre Feet
1	Hansen Feeder Canal via Big Thompson	3,381.0
3	Hansen Supply Canal via Cache La Poudre	63,300.2
	Direct Delivery	13,070.0
4	Hansen Feeder Canal via Big Thompson	38,092.7
	St. Vrain Supply Canal via Little Thompson	8,083.2
	Direct Delivery	5,197.8
5	St. Vrain Supply Canal via St. Vrain	14,588.1
	Direct Delivery	11,743.5
6	Boulder Cr. Supply Canal via Boulder Cr.	9,570.2
	Direct Delivery	875.1
	Total to all districts, including replacement water.	167,901.8

Quota water declared available - 70% or 217,000 acre feet
Replacement water - 3,487.4 acre feet

COMPARISON BETWEEN ORDERED AND ACTUAL DELIVERIES

Stream	Ordered	Delivered	Difference
Cache La Poudre	63,300.2	63,941.7	+641.5
Big Thompson	41,473.7	*41,482.0	+8.3
Little Thompson	8,083.2	8,127.2	+44.0
St. Vrain Creek	14,550.2	14,930.0	+379.8
Boulder Creek	9,570.2	9,843.2	+273.0
Turnouts	30,908.3	31,006.5	+98.2
Total Acre Feet	167,885.8	169,330.6	+1,444.8

*Deliveries less Big Thompson "Skim", Dille Tunnel diversions during 1973 irrigation season.

PROJECT GAIN AND LOSS

ESTES PARK AREA

Inflow	Nov. 1, 1972 - Nov. 1, 1973	Total Acre Feet
Alva B. Adams Tunnel	218,507.	
Wind River	1,426.	
Big Thompson River	99,281.	
Fish Creek	2,665.	
Storage Nov. 1, 1972	2,269.	
		324,148

Outflow	Nov. 1, 1972 - Nov. 1, 1973	Total Acre Feet
Estes Park Water District	165.	
Town of Estes Park	396.	
Estes-Foothills Canal	263,827.	
Big Thompson River	60,411.	
Storage Nov. 1, 1973	2,407.	
		327,206.

Apparent Gain 3,058. acre feet

CARTER LAKE AREA

Inflow

Estes-Foothills Canal	263,827.	
Storage Pinewood, Flatiron	2,002.	
Storage Carter Nov. 1, 1972	48,721.	
Dille Tunnel	28,385.	
		342.935.

Outflow

Hansen Feeder Canal	121,785.	
Big Thompson River	113,602.	
St. Vrain Supply Canal	46,728.	
Little Thompson Water District	2,493.	
Storage Carter Nov. 1, 1973	51,367.	
Storage Pinewood, Flatiron	1,980.	
Measured Seeps	1,834.	
		339.789.

Apparent Loss 3,146. acre feet

HORSETOOTH AREA

Inflow

Hansen Feeder Canal	119,542.	
Storage Nov. 1, 1972	51,402.	
		170,944.

Outflow

Hansen Supply Canal	89,136.	
Direct Delivery	13,070.	
Measured Seeps	1,113.	
Storage Nov. 1, 1973	87,016.	
		190,335.

Apparent Gain 19,391. acre feet

BOULDER AREA

Inflow

Boulder Feeder Canal	13,450.	
Storage Nov. 1, 1972	2,890.	
		16,340

Outflow

Boulder Cr. Supply Canal	13,630.	
Dry Cr. Replacement	463.	
Storage Nov. 1, 1973	6,746.	
		20,839.

Apparent Gain 4,499 acre feet

Summations

Estes Park Area	+3,058.
Carter Lake Area	-3,146.
Horsetooth Area	+19,391.
Boulder Area	+4,499.

Total Apparent Project Gain 23,802. acre feet

OPERATION "SKIM"

Computations are based on measured sum of Big Thompson River at Estes Park, Fish Creek and Wind River to Bureau system minus Big Thompson near Estes Park.

Big Thompson "Skim" extended from May 8, 1973 until September 19, 1973.

May	June	July	August	September	Total CFS	Total Ac. Ft.
6,057	10,828	2,305	2,481	307	21,978	43,590

RIVER OPERATION

Since the 1970 irrigation season, the operating criteria on the Big Thompson River has remained virtually unchanged. This mode of water management is of great benefit to the water users, water administrators and power production. The success of this operation is primarily due to the efforts and cooperation between the bureau personnel and state representatives.

AREA PRECIPITATION

Estes Park	15.49 inches	Ft. Collins	12.28 inches
Longmont	17.16 inches	Greeley	15.11 inches
Waterdale	15.74 inches		

STREAM FLOW MEASUREMENTS - 1973 WATER YEAR
DIVISION OFFICE - GREELEY

Hydrographer	Streams	Canals	Mileage
T. S. Bell	149	11	11,850
R. S. Liesman	195	24	16,887
G. E. Sievers	39	12	2,376
D. E. Thompson	68	44	8,355
Totals	451	91	37,086

On July 31, 1973, Dean Thompson retired after twenty-one years of service with the State. All this time was served in Division I as a hydrographer. During his twenty-one years Dean made over six thousand current meter measurements.

Prior to working for the State, Dean had worked with the Bureau of Reclamation during the construction of the Big Thompson Project. With this background and experience, few men have understood the operation of the Big Thompson Project as he does.

George Sievers, our summer help for the past three years, was put into service as a hydrographer until school started in the fall.

It is anticipated that the hydrographic section will be at full strength when Bob Cooper transfers from the Denver Office in October.

Respectfully submitted,

Raymond S. Liesman

Raymond S. Liesman
Water Resources Engineer

III.

G. RESERVOIR STORAGE DISTRICT NO. 1

NAME	SOURCE	AMOUNT - A.F. 11-1-72	5-1-73	10-31-73
Empire	South Platte	8205	33992	3554
Riverside	South Platte	25523	59925	9672
Jackson Lake	South Platte	21703	34694	14580
Bijou No. 2	South Platte	150	230	3150
Klug No. 1	Box Elder	0	633	633
Heart	Little Crow	0	291	150
Sidwell Reservoir #1	Lone Tree Creek		21	
Sidwell Reservoir #2	Lone Tree Creek		61	
Snyder	South Platte	300	ESTIMATE	
	TOTAL	55881	129847	31739

III.

G. RESERVOIR STORAGE DISTRICT NO. 2

NAME	SOURCE	AMOUNT - A.F. 11-1-72	5-1-73	10-31-73
Barr-Oasis	South Platte	12004	27686	20110
Behrns	South Platte	17	40	20
Beulah	South Platte	0	0	0
Bowles No. 1	South Platte	6	0	5
Bowles No. 2	South Platte	25	20	45
Brantner No. 2	Brantner Gulch	11	11	11
Carlin	South Platte	0	0	0
Church Lower Lake	Dry Creek	120	120	120
Coal Ridge (Sandhill)	Little Dry Creek	564	410	565
Fulton Waste	South Platte	420	400	262
German No. 2	Big Dry Creek	46	55	72
German No. 3	Big Dry Creek	1	3	2
German No. 4	Big Dry Creek	18	45	30
German No. 6	Big Dry Creek	21	16	12
German No. 8	Big Dry Creek	48	54	54
German No. 9	Big Dry Creek	16	18	18
German No. 12	Big Dry Creek	80	92	88
Great Western	Clear Creek	2247	2417	2686
H. A. Smith	South Platte	20	20	20
Henry	South Platte	0	0	0
Horse Creek	South Platte	1641	14010	3234
Ireland No. 1	South Platte	110	118	0
Ireland No. 5	South Platte	51	80	0
J. B. Smith	Todd Creek	100	135	140
Karsh	Big Dry Creek	3	10	3
L. A. Dore	Seepage	384	332	374
Loloff	South Platte	94	145	145
Lord	South Platte	84	737	268
Lower Latham	South Platte	4749	34	0
Marshall	Brantner Gulch	32	32	32
Mathison	Big Dry Creek	15	9	10
Maul	First Creek	33	33	25
Meek No. 1	South Platte	18	10	25
Meek No. 2	South Platte	10	0	5
Milton	South Platte	13284	18122	3113
Mose Davis Lake No. 2	South Platte	110	40	40
North Starr	Big Dry Creek	60	90	110
Olds	South Platte	0	0	0
Parson-Holmes	Second Creek	0	0	0
Prospect	South Platte	995	5610	2120
Standley - Kinnear	Clear Creek	16167	31049	24617
Thompson	Big Dry Creek	200	200	200
	TOTAL	53804	102203	58581

III.

G. RESERVOIR STORAGE DISTRICT NO. 3

NAME	SOURCE	AMOUNT - A.F. 11-1-72	5-1-73	10-31-73
Barnes Meadow	Barnes Meadow	0	0	1232
Big Beaver	Big Beaver Creek	0	0	0
Black Hollow	Cache la Poudre	4171	4501	4376
Cache la Poudre	Cache la Poudre	5455	9342	6160
Chambers	Wright, Trap & Fall Cks	2192	4501	1991
Clarks Lake	N Fk Cache la Poudre	690	438	0
Claymore	Cache la Poudre	752	840	684
Cobb	Cache la Poudre	21000	20840	19450
Comanche	Big Beaver Creek	229	430	172
Curtis	Cache la Poudre	838	814	886
Douglas	Cache la Poudre	7970	8120	6453
Dowdy	Pine Creek	784	784	818
Fossil Creek	Cache la Poudre	5837	10295	7307
Gray No. 3	Boxelder Creek	9	121	11
Halligan	N Fk Cache la Poudre	1014	6428	0
Horsetooth	Colo. Big Thompson	59726	129995	95723
Indian Creek	N Fk Cache la Poudre	1339	1169	1814
Joe Wright	Joe Wright Creek	0	0	0
Kluver	Cache la Poudre	810	880	907
Larimer & Weld	Cache la Poudre	4193	6420	3883
Lindenmeir	Cache la Poudre	485	467	495
Long Draw	Long Draw	1174	1412	0
Long Pond	Cache la Poudre	2890	3009	2814
North Gray	Boxelder Creek	132	248	135
N. Poudre No. 2	N Fk Cache la Poudre	2286	3231	2175
N. Poudre No. 3	N Fk Cache la Poudre	1403	2513	1033
N. Poudre No. 4	N Fk Cache la Poudre	332	332	810
N. Poudre No. 5	Cache la Poudre	3054	4133	4331
N. Poudre No. 6	Cache la Poudre	6224	6224	5013
N. Poudre No. 15	N Fk Cache la Poudre	4304	4304	4192
Park Creek	N Fk Cache la Poudre	4222	6194	7063
Peterson	Unnamed Creek	0	26	0
Portner	Fossil Creek	74	70	66
Res. No. 8	Cache la Poudre	7582	8070	8040
Res. No. 8 Annex	Cache la Poudre	2658	2783	2855
Richards	Cache la Poudre	698	719	188
Rocky Ridge	Cache la Poudre	3243	3711	3711
Seaman	N Fk Cache la Poudre	2460	4140	4315
Seeley		611	996	961
South Gray	Boxelder Creek	165	725	237
Twin Lake	Trib of Pennock	0	0	0
Warren Lake	Cache la Poudre	1084	900	1192

III.

G. RESERVOIR STORAGE - DISTRICT NO. 3 (Continued)

NAME	SOURCE	AMOUNT - A.F. 11-1-72	5-1-73	10-31-73
W S & S No. 3	Cache la Poudre	3821	3920	4140
W S & S No. 4	Cache la Poudre	610	704	0
Windsor Lake	Cache la Poudre	900	917	0
Windsor Reservoir	Cache la Poudre	9805	15701	8852
Wood Lake	Cache la Poudre	1432	2201	1946
Worster	Sheep Creek	71	500	91
	TOTAL	178729	284068	216522

III.

G. RESERVOIR STORAGE DISTRICT NO. 4

NAME	SOURCE	AMOUNT - A.F. 11-1-72	5-1-73	10-31-73
Boulder-Larimer (Ish)	Little Thompson	2425	3536	2204
Boyd Lake	Big Thompson	36351	37682	45619
Carter	Colo. Big Thompson	51399	106058	54673
Cemetary	Big Thompson	308	202	226
Donath	Big Thompson	437	1077	419
Fairport	Big Thompson	329	325	213
Geo. Rist (Buckingham)	Big Thompson	409	345	350
Hertha	Dry Creek	663	1074	559
Horseshoe	Big Thompson	7170	6274	4422
Lake Loveland	Big Thompson	12058	11354	11540
Lawn Lake	Roaring Fork	0	0	817
Lone Tree	Big Thompson	5994	8869	8139
Lon Hagler	Big Thompson	5109	5168	5128
Loveland Lake	Big Thompson	1502	1545	1310
Mariano	Big Thompson	3907	5691	2326
Oklahoma	Big Thompson	308	245	347
Rist Benson	Big Thompson	421	394	416
Ryan Gulch	Ryan Gulch	589	812	602
South Side	Big Thompson	448	548	411
Welsh	Big Thompson	5240	5322	6328
	TOTAL	135067	196521	146049

III.

G. RESERVOIR STORAGE DISTRICT NO. 5

NAME	SOURCE	AMOUNT - A.F. 11-1-72	5-1-73	10-31-73
Allen Lake	Left Hand	700		700
Akers & Tarr	St. Vrain	143	143	162
Arbucle No. 2	M. Fk. N. St. Vrain	966	966	966
Arbucle No. 4	S. Fk. N. St. Vrain	420	420	420
Ballinger	St. Vrain	10		10
Baxter	St. Vrain	170	170	182
Beaver Park	Beaver Creek	1330	1405	1246
Bellmire	St. Vrain	27	27	27
Button Rock	N. St. Vrain	13998	13998	12622
Calkins Lake	St. Vrain	125	125	
Clark	St. Vrain	80	80	78
Clennon	St. Vrain	80	80	120
Clover Basin	St. Vrain	570	570	570
Copeland	N. St. Vrain	70	70	20
Crystal	St. Vrain	110	110	136
Culver	St. Vrain	140	140	144
Divide	St. Vrain	245	245	288
Foothills	St. Vrain	2622	3604	1650
Genevieve	St. Vrain	74	74	66
Gold Lake	Left Hand	320	388	160
Green Lake	St. Vrain	100	120	110
Hartford	Middle St. Vrain	47	47	80
Hayden	St. Vrain	38	44	40
Hewitt	St. Vrain	32	32	34
Highland Lake	St. Vrain	300	300	455
Highland No. 1	St. Vrain	873	873	677
Highland No. 2	St. Vrain	2550	2754	2711
Highland No. 3	St. Vrain	1324	1320	801
Hill	St. Vrain	115	134	110
Holt	St. Vrain	120	120	148
Ide & Starbird No.1	St. Vrain	96	96	112
Ide & Starbird No.2	St. Vrain	38	38	56
Independent	St. Vrain	160	160	160
Isabelle	S. Fk. St. Vrain	NOT USED		
Kistler & Holliday	St. Vrain	5		5
Knouth	St. Vrain	UNDER CONSTRUCTION		
Lagerman	Left Hand	DRAINED		
Left Hand	Left Hand	176		184
Left Hand Park	Left Hand	990	990	1648
Left Hand Valley	Left Hand	2959	3783	1772
Little Gem	St. Vrain	54	54	62
Logan	St. Vrain	22	22	26
Marie	St. Vrain	400	400	400

III.

G. RESERVOIR STORAGE DISTRICT NO. 5 (Continued)

NAME	SOURCE	AMOUNT - A.F. 11-1-72	5-1-73	10-31-73
Marshall	St. Vrain	22	22	24
McCall	St. Vrain	475	475	196
McCaslin	St. Vrain	114	114	119
McIntosh	St. Vrain	1281	2202	1281
McKay	St. Vrain	42	42	46
Miantenoma	St. Vrain	110	110	130
Minnie	St. Vrain	58	58	54
Moeller	Walker Gulch	50	50	48
Mulligan	St. Vrain	44	44	46
Myron Isabell	St. Vrain	66	66	60
Oligarchy No. 1	St. Vrain	1545	1545	1452
Parmalee	St. Vrain	40	40	40
Pleasant Valley	St. Vrain	2550	2550	2428
Sanborn	St. Vrain	178	178	200
Silinde	St. Vrain	88	88	80
Supply No. 1	Big Cascade	296		296
Swede	Left Hand	136	136	198
Thomas	St. Vrain	545	545	545
Union	St. Vrain	10442	11500	12715
Walker	St. Vrain	52	52	73
Zimbeck	St. Vrain	40	40	56
	TOTAL	50773	53759	49245

III.

G. RESERVOIR STORAGE DISTRICT NO. 6

NAME	SOURCE	AMOUNT - A.F. 11-1-72	5-1-73	10-31-73
Albion	Albion Creek	1111	1111	1111
Ballinger Hollow		NOT ACTIVE		
Barker	M. Boulder Creek	9919	2831	9808
Baseline	S.& M. Boulder Creek	1583	4860	3271
Boulder	Big Thompson Project	3686	7257	8046
Davis No. 1 & 2	Middle Boulder Ck	74	217	96
*Elmwood	South Boulder Ck	40	3/4 Full	1/8 Full
Erie	South Boulder Ck	43	7/8 Full	Full
Glacier Summer	North Boulder Ck	189	189	228
Great Western	Clear & Coal Cks	2157	2213	2661
Green Lake No. 1	North Boulder Ck	197	Full	Full
Green Lake No. 2	North Boulder Ck	333	274	332
Green Lake No. 3	North Boulder Ck	285	Full	Full
Green Lake No. 4	North Boulder Ck		Full	Full
Green Lake No. 5	North Boulder Ck		Full	Full
Goose Lake	North Boulder Ck	1036	1036	1036
Gross	S. Boulder Ck & Moffat	22540	21112	30308
Haden	Middle Boulder Ck	240	452	376
Hillcrest	S. Bldr Ck & M Bldr Ck	1846	1834	1937
Island	North Boulder Ck	334	Full	Full
Jasper	Middle Boulder Ck	0	Full	Empty
Last Chance No. 1	Coal Creek	0	Full	1/8 Full
Last Chance No. 2	Coal Creek		Full	1/8 Full
Leggett	S & M Boulder Creeks	1331	1324	1399
Louisville	South Boulder Creek	97	165	103
Lower Boulder Ext.	Middle Boulder Ck	308	161	372
*Marfell Lake No.1	South Boulder Ck	26	Full	1/8 Full
*Marfell Lake No.2	South Boulder Ck	19	1/2 Full	0
Marshall	South Boulder Ck	1649	5697	4408
McKay	South Boulder Ck	181	555	304
Mesa	Middle Boulder Ck	150	3/4 Full	3/4 Full
Mesa Park	Middle Boulder Ck	95	3/4 Full	3/4 Full
Panama No. 1	Middle Boulder Creek	3267	4544	3426
*Prince No. 1	South Boulder Ck	60	Full	Full
*Prince No. 2	South Boulder Ck	61	Full	Full
Silver Lake	North Boulder Creek	3883	1149	3577
Six Mile	Middle Boulder Creek	793	1088	745
Sky Scraper	Middle Boulder Creek	146	146.4	146.4
Smart	Coal Creek	589	725	589
*Teller Lake No. 1	South Boulder Creek	0	3/4 Full	3/4 Full
*Teller Lake No. 5	South Boulder Creek	4	1/4 Full	1/8 Full
Thomas	South Boulder Creek	11	1/2 Full	1/8 Full
Valmont	S & M Boulder Creeks	6597	6509	6807
Waneka	South Boulder Creek	355	1/4 Full	1/2 Full
West Lake	South Boulder Creek	NOT IN USE		
	TOTAL	65235	65449.4	81086.4

*DECREED CAPACITY ASSUMED TO BE EQUAL TO ACTUAL CAPACITY

III.

G. RESERVOIR STORAGE DISTRICT NO. 7

NAME	SOURCE	AMOUNT - A.F. 11-1-72	5-1-73	10-31-73
Adams	Clear Creek	NO RESERVOIR		
Beardsley	Clear Creek		Full	Full
Beaver Brook No.1 & Enl.	N & S Beaver Brook			
Beaver Brook No. 2	N. Beaver Brook	NO RESERVOIR		
Beaver Brook No.3 & 4	N & S Beaver Brook			
Beaver Brook No. 3A	S Beaver Brook & Blue Creek			
Blackham Ponds	Clear Creek	NOT KNOWN		
Blackhawk		NO RECORD		
Braukman	Fall River	NOT BUILT		
Brewer	Clear Creek, Ralston Van Bibber, Leyden			
Bright View No. 1	Clear Creek		Full	Full
Bright View No. 2	Clear Creek		Full	Full
Broad	Clear Creek		Full	Empty
Broomfield	Clear Creek			
Brown	Clear Creek		Full	Full
Brunel		NO RECORD		
*Calkins H. D.	Clear Creek	NEAR FULL	Full	Empty
Campbell No. 1 (Long Lake)	Ralston Creek	879	1216	1160
Campbell No. 2	Ralston Creek			
*Church J.M. No. 1 & 2	Clear Creek		Full	Full
Church's Lower	Clear Creek			
Clear Reservoir	Leavenworth Ck			
Clover Knolls	Clear Creek	NO RESERVOIR		
Clover Knolls South	Clear Creek	NO RESERVOIR		
Cole	Clear Creek		Full	Full
Copeland	Clear Creek			
*Croke 7	Clear Creek		Full	Full
Croke 12	Clear Creek		Full	Full
Crosley & Westfield	Clear Creek	NO RESERVOIR		
*Crown Hill Cemetary	Clear Creek			
Currier No. 1	Clear Creek		Full	Full
Currier No. 2	Clear Creek			
Davy	Clear Creek		Full	Full
DeVinney		NO RECORD		
Dewey	Clear Creek			
Dierks No. 1 & 2	Clear Creek		Full	Full
Downing	Clear Creek			
Dumphy	Clear Creek		Full	Full
East	Clear Creek	Full	Full	Full
East Lake No. 1	Clear Creek	80% Full	Full	Full
East Lake No. 2	Clear Creek	NEARLY EMPTY	Full	Full
East Lake No. 3	Clear Creek	NEARLY EMPTY	Full	Full

*DECREED CAPACITY ASSUMED TO BE EQUAL TO ACTUAL CAPACITY

III.

G. RESERVOIR STORAGE DISTRICT NO. 7 (Continued)

NAME	SOURCE	AMOUNT - A.F. 11-1-72	5-1-73	10-31-73
Eppinger Reservoir	Clear Ck, Van Bibber, Ralston	NO RESERVOIR		
Erie	Clear Creek	0	Full	Full
Fall River Group of Reservoirs	Fall River			
Fitzgerald	Clear Creek			
Funk	Clear Creek	NO RESERVOIR		
Furrer	Clear Creek		Full	Full
Gangl	Clear Creek	NOT KNOWN		
Georgetown	Leavenworth Ck	NO RECORD		
Ginther Res. No. 1	Clear Creek		Full	Full
Ginther Res. No. 2	Clear Creek		Full	Full
Ginther Res. No.3,4,5	Clear Creek		Full	Full
Graves No. 1, 2, 3	Clear Creek	NOT KNOWN		
Green Lake	Leavenworth Ck	NO RECORD		
Guthrie No. 1	Clear Creek	NOT KNOWN		
Guthrie No. 2	Clear Creek	NOT KNOWN		
Hallack (East, North, South)	Clear Creek	TRANS.		
Hansen No. 1 & 2	Clear Creek		Full	Full
Harris	Clear Creek	NOT USED		
Hartley	Clear Creek		Full	Full
Hole in the Ground		NO RECORD		
Home No. 1	Clear Creek		Full	Full
Hyatt	Clear Creek	Full	Full	Full
Idaho Springs Res.No.1, 2 & 3 Enl.	Soda & Chicago Creeks	NO RECORD		
Johnson	Clear Creek		Full	Full
Joint	Clear Creek	NO RESERVOIR		
Kalsevic	Clear Creek		Full	Full
Kelley	Little Dry Ck			
Kingsbury	Clear Creek	NOT USED		
Koleski Helen	Clear Creek		Full	Full
Krosky	Clear Creek		Full	Full
Larson	Clear Creek	NO RESERVOIR		
Lee (Henry) North & South	Clear Creek	NOT KNOWN		
Leyden	Clear Creek	0	1152	0
Linscott	Clear Creek		Full	Full
Little Tynon	Clear Creek		Full	Full
Loch Lomond Group	Fall River		Full	0
Main	Clear Creek	NEAR FULL	Full	99% Full
Maple Grove		545.91	545.91	549.8
Marshall	Clear Creek		Full	Full

III.

G. RESERVOIR STORAGE DISTRICT NO. 7 (Continued)

NAME	SOURCE	AMOUNT - A.F. 11-1-72	5-1-73	10-31-73
Mary's Lake		NO RECORD		
Mayhem	Clear Ck & Seepage			
Missouri Lake				
Moir Res. & Enl.	Clear Creek	NOT KNOWN	Full	Full
Morgan No. 1	Clear Creek		Full	Full
Morgan No. 2	Clear Creek		Full	Full
Moxley	Clear Creek		Full	Full
*Myers No. 1, 2 & 3	Clear Creek		Full	Full
Nelson	Clear Creek		Full	Full
Newlander	Clear Creek	NO RECORD		
Nissen No. 2 & Enl.	Clear Creek			
Nissen No. 6	Clear Creek	NON EXISTENT		
*Oberon No. 1 & 2	Clear Creek		Full	Full
Ohio	Clear Creek		Full	Full
Patricia Lake		NO RECORD		
Pavlinic	Clear Creek	NO RESERVOIR		
Plaster	Clear Creek	NOT KNOWN		
Poitz & 1st Enl.	Clear Creek		Full	Full
Pomona No. 1 & 1st Enl.	Clear Creek			
Pomona No. 2 & 1st Enl.	Dry Creek			
Pomona No. 3	Clear Creek	NOT USED		
Ralston	Moffat via Gross	9917	8233	7135
Richards	Clear Creek		Full	Full
Robinson	Clear Creek	NO RESERVOIR		
*Savory Ponds	Clear Creek		Full	Full
School	Clear Creek	NO RESERVOIR		
Sea of the Storms		NO RECORD		
Sea of Tranquillity		NO RECORD		
Signal No. 1	Clear Creek	0	Full	Full
Signal No. 2	Clear Creek	0	Full	Full
Silver Lake	Silver Creek			Full
Smith J.B. (Horseshoe)	Clear Creek		Full	Full
Smith Reservoir	Clear Creek	Full	Full	96% Full
Soper No. 1,2,3 & 4	Clear Creek		Full	Full
Standley	Clear Creek	15232	28046	25116
St. Mary's Lake	Chesapeake			49
Stonehouse	Clear Creek	NO RESERVOIR		
Storm	Clear Creek	NOT USED		
Susan Lake		NO RECORD		
Talbot	Clear Creek		Full	Full
Timm	Clear Creek		Full	Full

*DECREED CAPACITY ASSUMED TO BE EQUAL TO ACTUAL CAPACITY

III.

G. RESERVOIR STORAGE DISTRICT NO. 7 (Continued)

NAME	SOURCE	AMOUNT - A.F. 11-1-72	5-1-73	10-31-73
Tom Frost	Clear Creek	NO RECORD		
Tucker	Ralston	181	254	254
Union No. 1 & 2	Clear Creek			
Vogel Ponds			Full	Full
Wadley No. 1	Clear Creek		Full	Full
Wadley No. 2	Clear Creek		Full	Full
Wadley No. 3	Clear Creek		Full	Full
Wahlberg		NO RECORD		
*Ward No. 1 & Enl.	Clear Creek			
Watts No. 1	Clear Creek		Full	Full
Watts Reservoir No. 2	Clear Creek		Full	Full
Webster Res. & Enl.	Clear Creek			Full
Wesley Chapel	Clear Ck, Ralston Van Bibber	NO RESERVOIR		
Westminister Orchards	Clear Creek	NO RESERVOIR		
Wiesel Reservoir	Clear Creek			Full
Zang Res. No. 1 & 2	Clear Creek	NO RESERVOIR		
	TOTAL	26754.91	38230.91	34263.82

*DECREED CAPACITY ASSUMED TO BE EQUAL TO ACTUAL CAPACITY

III.

G. RESERVOIR STORAGE DISTRICT NO. 8

NAME	SOURCE	AMOUNT - A.F. 11-1-72	5-1-73	10-31-73
Allis Reservoir	Carpenter Creek			
Aurora Rampart	South Platte	1068	1221	1261
Baird	Russellville Gulch			
Cherry Creek	Cherry Creek	12652	16472	14771
Derby	No. Colo. Highline (South Platte)			
*Fairview & Enl.	Deer Creek			
*Fairview No. 2	Deer Creek			
Greenwood	No. Colo. Highline (South Platte)			
Haystack	W. Branch W. Plum			
Lambert	Willow Creek			
Linhart No. 2	Seep & Palmer Gulch			
Lininger	Beaver Creek			
Mann	Deer Creek			
Marston	South Platte	14576	16771	17025
McLellen	South Platte	5148	4986	5470
Mitchell	Mitchell Gulch			
Platte Canon	South Platte	910	937	923
Tinker & Shaffer & Enl.	Gulch			
Wakeman & Enl.	Willow Creek			
Waucundah	Bear Springs Creek			
DISTRICT NO. 23-8				
Altura R. (Duck)	Geneva	0	111	37
Cheesman	S. Fk. South Platte	51118	60544	60723
Wellington	Buffalo Creek	1610	2094	3036
	TOTAL	87082	103136	103246

*DECREED CAPACITY ASSUMED TO BE EQUAL TO ACTUAL CAPACITY

III.

G. RESERVOIR STORAGE DISTRICT NO. 9

NAME	SOURCE	AMOUNT - A.F. 11-1-72	5-1-73	10-31-73
Bergen No. 1 (East)	Turkey Creek	40	125	100
Bergen No. 2 (West)	Turkey Creek	110	600	245
Bowles	Bear Creek	860	1760	1650
Carmody	Bear Creek	0	0	0
Deane	Turkey Creek	50	315	310
Grant A (West)	Bear Creek	50	50	60
Grant B (South)	Bear Creek	80	80	125
Grant C (East)	Bear Creek	45	45	60
Harriman	Bear Creek	150	0	365
Harwood	Turkey Creek	75	160	70
Henry Lake	Bear Creek	155	185	125
Johnston	Bear Creek	80	450	280
Kendrick	Bear Creek	70	75	70
Patrick	Bear Creek	750	950	785
Soda No. 1 (West)	Bear Creek	0	240	240
Soda No. 2 (East)	Bear Creek	450	1486	745
Tule No. 1 (Upper)	South Platte	60	80	85
Tule No. 2 (Lower)	South Platte	70	90	90
Ward	Bear Creek	800	700	800
	TOTAL	3895	7391	6205

III.

G. RESERVOIR STORAGE DISTRICT NO. 23

NAME	SOURCE	AMOUNT - A.F. 11-1-72	5-1-73	10-31-73
Antero	So. Fk. South Platte	16016	15878	15878
Eleven Mile	So. Fk. South Platte	90463	91049	98768
Jefferson	Jefferson Creek	Full*	Full	Full
Montgomery	Md. Fk. South Platte and Hoosier Tunnel	4118		3683
Tarryall	Tarryall Creek	Full	Full	Full
	TOTAL	110597	106927	118329

*No Staff

III.

G. RESERVOIR STORAGE DISTRICT NO. 64

NAME	SOURCE	AMOUNT - A.F. 11-1-72	5-1-73	10-31-73
Julesburg R.	South Platte	13854	23109	19794
North Sterling	South Platte	25260	70060	18240
Prewitt	South Platte	7570	28130	17140
	TOTAL	46684	121299	55174

IV. AGRICULTURE

CROP REPORTS

The following crop report statistics are final for the 1971 season and preliminary for the 1972 season. They are presented as published in the 1973 Colorado Agricultural Statistics Bulletin 1-73 by the Colorado Department of Agriculture, except for counties which do not lie entirely in Division I. The figures shown for these counties is equal to the fractional portion of the county that lies in Division I.

The 1973 yields were generally good for most crops. With prices at record highs for some crops, most farmers did very well this year.

BARLEY

1971 FINAL

COUNTY	PORTION OF COUNTY IN DIV.I (%)	IRRIGATED ACRES	IRRIGATED YIELD bu/acre	IRRIGATED VALUE x $1000	NON IRRIGATED ACRES	NON IRRIGATED YIELD bu/acre	NON IRRIGATED VALUE x $1000	TOTAL VALUE x $1000	1972 PRELIMINARY ACRES	1972 PRELIMINARY BUSHELS x 1000	1972 PRELIMINARY VALUE x $1000
ADAMS		4,200	55.6	277.0	23,300	35.2	972.2	1,249.2	8,500	345.7	518.6
ARAPAHOE					9,500	18.0	200.1	200.1	8,700	261.4	392.1
BOULDER		5,900	60.0	446.3	1,900	34.0	81.5	527.8	7,800	393.9	590.8
CHEYENNE	39	39	54.0	2.4	660	35.0	26.7	29.1	390	11.7	17.6
CLEAR CREEK											
DENVER											
DOUGLAS					1,500	20.0	35.4	35.4	1,200	67.0	100.5
ELBERT	69	140	58.0	10.1	4,000	29.0	146.2	156.3	2,485	64.7	97.0
GILPIN											
JEFFERSON		400	60.0	29.0	800	35.0	33.9	62.9	1,200	59.0	88.5
KIT CARSON		700	54.0	46.5	2,300	20.0	50.9	97.4	600	21.2	31.8
LARIMER		11,000	64.0	1,108.3	3,000	32.0	151.1	1,259.4	10,500	569.8	854.7
LINCOLN	26.5	80	57.0	5.5	292	28.0	10.0	15.5	130	5.2	7.8
LOGAN		1,200	63.0	88.4	7,100	42.0	348.9	437.3	6,000	180.8	271.2
MORGAN		3,000	69.0	250.5	6,100	31.0	228.8	479.3	8,000	408.5	612.8
PARK	87.4										
PHILLIPS		300	50.0	17.1	3,200	36.0	131.3	148.4	1,400	50.2	75.3
SEDGWICK					4,600	38.0	206.3	206.3	1,000	31.0	46.5
TELLER	47.5										
WASHINGTON		850	68.0	71.1	12,650	36.0	560.1	631.2	5,400	225.4	338.1
WELD		21,500	63.7	1,982.0	33,500	37.6	1,335.9	3,317.9	30,500	1,487.0	2,230.5
YUMA		300	60.0	20.4	1,500	35.0	60.0	80.4	600	20.4	30.6
TOTALS		49,609	836.3	4,354.6	115,902	541.8	4,579.3	8,933.9	94,405	4,202.9	6,304.4

CORN FOR GRAIN

1971 FINAL

COUNTY	PORTION OF COUNTY IN DIV. I (%)	IRRIGATED ACRES	IRRIGATED YIELD bu/acre	IRRIGATED VALUE x $1000	NON IRRIGATED ACRES	NON IRRIGATED YIELD bu/acre	NON IRRIGATED VALUE x $1000	TOTAL VALUE x $1000	1972 PRELIMINARY ACRES	1972 PRELIMINARY BUSHELS x 1000	1972 PRELIMINARY VALUE x $1000
ADAMS		7,200	75.0	631.8				631.8	6,500	679.9	809.1
ARAPAHOE		100	74.0	8.7	50	14.0	0.8	9.5	150	15.6	18.6
BOULDER		3,500	82.0	341.5				341.5	2,800	291.2	346.5
CHEYENNE	39	2,260	85.0	226.9				226.9	2,145	225.2	268.0
CLEAR CREEK											
DENVER											
DOUGLAS		250	66.0	19.3	100	14.0	1.6	20.9	300	24.6	29.3
ELBERT	69	105	66.0	8.0	450	48.0	9.5	17.5	550	17.6	20.9
GILPIN											
JEFFERSON		300	82.0	29.5				29.5	200	20.8	24.8
KIT CARSON		43,500	83.0	4224.6	1,000	22.0	25.7	4,250.3	50,000	5,797.0	6,898.4
LARIMER		6,700	76.2	607.4				607.4	5,000	585.0	696.2
LINCOLN	26.5	130	78.0	12.3				12.3	2,300	142.5	169.6
LOGAN		27,900	103.0	3,448.8	3,600	24.9	107.5	3,556.3	27,500	2,957.0	3,518.8
MORGAN		50,900	103.0	6,242.7	100	28.0	3.3	6,246.0	44,000	5,334.0	6,347.5
PARK	87.4										
PHILLIPS		13,500	92.0	1,453.2	6,000	32.0	224.6	1,677.8	21,000	2,071.0	2,464.5
SEDGWICK		11,200	105.0	1,433.2	2,800	27.0	92.1	1,525.3	14,000	1,582.0	1,882.6
TELLER	47.5										
WASHINGTON		9,200	103.0	1,108.7	800	23.0	21.5	1,130.2	10,000	1,154.0	1,373.3
WELD		76,500	87.0	7,988.2	1,500	26.0	46.8	8,035.0	56,500	6,504.0	7,739.8
YUMA		65,000	109.4	8,307.9	6,000	21.7	151.9	8,459.8	71,000	7,276.5	8,659.0
TOTALS		318,245	1469.6	36,092.7	22,400	280.6	685.3	36,778.0	313,945	34,677.9	41,266.9

1971 FINAL

PORTION OF COUNTY COUNTY IN DIV. I	POTATOES ACRES	POTATOES YIELD cwt/acre	POTATOES VALUE x $1000	CORN FOR SILAGE ACRES	CORN FOR SILAGE YIELD tons/acre	CORN FOR SILAGE VALUE x $1000	HAY ACRES	HAY TONS x 1000	HAY VALUE x $1000
ADAMS				7,100	16.0	987.2	19,700	55.7	1,643.0
ARAPAHOE				650	16.0	90.4	5,300	6.8	200.6
BOULDER				6,700	12.0	787.7	18,100	45.3	1,320.0
CHEYENNE 39				585	17.0	86.4	5,070	6.7	197.9
CLEAR CREEK									
DENVER									
DOUGLAS				500	17.0	73.9	8,900	16.1	475.0
ELBERT 69				3,105	10.0	269.9	16,560	18.2	537.4
GILPIN									
JEFFERSON				300	14.0	41.3	5,100	8.7	254.0
KIT CARSON				11,100	12.0	1,158.0	23,300	39.0	1,151.0
LARIMER	50	200	19.0	18,900	15.0	2,790.0	42,000	103.5	3,017.0
LINCOLN 26.5				848	6.0	44.2	4,640	4.2	122.7
LOGAN	20	200	7.6	13,900	18.0	2,463.0	56,500	134.5	3,921.0
MORGAN	4,450	240	2,029.2	14,000	18.0	2,480.0	29,500	82.2	2,396.0
PARK 87.4							17,920	15.6	474.5
PHILLIPS	100	280	53.5	1,400	21.0	255.5	15,500	26.9	793.5
SEDGWICK	80	225	34.2	6,200	18.0	1,098.0	14,300	35.7	1,041.0
TELLER 47.5				95	20.0	15.2	1,690	2.6	79.7
WASHINGTON				3,400	17.0	501.7	38,000	45.5	1,342.0
WELD	5,000	273	2,597.0	76,000	15.7	11,702.0	128,500	302.1	8,810.0
YUMA	600	280	319.0	9,700	20.0	1,652.5	38,000	85.5	2,522.0
TOTALS	10,300	1,698	5,059.5	174,483	282.7	26,496.9	488,580	1,034.8	30,298.3

DRY BEANS

1971 FINAL

COUNTY	PORTION OF COUNTY IN DIV.I (%)	IRRIGATED ACRES	IRRIGATED YIELD lbs./acre	IRRIGATED VALUE x $1000	NON IRRIGATED ACRES	NON IRRIGATED YIELD lbs./acre	NON IRRIGATED VALUE x $1000	TOTAL VALUE x $1000	1972 PRELIMINARY ACRES	1972 PRELIMINARY PRODUCTION cwt	1972 PRELIMINARY VALUE
ADAMS		800	1,500	112.2				112.2	600	6,600	54.8
ARAPAHOE											
BOULDER		1,400	2,180	283.7				283.7	1,400	29,400	244.0
CHEYENNE	39	78	1,480	10.8				10.8			
CLEAR CREEK											
DENVER											
DOUGLAS											
ELBERT	69				414	200	11.0	11.0	207	1,140	9.5
GILPIN											
JEFFERSON											
KIT CARSON		6,000	1,560	847.1	100	300	2.7	849.8	6,100	85,150	706.7
LARIMER		3,200	1,950	608.4				608.4	4,000	76,000	630.8
LINCOLN	26.5				80	250	1.7	1.7	26	360	3.0
LOGAN		3,900	1,960	733.4	100	600	5.8	739.2	5,000	85,000	705.5
MORGAN		7,500	2,030	1,462.0				1,462.0	8,900	176,500	1,465.0
PARK	87.4										
PHILLIPS		7,300	1,642	1,115.1	100	200	1.9	1,117.0	3,900	65,300	542.0
SEDGWICK		5,300	2,060	1,048.2	200	650	12.5	1,060.7	5,700	88,500	734.6
TELLER	47.5										
WASHINGTON		3,000	1,850	510.6	100	200	1.8	512.4	3,500	43,400	360.2
WELD		20,700	1,978	3,927.9	1,700	712	116.1	4,044.0	22,000	369,600	3,067.7
YUMA		2,600	2,100	502.0	400	325	12.0	514.0	1,900	29,300	243.2
TOTALS		61,778	22,290	11,161.4	3,194	3,437	165.5	11,326.9	63,233	1,056,250	8,767.0

OATS

1971 FINAL

PORTION OF COUNTY COUNTY IN DIV.I (%)	IRRIGATED ACRES	IRRIGATED YIELD bu/acre	IRRIGATED VALUE x $1000	NON IRRIGATED ACRES	NON IRRIGATED YIELD bu/acre	NON IRRIGATED VALUE x $1000	TOTAL VALUE x $1000
ADAMS	1,300	62.7		200	22.0		62.0
ARAPAHOE				400	21.0	6.0	6.0
BOULDER	1,300	55.0		100	16.0		53.0
CHEYENNE 39				39	15.0	1.1	1.1
CLEAR CREEK							
DENVER							
DOUGLAS				550	14.0	5.5	5.5
ELBERT 69	69	68.0		1,860	22.0		32.8
GILPIN							
JEFFERSON	250	80.0		150	26.0		17.0
KIT CARSON	50	76.0		450	14.0		7.3
LARIMER	950	60.0		350	18.0		45.6
LINCOLN 26.5				106	24.0		1.8
LOGAN	1,100	63.0		4,300	46.0		192.5
MORGAN	1,000	80.0		400	27.0		65.5
PARK 87.4							
PHILLIPS	300	81.0		2,200	35.0		73.0
SEDGWICK	100	64.0		4,100	46.0		140.4
TELLER 47.5							
WASHINGTON	100	81.0		1,100	26.0		26.4
WELD	3,300	60.5		7,600	22.1		264.3
YUMA	100	81.0		950	28.0		25.0
TOTALS	9,919	912.2		24,855	422.1	12.6	1019.2

SORGHUM FOR GRAIN

1971 FINAL

COUNTY	PORTION OF COUNTY IN DIV. I (%)	IRRIGATED ACRES	IRRIGATED YIELD bu/acre	IRRIGATED VALUE x $1000	NON IRRIGATED ACRES	NON IRRIGATED YIELD bu/acre	NON IRRIGATED VALUE x $1000	TOTAL VALUE x $1000	1972 PRELIMINARY ACRES	1972 PRELIMINARY BUSHELS x 1000	1972 PRELIMINARY VALUE x $1000
ADAMS		900	47.0	43.6				43.6	100	6.7	8.8
ARAPAHOE					400	12.0	5.0	5.0	1,300	87.1	115.0
BOULDER									100	6.8	9.0
CHEYENNE	39	78	46.0	6.3	3,080	22.0	120.0	126.3	3,700	129.6	171.1
CLEAR CREEK											
DENVER											
DOUGLAS					50	20.0	1.0	1.0			
ELBERT	69	34	46.0	1.7	276	20.0	5.8	7.5	760	12.4	16.4
GILPIN											
JEFFERSON											
KIT CARSON		2,000	59.0	121.5	4,000	29.0	119.5	241.0	5,500	251.0	331.3
LARIMER											
LINCOLN	26.5	146	46.0	7.2	1,285	17.0	23.4	30.6	1,855	45.6	60.2
LOGAN		150	62.0	9.0	800	25.0	18.6	27.6	1,050	35.0	46.2
MORGAN		500	30.0	15.0	500	20.0	10.0	25.0	1,050	25.2	33.3
PARK	87.4										
PHILLIPS		900	45.0	40.5	4,100	36.0	147.6	188.1	6,000	225.0	297.0
SEDGWICK		50	40.0	1.9	1,000	28.3	27.2	29.1	1,200	44.4	58.6
TELLER	47.5										
WASHINGTON		250	48.0	12.7	3,050	14.0	45.3	58.0	5,000	122.3	161.4
WELD		300	49.0	15.7	200	25.0	5.4	21.1	1,400	79.2	104.5
YUMA		5,100	51.8	269.4	26,400	21.3	572.7	842.1	26,500	1,205.9	1,591.8
TOTALS		10,408	569.8	544.5	45,141	289.6	1,101.5	1,646.0	55,515	2,276.2	3,004.6

SPRING WHEAT

1971 FINAL

	PORTION OF COUNTY IN DIV.I (%)	IRRIGATED ACRES	IRRIGATED YIELD bu/acre	IRRIGATED VALUE x $1000	NON IRRIGATED ACRES	NON IRRIGATED YIELD bu/acre	NON IRRIGATED VALUE x $1000	TOTAL VALUE x $1000
ADAMS		200	38.0	8.9	100	24.0	2.8	11.7
ARAPAHOE								
BOULDER		100	33.0	3.9	250	24.0	7.2	11.1
CHEYENNE	39				273	21.0	6.7	6.7
CLEAR CREEK								
DENVER								
DOUGLAS					70	17.0	1.4	1.4
ELBERT	69				138	14.0	2.3	2.3
GILPIN								
JEFFERSON								
KIT CARSON					850	19.0	19.0	19.0
LARIMER		100	33.0	3.8	500	25.0	14.2	18.0
LINCOLN	26.5				345	15.0	6.0	6.0
LOGAN					800	21.0	20.0	20.0
MORGAN		100	34.0	4.0				4.0
PARK	87.4							
PHILLIPS					330	23.0	8.9	8.9
SEDGWICK					1,350	22.0	35.1	35.1
TELLER	47.5							
WASHINGTON					200	20.0	4.7	4.7
WELD		200	40.0	9.6	2,600	22.0	69.0	78.6
YUMA					150	20.0	3.5	3.5
TOTALS		700	178.0	30.2	7,956	287.0	200.8	231.0

SUGAR BEETS

1971 FINAL

IRRIGATED

1972 PRELIMINARY

PORTION OF COUNTY COUNTY IN DIV.I	ACRES	YIELD tons/acre	VALUE x $1000	ACRES	TOTAL TONS x 1000	VALUE x $1000
ADAMS	2,200	16.8	577.1	2,500	41.3	660.8
ARAPAHOE						
BOULDER	2,500	16.8	656.0	2,400	39.6	633.6
CHEYENNE 39	250	16.8	66.5	350	5.3	84.8
CLEAR CREEK						
DENVER						
DOUGLAS						
ELBERT 69						
GILPIN						
JEFFERSON						
KIT CARSON	19,200	17.0	5,116.0	18,000	315.4	5,046.4
LARIMER	6,750	16.6	1,752.0	6,700	117.3	1,876.8
LINCOLN 26.5						
LOGAN	11,800	19.1	3,523.7	12,000	216.0	3,456.0
MORGAN	13,800	18.8	4,064.8	14,000	280.0	4,480.0
PARK 87.4						
PHILLIPS	4,750	13.4	993.1	7,400	129.5	2,072.0
SEDGWICK	2,950	19.3	891.5	2,900	58.0	928.0
TELLER 47.5						
WASHINGTON	1,900	18.7	556.3	2,300	36.8	588.8
WELD	45,300	18.7	13,235.0	48,000	901.1	14,417.6
YUMA	11,000	18.9	3,253.0	11,500	195.5	3,128.0
TOTALS	122,400	210.9	34,685.0	128,050	2,335.8	37,372.8

WINTER WHEAT

1971 FINAL

PORTION OF COUNTY COUNTY IN DIV. I	IRRIGATED ACRES	IRRIGATED YIELD bu/acre	IRRIGATED VALUE x $1000	NON IRRIGATED ACRES	NON IRRIGATED YIELD bu/acre	NON IRRIGATED VALUE x $1000	TOTAL VALUE x $1000	1972 PRELIMINARY ACRES	1972 PRELIMINARY BUSHELS x 1000	1972 PRELIMINARY VALUE x $1000
ADAMS	8,000	45.0	428.4	110,000	30.0	3,926.6	4,355.0	128,000	3,784.0	5,978.7
ARAPAHOE				59,500	27.0	1,896.0	1,896.0	61,000	1,647.0	2,602.2
BOULDER	1,800	47.0	102.4	5,200	40.0	251.6	354.0	6,300	195.5	308.9
CHEYENNE	1,560	54.0	98.6	50,310	28.0	1,648.2	1,746.8	46,800	786.2	1,242.2
CLEAR CREEK										
DENVER										
DOUGLAS	100	34.0	4.0	6,900	23.0	187.3	191.3	6,500	144.7	228.6
ELBERT	620	34.0	24.9	30,430	21.0	754.1	779.0	28,980	655.1	1,035.1
GILPIN										
JEFFERSON	500	47.0	29.1	3,800	27.6	130.2	159.3	3,200	122.0	192.8
KIT CARSON	4,600	38.0	204.5	180,400	24.0	5,066.5	5,271.0	202,000	4,516.7	7,136.4
LARIMER	800	47.0	44.7	13,200	30.0	471.3	516.0	13,000	415.0	655.7
LINCOLN	26	42.0	1.3	31,245	23.0	862.3	863.6	33,920	712.8	1,126.2
LOGAN	600	53.0	37.9	124,400	34.0	5,038.1	5,076.0	130,000	3,652.2	5,770.5
MORGAN	3,300	55.2	216.6	46,700	31.0	1,723.1	1,939.7	48.500	1,488.0	2,351.0
PARK	87	45.0	5.6				5.6	87	2.5	4.0
PHILLIPS	1,900	46.0	103.1	103,100	36.0	4,379.9	4,483.0	111,000	3,681.0	5,816.0
SEDGWICK				64,200	42.0	3,181.0	3,181.0	71,000	2,982.0	4,711.6
TELLER										
WASHINGTON	5,400	45.5	292.4	197,600	29.3	6,879.6	7,172.0	264,000	6,476.5	10,232.9
WELD	4,500	48.0	265.7	146,500	29.0	5,226.3	5,492.0	175,000	4,795.3	7,576.6
YUMA	1,800	46.0	99.3	110,200	31.0	4,094.7	4,194.0	101,000	2,257.9	3,567.5
TOTALS	35,593	726.7	1,958.5	1,283,685	505.9	45,716.8	47,675.3	1,430,287	38,314.4	60,536.9

V. COMPACTS AND COURT STIPULATIONS

A. COMPACTS

No serious problems were encountered this year in the administration of the Interstate Compacts.

The South Platte River Compact, Colorado and Nebraska being the signatory states, specifies that the flow of the river at the state line between April 1st and October 15th of each year shall be at least 120 cfs. Otherwise, diversions below the Washington-Morgan County line, junior to June 14, 1897, will be curtailed sufficiently to provide said 120 cfs or such portion thereof as might be produced by suspending those diversions.

The flow at Julesburg gage fell below the 120 cfs Compact figure for approximately 39 days in the period between July 11 and September 10. The balance of the water year saw unseasonable high flows at the state line. In fact, an annual record flow of 1,069,000 acre-feet was recorded at the Julesburg station.

The decree of the United States Supreme Court, in the case of Wyoming vs. Colorado, limits Colorado allocations to 49,375 acre-feet per calendar year. Of this amount 19,875 acre-feet is allocated to the Transmountain Users. The Meadowland Users are entitled to the remaining 29,500 acre-feet, with the restriction that not more than 1,800 acre-feet shall be diverted after July 31 in any calendar year. The Meadowland Users are also entitled to use any non-diverted Transmountain water.

As mentioned in the introductory statement, the diversions from the Laramie River within Colorado were 39,945 acre-feet or approximately 81 percent of the allowable diversion under the federal court order. Although plenty of water was available, the irrigation requirements were less than normal.

The Republican River Compact allocates water to the signatory states, Colorado, Kansas and Nebraska, on the basis of beneficial consumptive use. Colorado's total allocation of 54,100 acre-feet is broken down as follows:

North Fork of the Republican River Drainage Basin	10,000 ac.ft.
Arikaree River Drainage Basin	15,400 ac.ft.
South Fork of the Republican River Drainage Basin	25,400 ac.ft.
Beaver Creek Drainage Basin	3,300 ac.ft.

and IN addition, for beneficial consumptive use in Colorado annually, the entire water supply of the Frenchman Creek (River) Drainage Basin in Colorado and the Red Willow Creek Drainage Basin in Colorado.

The computed annual consumptive use in Colorado in the Republican River Basin for the 1972 Water Year was as follows:

North Fork of Republican River	6,400 ac.ft.
South Fork of Republican River	6,490 ac.ft.
Arikaree River	2,790 ac.ft.
Beaver Creek	0 ac.ft.

The above figures were taken from preliminary sheets being prepared for the Thirteenth Annual Report for the Republican River Compact Administration for the Year 1972 as approved in June 1973.

V.

B. COURT STIPULATIONS

The court action of greatest singular interest for the 1973 water year was, as in 1972, involved with the rules and regulations governing the use of underground water.

In November of 1972, C. J. Kuiper, State Engineer, published proposed rules and regulations upon the use of underground water for the South Platte River and its tributaries. These rules were to become effective February 19, 1973 and were quite similar to those proposed in 1972 with the exception of the allowable nonregulated pumping time. The '73 rules allowed those wells for which application for adjudication had been made prior to July 1, 1972 to be used without regulation 3/7 of the time and wells not meeting the application deadline were to be regulated full time. Wells which were able to make replacements to the river in the amount of the depletion resulting from pumping during the regulation periods were to be allowed uncurtailed pumping after their replacement plans were approved by the division engineer. Some 14 plans were approved to allow either full time operation or scheduled pumping to comply with the 4/7 curtailment requirement.

Before the January 31, 1973 deadline, nine protests to the rules and regulations were filed in the water court. The protestants represented a very broad cross section of water users and included cities, small towns, surface and underground water irrigators, commercial and industrial users. At a prehearing conference in the water court on February 12, the state moved that the rules and regulations be effective and administered as proposed and a court hearing be held as soon as possible. The protestants opposed this course of action and asked the court to postpone any such regulation until an opportunity had been afforded for a full court hearing. The water court thereupon ordered the imposition of the rules and regulations be held in abeyance pending a final decision of the court.

The hearing was set for two weeks starting June 4. The time in court during those two weeks was all spent in the presentation and cross examination of a portion of the state's testimony. At the end of the period the case was continued to October 29. Upon reconvening, the state continued its presentation for nearly five and one-half days at the end of which, counsel and the court agreed to again recess to give counsel for all parties an opportunity to try to arrive at some agreeable plan for the regulation of underground water. The court would then resume at such time as necessary to consider only those items upon which there was still contention. It is expected that court will reconvene in January for this purpose.

As a result of the protests and subsequent delays no wells were regulated during the 1973 season. Providentially, with the exceptionally ample supply of surface water, there were no apparent material injuries to surface appropriators caused by the wells. Although the concept of well regulation can be technically supported even in a year such as '73, as a matter of public acceptance of the action which is such a departure from historic practice, it would be easier to support regulation in a year when there was an obvious shortage in surface flows which prompted valid calls from senior surface rights.

V.

C. LEGISLATION

New legislation passed in the 1973 session of the Colorado General Assembly included the following water-related bills.

SENATE BILL 97 - CONCERNING THE APPROPRIATION OF WATER AND PROVIDING FOR THE APPROPRIATION OF WATER BY THE STATE OF COLORADO TO PROTECT THE NATURAL ENVIRONMENT -

Defines beneficial use to include minimum stream flows and storage levels for environmental purposes and makes provision for the State to acquire such rights in behalf of the people.

SENATE BILL 192 - CONCERNING FEES TO BE PAID IN WATER PROCEEDINGS -

Establishes a $20 filing fee for a protest to a ruling of the referee of the Water Court.

SENATE BILL 213 - CONCERNING GROUNDWATER -

Established that in issuance of a permit for a well in a non-tributary acquifer, where there is no substantial artificial recharge, only the amount of water underlying the land owned by the applicant or consenting owners is unappropriated, and may be used under said permit. The minimum useful life of such an acquifer is established as one hundred years.

SENATE BILL 214 - CONCERNING THE STORAGE OF WATER BY EROSION CONTROL DAMS -

Allows for construction of erosion control dams having an ungated outlet at or below the two acre-foot level, a vertical height to spillway of fifteen feet, and a maximum capacity of ten acre feet.

SENATE BILL 313 - CONCERNING WATER RIGHTS, AND PROVIDING THAT FINDINGS OF REASONABLE DILIGENCE SHALL BE QUADRENNIAL -

Changes requirements for proof of diligence on development of conditional decrees to every fourth year instead of every second year.

HOUSE BILL 1167 - CONCERNING THE TABULATION OF WATER RIGHTS AS PROVIDED FOR IN THE WATER RIGHT DETERMINATION AND ADMINISTRATION ACT OF 1969 -

Provides for the revision of the water rights tabulation and filing thereof with the Water Clerk by October 10, 1973. Notice of revision shall be published with revised tabulations available for inspection in offices of division engineer, each water commissioner, and each county clerk and recorder with copies available from division engineer for $5 each.

HOUSE BILL 1230 - CONCERNING WATER AND RELATING TO DOMESTIC WELLS -

Provides for late registration with State Engineer of domestic wells existing prior to May 8, 1972, upon application and payment of $5 filing fee.

HOUSE BILL 1627 - CONCERNING THE REVISION OF STATUTES IN THE COLORADO REVISED STATUTES 1963, AS AMENDED, INCLUDING THE SESSION LAWS OF COLORADO 1972, TO AMEND OR REPEAL OBSOLETE, INCONSISTENT, AND CONFLICTING PROVISIONS OF LAW AND TO CLARIFY THE LANGUAGE AND REFLECT LEGISLATIVE INTENT OF THE LAWS -

Declared any person interfering with or damaging any State reservoir is guilty of a misdemeanor and subject to fine, imprisonment or both.

VI.

A. DAMS

The year of 1973 was marred by an unusual incidence of critical problems with dams some of which resulted in complete failure.

On April 12, the dam on the Lower Latham Reservoir in Water District No. 2 failed unexpectedly causing several million dollars worth of damages. Water overflowed approximately 3000 acres and most of the town of Kersey. Fortunately no lives were lost. The water in the approximately 5000 acre foot reservoir had been at spillway level. Failure occurred very near the concrete overflow spillway structure and rapidly eroded an approximate 300 foot section of the sandy material in the embankment. Maximum flows out of the reservoir were estimated at 15,000 cubic feet per second. The State Engineer held a hearing in Greeley on April 25 in an attempt to determine the immediate cause of the failure. No definite conclusion was reached but it was the general opinion that the past severe winter had occasioned frost action to cause enough displacement of the concrete structure and adjoining embankment to allow some water to seep along the weakened area until it eventually eroded sufficiently to precipitate complete failure.

The flood that originated in the Denver area on May 6 caused the failure of several small dams. Two of these on a side tributary of West Creek some ten miles southeast of Deckers caused damage downstream. A court action to recover damages is pending in the Douglas County District Court.

The same precipitation generated flood flows in the plains north and east of Denver. Small channel structures on the Boxelder Creek were washed out. These included Ireland No. 1, 4 and 5 and Lott Reservoir.

Horse Creek Reservoir, on Horse Creek, a tributary of Boxelder, developed a slip on the downstream side during the flood. The water level in the reservoir was reduced enough to allow the slip to stabilize. Repair plans have been approved.

Horseshoe Reservoir Dam, northeast of Loveland, developed a critical leak through the embankment at the south outlet structure on October 3. Fortunately reservoir personnel discovered the problem early and took immediate remedial action. With the help of volunteers and heavy equipment to

haul and place rock, hay, bed springs, mattresses and car bodies the flow through the developing breach was contained some twelve hours later. Maximum outflows were estimated at 600-800 cubic feet per second.

The normally dry Rosener Reservoir southwest of Fort Morgan on San Arroya Draw intercepted approximately 3000 acre feet of water resulting from exceptionally heavy precipitation in that area on September 8. Upon inspection it was determined that the cable operated flap gates on the upstream end of the outlet were closed but rusted out. The gates in the water filled downstream control structure were closed. One gate was opened by our field personnel working in neck deep water to afford some relief to the reservoir. The structure was in no way endangered, however, due to the inaccessibility of the control gates, continued inflow to the reservoir would have posed serious problems. The most interesting aspect was that no one claimed ownership to the reservoir. Research by the water commissioner finally disclosed that it belonged to the Colorado State Land Board who were unaware of their ownership of that particular resource or problem. Negotiations are underway for the reservoir to be used for ground water recharge under the management of GASP, an organization of well owners.

Construction on Chatfield Dam on the South Platte River below the mouth of Plum Creek was started some five years ago by the Corps of Engineers as a flood control project. The outlet facilities were completed this summer as was most of the dam with the exception of a section left open to pass the river flows. Following the dedication ceremonies this section was dried up and the stream routed through the outlet structure. Work is progressing on completion of the embankment. Full completion is expected in 1975.

Several other dams received major maintenance or enlargement during this year.

Both Barnes Meadow Reservoir and Peterson Lake, mountain reservoirs in Water District No. 3, owned by the City of Greeley, were overhauled to meet safety standards and increase their capacities.

Long Draw Reservoir in Water District No. 3 at the headwaters of Long Draw Creek, is undergoing enlargement to increase its capacity some 6600 acre feet. Work should be completed in 1974.

Headley Reservoir, northeast of Snyder on Antelope Creek in Water District No. 1, was brought up to safety standards, as required by the State Engineer, by the construction of

adequate spillway and freeboard facilities. Completion of this work made it unnecessary to press for a water court hearing upon a complaint which had been filed with the Water Clerk to force compliance with the State Engineer's orders.

Numerous orders have been issued by the Dams and Reservoir section of the State Engineer's Office requiring repairs to dams and spillways and restricting storage in many instances until the repairs have been completed. The owners are complying with the restrictions and most of them have made or are in the process of planning or completing the work necessary.

In 1972 Congress adopted legislation making the Corps of Engineers responsible for establishing a roster of dams which exceeded certain minimum measurements. The Corps contracted with the State Engineer to develop this information in Colorado. At the end of this year the field staff of Division 1 are busy collecting the necessary physical data on these reservoirs to complete the roster by April 1, 1974.

VI. DAMS

B. LIVESTOCK WATER TANKS - EROSION CONTROL DAMS

The total number of livestock water tanks and erosion control dams approved between November 1, 1972 and October 31, 1973 are presented below in tabular form by water district:

DISTRICT	NO. OF LIVESTOCK TANKS	TOTAL CAPACITY (AF)	NO. OF EROSION CONTROL DAMS	TOTAL CAPACITY (AF)
1	8	40.7	9	60.3
2				
3			1	2.5
4	2	8.5		
5	1	4.0		
6				
7				
8				
9				
23	4	8.0		
48	1	0.25		
49	2	11.0		
64				
65	2	11.0		
80				
		83.45		62.8

VII.

WATER RIGHTS

A. TABULATION

The revised tabulation was published and made available for sale about the middle of October. The demand for copies has been somewhat less than overwhelming. To date (November 29, 1973) we have received a total of twenty-two (22) requests for lists.

We are now in the middle of working tabulation cards for all rights decreed under the old law since 1969, and all rights filed under Senate Bill 81.

Next year we hope to begin compiling an abandonment list pursuant to 148-21-28 Colorado Revised Statutes.

The total number of filings to date is 7,540. The total number of structures is 24,652 and a total of 22,226 wells.

DIVISION I WATER COURT APPLICATIONS

1972	FILINGS	AMENDED FILINGS	TOTAL # OF STRUCTURES	WELLS	SPRINGS	STORAGE	SURFACE	SUMPS	CHANGE OF WATER RIGHTS	BIENNIALS	OTHER
July	61	8	116	84	24	3	3	2	0	0	1
August	63	4	84	57	8	5	11	0	3	0	0
September	51	5	71	54	7	3	4	1	2	1	1
October	63	6	135	59	60	7	8	0	1	0	1
November	26	7	68	27	17	14	10	0	0	0	0
December	72	7	180	80	34	33	29	0	7	0	10
1973											
January	36	9	106	50	18	30	6	0	2	0	4
February	26	8	94	53	24	2	6	5	4	0	0
March	26	10	60	25 (16-Aug)	15	2	2	0	0	4	2
April	26	2	30	18	2	2	4	1	3	0	2
May	20	7	5335	16 (5298-Aug)	0	11	2	0	8	3	3
June	24	8	51	24 (12-Aug)	4	5	1	0	5	0	1
July	28	12	1881	11 (1842-Aug)	8	3	8	0	9	1	4
August	28	4	340	23 (300-Aug)	8	2	1	0	6	0	1
September	20	0	75	22 (31-Aug)	5	3	0	0	13	0	0
October	33	9	112	18 (54-Aug)	5	9	5	0	1	1	1 19-alt
TOTAL	603	106	8738	8174	239	134	100	9	64	10	50

WATER DIVISION I - CASES DECREED

1972	DECREES	STRUCTURES
July	20	34
	11 dismissals	11
August	3	4
September	11	17
	32 dismissals	32
	18 transfers	18
October	195	455
	2 dismissals	2
November	53	123
December	225	370
	3 dismissals	3
1973		
January	115	199
February	119	211
March	39	91
April	129	379
May	112	244
June	91	140
July	147	238
	1 dismissal	1
August	151	262
	1 dismissal	1
September	153	279
	3 dismissal	3
October	161	365
	1 dismissal	1
Total	1724 decrees	3411
	54 dismissals	54
	18 transfers	18

VIII.

A. CONSERVANCY DISTRICTS

As mentioned in the introductory statements, a subdistrict has been formed under the Northern Colorado Water Conservancy District for the purpose of developing and supplying Colorado River water to the Six City Group for metropolitan uses. The water would be transported to the east slope through the Colorado-Big Thompson project facilities as authorized by a carriage contract between the subdistrict and the Bureau of Reclamation.

A ground water subdistrict to the Central Colorado Water Conservancy District has petitioned for and received approval from the Water Court in 1973. The subdistrict boundaries lie wholly within the parent district boundaries but do not include the entire district. The subdistrict was formed for the benefit of the wells included therein and will endeavor to provide replacement water to the stream through implementation of an augmentation plan should such become necessary by the imposition of rules and regulations on the use of underground water.

VIII.

A. ORGANIZATIONS

CONSERVANCY DISTRICTS

Upper South Platte Water Conservancy District	James Settele	Pres.	Fairplay
Central Colorado Water Conservancy District	David J. Miller	Attorney	1004 9th Avenue Greeley
Northern Colorado Water Conservancy District	J. R. Barkley	Manager	P.O. Box 679 Loveland
Lower South Platte Water Conservancy District	Eric Wendt	Secretary-Treasurer	P.O. Box 1725 Sterling
St. Vrain & Left Hand Water Conservancy District	David J. Miller	Attorney	1004 9th Avenue Greeley

VIII

B. ORGANIZATIONS

WATER DISTRICT NO. I

DITCH AND RESERVOIR COMPANIES

A. A. Smith Irrigating Canal Reservoir, Milling and Pipeline Company	Dave Spencer	Pres.	Snyder
Beaver Creek Ditch Company	John Higgins	Secy.	Brush
Beaver Ditch Company	Charles Henry	Pres.	Brush
Bijou Irrigation Company	John Samples	Secy.	104 West Beaver Ft. Morgan
Bijou Irrigation District	John Samples	Secy.	104 West Beaver Ft. Morgan
Corona Ditch Company	R. L. Twist	Owner	Masters
Duel and Snyder	E. L. Caneva	Pres.	Rt. 1 Ft. Morgan
Fort Morgan Canal Company	Lindy Crumley	Supt.	111 East Railroad Avenue Ft. Morgan
Gill & Stevens Ditch Company	Harold Hansen	Pres.	Rt. 1 Brush
Hillrose Irrigation District	Roy Boyles	Secy.	Hillrose
Hoover Ditch Company	Mrs. Pat Peterson	Secy.	Kersey
Iliff Irrigation District	Adam Koehler	Secy.	Sterling
Illinois Ditch Company	George Allard	Pres.	Kersey
Jackson Lake Reservoir Company	Lindy Crumley	Supt.	111 East Railroad Avenue Ft. Morgan
Johnson & Edwards Ditch Company	William Tramp	Pres.	Hillrose
Lower Platte & Beaver Irrigation Company	Roy Boyles	Secy.	Hillrose
Logan Irrigation District	John Elsenach	Pres.	Sterling
Morgan, Prewitt Reservoir Co.	John Samples	Secy.	104 West Beaver Ft. Morgan
North Sterling Irrigation District	Alex Michel	Supt.	Foote Building Sterling
Putnam Ditch Company	Harlan Snider	Pres.	Masters
Riverside Irrigation Company	Cecil Osborne	Supt.	Box 455 Ft. Morgan
Riverside Irrigation District	Cecil Osborne	Supt.	Box 455 Ft. Morgan
Snyder Ditch & Reservoir Co.	Gene Peterson	Pres.	Snyder
Tetsel Ditch Company	Bob Meisner	Pres.	Snyder
Trowell Ditch Company	Willis Elson	Pres.	Hillrose
Upper Platte & Beaver Canal Co.	John Higgins	Secy.	Farmers State Bank Brush
Union Ditch Company	B. B. Peterson	Pres.	Snyder
Weldon Valley Ditch Company	Maurice Jones	Pres.	Weldona
Kiowa-Bijou Groundwater Basin	Donald F. McClary		231 Main Street Ft. Morgan

WATER DISTRICT NO. 2

DITCH AND RESERVOIR COMPANIES

Big Dry Creek Ditch & Reservoir Company	Mrs. G. R. Norden	Secy.	Rt. 1 Ft. Lupton
Burlington Ditch Reservoir and Land Company	Joseph Zajonckowski	Supt.	Brighton
Brighton Ditch Company	George Stieber	Pres.	Rt. 1 Box 104 Ft. Lupton
Coal Ridge Ditch Company	Ray Sarchet	Pres.	Ft. Lupton
Delta Ditch Company	Robert Davis	Pres.	712 10th Street Greeley
Denver Water Board	James Ogilvie	Manager	144 W. Colfax Denver
Farmers Independent Ditch Co.	John Henderson	Secy.	1st National Bank Greeley
Farmers Reservoir & Irrigation Co.	Mel Sarchet	Pres.	Hudson
Fulton Ditch Company	W. W. Gaunt	Secy.	25 South 4th Avenue Brighton
Gardners Ditch Company	Sylvester DiGiacomo	Pres.	6820 York Denver
German Ditch Company	Albert Sack	Pres.	Brighton
Godfrey Ditch Company	Jerome Loeffler	Pres.	LaSalle
Henrylyn Irrigation District	Ralph Rouse	Manager	Box 141 Hudson
Highland Ditch Company	Mary Nix	Secy.	P.O. Box 15 Lucerne
Little Burlington Ditch Company	Mel Sarchet	Pres.	Hudson
Lower Latham Ditch Company	Victor R. Klein	Pres.	Kersey
Lupton Bottom Ditch Company	Ray Sarchet	Pres.	Ft. Lupton
McCanne Ditch & Reservoir Co.	John Stewart	Secy.	Great Western Suga Company Brighton
Meadow Island No.1 Irrigation Co.	Wm. Mayer	Secy.	Rt. 2 Box 74 Platteville
Meadow Island Irrigation Co.	Ruben Gustafson	Secy.	Rt. 2 Box 145 Ft. Lupton
New Brantner Ditch Company	W. W. Gaunt	Secy.	25 South 4th Ave. Brighton
North Star Reservoir Company	G. R. Norden	Pres.	Rt. 1 Ft. Lupton
Platte Valley Irrigation Company	E. D. Bruntz	Pres.	LaSalle
Platteville Irr. & Milling Co.	John Kunzman	Secy.	Rt. 2 Box 120 Ft. Lupton
Slate Ditch Company	George Breikler	Pres.	Ft. Lupton
Union Ditch Company	Mrs. Frances Hill	Secy.	LaSalle
Walter & Roberts Ditch Company	Roy Lunvall	Pres.	Greeley
Western Mutual Ditch Company	Ed. Fritzler	Pres.	LaSalle
Wellington Reservoir Company	Bernice McConnell	Secy.	301 S. Main Brighton
Thompson Ditch Company	G. R. Norden	Secy.	Rt. 1 Box 196 Ft. Lupton

WATER DISTRICT NO. 3

DITCH AND RESERVOIR COMPANIES

Arthur Irrigation Company	Ronald Strahle	Secy.	United Bank Building Ft. Collins
B. H. Eaton Ditch Company	Mrs. Carol Schmidt	Secy.	P.O. Box 98 Windsor
Boxelder Ditch Company	Wm. Stover	Secy.	United Bank Building Greeley
Boyd Irrigation Company	Rodger Houtchens	Secy.	1007 9th Avenue Greeley
Cache la Poudre Irrigation Co.	Cecil Elliott	Pres.	Ft. Collins
Divide Canal & Reservoir Co.	Don E. Engel	Secy.	106 Elm Eaton
Dixon Canyon Ditch & Reservoir Co.	Ronald Strahle	Secy.	United Bank Building Ft. Collins
Greeley Irrigation Company	Edgar Bartels	Secy.	1227 8th Avenue Greeley
Jackson Ditch Company	Vivienne Woodward	Secy.	2319 E. Mulberry Ft. Collins
Kern Reservoir & Ditch Company	C. W. Kirby	Pres.	P.O. Box 220 Windsor
Kitchell Reservoir Company	Alice Fisher	Secy.	Rt. 4 Ft. Collins
Lake Canal Company	John Hartman	Secy.	United Bank Building Ft. Collins
Lake Canal Reservoir Company	John Hartman	Secy.	United Bank Building Ft. Collins
Larimer County Canal No. 2 Irrigation Company	Ronald Strahle	Secy.	United Bank Building Ft. Collins
Larimer & Weld Irr. Company	Don E. Engel	Secy.	106 Elm Eaton
Larimer & Weld Reservoir Co.	Don E. Engel	Secy.	106 Elm Eaton
Mail Creek Ditch Company	Ronald Strahle	Secy.	United Bank Building Ft. Collins
New Cache la Poudre Irr. Co.	Jim Muroya	Secy.	708 8th Street Greeley
New Mercer Ditch Company	Ronald Strahle	Secy.	United Bank Building Ft. Collins
North Poudre Irrigating Co.	Lawrence Cox	Mgr.	North Poudre Irr. Office Wellington
No. 10 Ditch Company	Alden Hill	Secy.	160 W. Mountain Ave. Ft. Collins
Ogilvy Land & Irr. Company	Mrs. Shirley Wayman	Secy.	1007 9th Avenue Greeley
Pleasant Valley & Lake Canal Co.	Ward Fischer	Secy.	1st National Bank Bldg Ft. Collins
Taylor & Gill Canal Company	Wm. Seaworth	Pres.	Rt. 3 Ft. Collins
Tunnel Water Company	Vivienne Woodward	Secy.	2319 E. Mulberry Ft. Collins

WATER DISTRICT NO. 3 (continued)

DITCH AND RESERVOIR COMPANIES

Warren Lake Reservoir Company	Ronald Strahle	Secy.	United Bank Building Ft. Collins
Water Supply & Storage Company	Vivienne Woodward	Secy.	2319 E. Mulberry Ft. Collins
Whitney Irrigation Company	Mrs. Carol Schmidt	Secy.	P.O. Box 98 Windsor
Wm. Jones Irrigation Company	Geo. Firestien	Pres.	Farmers Spur Greeley
Windsor Reservoir & Canal Co.	Don Engel	Secy.	106 Elm Eaton

WATER DISTRICT NO. 4

DITCH AND RESERVOIR COMPANIES

Arkins Water Association	Mrs. Joy Cross	Secy.	P.O. Box 6 Masonville
Bald Mountain Water Association	Charles McAfee	Secy.	Rt. 2 Box 319N Loveland
Beeline Ditch Company	Guy A. Shable	Secy.	Rt. 1 Box 65 Milliken
Big Thompson Manufacturing Ditch Company	Robert Christensen	Secy.	P.O. Box 642 Loveland
Big Thompson & Platte River Ditch Company	Guy A. Shable	Secy.	Rt. 1 Box 65 Milliken
Blower Ditch Company	Henry Pope, Jr.	Supt.	Rt. 1 Box 138 Longmont
Boulder & Larimer County Irrigation & Manufacturing Ditch Company (Ish)	L. V. French	Secy.	Rt. 2 Box 23 Berthoud
Buckhorn Highline Ditch Co.	Mrs. Zella R. Soderburg	Secy.	Star Route Box 317 Loveland
Buckhorn Water Users Association	Mrs. Helen L. Mettlen	Secy.	Masonville
Central Weld County Water District	Dale D. Olhausen	Secy.	115 18th Street Greeley
Consolidated Hillsborough Ditch Company	Don Davis	Secy.	1st National Bank Bldg. Johnstown
Consolidated Home Supply Ditch & Reservoir Company	W. R. Keirnes	Secy.	Star Route Box 450 Loveland
Culver Irrigation Company	George Landers	Secy.	P.O. Box 209 Longmont
Diagonal Water & Sanitation District	Jim Hudson	Secy.	1200 28th Street Boulder
Eagle Ditch Company	Mrs. Donald H. Lemmon	Secy.	Rt. 2 Box 120 Berthoud
Eglin Ditch Company	Wayne Hicks	Secy.	Rt. 2 Box 127 Berthoud
Evans Ditch Company	Town Clerk of Evans	Secy.	Evans
Fairport Reservoir Company	Nellie Ver Straten	Secy.	Rt. 1 Ft. Collins
Farmers Irrigation Ditch & Reservoir Company	F. Ray DeGood	Secy.	P.O. Box 657 Loveland
Greeley-Loveland Irrigation Co.	Carroll E. Flack	Secy.	803 23rd Avenue Greeley
George Rist Ditch Company	W. R. Kiernes	Secy.	Star Route Box 450 Loveland
Handy Ditch Company	Louis Bein	Secy.	Box 460 Berthoud
Hill & Brush Ditch Company	Jim Nelson	Secy.	Rt. 1 Milliken
Kershner Ditch Company	Harry Soderberg	Secy.	Star Rt. Box 317 Loveland
Little Thompson Valley Water District	Lovilo Fagan	Mgr.	307 Welch Avenue Berthoud
Longs Peak Water Users Assn.	Mrs. Joanne Macy	Secy.	P.O. Box 714 Longmont

WATER DISTRICT NO. 4 (continued)

Louden Irrigation Reservoir and Canal Company	Ralph Benson		925 West 29th Loveland
Loveland & Greeley Reservoir Company	Carroll E. Flack	Secy.	808 23rd Avenue Greeley
Mariana Water District	Lovilo Fagan	Secy.	307 Welch Avenue Berthoud
Masonville Union Ditch & Reservoir Company	Ben Milner	Secy.	Star Route Loveland
Minor Longdon Ditch Company	Elmer Rutt		Rt. 1 Box 3 Johnstown
New Ish Ditch & Reservoir Co.	Horace G. McCarty	Secy.	P.O. Box 658 Longmont
North Carter Lake Water District	Lovilo Fagan	Secy.	307 Welch Avenue Berthoud
Osborn & Caywood Ditch Company	Donald J. Befus	Secy.	716 S. County Rd. 15 Berthoud
Perkins Ditch Company	Arnold Friend	Owner	Star Route Loveland
Rist & Benson Reservoir Co.	Ralph Benson	Supt.	925 West 29th Loveland
Rockwell Ditch Company	Max H. Schaal	Secy.	Rt. 1 Box 50 Berthoud
Ryan Gulch Reservoir Co.	Lavilo Fagan	Secy.	307 Welch Avenue Berthoud
Seven Lakes Reservoir Co.	Carroll Flack	Secy.	808 23rd Avenue Greeley
South Side Irrigation and Reservoir Company	Robert Ausenhus	Secy.	203 East 5th Street Loveland
Victory Irrigating Canal Co.	Cal Carter	Secy.	Star Route Loveland
Wind Cliff Water Association Inc.	Mrs.Vivien Wylene Buser	Secy.	62 Elmhurst Lane, Riverdale Bettendorf, Iowa

WATER DISTRICT NO. 5

DITCH AND RESERVOIR COMPANIES

Allen Lake Reservoir Company	Frank Gould	Supt.	Foothills Highway Boulder
Beckwith Ditch & Reservoir Co.	Mark Benson	Secy.	1500 Florida Avenue Longmont
Bonus Ditch Company	Fred Page	Secy.	Rt. 2 Longmont
Boulder & Left Hand Irrigation Company	Nels Jensen	Secy.	436 Coffman Street Longmont
Clover Basin Ditch & Reservoir Company	Wayne Jurgens	Secy.	Longmont
Davis & Downing Ditch Company	Gordon Kennedy	Secy.	Rt. 3 Longmont
Denio & Taylor Ditch Company	Harold Dawson	Secy.	Longmont
Highland Ditch Company	George Landers	Secy.	1st National Bank Longmont
Highland Lake Reservoir Co.	George Landers	Secy.	1st National Bank Longmont
Ide & Starbird Reservoir Co.	L. A. Biddle	Secy.	Mead
Independent Reservoir Co.	George Reynolds	Secy.	Longmont
James Ditch Company	Don Andrews	Secy.	Rt. 3 Box 171 Longmont
Last Chance Ditch Company	Al Kurtz	Pres.	
	Harold Nelson	Secy.	Rt. 4 Longmont
Left Hand Ditch Company	Frank Gould	Supt.	Foothills Highway Boulder
Longmont Supply Ditch Company	George Landers	Secy.	P.O. Box 209 Longmont
Lower Baldwin Ditch Company	Franklin Murphy	Secy.	Walden
Niwot Irrigation Ditch Company	Robert Sewald	Secy.	Rt. 2 Longmont
Oligarchy Irrigating Company	George Landers	Secy.	P.O. Box 209 Longmont
Peck Ditch Company	George Wagner	Secy.	Rt. 3 Longmont
Pella Ditch Company	Rueben Fredstrom	Secy.	Rt. 3 Longmont
Palmerton Consolidated Ditch Co.	James Goss	Secy.	Rt. 3 Longmont
Pleasant Valley Reservoir & Ditch Company	Harold Dawson	Secy.	1st National Bank Longmont
Rough & Ready Ditch Company	Harold Dawson	Secy.	1st National Bank Longmont
Smead Ditch Company	Warren Bashor	Secy.	Rt. 3 Longmont
South Flat Ditch Company	David Wagner	Secy.	Rt. 3 Longmont
South Ledge Ditch Company	Reinhold Loukonen	Secy.	Lyons
Supply Ditch Company	George Landers	Secy.	1st National Bank Longmont

WATER DISTRICT NO. 5 (continued)

Swede Ditch Company	Ed Sanderson	Secy.	Rt. 3 Longmont
Upper Baldwin Ditch Company	Franklin Murphy	Secy.	Walden
Union Ditch Company	Frances Hill	Secy.	LaSalle
Union Reservoir Company	Frances Hill	Secy.	LaSalle
Zweck & Turner Ditch Company	Russel Zweck	Secy.	Rt. 3 Longmont

WATER DISTRICT NO. 6

DITCH AND RESERVOIR COMPANIES

Andrews & Farwell Ditch Co.	Forest White	Secy.	Rt. 3 Boulder
Autrey Eggleston	Glen Murphy		Ames, Iowa
Baseline Land & Reservoir Co.	Mrs. Margaret Nelson	Secy.	Rt. 1 Box 218 Erie
Boulder Ditch (Town of)	City of Boulder	Owner	City Hall Boulder
Boulder & Left Hand Irrigation Company	Niels Jensen	Secy.	Longmont National Bank Longmont
Boulder & Weld County Ditch Co.	Geo. Landers	Secy.	P.O. Box 209 Longmont
Boulder & White Rock Ditch & Reservoir Company	Frank F. Flanders	Secy.	P.O. Box 209 Longmont
Butte Irrigation & Milling Co.	Cliff Hodgson	Pres.	7996 Valmont Drive Boulder
Carr & Tyler Ditch Company	Milton Nelson	Pres.	2040 W. Longs Peak Longmont
Church Ditch Company	Marcus Church	Pres.	Broomfield
City of Lafayette	City Manager		Lafayette
City of Louisville	City Manager		Louisville
Coal Ridge Ditch	Mrs. Mildred Sarchet	Secy.	Rt. 2 Box 162 Ft. Lupton
Community Ditch	M. L. Sarchet	Pres.	402 Cochran Building 1031 15th Street Denver
Consolidated Lower Boulder Reservoir & Ditch Co.	Mrs. Ray Nelson	Secy.	Rt. 1 Box 218 Erie
Davidson Ditch & Reservoir Co.	Mrs. J.D. Mayhoffer	Secy.	Rt. 1 Lafayette
Dry Creek Davidson	Ralph Bixler	Pres.	Lafayette
Dry Creek No. 2 Ditch Company	C. B. Beitelshees	Secy.	Rt. 1 Box 322 Boulder
East Boulder Ditch Company	Public Service Co. of Colorado (%Leonard Reichwein)		P.O. Box 840 Denver
Eggleston No. 1	Glen Murphy		Ames, Iowa
Eggleston No. 2	Glen Murphy		Ames, Iowa
Enterprise Irrigation Ditch Co.	Leonard Reichwein		P.O. Box 840 Denver
Erie Coal Creek Ditch & Reservoir Company	Dave Oscarson	Pres.	Rt. 1 Erie
Farmers Ditch Company	H. O. Dilsaver	Secy.	Woolworth Building Boulder
Goodhue Ditch & Reservoir Co.	Mrs. Gale Harmon	Secy.	Lafayette
Godding Daily & Plumb Ditch	Niels Jensen	Secy.	384 Main Street Boulder
Godding Ditch Co. Highland South Side	Niels Jensen	Secy.	Longmont National Bank Longmont

WATER DISTRICT NO. 6 (continued)

Green Ditch Company	Roger Fell	Secy.	Boulder
Harden	L. W. Van Fleet	Owner	Denver
Harris	Fred Nesbitt	Owner	Denver
Houck No. 2 Ditch Co.	Milton Nelson	Owner	2040 W. Longs Peak Longmont
Howard Ditch Company	Bill Suittes	Secy.	65 Manhattan Drive Boulder
Jones & Donnelly Ditch Company	Harley Keeter, Jr.	Secy.	Boulder
Kerr No. 1 and 2	Mrs. J. D. Mayhoffer	Owner	Lafayette
Kinnear Ditch & Reservoir	M. L. Sarchet	Pres.	Denver
Last Chance Ditch Co.	City of Westminster	P.Owner	Westminster
Leggett Ditch & Reservoir Co.	Niels Jensen	Secy.	Longmont National Bank Longmont
Lyner-Cottonwood Consolidated Ditch Company	Walter Wise	Secy.	11587 Jasper Road Canfield Erie
Lower Boulder Ditch Company	Mrs. Margaret Nelson	Secy.	Rt. 1 Box 218 Erie
Martha M. Mathews	A. S. Bailey	P.Owner	Broomfield
Marshall Reservoir	M. L. Sarchet	Pres.	402 Cochran Building 1031 15th Street Denver
Marshallville Ditch Co.	Ewalt Anderson	Secy.	Rt. 3 Box 325 Boulder
McGinn Ditch Company	Mrs. W. A. Thomas	Secy.	1232 Grand View Avenue Boulder
McKay Reservoir	M. L. Sarchet	Pres.	402 Cochran Building 1031 15th Street Denver
N. K. Smith & Tyler Ditch	Serafina	Owner	Rt. 4 Longmont
New Anderson Ditch Company	Grovner L. Ketterman	Secy.	3055 25th Street Boulder
North Boulder Farmers Ditch Co.	John Reich	Secy.	P.O. Box 227 Boulder
Original Cottonwood No. 2 Ditch Company	Albert Kolb	Secy.	Rt. 3 Box 316 Boulder
Rural Ditch Company	Catherine C. Owen	Secy.	1020 Emery Street Longmont
Silver Lake Ditch Company	Everette Long	Secy.	3240 Broadway Boulder
Schearer Ditch Company	L. W. Van Fleet	Owner	Denver
Smith & Emmons Ditch Co.	Ward Burrett	Secy.	Rt. 4 Box 54 Longmont
Smith and Goss Ditch Co.	City of Boulder	P.Owner	Boulder
South Boulder Canon Ditch Co.	Joe Beauprez	Pres.	Lafayette
South Boulder & Bear Creek Ditch	Tim Shanahan	Secy.	Marshall Boulder
South Boulder & Coal Creek Irrigating Ditch Co.	Richard Viella	Secy.	Louisville
Tom Delahant Ditch	Milton Nelson	Pres.	2040 W. Longs Peak Longmont
William C. Hake	Mrs. J. D. Mayhoffer	Owner	Lafayette

WATER DISTRICT NO. 7

DITCH AND RESERVOIR COMPANIES

Bayou Association of Ditches	Earnest R. Schultz	Secy.	4315 Xenon Street Wheatridge
Boyle	A. T. DeBell		3951 W. 56 Way Denver
Church (Golden City & Ralston Cr.) and Croke Canal	G. A. Pelz	Secy.	Farmers Reservoir & Irrigation Company Denham Building 1845 California Denver
Colorado Agricultural	Louis Rullo	Secy.	Rt. 1 Box 043 Denver
Cort Graves & Hughes	Sam Spano		6640 W. 52 Avenue Arvada
Denver View Water Company	Wayne Harkness	Secy.	Rt. 1 Box 590 Golden
Farmers Highline	Mrs.Virginia Collins	Secy.	Farmers Highline Canal & Reservoir Company 8889 Washington Avenue Denver
Fisher	John DiTirro, Jr.	Secy.	4400 Wynkoop Denver
Kershaw	Jack Calabrese		5801 Lowell Denver
Lee Stewart & Eskins	Albert F. Ervin	Secy.	12703 W. 52nd Avenu Arvada
Lower Clear Creek Company (Clear Creek & Platte River Ditch)	Frank Wooley	Secy.	Rt. 1 Box 515 Denver
Manhart	George Ditolla		6030 Wolff Arvada
Ouelette	Ira Fox		4298 Kipling Wheatridge
Reno Juchem & Swadley Longan	Mrs.Ernest Delva	Secy.	Consolidated Juchem Ditch & Reservoir Co. 6501 W. 60th Avenue Arvada
Rocky Mountain, Miles & Eskins and South Side	W. F. Moses	Secy.	Adolph Coors Co. Golden
United Water Company	Henry J. Johnson	Secy.	Box 840 Denver
Wannemaker	Ernie Bergman	Secy.	10285 Ridge Road Wheatridge
Welch and Agricultural	Wilson B. Roup	Secy.	Agricultural Ditch & Reservoir Company 10080 W. 27th Avenu Lakewood

WATER DISTRICT NO. 8

DITCH AND RESERVOIR COMPANIES

City & County of Denver	Wm. Schuler		Board of Water Commissioners 144 West Colfax Denver
F. L. Green Ditch Company	Edith Jurgens	Secy.	5480 West Arizona Place Denver
Last Chance Ditch Company	Wm. Schuler		Board of Water Commissioners 144 West Colfax Denver
Nevada Ditch Holding Company	Wm. Schuler		" " " "
Northern Colorado Irrigation Co.	" "		" " " "
Tri City Trust	" "		" " " "

WATER DISTRICT NO. 9

Bergen Ditch & Reservoir Co.	Wm. Grant	Owner	Western Federal Savings Building Denver
Bowles Ditch Company	Wm. Grant	Owner	" " "
Colorado Central Power Co.	Leonard Reichwein	Engr.	Evergreen
Hodgson Ditch Operating Ass'n	B. F. Lowell	Pres.	Mt. Morrison
Independent Highline Ditch Co.	Stan Harwood	Owner	Mt. Morrison
Pioneer Union Ditch Company	Jack McCoy	Pres.	Mt. Morrison
Ward Ditch Company	Wm. V. Hodges, Jr.	Secy.	Denver Club Bldg. Denver
Warrior Ditch Company	Earl Maddox	Pres.	Mt. Morrison

WATER DISTRICT NO. 23

Jefferson Lake Ditch Company	Paul Anschutz	Pres.	Jefferson

WATER DISTRICT NO. 48

Tunnel Water Company	Viviene Woodward	Secy.	2319 East Mulberry Fort Collins
Water Supply & Storage Co.	Viviene Woodward	Secy.	2319 East Mulberry Fort Collins

WATER DISTRICT NO. 49

Hale Ditch Company			Hale

WATER DISTRICT NO. 64

DITCH AND RESERVOIR COMPANIES

Batton Ditch Company	Clifford Sherwin	Owner	P.O. Box 63 Sterling
Bravo Ditch Company	Ivan Barden	Secy.	Iliff
Carlson Ditch Company	Hulbert Reichelt	Secy.	Julesburg
Chambers Ditch Company	Wm. Condon	Owner	916 Fairhurst Street Sterling
Davis Brothers Ditch Co.	Paris Oaccomasso	Secy.	Atwood
Farmers Pawnee Ditch Co.	Robert Roberts	Secy.	P.O. Box 70 Sterling
Harmony Ditch Co. No. 1	Mrs. Howard Hamilton	Secy.	P.O. Box 205 Crook
Henderson & Smith Ditch Co.	Scalva Brothers	Owner	R. R. Sterling
Iliff & Platte Valley Ditch Co.	Earl E. Reynolds	Secy.	205½ Main Street Sterling
J. B. Ditch Company	Frank Manuello	Owner	Iliff
Liddle Ditch Company	Don Liddle	Pres.	Ovid
Lone Tree Ditch Company	Kent L. Reynolds	Secy.	P.O. Box 111 Sterling
Low Line Ditch Company	Earl E. Reynolds	Secy.	205½ Main Street Sterling
Peoples Ditch Company	Sam Carg	Secy.	Rt. 2 Sterling
Peterson Canal & Reservoir Co.	Jacob Sanger	Pres.	Ovid
Proctor Water Company	Kent L. Reynolds	Secy.	P.O. Box 1111 Sterling
Ramsey Ditch Company	Don DeMers	Secy.	708 Elm Street Sterling
Red Lion Ditch Company	Maynard Sonnenberg	Secy.	P.O. Box 1271 Sterling
Schneider Ditch Company	James Williamson	Secy.	Atwood
South Platte Ditch Company	Melvin Bartlett	Secy.	Merino
South Reservation Ditch Co.	James Parker	Secy.	Ovid
Springdale Ditch Company	Robert Roberts	Secy.	P.O. Box 70 Sterling
Sterling Irrigation Company	Lawrence Giacomini	Secy.	P.O. Box 1013 Sterling
Sterling No. 2 Ditch Company	Lester Garner	Secy.	327 Taylor Sterling
Upper Harmony Ditch Company	Garold Merick	Secy.	Crook
Julesburg Irrigation District	Herbert Bonesteel	Secy.	Julesburg
North Sterling Irrigation Dist.	Alex Michel	Secy.	205½ Main Street Sterling
Prewitt Reservoir Company	Alex Michel	Secy.	205½ Main Street Sterling

WATER DISTRICT NO. 65

DITCH AND RESERVOIR COMPANIES

Laird Ditch Company	Warren Noffsinger	Secy.	Laird
Pioneer Ditch Company	Paul Wiley	Pres.	Laird
Wray Ditch Company	Henry Wiltfang	Pres.	Vernon

VIII.

C. GROUND WATER MANAGEMENT DISTRICTS

Although some consideration was given to forming management districts under the Basin Authority Bill adopted in 1969, no such districts were formed. There is still much opposition to the concept of underground water regulation and indecision as to how best to cope with the whole situtation on the part of water users taking water from the alluvium tributary to the South Platte River.

The ground water management districts in the non-tributary areas continue to function as they have in the past. These districts are shown in the following tabulation:

GROUND WATER MANAGEMENT DISTRICTS

Arikaree Management District	Dave Idler	Secy.	Kirk
Central Yuma Management District	Elbert Zion	Secy.	Rt. 1 Vernon
Frenchman Management District	Doyle Neiman	Secy.	Holyoke
Plains Management District	Cliff Hawthorne		1454 Martin Avenue Burlington
Sandhills Management District	Richard Wisdom	Secy.	Holyoke Route Wray
W - Y Management District	Roy L. Mekelburg	Secy.	Rt. 1 Box 19 Yuma

IX. WATER COMMISSIONERS' SUMMARY

The Division of Water Resources has entered into a program to computerize all its records. Irrigation Division No. 1 was chosen to make the initial effort of entering current diversion data into the program because of its proximity to the State Office in Denver and to Colorado State University in Fort Collins with whom the State had contracted for computer service. It was further felt that if computer records could be generated that adequately reflected the diversions and distribution of water with all the complexities inherent in administration of water rights on the South Platte River and its tributaries, then the system could be adapted to any other part of the State. Consequently, five water districts were designated for that purpose. These were Districts No. 1, 2, 3, 8, and 64 and included all of the main stem of the South Platte below Cheesman Reservoir as well as the Cache la Poudre watershed which is generally conceded to have the most complex supply, distribution, reservoir and exchange system in Colorado.

Needless to say, many problems have been encountered in trying to adapt to this modern method of record keeping. Procedures had to be analyzed, definitions standardized, report forms developed, communications maintained and meetings held for periodic discussions. Definite, and perhaps an unexpected measure of success has been achieved. This has been largely due to the spirit of cooperation, interest and extra efforts extended by the participating water commissioners in the above mentioned districts. Certainly they are to be commended for their outstanding efforts.

As of mid-December 1973 the records generated by the computer are still being checked for accuracy and completeness. To the extent that those records are used in this annual report, any figures herein shown are subject to revision pending final certification.

The above mentioned water commissioners were asked to comment at the end of the year upon their experience with the computer program and to express their ideas upon its usefulness, adaptability and the work requirements, both in time and effort.

The written replies received to date are those from Robert Samples, Jack Neutze and Robert Littler, water commissioners in Districts 1, 3 and 64 respectively. These gentlemen are intelligent, deeply concerned and very capable employees. Copies of their comments follow.

December 10, 1973

Division of Water Resources
W. G. Wilkinson, Division Engineer
Room 208, 8th & 8th Office Building
Greeley, Colorado 80631

TO: W. G. Wilkinson, Division Engineer

FROM: Robert Samples

SUBJECT: Computer Comments

In my estimation, this was one of the best water years to start a new project on the computers. Due to the abundance of irrigation water, everything ran very steady and did not require as many daily changes to keep records of. This project is like any other change and you have to adapt a pattern of operation as time progresses. My pattern was this:

My first objective was to have the Annual Report state the same as it did in 1972, then I looked at a method of reporting that would allow anyone to make an analysis of the total water diverted for use by the many methods. I felt that I needed a method that would enable me to predict the amount of water that is available for re-use. In the previous record keeping there was no method to analyze this amount of water lost in transportation except by averages and that is only a guess. This I did by including all reservoir releases to the streams. I did not try to make many changes all at once, but hope to be able to work out more improvements in reporting as time goes on.

My main problems with the computer scan sheets were as follows:

1. Computer does not think as I do.
2. I finally understand the computer, it only prints what it is told.
3. I have to change my translator thinker from a number to a # 2 dark lead pencil line.
4. I am very discouraged to find that I will have to buy eye glasses to read the small numbers on the scan sheets.
5. Also very discouraged to find that I must be color blind, some of the colors on the scan sheet caused me to make more errors than others.

6. I found that in correcting the final print-out of the year that in most cases the errors were my own, the most frequent being the following.

   a. Neglect of decimal point
   b. Forgetting to 0 out from one week to next.
   c. Remembering the correct ident number.
   d. Keeping same kind of ident and type from week to week.
   e. Would make a correction on one print out and the same error would show up again.

7. I kept my records the old way in order to have a daily check on the print out. This caused extra work but seems necessary at this time.

8. Some scan sheets never did show up in the print-outs. (lost)

9. When reading a carbon scan sheet they would often have a scratch on the top scan or the lines did not line up, which made them of no value.

Questions I have:

1. Can errors be corrected readily.
2. Can I retrieve material when needed or will I have to " wait in line ".
3. What will be the cost, (not to me, but to water users,)
4. May I change my reporting method as need and demand change.

Summary:

I am always willing to change if it makes my work more meaningful, easier, more accurate, beneficial or more economical.

Respectfully submitted,

Robert Samples

Robert Samples
Water Commissioner
District 1

John W. Neutze
Water Commissioner
District 3
December 13, 1973

Dugan Wilkinson
Division Engineer
208 8th & 8th Office Bldg.
Greeley, Colo.

Dear Dugan:

Going on the computer has not been a rewarding experience for me. I have found that it has taken about 20 extra hours a week of office time to accomodate the amount of detail necessary to get the information on the opscan sheets. This time has to be taken from the time for field observations thus reducing the effective administration of the district.

To illustrate:

Prior to the computer program we had five basic sources; Foreign [transmountain], river, storage, project, and exchange. The individual structures were totaled collectively into these sources and reported in the weekly reports as daily averages and in the annual report as daily amounts. There is no provision for this in the computer program so that instead of one foreign source there are now six, instead of one source from storage there are now twenty and for exchange there are now about twenty. Also prior to the computer program we had water going to direct use and water going to storage; with the computer this has been increased to nine uses plus the sixty or more reservoirs to be reported on individualy. On the Larimer County Canal which has four foreign ditches, river water and project water going to nine reservoirs and to irrigation, the number of possible combinations is increased from six to sixty. This has about tripled the number of computations necessary to get the information on the opscan sheets. Acode number was issued that enabled the water to be collected in the canal and then collectively distributed to irrigation and

to the varios reservoirs which is of some help. Attachment "A" shows the number of entries needed prior to thr inception of the computer program. Attachment "B" shows the number of entries needed to get the same information on the opscan sheets. As the opscan sheets cannot be used for a worksheet and the weekly reports do not provide for the detail, it is necessary to have a separate worksheet to make the necessary computations and to transfer them to the reports and opscan sheets resulting in longhand triplication.

It is being suggested that a form be used as suggested by the attachments "A" and "B" that could be used as a worksheet and copies Xeroxed for the Division Engineer and the computer to be keypunched. This may reduce errors by eliminating copying but could be offset with illegible entries.

While some problems were found to be the direct result of mis-marking the opscan sheets, most were the complete omission of data from the printout. Whether this was from my lack of filling out data sheets or their being lost I have not assertained. About 1500 sheets were filled out during the year requiring about 150 hours of time.

You and I both feel that the data being reported is in excess of that necessary to give a complete picture of river operations. I have never had a request for information in such detail; the requests are for total deliveries and diversions usualy on a monthly basis and they are not interested in how the totals are arrived at. The major ditch companies keep their own records of the sources of their diversions so their requests are for totals of river water only.

With minor changes I would like to return to the original format which will require a change in the computer coding. I would like to reduce the code headings from five to two or three which would be sufficient to describe a run and eliminate the arbitrary 'piping' of water from one structure to another and reduce the number of possibilities for describing a run.

Except for gage heights the return to whole numbers and eliminating the use of decimal amounts is desirable.

By doing this the extra time would be for entering the coding information on the reports - about an hour or two a week.

Sincerely,

John W. Newton

DIVISION OF WATER RESOURCES

Division No. 1/0 District No. 03/00 Beginning Date 07/00 01/00, 1973/00.

(A)

Structure	ID	S	From	U	T	1st of Month Reservoir G.H.	1st of Month Reservoir A.F.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	31	Totals
								16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
LARIMER COUNTY								490	460	440	410	410	400	420	430	425	425	415	410	385	375	410		6305
RIVER	911	1		10				217	209	074	044	029	070	161	119	044	037	030	037	048	008	023		1150
FR STRGE	911	1	*	10	1						013	015	0		007	015	039	045	045	025	0			204
TRNSMTN	911	4		10				273	251	366	353	366	330	259	304	366	349	340	328	312	327	387		4951
TO STRGE	*	6	911	0				037	038	038	038	038	002	337	289	023	002	001	002	133	295	164		867
FR STRGE	*	2		10				113	114	114	114	113	072	002	001	063	071	070	070	011	011	010		949
- IRRIG		6	911	1				566	536	516	486	485	470	085	142	465	474	484	478	263	091	256		5817
TOTALS								603	574	554	524	523	472	402	431	1188	496	485	480	396	386	420		6684

* CODING NEEDED

ONLY DATA BETWEEN DOUBLE LINES + HAVING CODING INFORMATION IS KEYPUNCHED.
TOTALS WOULD NOT BE KEYPUNCHED

CLEAR	3679			M190	05824
LaVA	3676			-0-	-0-
		ETC.			

DIVISION OF WATER RESOURCES Division No. 1. District No. 03. Beginning Date Month 07-01, 1973.

(B)

Structure	1st of Month Reservoir G.H.	A.F.	ID	S	From	U	T	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
								16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
LARIMER COUNTY								420	460	440	410	410	400	420	430	425	425	415	410	385	375	410	6305
-R-			911	1		10		217	209	74	44	29	70	161	119	44	37	30	37	48	8	23	1150
-SPRVL-			911	4	4601	10		57	78	198	214	193	198	190	197	205	188	180	175	160	164	175	2569
-CNSV-			911	4	4602	10		10	8	7	6	7	7	6	5	5	5	4	4	4	6	7	87
-SNYL-			911	4	4605	10		50	48	44	44	44	46	44	42	42	43	44	44	44	48	48	675
-TUVL-			911	4	4600	10		156	117	117	89	122	79	19	63	114	113	112	105	104	149	160	1619
-CPMS	079.0	08884	3679																				
-LG DR	-0-	-0-	3676																				
-BLK HLW-			911	2	3744	10		113	113	113	113	112	63	0		55	63	63	62	0			870
-BLK HLW	028.3	04210	3744	6	911	0		0						27	202	0					177	148	798
-CURT	020.1	00929	3735	6	911	0		4	4	4	4	4	0										20
-KLVR-			911	2	3740	10		0	1	1	1	1	0										4
-KLVR	011.9	00989	3740																				
-LG PD	021.3	03400	3742	6	911	0		29	29	29	29	28	0	64	86	21	0			133	102		550
-LG PD-			911	1	3742	10	1	0			13	15		0			19	25	25	13	0	.	110
-ARCH	015.2	02740	3741																				
-DIV R	026.8	03795	3736	6	911	0		0													16	16	32
-DIV R-			911	2	3736	10		0					3	0		3	2	2	2	0			11
-WS 3	021.8	01364	3737	6	911	0		4	4	4	4	5	0										21
-WS3-			911	2	3737	10		0					6	2	1	6	6	5	6	11	11	10	64
-WS4	014.9	00805	3739	6	911	0		0	1	1	1	1	2	2	1	2	2	1	2	0			16
-LIND	026.7	00633	3743																				
-LIND-			911	1	3743	10	1	0								15	20	20	20	12	0		87
-IRR	1.0'	57911						566	536	516	486	485	470	135	142	165	494	1184	478	263	91	236	5817
[illegible]			911	1	3738	10	1	0							7	0							7

91

December 10. 1973

TO: W.G.Wilkinson, Division Engineer

FROM: Robert D. Littler, Water Commissioner, Dist. 64 R.D.L.

SUBJECT: Computer Reporting

This is an evaluation of District 64 only. It does not have as many types or exchanges of water as do many other districts.

If initial information could be permanently recorded in computer, then one form only would be needed for entire yearly information. This would simplify our system. Repitition of records complicate our reports and is time consuming.

I very much like computer reporting, but colors are confusing and hard on the eyes.

With no critisism intended, the print-outs were not sent out in time for correction. After correction they were still incorrect. I'm sure that after talking with computer expert, and this being a pilot project, these ills will be easily corrected. Many errors were due to my own confusion and carelessness.

If computer excludes long-hand annual reports, then time, energy and confusion will be saved.

If computerization is not adopted, most of the above ills are applicable to the long-hand reporting and could also simplfy that system.

ml

[redacted]

XI. A. WATER COMMISSIONERS' SUMMARY

As a result of computer problems and time limitations the diversion figures for the various districts may be missing or preliminary in nature. The missing information will be entered and all figures verified as soon as possible.

W.D.	Total Structures Reported Active	Inactive* NA	Inactive* NU	Irrigation Use Diversions AF	No. of Acres Irrigated	Ac. Ft. Per Acre	Industrial Use Diversions Ac.Ft.	Municipal Use Diversions Ac.Ft.	Recreation Use Diversions Ac.Ft.	Trans Mtn.* Diversions Ac.Ft.	Total Diversions Ac.Ft.	Total No. of Daily Reports	Delivered To Compact Cmtmt Ac.Ft.
1				202,[illegible]									
2				267,267	201,728		17,894				285,161		
3				256,414	281,700			24,402		T 37,804			
4				128,270	107,706	1.19		6,273			134,543		
5				110,349	91,350	1.21		3,973			114,322		
6				85,353	166,700	0.51		42,013		T 33,170	160,536		
7				85,575	51,250		13,000	17,723		T 839	117,137		
8-80				48,[illegible]			1670(1972)	941,182(1972)		T 2,250			
9				12,328	9,830	1.25	520	1,574			14,422		
23				131,587	15,000	4.50		500		T 12,190	144,277		
48				19,980						F 20,750	40,730		
49				3643									
64				149,197	159,269	0.94					149,197		
65				9478									
TOTALS													

1307 Total Structures

NA = No Water Available
NU = Non Use

*Transmountain Diversions: Designate either to (T) or from (F) District.
E = Estimate

XI. B. WATER COMMISSIONER'S SUMMARY

As a result of computer problems and time limitations the figures for the water budget were not available in time for the submission of this report. The information will be entered as soon as possible.

	W.D.	Amount in Storage Acre Feet 11-1-72	5-1-73	10-31-73	Actual Am't Diverted to Storage During Season	Delivered from Storage to Irrigation	Storage to Industrial Use	Storage to Municipal Use	Storage to Projects
+24,142	1	55,881	129,847	31,739					
- 4,777	2	53,804	102,203	58,581	76,284	82,068			4,700 CBT to Irr.
-37,793	3	178,729	284,068	216,522					CBT to Irr.
-10,982	4	135,067	196,521	146,049	28,786	37,324			34,462 CBT to Irr.
+ 1,528	5	50,773	53,759	49,245	7,708	7,632		5,822	19,075 CBT to Irr.
-15,851	6	65,235	65,449	81,086		20,676			6,355 CBT to Irr.
- 7,509	7	26,755	38,231	34,264	33,239				
-16,164	8-80	87,082	103,136	103,246					
- 2,310	9	3,895	7,391	6,205		2,846			
- 7,732	23	110,597	106,927	118,329					
	48								
	49								
- 8,490	64	46,684	121,299	55,174		97,068			
	65								
	TOTALS	814,502	1,208,831	900,440	146,017	82,614		5,822	64,592

DIVISION NO. 1

	DATE OF ISSUE	DISTRICT CALLING	PRIORITY CALLING	DISTRICTS AFFECTED									
				1	2	3	4	5	6	7	8	9	23
1.	3-26-73	8	4- 1-1911 Cancelled										x
2.	7- 1-73	1	5-31-1907		x	x	x	x	x	x	x	x	x
3.	7- 3-73	64	7-19-1886	x	x	x	x	x	x	x	x	x	x
4.	7-16-73	1	10- 1-1888		x	x	x	x	x	x	x	x	x
5.	7-18-73	1	5-31-1907		x	x	x	x	x	x	x	x	x
6.	7-21-73	NO DEMAND		x	x	x	x	x	x	x	x	x	x
7.	8-11-73	2 Ab. St. Vr.	6- 9-1909							x	x	x	x
8.	8-12-73	2 Ab. St. Vr.	11-20-1885								x	x	x
9.	8-23-73	2 Ab. St. Vr.	10-15-1873							x	x	x	x
10.	8-26-73	2 Ab. St. Vr.	11-20-1885							x	x	x	x
11.	8-27-73	2 Ab. St. Vr.	7- 8-1876							x	x	x	x
12.	9- 3-73	2 Ab. St. Vr.	11-20-1885								x	x	x
13.	9- 6-73	8	9-10-1878										x
14.	9- 7-73	8 Released Demand											x
15.	9-10-73	NO DEMAND								x	x	x	x
16.	9-14-73	8	4- 1-1911										x
17.	9-25-73	8	9-10-1878										x
18.	9-28-73	NO DEMAND											x
19.	10-23-73	8	4- 1-1911										x

X. RECOMMENDATIONS AND SUGGESTIONS

The testimony presented by the state in the hearing now before the Water Court on protests to the rules and regulations pertaining to ground water use has been very convincing as to the need for such administrative action to prevent material injury to senior water rights. Further, the general attitude of counsel for the protestants suggests the inevitability of well regulation with the major concern being how and to what extent such regulation shall be implemented. If well regulation becomes a reality, as it now appears it shall, the burden of administration of wells will be added to the already extensive responsibilities of the division staff. Additional field personnel will be needed to accomplish this. Some of the responsibilities may be born by user organizations such as GASP or ditch companies, but it is estimated that at least fifteen full-time-equivalent positions will need to be staffed.

Regulation of wells such as they now exist will be difficult at best. While most wells have an electric meter on their power supply, the many variables involved make definite determination of the volume or rate of flow at the well very difficult. For this reason it is recommended that all wells be equipped with water meters.

The position of water commissioner and deputy have been classified in the state personnel system by comparison with that of a junior draftsman as a key class. It is felt by all division personnel that this results in underrating the water commissioner and deputy positions. It is recommended that the jobs be classified on the basis of responsibility, economic value and hazards involved. Further the division field staff must supply their own office space, utilities and furniture with the exception of file cabinets which were furnished this last year by the state. These officials also use help from their families for telephone and secretarial assistance. Compensation for these home facilities and help would certainly be appropriate.

The computer program for diversion and distribution records now makes use of op-scan sheets to enter the data into the machine. The water commissioners complete these sheets by simply making a mark in the applicable spaces. The machine then reads these marks by location on the sheets and interprets the numbers and/or codes. The original purpose of these op-scan sheets was to eliminate the need for key-punching. However, after a year's experience, it is believed desirable to have the water commissioners submit their reports on a standard periodic form, using numeric

and alphabetic characters commonly used and easily understood. A keypunch operation ahead of the computer would then be required. This would materially reduce the errors and omissions common to the present method and, while requiring more work before going into the computer, would reduce the need for checking and revision after the initial printout.

Much constructive effort has gone into the determination of adequate water supplies and sewage disposal systems for subdivision developments. Some consideration has also been given drainage but it is believed that much more comprehensive evaluation must necessarily be made to force recognition by developers and planning groups of the disastrous flood potential resulting from changes in land use. A case in point was the May flood on the South Platte River occasioned by the heavy precipitation in the Denver area. While much heavier than normal, this particular storm dropped only 3.5 inches of water. Twenty-five years ago this would have caused some local flooding but much of the water would have been absorbed into the ground, retained by vegetation and generally slowed in runoff by natural circumstances. As it was in 1973 the rain and runoff was rapidly collected by rooftops, driveways, sidewalks, parking lots, streets, storm sewers and channeled immediately into creeks and rivers. The result was disastrous for those low-lying areas adjoining these streams from Denver to the state line. As urban development is expanded the flood potential is multiplied. Many residence, commercial and industrial buildings have been built in old flood plains. Creek channels, drain ditches, and natural draws have been choked off, obliterated or otherwise encroached upon. Canals which once intercepted the minor runoff of open rural areas are now used as storm sewers in addition to their normal purpose as a conduit for irrigation water. The danger of accumulating water from one natural drainage and transporting it to other drainages where inadequate capacity or physical failure may result in flooding an area with imported water is an increasing threat to life and property.

Certainly, definite guidelines and provisions for control of future man-made runoff would be advisable.

Division 1, Dugan Wilkinson, Division Engineer

As of mid-October, the weather continues warm and dry and stream flows are quite low. Most direct irrigation has been discontinued for the season allowing reservoirs to start storing for the 1973 season. The good weather has been a boon to farmers in harvesting their crops. The beet harvest is approximately one-half completed with both yields and sugar content running well above average.

The directors of GASP have been working diligently on the terms of a proposed contract and at their directors meeting on the 24th of October, the board decided to make contracts available for the 1973 season on the 15th of November. The assessments will be determined later and will be announced as soon as they have been determined. Plans are also being made to hold at least four public meetings within the division at which time interested persons are urged to participate. Announcement of the time and place for these meetings will be forthcoming.

The Dean Thompson and Dugan Wilkinson families have enjoyed vacations the past month. Both reported pleasant weather and beautiful fall scenery for their drives into the northwest.

Art Wenz, Water Commissioner in South Park, was released from the hospital October 14 after some two weeks of treatment. Art has been incapacitated much of the time as a result of injuries suffered in an automobile accident in March. We hope that his health will continue to show improvement.

Division 1, Dugan Wilkinson, Division Engineer

As of mid-November, most of our water commissioners had completed and submitted their annual reports. The office staff is now directing its efforts to accumulating and assembling all the material necessary for our annual report to the State Engineer.

The several snows this fall give us more confidence in Andy Nelson's snow forecasts. Andy, and old ditch superintendent, now deceased, contended that the day of the month for the first snow of the season was an accurate indicator of the number of snows we could expect during the winter and spring. After our first snow on October 29, we are now keeping the water bucket filled and the wood piled near the back door.

GASP has recently opened an office in Fort Morgan. It is very competently staffed by Marge Samples, Secretary, and Joe Howell, Manager; both are well qualified in the water business. Joe is a past superintendent with the Bijou Irrigation Company and director for the Northern Colorado Water Conservancy District and Marge as clerk in the Bijou office and wife of Bob Samples, Water Commissioner. GASP is now accepting contract applications for 1973. Four public informational meetings in December are planned. These will be held in the Brighton-Fort Lupton area, Greeley, Fort Morgan and Sterling. Applications and further information may be obtained from GASP, P.O. Box 974, Fort Morgan, Colorado 80701.

We are pleased to have Wes Hayman, Water Commissioner, join us in the Greeley office. Wes has been Deputy Water Commissioner in the Fairplay area the past two summers.

Marilyn Palmer, a member of the Water Commissioner Auxiliary, is recovering from major surgery at the Longmont Hospital. Our best wishes to Marilyn.

Justice is being well served. Bob Littler, Water Commissioner at Sterling, has been called for jury duty in the U. S. District Court at Denver starting November 13. He is probably asking himself, "Why couldn't this have happened in August?"

WATER NEWS January 1, 1973

Division 1, Dugan Wilkinson, Division Engineer

Temperatures averaging 30 to 40 degrees below normal have slowed water use to a snail's pace the last few weeks. We are fortunate in some respects since early snowfall has been good in the mountains and we have had little wind.

Jim Clark and Dugan Wilkinson attended the annual Division Engineers' Meeting in Denver, December 14 and 15, and would like to thank the staff of the Denver office for the effort expended in preparation of an excellent report to the Division Engineers. Of particular interest in plans for the coming year will be the initiation of a diversion reporting system designed for inclusion in the data bank and the automated data processing system.

The State Engineer has published the rules and regulations for the use of underground water effective February 19, 1973. Under these rules, the non-exempt wells with applications in the Court prior to July 1, 1972 will be allowed to pump 3/7 of the time unless they are operating under some alternate plan of operation approved by the Division Engineer or one of his agents. Anyone having questions regarding these rules and regulations are asked to contact the Division Engineer.

GASP has held public meetings in Fort Morgan, Fort Lupton, Greeley and Sterling to explain their 1973 program to well owners and assist in making application for membership. A great amount of interest has been shown and a large sign up is anticipated. The final deadline for making application will be March 15, 1973. Contract applications are available at the GASP office, P.O. Box 974, Fort Morgan or at the Division office in Greeley, Room 208, 8th & 8th Office Building.

Wanda and Ray Leisman were the recipients of a very special Christmas present. Natalie Jo chose Christmas Day to join the family. Congratulations Ray and Wanda.

The annual dinner for staff members of Division 1, their spouses and guests, was held December 1 at the Regency Inn at Denver with 33 in attendance.

Division 1, Dugan Wilkinson, Division Engineer

It has come to our attention that three petitions are now being circulated in opposition to Central Colorado Water Conservancy District. The petitions are opposing:

(1) Formation of a ground water sub-district
(2) Existence of Central itself
(3) Inclusion in sub-district if it is formed

A decree handed down by Judge Wolvington in the Division Water Court recently was a staggering blow to Central. The Court denied each of nine applications, with the decretal section reading as follows:

> "It is therefore ordered, adjudged and decreed by the Court that there being no date on which any of the projects contained in the applications herein appears from the evidence to have been initiated and pursued thereafter with diligence, as a result of a manifested intent to appropriate water, each of the applications herein is denied and no decree for any water or water right is awarded herein with respect to any of the applications enumerated in the caption hereof (W-89-98) and each of Central's applications be, and they hereby are, dismissed."

A recent meeting with Bureau of Reclamation people indicated they are not optimistic about the Narrows dam being built in the near future. The present political climate will probably slow most dam construction until adequate emvironmental impact statements can be filed.

Several protests to the rules and regulations governing the use, control and protection of surface and ground water rights on the South Platte River and its tributaries have been filed with the Division Water Court. These range from those insisting that regulations should be 100% of the time to those who feel any regulation is a violation of justice. It is our hope that these protests can all be heard together, with a workable decision resulting.

Some other news items in brief:

(1) Julesburg Hotel discovered burning shortly after hydrographer seen leaving town.

(2) Ted Bell's very bright ties continue to warm our cold winter days.

(3) Dean Thompson says the zipper on his briefcase is worn out and his ash tray cracked . . . I think he is informing us that he is thinking pretty strongly about fishing, traveling, and warmer climates.

(4) Glenna Bell caused a little excitement recently when she and a friend got a jeep stuck late in the evening and had to spend the night high in those cold Colorado Rockies.

WATER NEWS March 1, 1973

Division 1, Dugan Wilkinson, Division Engineer

The February 1 stream flow forecasts for 1973 are encouraging. The National Weather Service report indicates stream flows in the 100-110 percent range. The Soil Conservation Service reports snowpack as approximately 120 percent of average.

Severe ice conditions in several reservoir inlet canals are restricting the carrying capacity drastically. As a result, water which might otherwise be stored is going into Nebraska; approximately 2000 acre-feet is passing the Julesburg gage daily.

The Greeley Farm Show sponsored a public meeting January 24th at which Jeri Danielson explained the proposed regulation of wells for 1973 to several hundred interested water users.

At another meeting, which filled the R.E.A. Hall in Fort Morgan, on February 8th, several members of the Joint Legislative Committee on Natural Resources discussed proposed legislation on water use with water users and administrative officials. The general concensus of opinion was that some type of basin management by water users was desirable and necessary.

Applications to join GASP are coming to the Fort Morgan office of that corporation in a steadily increasing volume. The Bijou Irrigation Company presented a temporary plan of augmentation which has been approved by the State Engineer. Some 200 wells under the Bijou system will operate as they are needed this year with the replacement of their depletion made to the river as necessary by the company from reservoir or alternate sources. Several other alternate plans are under study at this time.

Nine protests to the rules and regulations on the use of underground water have been filed in the Water Court. These protests cover a wide range of objections from a variety of water users. Asking to be heard are diverters of surface water, underground water, water for irrigation, commercial, industrial and municipal uses. The protestants contend well use controls, varying from strict restriction by priority to no restriction whatsoever, should prevail. The Court has set aside two weeks beginning June 4th for hearings of the protests and has directed that imposition of rules and regulations be withheld pending the ruling of the Court on the protests. With most water uses and interests becoming involved, the hearings should be most interesting and the ultimate decisions conclusive.

A division staff meeting was held in Greeley on January 16th to discuss administrative procedures and problems for 1973. The inclusion of well regulation into the administrative duties has multiplied the responsibilities of our entire staff.

Joy Ahlborn, who served most ably as the Clerk of the Water Court since its inception in 1969, returned January 1 to her former position as Court Librarian for Weld County District Court. Moving up to the position of Water Clerk is Lois Bohlender, who, after working in that office for some two years, is now directing its activities very capably. Congratulations to both of these good ladies on their new jobs and for work well done.

Jim Clark took advantage of the two national holidays and some annual leave to visit his family and friends in California in mid-February. Tom Platt of Boulder has also taken annual leave to vacation in Arizona and California.

Division 1, Dugan Wilkinson, Division Engineer

The month of February produced very little moisture in the South Platte drainage area. This fact is reflected in the March 1 streamflow forecasts which indicate surface flows will be in the 90-100 percent of average range.

During the month of February approximately 53,000 acre-feet of water passed out of the state at Julesburg. In mid-March this flow still amounted to 1,500 acre-feet per day. Diversion of a portion of this water to small recharge projects would go a long way toward alleviating the late summer water shortages.

The organization GASP (Groundwater Appropriators of the South Platte) reports that a large number of applications were received during the final week before the March 15th deadline. The totals will be reported in next months newsletter.

The Water Court has continued hearings on the formation of the Groundwater Subdistrict of the Central Colorado Water Conservancy District until April 3.

Marshall Grace and Norman Prosser from the Denver office of the National Weather Service visited the Greeley office March 21 to formulate plans to coordinate stream flow information with weather conditions in an effort to provide early, reliable flood flow predictions.

Division 1, Dugan Wilkinson, Division Engineer

The failure of Lower Latham Reservoir Dam on April 12th has been the event of prime interest and greatest concern in this area. The full extent of damage done by the water is not yet known but estimates run as high as four million dollars. The Lower Latham Reservoir Company stockholders had a meeting on April 25th to discuss whether to rebuild or abandon the reservoir. As of this date, a firm decision on that matter has not yet been reached. Further information on the Latham Reservoir disaster may be found elsewhere in this issue of the Water News.

The April 1st Water Supply Outlook forecasts stream flows in the South Platte drainage varying from 79 percent of normal on the St. Vrain at Lyons to 93 percent on the Cache la Poudre at the mouth of the canyon. Reservoir carry over storage is good, making a total water supply outlook adequate; now all we need are a few good warm days to allow area farmers to prepare the ground and plant their crops.

A report, dated April 12th, received from the Groundwater Appropriators of the South Platte (GASP) indicates the following contracts signed with GASP for the 1973 season:

Contracts	922
Wells	2095
Units *	3401

* 1 unit = 100 A.F. of water to be pumped

We see this as a strong, healthy step forward for area well owners in attempting to solve their water problems.

Division 1, Dugan Wilkinson, Division Engineer

Our calamity of the month was the flood on the South Platte River starting May 6th. Heavy rains on the South Platte River, Plum, Bear, Clear and Sand Creeks concentrated the runoff in the Denver area to flood proportions of nearly 23,000 cfs. Inflows of lesser magnitude from downstream tributary streams increased the peak measurement at Kersey to more than 30,000 cfs. The crest continued downstream and passed out of the state on May 11 with a peak flow of 20,340 cfs at Julesburg.

At least two lives were lost in the flood waters, many roads and bridges were destroyed, irrigation diversion works washed out, homes and farms were flooded and livestock drowned. Estimates of damage are running in excess of $50,000,000.00. If any comfort can be found in the weather and runoff circumstances at the time of the flood, it might be pointed out that due to the cold spring, the base flows in the stream were considerably less than would otherwise have been expected. The very excessive precipitation did not extend into the Boulder and St. Vrain Creeks and the Thompson and Poudre River watersheds and, further, the Bijou, Kiowa, Box Elder, Lost, Badger and Beaver Creek flood flows entered the Platte well ahead of the Denver Crest. The above normal snowfalls in April have increased the snowpack to well above average and had the weather been normally warm, the runoff would have far exceeded the already record discharges between Denver and Weldona. We still have a serious potential for flooding conditions if we get a combination of hot weather and rain on the present snow accumulation in the mountains.

Farm work is far behind schedule in most of the division as a result of the cold, wet winter and spring. Very little irrigation has been necessary through mid-May. Major repair of flood damaged irrigation systems will be necessary before they can be effectively used.

Governor Love has declared those areas affected by the flood a disaster area and the President of the United States is expected to also proclaim portions of the state a major disaster area and thereby make federal funds available for repair and restoration both by grant and loan at low interest rates.

On May 8, President Nixon proclaimed a major disaster in Weld County as a result of the failure of Latham Reservoir Dam. Applications are now being made for federal funds to repair the damage resulting from the Lower Latham flood.

Bob Samples, Water Commissioner of Water District No. 1, had the painful misfortune of breaking his hip on May 13. He has been pinned back together and will be confined to the hospital for about 3 weeks. Our best wishes to Bob for the speediest recovery possible. Don Brazelton will assist in the administrative duties while Bob is convalescing.

WATER NEWS July 1, 1973

Division 1, Dugan Wilkinson, Division Engineer

A large portion of the first two weeks in June was taken up attending the hearing of protests to the State Engineer's Rules and Regulations. A large amount of testimony was entered and more will be heard starting on Monday, October 29, 1973. As a result of this delay, and under order of the Court, wells will not be regulated this irrigation season.

The South Platte River between Kersey and Julesburg has remained at flood stage almost continuously since May 6th. Approximately 925,000 acre-feet of water passed the Kersey gage during the month of May and the first 15 days of June. The average annual discharge at Kersey for the past ten years has been 607,640 acre-feet.

New and summer employees of Division 1 are as follows: Ben Saunders joined us on June 6th as Water Commissioner 1 in the 1042 position recently vacated by the transfer of Wes Hayman. George Sievers was welcomed back to the Greeley Office for the summer on June 4th. Bruce Smith has been working for us since May 1st as Deputy Water Commissioner in District No. 3 assisting Jack Neutze on the Poudre. Bruce has worked with Bill Gleason on the Laramie for the past two summers. Welcome back to Bruce and George and a glad to have you aboard, Ben.

Bob Samples is home again and able to get around on crutches.

Our deepest sympathy is extended to Arlyn Davison whose mother passed away recently at Ogallala, Nebraska, and to the Bob Littler family. Bob's brother and Millie's father both passed away recently.

We also extend our heartfelt sympathy to Jack Fisher whose wife, Edith, passed away recently.

Merrie Wankelman Sims, daughter of Dorothy Wankelman, our secretary, was named one of America's Outstanding Elementary Teachers recently. Merrie is a 1969 graduate of UNC and teaches in Shelton, Washington. Congratulations, Merrie!

Members of our Division 1 family are on the move. Joe Clayton's daughter, Dixie, left recently for Colombia as an exchange student. Have fun, Dixie. Ula Bell, daughter of Ted Bell and sister of Orlyn Bell, will be getting married July 15th in Indonesia. Best Wishes to you, Ula. Don, Carolyn and Kendall Brazelton spent two weeks in Pennsylvania in June.

WATER NEWS August 1, 1973

Division 1, W. G. Wilkinson, Division Engineer

The extremely dry weather we have been having for about a month broke on Thursday, July 12th. Good rain continued off and on through the weekend bringing much needed moisture to thirsty crops. The crisis may be past for most crops now, with foliage enough to shade the ground, it won't take as much water to keep them going. Reservoir storage is good and with average rainfall from here on out we anticipate a fairly good crop year.

The dry weather has made it necessary for the City of Greeley to curtail lawn watering substantially. Homes with even numbered addresses are allowed to sprinkle on even numbered days and odd numbered homes on odd numbered days. In addition, no watering is allowed from 12:01 A.M. - 5:00 A.M. and from 1:00 P.M. until 5:00 P.M.

A temporary gaging station has been installed on the South Platte at Kersey with hopes eventually of having a bubble gage and telemark there. This station is the key for all water administration below Kersey and a reliable, easily monitored station would be a great help.

Division 1 was represented at a meeting in Glenwood Springs on July 27th by Dorothy Wankelman, Ray Leisman, Don Brazelton and Dugan Wilkinson. New directives and procedures, as adopted by the Department of Personnel, were presented and discussed for the supervisory personnel attending from Divisions 1, 4, 5 and 6.

Art Wenz continues to have problems with injuries sustained while driving the Division 1 Bronco over a year ago and remains under doctor's care.

Dean Thompson, whose retirement begins today, was honored yesterday at a noon dinner by Division personnel. Thanks, Dean, for a job well done. Best wishes to you and Effie in the carefree days ahead.

Division 1, Dugan Wilkinson, Division Engineer

Water has remained plentiful throughout this season. Due to the availability of ample direct flow water, most reservoirs have remained full all year. This is becoming a matter of some concern at this time since most older irrigation reservoir dikes were not designed to hold water continuously. If they remain full for the rest of the year, they will have to be watched closely next spring for signs of stress. Reservoir owners are encouraged to help the State by reporting any problem dams as soon as there is any sign of difficulty.

The late start most farmers had last spring will make a long warm fall necessary for crops to reach maturity. Those predicting an early September frost are not much appreciated at this time.

The ceremony marking the closing of the Chatfield Dam was attended by the Division Engineer. The dedication speech was delivered by Vice-President Agnew who received a standing ovation.

A Four States Irrigation Council Tour was attended by the Assistant Division Engineer recently. He reported an interesting and informative tour was conducted through a portion of the Arkansas Valley. A running narrative on the role of irrigated agriculture was presented by members of the Southeastern Colorado Water Conservancy District. Visits were also made to the CF&I Steel Mill, CF&I Farms and the new Pueblo Dam.

One million dollars for the Narrows Project was authorized recently. This money is to be used for land acquisition according to Eric Wendt, Secretary-Manager of the Lower South Platte Water Conservancy District. Ceremonies for the signing of the contract between the Lower South Platte Water Conservancy District and the Department of Interior have been set for September 11 in Sterling.

The week of August 16th was a very trying and aging one for Dugan as he became a grandfather on Thursday the 16th with the arrival of Jared David Morrow. This was accomplished with the help of daughter Greta and son-in-law Al. "Grandpa Wilkinson", Grandson, and Mother are all doing fine.

We welcomed Beverly Thomas to our staff on August 21st to assist Dorothy Wankelman. Dorothy hopes to have time to take a lunch break some time in the future with Beverly's help.

Water Commissioner Art Wenz passed away on August 5th. He was to have retired on September 1st. We extend our deepest sympathy to his wife, Marge.

We also extend sympathy to Quinto Brunelli whose brother passed away recently and to John Noonen whose uncle passed away.

Division 1, Dugan Wilkinson, Division Engineer

The 1973 irrigation season is rapidly drawing to a close. In spite of below normal precipitation in many areas, we have been blessed with the best all-season water supply in many years. Most of the division has a large carry-over in reservoir storage. A credit balance, as of September 1, of nearly 47 percent of the 1973 quota in the CBT Project was indicative of the ample reserve of supplemental water.

The potential for unseasonable weather in Colorado was again emphasized by the destructive hail in the Wiggins-Fort Morgan area on September 8. Widespread rains in that storm system curtailed harvest activities for several days.

The enlargement of Greeley's Barnes Meadow Reservoir has been completed as designed. Water from Peterson Lake is now being transferred in Barnes Meadow for winter storage.

Bill Gleason, Water Commissioner on the Laramie River, reports that most of the Glendevey unit of the Flying W Cross Ranch has been sold to Greeley investors. This, and sale of other Laramie River property in the past two years, portends a significant change from ranching to recreational interest in that area.

After climbing all of the 14,000 foot peaks in Colorado, Jim Clark spent September in Europe looking for new heights to conquer. A postcard from Switzerland brought the good news that he had successfully scaled the Matterhorn. Congratulations, Jim.

George Sievers has completed another summer working as an Engineer-Technician in the Hydrographic Unit of the Greeley office and has returned to CSU to complete his senior year. We hope that he will return to work next summer on a permanent basis.

The Division Engineer was privileged to attend the Western State Engineers Conference at Steamboat Springs, September 12-15. The program presented was interesting and informative.

Environmentalists question impact of Narrows Project

TOWN & COUNTRY 9-13-73

The proposed Narrows Dam across the South Platte River near Fort Morgan is causing considerable consternation for Colorado conservationists.

Colorado Environmental Legal Services (CELS), a Denver-based ecology action group, has formally requested that the Bureau of Reclamation issue a new Environmental Impact Statement for the project. The organization has also requested that the Office of Management and Budget refuse to release any funds for the project until an adequate impact statement is made in compliance with the National Environmental Policy Act of 1969.

Gary Parish, a spokesperson for CELS, said that his office had been contacted by persons who feel the environmental impact of the project has not been fully considered. An Environmental Impact Statement for the project was filed in 1970, but CELS is demanding a new statement because of the passage of time and changed circumstances, and because they claim original statement is not fully in compliance with Council on Environmental Quality guidelines or the requirements in the National Environmental Policy Act for impact statement contents.

Parish said this original statement was issued shortly after the passage of the Environmental Act and before guidelines had been adequately interpreted. He said the statement issued in 1970 was only 12 pages long, whereas a similar study conducted on the impact of oil shale development filled six volumes. He termed the original statement "the worst I've ever seen in terms of complying with the goals and objectives of the Environmental Act."

Parish reported that his organization is considering litigation against the Bureau of Reclamation if they do not comply with requests for a new impact statement.

He claimed that the present study does not adequately discuss alternative sites for the project and that the cost-benefit figures are out of date.

Debate over the Narrows Project was renewed recently when President Nixon signed a bill allocating a million dollars for basic studies and project design. The Narrows Project has been "in the works" for several years, but the signing of the recent bill seemed to indicate that the project was on the way to becoming reality. The allocation of funds still must go through the Office of Management and Budget before it becomes available to the Bureau of Reclamation for use on the project.

A spokesman for the Bureau said that if the funds are approved by the OBM, the money will be used for advance planning on the project. Right-of-way must be obtained, surveys taken, and plans made for moving a railroad track which runs through the area. The spokesman, who said "I'm just a cog in the machine" and asked not to be identified, reported that the Bureau was aware of the dispute over the adequacy of the original impact statement.

"The Bureau is in the process of deciding if submission of a new impact statement is required," he said. "It is conceivable that funds now being processed through the Office of Management and Budget could be used for the purpose of conducting another environmental impact survey, but at the present time we have no money to spend on any aspect of the project."

State takes testimony on Latham break

Thurs., April 26, 1973

By LYNN HEINZE
Tribune Agricultural Writer

In a tense atmosphere, punctuated with claim and counter-claim, a hearing into the cause of the breach in the Lower Latham Reservoir on April 12 was conducted Wednesday in Greeley by the state engineer, Clarence Kuiper.

Those who testified at the hearing were not required to be sworn in before giving their testimony, but the hearing was recorded and will be used in the continuing study of the breach, Kuiper told the standing-room-only crowd.

The purpose of the hearing was to gather first-hand information as to the events leading up to and following the breach. The breach, and resulting flood, caused damages estimated at about $3.5 million according to official county estimates. The damage was in the vicinity of Kersey and estimates included road repair, railroad repair, damage to public facilities in Kersey and to personal losses to the residents of the area. Another $220,000 damage was done to school buildings in Kersey.

Kuiper said the purpose of the hearing was to neither fix blame nor assess the damages, but simply to aid in determining the cause.

Kuiper also noted the economic impact of this type of break. "Such a failure can cause a real disaster to the town and the farms in the area simply because both are dependent on the production of the agricultural sector," Kuiper said.

According to the Bureau of Reclamation, Kuiper noted, "for every man out carrying a shovel, there are five men living in town who are living off his efforts."

The first witness to appear before the hearing was reservoir board member Victor Klein. Klein said he first heard of the breach at 9:30 a.m., April 12.

He said that he met ditch superintendent Roy Mitchell at the site shortly after that time and drove to the site of the breach on the dike. Klein reported that at the time he and Mitchell arrived, the breach was about 30 feet wide and "no more than five to six feet deep."

The point of breach, Klein said, at that time was west of the spill way structure. He indicated that it was difficult to estimate the depth of the breach because water was "shooting out in a V-shape along the structure. But the dirt along the east dike was still intact at the time we arrived," Klein noted.

"By the time we left the area, which was a few minutes, the breach was over 50 feet wide, but still to the west," Klein said.

Klein noted that the spill-way was located at the site of a natural island in the reservoir. "That island goes about 150 yards out into the reservoir, and the water at that point was probably pretty shallow," Klein said.

Klein noted that there had been rumors of excessive seepage from the dike. "To my knowledge," Klein said, "no one ever came to the board with any mention of the excessive leakage or spill-over. If they did, I didn't hear of it.

"The only real seepage that I know about," Klein said in his testimony, "was what everyone referred to as the spring. This spring was about 250 yards from the point of the breach. It's been there as long as I can remember, and was always crystal-clear."

Klein also noted that the reservoir has natural fill from the Beebe Draw and seep in the area of the inlet. "It has been the policy of the board to allow about as much water out of the outlet as is going over the spill-way. In this way we felt we could keep ahead of the water," Klein said.

Klein also noted that "we kept the amount of fill down this year in expectation of increased run-off this spring. So we didn't fill it at the same rate as we have in the past."

Joe Brantner, whose farm lies to the northwest of the point of the breach, confirmed the time of the breach and noted that he and his wife were the first to see and report the break.

Brantner denied, however, the claims that there was no excessive leakage or seeping at the dike.

"I had a lake of about two to three acres in my pasture which is right at the base of the dike," Brantner charged. "There was so much water in that pasture that the two 24-inch tubes which are supposed to take the water off my pasture couldn't handle it. I called the board about it, and they voted on April 4 to take no action on the situation."

Although Brantner said he could not determine the specific reason for the excessive ground water in the area, but said he noticed the "excessive groundwater many weeks before the breach, but the board took no action at the time."

Johnny Rein, president of the reservoir company, testified that he had walked the area in which Brantner had said there was a problem. "I went to the area with the superintendent (Roy Mitchell) and there was only a few inches of water. It was clear, and was groundwater, in my opinion, not the result of a leak."

Rein said that while inspecting the site Mitchell's hat blew off into the seep ditch which was designed to carry off any excess water. "I walked out in the ditch to get Roy's hat," Rein said, "it was only a couple of inches deep." Rein said the inspection was made on April 2.

The board decided not to take action to increase the size of the tubes under the road, Rein said, "because there didn't seem to be a problem."

Mitchell was the next to offer testimony at the hearing. He told the state engineer that Brantner had called him in late March complaining of excessive seepage in his pastures.

"The board was waiting to find out what the county was going to do about the road that the tubes went under," Mitchell said. "The county had indicated at one time that the road might be re-routed, and the board didn't want to spend the money until it knew what the county was going to do."

Mitchell continued, "The day that Johnny (Rein) and I went out to the area, there wasn't that much water. There was probably more than usual because other farmers had cut water from their field across to run into the seep ditch. But, I couldn't see that there was that much considering the moisture we've had."

Mitchell was asked whether he'd noticed any cracks in the dike on the day he and Rein had been in the area. He indicated that there were none. "There was a crack in the dike which was reported many months ago," Mitchell noted, "but that was located more than a city block from the point of the breach."

"In that case, we dug out behind the break in the wall and filled it with cement. There's never been a leak at that point though and it's still in place," Mitchell concluded.

Mitchell also said that he had been across the dike two days before the breach and "saw no indication of any cracks or leaking."

Other testimony indicated that there was an extremely deep frost line in the area this past season.

Dams Get Second Look In Wake Of Kersey Flood

Ft Morgan Times 4-23-73

In the wake of the Latham Reservoir Dam collapse and flooding of Kersey, dams along the South Platte River are getting a second look in their regular inspections.

Bob Samples of Snyder, State Water Commissioner, Division I, is making weekly checks of dams all along the Platte and this past week he and an engineer from the dam section of the Division of Water Resources have been walking along every dam or dike on both sides.

"I inspect dams in my area once a week during this period," Samples said, "and the state inspects periodically." He also pointed out that "people who are caretakers check the dams every hour or more frequently" during severe windstorms like Thursday's.

Strong winds form waves on the reservoirs and cause the water to pound into and over dams.

Some reservoirs we check more frequently than others," Samples continued. "Those with larger bodies of water we inspect more often than the smaller ones."

He also pointed out that this time of year reservoirs are more nearly full than usual since it is just before the irrigation season.

"With Latham breaking people want to know about each of the dams and after Latham we're giving them another check."

Samples said reservoirs along the Platte are not completely full. They are full enough for safety at this time of year, and "we'll finish filling them just before the direct ditches start to irrigate."

When this is varies from year to year. Some years the reservoirs have to be filled earlier because of the available supply and the demand of the crops.

"All my reservoirs are about a foot below capacity except Bijou No. 2 which is dry," the commissioner explained. "We've been holding them there about a month now and will start filling Bijou No. 2 the first part of the week."

Samples also said that a formal hearing will be held Wednesday in Greeley at the Farm Fare on the Latham Reservoir Dam break and resulting Kersey flood. The hearing will start at 10 a.m.

Latham Dam to be rebuilt

By JOHN SEELMEYER
Tribune Staff Writer 9-5-73

Reconstruction of the Lower Latham Dam, damaged in an April 12 flood, will begin "in the next few weeks," according to Bob Boekenkamp of the Greeley engineering frim Nelson, Haley, Patterson and Quirk.

Boekenkamp said Hensel Phelps Construction Wednesday was awarded a $547,000 contract to repair flood damage and improve the dam.

The construction work involves two segments, Boekenkamp said.

First, the portion of the dam breached in the flood will be rebuilt and the spillway enlarged, at a cost of $410,000. The 18-foot wide spillway in the old dam will be replaced by a 360-foot wide spillway, Boekenkamp said.

The first portion of the construction will be financed through funds from the Office of Emergency Preparedness, Boekenkamp said.

The second part of the construction will involve building embankments on the upstream side of the reservoir, Boekenkamp said.

That construction, at a cost of $137,000, will be financed through a Farmers Home Administration loan and through funds the stockholders in the reservoir company have assessed themselves, he said.

The project was designed by Boekenkamp with Tom Burnett acting as engineer for the project. The work will bring the dam up to state specifications.

'SB 35': Tough Law On Land Control

By Paul Danish

It is probably possible to discuss growth in Colorado without mentioning Senate Bill 35, but it's probably not worth the effort.

"Senate Bill 35" is the short-hand name for Colorado's new law regulating the creation of subdivisions. It stopped being a "bill" last May 5 when Governor Love signed it into law, but the General Assembly's numerical designation has stuck.

Senate Bill 35 is probably the most significant land use law passed to date since the wave of concern with growth and the environment began sweeping Colorado.

It was enacted, according to the County Planning Department, because of concern over "land sales activities involving 1.5 to 2 milllion acres of Colorado land."

The law was not intended to halt growth, or even future subdivisions, and from all appearances it hasn't. It's object was to insure a more orderly development and to require that those subdivisions that were approved met certain minimum standards. Whether it has succeeded remains to be seen.

The regulations were nonetheless broad enough to effect one way or another most residential development outside of incorporated areas in Colorado.

And they were vague enough to pose a fascinating dilemma over whether the spirit of the law can be best served by a relatively permissive policy of granting exemptions to it.

The law required each of the 63 counties in Colorado to have adopted sub-division regulations by Setember 1, 1972.

A key feature of the law was that it redefined the terms "subdivision" and "subdivised land" to include a greater catagory of proposed land activities.

With certain specifically spelled out exceptions, "subdivided," and therefore regulated, land is defined as "any parcel of land in the state which is divided into two or more parcels, separate interests, or interests in common."

The two most important exceptions are 1. divisions of land which create parcels all of which are at least 35 acres in size, and 2. "any division of land if the board of county commissioners determines that such division is not within the purposes of this article."

Other exceptions include divisions of land which 1. are created by court order, 2. are created as security, 3. create cemetery plots, and 4. create mineral or water interests apart from the surface ownership.

The 35-acre clause — the number and the name of the bill were coincidental — effectively insures that no developer will attempt to create a suburban or exurban subdivision without going through the subdivision regulations.

Among other things, regulations require the developer to demonstrate that:

The proposed subdivision's water supply is sufficient "in terms of quality, quantity, and dependability."

Provision has been made for a suitable means of sewage disposal.

Land areas for parks and schools have been set aside "when such are reasonably necessary to serve the proposed subdivision and the future residents."

The impact of the geologic characteristics of the area on the subdivision have been evaluated.

In areas of radiation hazard the potential radiation hazard has been evaluated.

In areas where soil or topographical conditions present hazards "the proposed uses of these areas are compatible with such conditions."

Senate Bill 35 also provides that appropriate interested agencies, ranging from school boards to the forest service, receive copies of the proposed subdivision's plans in advance of any hearing.

It should, therefore, insure that 1. at least a minimum level of essential services have been provided for, in future developments, and 2. that future projects are subjected to at least a modicum of planning and review by interested public agencies.

In short, growth and land use are both regulated but not limited.

The limits of that regulation are shown by the problems posed by the exemption clause which permits the county commissioners to allow the transfer of a parcel of land of less than 35 acres without it having first gone through the subdivision process.

By January, some nine months after Senate Bill 35 became law, 79 requests for exemptions had been submitted in Boulder County. Twenty-eight of those had been approved, creating 98 new lots with an average size of about 8.75 acres.

Another 38 applications involving some 1,800 acres were under consideration.

The planning department said the bulk of those applications involved farmers who wanted either to transfer a parcel of land to a relative for a home or sell a parcel of land to pay taxes.

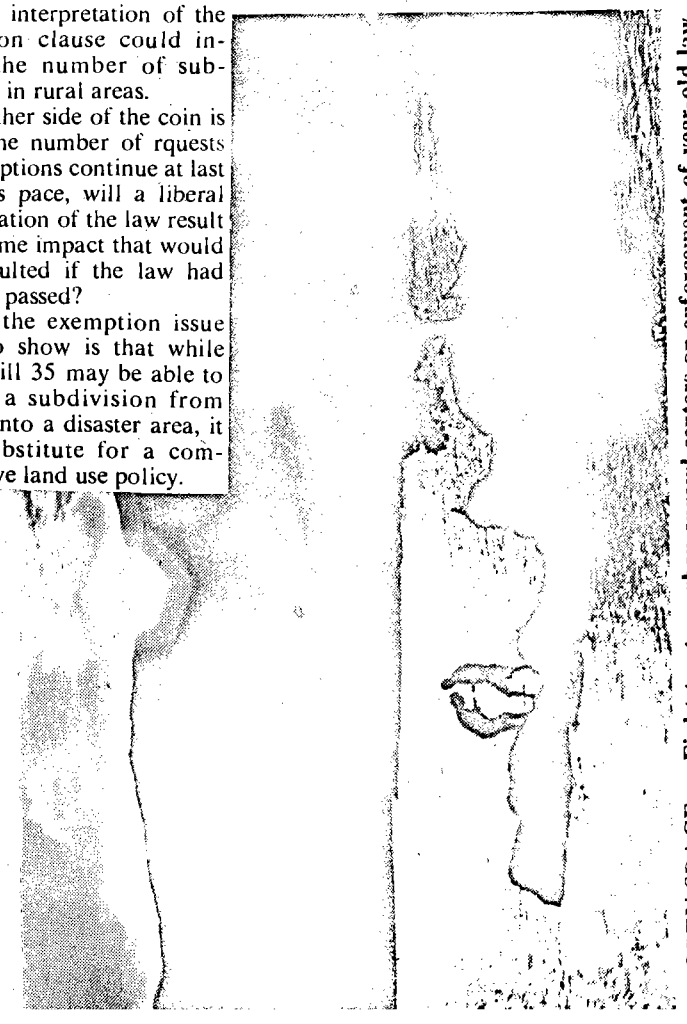
The planning staff has tended to recommend approval of such requests, although requiring proof that water and sewer requirements could be met.

An argument in favor of the generally liberal approach to the exemption clause is that if exemptions are denied on a relatively small tract of ground some farmers will take their entire farms through the subdivision process.

In other words, a conservative interpretation of the exemption clause could increase the number of subdivisions in rural areas.

The other side of the coin is that if the number of rquests for exemptions continue at last January's pace, will a liberal interpretation of the law result in the same impact that would have resulted if the law had not been passed?

What the exemption issue seems to show is that while Senate Bill 35 may be able to prevent a subdivision from turning into a disaster area, it is no substitute for a comprehensive land use policy.



OPEN SPACE — Fight to stop urban sprawl centers on enforcement of year-old law.

Across the Fence

by Lynn Heinze

1-30-73 Tribune

We are entering a period of crisis.

The crisis stems from the rules and regulations issued by the state engineer, Clarence Kuiper.

The regulations will go into effect Feb. 19.

We all know that the regulations order the curtailment of well pumping four-sevenths of the time.

And we all know what such a shut-down will mean to the agricultural economy of the state.

We also know that anything which affects the agricultural economy has a residual effect on the entire economy.

Because we are aware of these things and because we don't want our families to starve this year, we are mad.

The problem is that most of us are going after the wrong people. I've heard you good folks out there say that you'll shoot anybody who dares to shut off your wells. I've also heard some of you say that the state engineer should be strung up.

Now — think about it for a minute!

Before we make the state engineer our whipping boy, let's walk a mile in his boots.

Senate Bill 81 and House Bill 1205 laid out the law, and to save money they threw the responsibilities of water management into the lap of the state engineer.

These laws put the wells into an unfair position by placing them into the priority system. It is commonly known that almost every well in the state is junior in right to surface diversions.

It cannot be denied that all of the water is interrelated. However, if we are to attain the maximum utilization of our water resources, the priority system is not the way to do it.

The law gave the state engineer basically two alternatives: the first was to shut down the wells. The second was to issue rules and regulations under which a replacement scheme could be administered.

The state engineer, realizing the great economic catastrophe which would result in immediate shutdown of the wells, had no choice but to issue the regulations.

The law, as it now stands on the books, was the result of special interest group pressure. This group controls the surface diversions, and depends upon them. In its greed, the rest of the state may suffer.

The law was enacted to facilitate the management of water resources to maximize beneficial use. However, it did not set up the machinery to maximize the use.

We, the farmers, ranchers and others who depend upon well waters for our existence — we must change the laws.

We cannot do this with bombs, nor with guns, nor with rocks. But we can do this with a show of concern.

We can show the state legislative bodies that the special interest groups and their greed are things of the past.

We can hire lobbyists of our own to pressure the men on the hill, which can be very expensive. Some of the special interest groups have $800,000 budgets just for this purpose.

The cheapest, most effective method is still doing the job ourselves.

Writing letters to the representatives is effective. It would cost each of us only 56 cents to write our state senators and state representatives. If every adult, in this county alone, wrote a letter to our representative, the statehouse would be flooded by more than 350,000 letters.

A method which would be more effective would be to go down to the state capital personally.

If we were to charter a bus to take us from Greeley to the capital and back, it would cost us each about $3. Each bus would carry 39 passengers, each day.

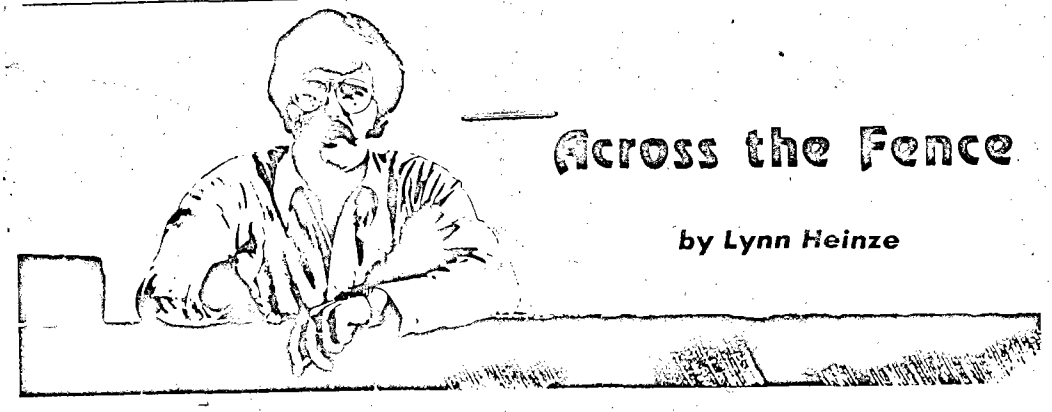
If one busload of us went down every working day for one month, our representatives would have the opportunity to meet with 780 of us.

I suppose most of you are saying "Ha! May sound good on paper, but it'll never work."

And you know, with that kind of attitude, you're absolutely right.

The law will change only when the needs of the people across the fence are not being met.

It is up to us to see that it is done.



Across the Fence

by Lynn Heinze

To act or to react

The pressure is off.

At least for the time being.

The temporary relief came Thursday with the decision of Judge Donald Carpenter that the rules and regulations of the state engineer, as they apply to the South Platte River, could not become effective until they were heard before the District I Water Court.

Judge Carpenter set a date of June 4 for the hearings to begin, and decided all protests of the regulations would be heard and ruled upon during those hearings.

The decision to hear the nine protests at the same time is a good one, for it will allow widely diverse attitudes of water regulation to be aired in the same case.

But the postponement of the enforcement of the rules and regulations is of concern.

Although it will allow us to pump without curtailment for the next four months, what will happen after that?

And what of the complacency which will accompany the postponement? What of the people who, in the face of curtailment said "It'll never happen"0 They will have even more reason now to lay back and let the world go by.

So the decision Thursday came across the fence with mixed blessings. On the one hand, the wells will not be curtailed, at least for a while. And on the other hand, the massive effort to bring about change in the management of our water resources may fall into the purgatory of complacency.

My concern was expressed in the words of Sen. Dan Noble when he addressed a local group of conservationists recently. He told the group that we seem ready to react to a situation, but never ready to act in the first place.

Will we commit our welfare to others in our complacency?

Or, will we take advantage of this period to act?

The decision that will shape our future will not be made by others, although others may choose the path we will follow.

The decision will be made by us. The outcome will be determined by our efforts or lack of efforts.

The final outcome will be the direct result of our action. Our action may take two forms: first, the form of complacency; and second, the form of an unified effort to bring about change.

It is during this period that we must act.

Now is the time for us all to continue to press for a viable water management plan.

The outcome of last year's water hearings on the regulations of the state engineer should be a lesson to us. The wells were curtailed last year, and the regulations were given the support of the courts.

Should we expect anything else today?

The wells will pump for the next four months, and the waters which they produce will bring forth another year's crop.

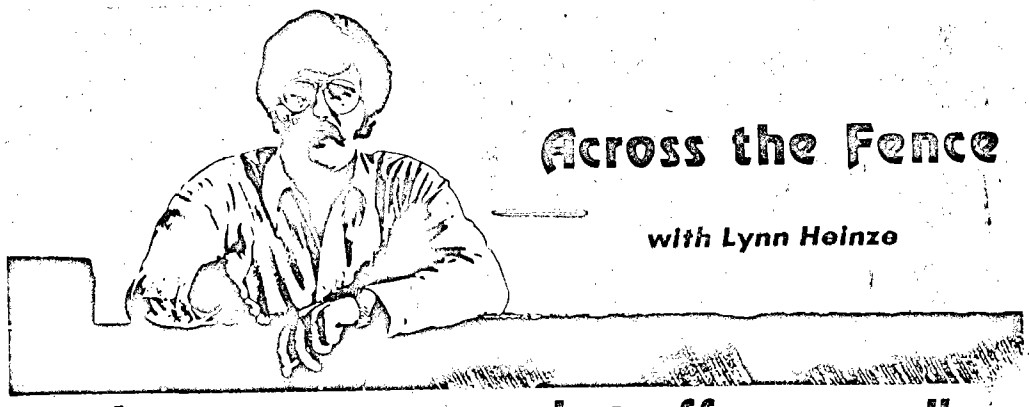
And with the sprouting of this new life must come the beginning of new ideas in water management.

As the seedling must receive the nourishment of water if it is to survive, so too must the seedling ideas be nourished with action if they are to survive.

Others do not tell us when to plant, how to fertilize, the time to cultivate or the week to harvest.

But will we allow others to dictate when we will irrigate?

The answer will be decided by our desire to act, or our willingness to settle for reaction.



Across the Fence

with Lynn Heinze

The man wants to shut off your well

TRIBUNE 3-23-73

"Every s.o.b. well in this state is going to be shut down; as long as I'm still able to fight for that shut-down, I will."

That statement has been attributed to an eminent attorney representing the Denver Water Board.

In this space my aim is to deal with problems of interest to the farmer and the city dweller. There is no more important problem facing either sector of our economy, than the problem of water.

The man I just referred to represents a very powerful and prestigious group. The Denver Water Board has had a history of getting what it wants.

According to this man, that board wants every well owner in the state to shut down. And there were no exclusions to the man's goal.

When he refers to every well, he includes every farm, agricultural, and city well in the state.

The reason for this man's vendetta is simply that he does not understand the situation. He does not understand that the state is dependent upon agriculture for its income.

Nor does he understand the fact that Denver cannot exist alone in this state.

And most importantly, he does not understand that the great days of omni-power are past for the Denver Water Board. He has not yet realized the impact of the decision of the voters of Denver last year when they turned down the board's request for more money to bring more trans-mountain water from the West Slope across to Denver.

But the tragedy is that this man may get what he wants!

He may get what he wants because others aren't willing to go down to the statehouse and describe what they want. Our representatives and senators in Denver report that no one is apparently interested in water management, or at least not interested enough to force the question to a vote.

What all of this boils down to is the simple fact that if you own a well, or if you drink water from a well — your life depends on that well.

It is not enough to say "if I lose my well, the state will regret it." Because we are the state.

It is not enough to say "they can't do this to me." Because the state has been known to do it before.

It is not enough to say "they'll work it out." Because "they'll" work it out to meet their own needs.

It is only enough to take the initiative yourself. You must write or call the men who represent us in government. And that includes every member of the House or Senate.

It is only enough to pack every hearing related to water and to present your case.

And that is best done by meeting locally, hashing out differences and appointing one of your number as a spokesman. Then go south in numbers and let your man speak for you.

The option is yours: either prepare to shut down your agricultural and municipal wells, or prepare to fight for them at the statehouse.

GASP is effort toward water solution

2-13-73

By LYNN HEINZE
Tribune Agricultural Writer

This is a fifth article in a series dealing with the dilemma of water users in Colorado.

There is one organization which is making an effort toward basin-wide management.

It was conceived as a stop-gap measure and its purpose was to keep member wells pumping during periods of curtailment under rules and regulations issued by the state engineer.

During the summer of 1972, when a call was placed on the South Platte River, member wells kept pumping during a period of curtailment. The organization provided enough water to replace the damage done to the river by the member wells, and the members were allowed to continue pumping.

The organization is the Ground-water Appropriators of the South Platte (GASP).

Originally, GASP was conceived as an organization of agricultural appropriators. Today the organization's membership includes cities and towns along the Platte which have found that they too face curtailment under the rules and regulations.

While GASP was organized as a temporary "authority" along the South Platte, members and directors admit that the organization could eventually provide management of the entire basin, from the headwaters to the Nebraska line.

The biggest problem facing GASP is that to be effective on a basin-wide basis, nearly all water users would have to become members. But reasonably effective control and management could be accomplished with a majority of the users as members.

Another important limitation of the organization is that membership is strictly voluntary. This means a user can join until he feels he's safe from curtailment.

In other words, if the organization were to construct recharge points, storage areas and other remedies of injury, most people would consider the need for the organization no longer existed. In fact, this type of action would cause a return of the condition which now exists.

The organization is based on the idea that as long as remedy is provided for injury to prior diversion rights members will be allowed to continue to pump their wells.

This logic is consistent with the rules and regulations of the state engineer. These regulations allow for the replacement of water in lieu of curtailment. But under the regulations a plan of replacement must be approved by the state engineer.

The cost of the organization is minimal. Each member pays only for the estimated damage of his wells. This is calculated as a percentage of the total volume of water the wells pump, since a certain amount of the water returns to the aquifer.

A well owner pays $25 per 100 acre feet of water, according to the estimation of damage of the wells. A typical, well-irrigated farm of 160 acres would require an expenditure of as little as $120 per year.

Many farmers estimate that the cost of membership is "inexpensive insurance" when they consider other production costs. They are quick to point out that other costs would represent total loss without the use of their wells.

"It's like crop insurance," said one farmer. "You hope that your crop won't get hailed out, but you buy crop insurance just in case. Well, my crop might recover from the hail, but I won't have anything without water."

The organization does provide a viable alternative to the water crisis we now face. Whether it will continue to serve in a meaningful way in the future remains to be seen.

It is an important step toward the day when basin-wide management will become a reality. And much may be learned from it along the way.

The important thing is that it is a step.

Well shutdown delayed

TRIBUNE 2-19-73

A request of the state for permission to implement new well water regulations for the South Platte River Basin was denied by Judge Donald A. Carpenter in Water Court here last Thursday.

The new rules had been scheduled to take effect today and the state asked to implement them immediately pending a decision by the court on nine protests that have been filed against the rules.

Judge Carpenter set a hearing for June 4 on the regulations and suspended imposition of the new rules until their validity has been determined by the court.

The rules would prohibit pumping of water wells four days a week unless a plan for replacement of the water exists.

The nine protests to the rules were filed by Eaton, La Salle, Pierce and Nunn, the city and county of Denver, Monfort Packing Co., Central Colorado Water Conservancy District, Great Western Sugar Co. and Public Service Co.

Nixon signs $1 million Narrows authorization

TRIBUNE 8-20-73

WASHINGTON — President Nixon late last week signed a compromise bill that will provide $1 million in the fiscal year that began July 1 for the long-proposed Morgan-Weld counties' Narrows Dam project.

Meanwhile, local spokesman Eric Wendt of Sterling said the proposed $84 million Narrows project just downstream on the South Platte River from Weldona will have $1.28 million available this fiscal year for land acquistion.

Wendt, secretary-manager of the Lower South Platte Water Conservancy District, indicated actual building of the Narrows Dam appears several years away. He said $4 million to $5 million — or perhaps more — in federal funds will be sought next fiscal year for further land acquisition.

This year's federal money for the Narrows earlier appeared dead after the U.S. House Appropriations Committee wholly chopped a proposed $1.5 million amount from the federal public works budget.

However, behind pressure from the Colorado congressional delegation and other Colorado officials, a compromise $1 million appropriation was reinstated in the Senate, Wendt said, and passed by a Senate-House conference committee working out differences.

Wendt said that beyond the $1 million federal funding, other money will be available for Narrows land buying this year. That includes $250,000 in fiscal 1973 funding that had been "frozen" plus $20,000 from the state and $10,000 from the Lower South Platte district.

Wendt predicted that current agricultural hardship may even speed up federal funding of the project in coming years.

Officials pointed out that the Lower South Platte District will repay to the Federal Government 87 per cent of the project construction costs allocated to irrigation; the rest will be picked up by the Central Colorado Water Conservancy District. The two districts are joint claimants of a decreed right to store up to 718,147 acre-feet of water annually in the Narrows Reservoir. The repayment revenue will be derived from a one mill property tax and the proceeds of project water sales for irrigation, municipal and industrial uses.

Negotiations on terms of the repayment contract, which will extend over a period of 50 years, have been carried on for several months.

District officials have been authorized to execute the contract when it is presented in final form.

This ceremony is now anticipated to occur in Sterling in the district office on Sept. 11, and will remove the last obstacle in the path of the actual start of construction of the Narrows Project.

Surveyors estimate damage from floods on lower Platte

STERLING — Formal survey of flood damages to irrigation works in the lower South Platte river valley began Thursday with an official field inspection of works of the Sterling Irrigation Company and the Farmers Pawnee Canal Company.

Preliminary estimates of damage in the Conservancy District service area total more than $501,000, and involve 33 irrigation entries. In June, 1965, preliminary flood damage estimates in the same area totaled $860,000. May 1969 flood damage to irrigation works was originally set at more than $400,000.

A team of professional engineers is conducting the current survey for the Office of Emergency Preparedness (OEP).

The OEP survey team has established headquarters and may be contacted in the office of the Lower South Platte Water Conservancy District, 211½ Main St., Sterling, telephone 522-1378.

Arrangements have been made for flood damage applications and other necessary paper work to be channeled through the office of the Lower Platte Water Conservancy District.

After a Thursday conference in Denver with OEP officials and Logan Rappe, state coordinator, Emergency Operations Center, it was announced by the district office that it will handle 1973 flood matters in much the same fashion as was done in 1965 and 1969. Eric Wendt, general manager of the district, is in charge.

Ditch company officials who have not already submitted written notice of interest in applying for federal financial assistance should do so at once by contacting the District office, Wendt said.

Before an application will be considered for approval by the Office of Emergency Preparedness, the applying irrigation entity must file (a) an up-to-date copy of its articles of incorporation, (b) a map of the service area involved, (c) a statement indicating the number of farm units served.

As soon as all applications are at hand, Rappe will schedule, probably in mid-June, a special meeting in Sterling to inform ditch company officials as to the form and content of records which must be kept to obtain reimbursement for disaster costs eligible under the law.

On May 23 President Nixon declared a 16-county section of Colorado a disaster area receiving an urgent request for relief from Governor John A. Love. Under provisions of Public Law 91-606, the Disaster Relief Act of 1970, Federal financial assistance is available to qualified applicants for debris removal, temporary repairs and permanent restoration of facilities.

Members of the survey team estimate that it will take until the middle of June to complete the formal survey of damages from the South Platte flood disaster which began early in the week of May 6.

Supreme Court to study water bill before making opinion

3-21-73 TRIBUNE

DENVER (AP) — Colorado's Supreme Court refused Tuesday to give an immediate opinion on the constitutionality of a water bill pending in the legislature.

Acting Chief Justice Donald E. Kelley said the six court justices "respectfully" declined to answer four questions submitted to it by the House of Representatives on the bill.

The measure declares it is a beneficial use of water to maintain the flow of streams.

The measure passed the Senate several weeks ago, then cleared the house on preliminary reading last week.

Before the final vote, the House decided Monday to submit the interrogatory to the court.

When Gov. John Love spoke to the legislature last January he called for establishment of the principal of maintaining stream flow but said he thought a constitutional amendment would be necessary.

Several law makers expressed belief the point could be established legally simply through enactment of a bill. Sen. Fred Anderson R-Loveland, sponsored the measure.

The high court's decision to stay out of the case left the lawmakers with two alternatives; to complete passage of the bill and seek a quick test in a water court, probably on the Western Slope or to start a constitutional amendment.

Anderson originally favored passage of a bill and a test suit. He said whatever the water court ruling may be it could be appealed to the Supreme Court and a decision obtained.

Anderson said he thought this could be done by next legislative session.

In the event the act is ruled unconstitutional, he said, there still would be time for the legislature to put a constitutional amendment on the ballot for a vote of the people at the 1974 general election.

The chairman of the House Natural Resources Committee, Rep. C. M. "Bud" Edmonds, R-Manitou Springs, preferred the interrogatory approach and the House went along with him.

The final House vote on the bill has been set for April 2. Presumably the measure could be advanced if House leaders decided what to do with it.

The supreme Court is not required by the constitution to answer interrogatories.

An interrogatory is a seldom-used procedure under which the governor or legislature can submit a question of major public importance to the high court and get a quick answer, thereby preventing enactment of a law which might be declared unconstitutional

Backers going ahead with stream bill despite uncertainty

3-24-73

By GORDON G. GAUSS
Associated Press Writer

DENVER (AP) — Backers of a bill to declare maintenance of stream flow in Colorado rivers a beneficial use of water are going ahead with plans to pass the measure even though the state's Supreme Court has declined to give an advance opinion on its legality.

They hope to have the House of Representatives give final passage to the measure then get the Senate to accept a House amendment assuring the validity of interstate compacts, then ask Gov. John A. Love to sign it.

If the governor approves the measure, they intend to seek a quick test of its constitutionality through a suit brought in a water court—probably in western Colorado.

This ruling, whatever it is, likely will be appealed to the Supreme Court. Hopefully, the high court will be able to act on the measure before the lawmakers reassemble for their 1974 session.

If the decision is unfavorable to the bill, the sponsors intend to ask the legislature next year to pass a constitutional amendment covering the maintenance of stream flow.

The basic strategy was outlined to a reporter by Sen. Fred Anderson, R-Loveland, the bill's chief sponsor, and the two House members most active in that chamber on its behalf—Rep. C. M. "Bud" Edmonds, R-Manitou Springs, and Rep. Michael Strang, R-Carbondale.

All agreed that they will not ask the legislature—which still hasn't considered major bills after 12 weeks in session—to take up the problem of a constitutional amendment this year.

In any event, the amendment would have to go before voters for final approval or rejection at the 1974 general election.

When Love called for maintenance of stream flow to be made a beneficial use of water, he expressed belief a constitutional change would be necessary. The lawmakers decided, however, to try enactment of a bill first.

17-Hour Battle Saves Dam

10-4-73 Loveland Daily Reporter-Herald

By Diana Sheek

Braving freezing temperatures through the night, men worked until 6 this morning to close a gaping hole in the dam of Horseshoe Lake, dumping in more than 40 car bodies and truckloads of rocks, bales of hay and mattresses.

Horseshoe Lake, an 8,000-acre-foot reservoir owned by the Greeley-Loveland Irrigation Co., is located on the west side of Boyd Lake, northeast of Loveland. The dam leak was located at the bridge on the southeast edge of the lake, just east of the outlet.

The immense outpour of water was finally haled about 6 a.m., nearly 17 hours after the leak was first discovered by Norman Wilson and his wife. Wilson is the superintendent for the Seven Lakes division of the Greeley-Loveland Irrigation Co.

Discovered 1 p.m.

"Norman and I discovered it shortly after 1 p.m.," said Mrs. Wilson, "and it was just a small whirlpool then."

"Apparently," Wilson said, "it started leaking about 12:30 p.m." He said he had driven across the dam about noon Wednesday and had seen no leak.

Throughout the 17 hours, officials for both the irrigation company and the Larimer County Sheriff's Department seemed relatively certain of no threat to houses, farms or businesses south of the lakes. No items were evacuated.

Channeling

Ed Boreson, chairman of the Seven Lakes board, said about 3 p.m., Wednesday, he thought all the water could be handled by channeling it into Boyd Lake through the upper, eastern dike and through Heinricy Lake.

Additional water, he said, could go south into Upper and Lower Hoffman Lakes, through a Greeley-Loveland ditch and into Equalizer Reservoir east of Boyd Lake. Boreson estimated the Greeley-Loveland ditch could carry about 1200 cubic feet per second of water.

Superintendent Wilson was uncertain about the initial cause of the leak but was guessing it could have been caused by a muskrat digging its burrow in the dam.

Inspected

Wilson said the dam had been inspected by the state about six months ago, shortly after the Latham Reservoir near Kersey broke and flooded low-lying areas.

"We repaired the whole damn dike here last spring," remarked Boreson. "We were just talking here the other day about what good shape the dam was in."

Boreson said Horseshoe Lake will now have to be drained low enough to permit repair of the damaged dam, probably sometime this fall.

Hauling Rocks

When the leak was discovered, Wilson said, "Luckily, I had some trucks hauling rocks." About 1:30 p.m., dump trucks began hauling in chunks of cement and dirt, some from the Boyd Lake dam and more supplied by county crews.

When the rock and dirt appeared to be simply washing away, Wilson called for car bodies with most of them obtained from Hiway Auto on South Lincoln Avenue in Loveland. With each successive car, the vehicle was pushed in by a loader and eventually sank out of sight into what appeared to be a bottomless hole of water. After the water had eaten through all the pavement on the east side of the bridge the men chained together about five car bodies and dumped the collection into the hole. With this move, the course of the battle seemed to tilt in favor of h workers.

Nearby farmers contributed bales of hay and new and used mattresses were obtained from Quality Furniture—all dumped into the hole. In addition, the "bottomless hole" also contained three truckloads of old car and truck tires.

At the point, Joe Mitchell was operating a Coulson Excavating loader when a front wheel went through the west side of the bridge. He managed to throw the machine in reverse and moved it out of danger.

The final closing of the leak was accomplished by slowly building a wall of cement chunks across the leak area.

Among the groups contributing help to the effort were the Loveland Fire Department, the Larimer County Sheriff's Department, Ward Construction, Coulson Construction, Loveland Excavating, the Loveland division of the county road department, Jake Kauffman and Son Excavating and the State Department of Game and Fish.

Latham dike breaks; area cleared

By MIKE PETERS
and RED EDGERTON
Tribune Staff Writers 4-12-73

"Fifty homes and thousands of head of cattle are endangered by the water. We may have to dynamite some roads or ditches in order to relieve some of the pressure."

Those were the words of County Commissioner Roy Moser Thursday as he surveyed waters rushing from Latham Reservoir east of La Salle.

The reservoir's north dike broke open at 9:30 a.m. Thursday sending millions of gallons of water over the surrounding farm land.

The most immediate danger was to the elaborate home of Robert Stroman, which was recently finished. The home is located about a half mile north of the reservoir. Soon after the dike broke, the waters crossed the road in front of the house, surrounding it.

State highway department workers dug through ditch banks to relieve the high waters which completely surrounded the home.

The La Salle Fire Department sent volunteers around to homes in the area to warn residents of possible evacuation. Cattle were also herded from the area as quickly as possible.

A county road north of the reservoir was the first to wash out, and lead-in roads were closed by the highway department. A section of railroad track three miles north of the reservoir was reportedly washed out.

Commissioner Glenn Billings said there was a possibility that the town of Kersey was in the most danger, and the residents there were alerted for evacuation.

According to officials at the scene, the reservoir was swollen from recent snow run-off. Apparently, the water began washing over the dike during the night, and gradually wore away the remaining dirt.

Water running through the hole in the dike rapidly washed away more dirt, and the hole widened.

At the old Auburn school site East of Evans, the water rose about a foot in 45 minutes, crossing the road and threatening the Wadsworth family, who now live in the remodeled school building.

Trucks hauling stranded cattle out of the vicinity of the Orr, Croissant and Dumler houses, were able to make it without too much trouble, but several passenger cars stalled and had to be pulled out.

From the Auburn school site, the water was running both east and west and will run north as the flow increases.

Tribune Sports Editor Marcus Newton walked a mile south of the Auburn school to the houses mentioned above and then had to wade through nearly hip deep water less than an hour later.

Victor Klein of Kersey said that the whole town of Kersey might well be under water from the break which had widened to 100 feet by noon.

Paul Hoshiko said that he thought the ditch spillways north of Auburn school would handle the runaway water, but there was talk shortly before noon of dynamiting some of the ditches to ease the pressure.

Reports at Auburn school said that Kersey schools would be dismissed at noon and the students taken north across the river.

State patrolmen and others at the scene estimated that as many as 50 farm homes might be damaged by the water.

Water is following the Latham ditch and the Union Pacific tracks toward Kersey.

Greeley police, sheriff's officers and Colorado state patrolmen were sent to the area to aid residents and move cattle.

U.S. 34 was closed about noon, and commissioner Billings said Kersey residents were being evacuated.

The water was following the Latham ditch, and was partially diverted by the railroad tracks north of the dike.

Owner of the reservoir is the Lower Latham Ditch Co.

Water observers said that loss of the water could be a severe setback this coming summer to farmers who depend on the reservoir for irrigation supplies.

The office of the State Water Resources Division One here said the reservoir contained 5,740 acre feet of water as of April

Latham hearing to be Wednesday

APR. 73

The hearing into the cause of the failure in the dike of the Lower Latham Reservoir scheduled by the state engineer will take place at 10 a.m., Wednesday, April 25, at the Farm Fare Cafeteria in Greeley.

The purpose of the hearing, according to State Engineer Clarence Kuiper, is to investigate the reasons for the failure, not to assess the damage which may have resulted from the failure.

The breach in the dike caused an estimated $3.5 million damages to the town of Kersey and the surrounding area last Thursday.

Kuiper urges any person having first-hand information as to the condition of the dike prior to, or at the time of the breach, to be present at the hearing.

The preliminary report issued by Governor John Love Tuesday indicated that cold, wet weather and rodents were the probable cause of the breach.

Latham flood damage nears $3.5 million

By RED EDGERTON Apr. '73
Tribune Staff Writer

With damage reports continuing to come in, the total bill for last week's Latham reservoir disaster is reaching toward the $3½ million figure, according to Weld County Commissioner Glenn Billings.

Commissioner Billings said ranges 65 west and 64 west, both in Township 5 north, took the brunt of the rampaging waters which flooded a total of 4,365 acres of land.

Farms in the path of the waters received the greatest damage, Billings said.

He put the total farm damage at $2,182,500. This figure includes damage to land, buildings, ditches, fences, equipment and other related items.

Damage in the town of Kersey was put at $993,000, but this figure does not include damage to the Platte Valley School buildings in Kersey.

Billings said he estimated it would take $10,000 to repair the Kersey sewage lagoons and there was some doubt in his mind that this figure would bring the lagoons up to standards set by the state health department.

Damage to three county bridges was put at $90,000 and the repair bill for county roads and culverts hit by the flood waters was set at $110,000.

These figures, Billings said, include time, materials and equipment which will be needed in effecting the repairs needed.

Billings said he received a late report last night from the Union Ditch Company and the report indicated that $5,000 in repairs will be needed to Union Ditch before irrigation water can be turned into the ditch this year.

Reason given was that Union Ditch crosses the top of Latham Ditch in a concrete structure about half a mile from Auburn School and during the flood, the concrete structure collapsed and fell into Latham ditch.

Billings said that some of the land was to have been planted to sugar beets this year and that this would be impossible now.

He said some of the land can be planted to corn if it can be readied in time and some of the damaged land will not be able to sustain a crop of any kind this year.

Billings also said that the long range effects of the flood may possibly be the most damaging of all.

He said it was his opinion that it will be impossible to repair the Latham Dam and get water back in the reservoir this year and this will mean a short supply of water this year and possibly next year as well.

Billings said he was going to talk to Sen. Peter Dominick and Congressman Jim Johnson in Washington, D.C., Wednesday to see what they could do in the way of helping to get funds for the county.

He will be going to Denver Thursday morning to talk with Gov. John Love about the situation, Billings said.

According to Billings, some farmers may be able to get long range, low interest loans through the Farmers Home Administration or the Small Business Administration, but this was not a certainty.

Billings also emphasized that damage to the Platte Valley Schools and Union Pacific Railroad right of way was not included in the $3½ million figure.

Meanwhile, State Sen. Hank Brown, R-Greeley, said Tuesday the Weld County legislative delegation had met with Gov. John Love. The governor, Brown indicated, said he will recommend a special state appropriation to aid Kersey's flood-damaged schools.

Brown noted that the governor feels Kersey will not qualify for federal disaster-area designation.

Brown said it was not stated during the conference with the governor how much the Kersey school aid might amount to.

Anderson switches water bills

1-30-73

DENVER (AP) — A new version of a bill declaring that "beneficial use" of water includes allocations for recreation and minimum flows of lakes and streams was introduced today into the Colorado Senate.

The measure, Senate Bill 97, covers the same points as an earlier bill, Senate Bill 79.

Both were introduced by Sen. Fred Anderson, R-Loveland. Anderson told reporters his new measure carries a broader title than the original bill and is intended to prevent any court test on the basis of a title after amendments are added.

Anderson said he plans to kill his original bill — No. 79 — at a committee meeting Wednesday and to work on the new measure.

Even this proposal, he said, is facing a court test because it seeks to do by legislation what Gov. John Love probably will require a constitutional amendment.

The committee work will be done in the Senate by the Agriculture Livestock and Natural Resources Comittee, which Anderson heads.

Joining him as cosponsors on the new bill were Sens. Kenneth Kinnie, R-Julesburg; Harold McCormick, R-Canon City; Hank Brown, R-Greeley; Fay DeBerard, R-Kremmling; Joe Schieffelin, R-Lakewood; Dan Noble, R-Norwood; and Ray Kogovsek, D-Pueblo; and two Republican representatives, Mike Strang of Carbondale and Charles M. Edmonds of Manitou Springs.

Stream flow bill passes House vote

TRIBUNE 2-13-73

By GORDON G. GAUSS
Associated Press Writer

DENVER (AP) — The Colorado Senate, working during a legal state holiday, gave initial approval Mon. to a bill which would make maintenance of river flow a benefical use of water.

The bill, sponsored by Sen. Fred Anderson, R-Loveland, and others, would allow the state to appropriate water or purchase water for the purpose of maintaining the level of a river or a lake.

It attempts to do by legislation what Gov. John Love asked the legislature to do by constitutional amendment.

The bill passed without dissent on preliminary reading and will come up for a final Senate vote Tuesday. If approved, it will go to the House for consideration.

Anderson said that by use of the statutory approach "we do not jeopardize case law built up over 100 years."

He also described the measure as "a good approach to solving a need that exists within the state."

The Western Slope, in particular, he said, could benefit from the measure.

Principal discussion centered on an amendment offered by Sen. Christian Wunsch, D-La-Junta, which would have prevented the state from acquiring any water for the purposes of the bill if that water is now used benefically for agricultural purposes.

"I don't think we should dry up agricultural areas and harm the towns where people live and diminish our food supply," Wunsch said.

His proposal lost overwhelmingly on a voice vote.

Wunsch and Rep. Forrest Burns, D-Lamar, are sponsoring a separate bill intended to halt the purchase of water now allocated for agriculture.

The action came as the Senate held a Lincoln's Birthday session, beginning the seventh week of the 1973 meeting.

The lawmakers gave preliminary approval to five other bills, one of which would provide free tuition for children of men who have been prisoners of war in Vietnam or who are listed as missing in action.

Sen. Kingston Minister, R-Security, the bill's principal sponsor, described it as "a small way for those of us in Colorado to say thanks for the sacrifice' of the men.

He said the best estimates are that between 69 and 72 persons would be eligible for the free tuition eventually, and that probably only half of them would take advnatage of it.

The Senate gave final approval to three bills, all without dissent. One of them would provide penalties of a year in jail and $1,000 for interrupting legislative sessions and would make the penalty five years in prison and a $5,000 fine if the person had a firearm.

Another of the bills would raise the renewal fee for snowmobiles from $3 to $5 and provides a reporting procedure i

House asks Court opinion of stream flow measure

TRIBUNE 3-23-73

By GORDON G. GAUSS
Associated Press Writer

DENVER (AP) — Colorado's House of Representatives asked the state's Supreme Court today to answer four questions which would determine the constitutionality of a bill allowing the state to protect the flow of its streams.

The House voted unanimously, 60-0, to submit an interrogatory to the high court in an effort to determine whether the problem can be handled by a law or whether a constitutional amendment will be necessary.

When Gov. John Love suggested maintenance of stream flow in his message to the legislature more than two months ago, he urged a constitutional amendment to handle the problem.

However, Sen. Fred Anderson, R-Loveland, expressed belief the problem could be handled by a law. Anderson introduced the measure—Senate Bill 97—and it was approved by the Senate and cleared the House on preliminary reading last week.

The questions asked by the House are:

1. May the state dedicate certain waters to the people and remove them from availability for appropriation for other purposes?

2. If not, may the state dedicate a portion of the waters simply for use of the people?

3. May the General Assembly define appropriation to mean application of a certain portion of the waters "to beneficial use"?

4. Is maintenance of minimum stream flow a beneficial use of water?

The interrogatory was approved by the House acting under special orders at the request of C. M. "Bud" Edmonds, R-Manitou Springs, chairman of the Natural Resources Committee.

Acting Chief Justice Donald E. Kelley of the Supreme Court said he will call the other justices to meet with him, possibly before Thursday's regular conference, to see whether the court will consider the interrogatory or not.

Kelley, recuperating from knee surgery, became acting chief justice when Chief Justice Edward E. Pringle left on a two-week trip to Spain and Portugal.

The court can refuse to answer the interrogatory if it wishes.

Kelley said the six justices will look over the questions to see whether a legal answer is possible. He pointed out that the situation is different from the usual case because there are no adverse parties in it and the factual situation has not been developed through briefs.

The acting chief justice said this might make a situation where a ruling would be impossible.

If the court decides to answer the questions, it likely will call for briefs from interested parties, then one judge will be assigned to write the opinion.

To give the court time to act, the House delayed its final vote on the bill until April 2. Both Edmonds and Speaker John Fuhr, R-Aurora, indicated a further delay might be likely if the court takes jurisdiction.

The action came as the legislature opened the 12th week of its 1973 session.

Stream-flow maintenance bills introduced Friday

1-20-73

By GORDON G. GAUSS
Associated Press Writer

DENVER (AP)—Two measures — one with questionable legal status—were introduced Friday into the Colorado Legislature to carry out Gov. John Love's demand for maintenance of stream flow in the state's rivers.

Rep. Mike Strang, R-Carbondale, and Sen. Fay DeBerard, R-Kremmling, introduced a constitutional amendment asked by the governor.

Sen. Fred Anderson, R-Loveland, introduced a bill which would have the same effect but he told reporters he isn't positive that it will stand a court test.

Strang's amendment, with only a minor change in wording from one suggested by the governor says in part that "to preserve the natural environment to a reasonable degree, including the preservation of fish and wildlife, for the benefit and enjoyment of present and future generations no appropriation, diversion or use initiated hereafter ... shall be permitted which will deplete any perennial natural stream or lake below a minimum flow or level as shall be established by law ..."

Anderson's bill, with Strang as a co-sponsor, cuts from the definition of diversion a list of ways a stream can be diverted. These include ditch, canal, flume, reservoir, bypass, pipeline,conduet, well, pump or other structual diversion.

It adds to a section of the law describing beneficial use of water "maintaining all or a portion of the natural flow of a stream for recreational or other values to man kind."

Anderson said he thinks the legislature should pass his bill, making it a law, and then should seek a test in the courts. He said this test could be completed by next winter, in time for the legislature to pass the constitutional amendment if necessary.

When the governor presented his proposal in his message to the legislature 10 days ago he told the lawmakers he thinks a constitutional amendment will be required.

Both Strang's amendment and Anderson's bill were introduced only moments before the legislature quit Friday noon for its third weekend recess of the year.

Legislative panel to decide who will control state water

4-12-73

By RON TOLLEFSON
Tribune Staff Writer

DENVER — State Engineer C. J. Kuiper hopes members of a legislative committee will decide whether they want his office, the State Water Conservation Board or a proposed system of state basin authorities to deal with projects for better water use.

This potential of triple duplication arose Wednesday as the Natural Resources Committee of the Colorado House conducted hearings on two water-management bills.

One Bill (HB 1303), sponsored by Rep. Walt Younglund, R-New Raymer, would authorize the state engineer's office to build and operate state irrigation wells.

These wells would have to be built without jeopardizing existing surface and ground water rights, the bill says. They would provide water to those holding senior rights on stream flows during low-water periods so they would not be forced to insure their water rights by placing a call on the river.

The second bill (HB 1274), being carried by Rep. Carl Showalter, R-Greeley, would create seven river basin authorities based on existing boundaries for Colorado's seven water adjudication districts.

Seven-member boards would preside over the authorities. They would consist of three ground water and three surface water users plus one director not a water appropriator in the basin. All would be appointed by the district water judge.

The basin authority boards would be empowered to build and operate wells, ditches, dams, reservoirs and other management projects and would have the power to condemn land for such [illegible] would designate basin areas where surface waters could be used for recreational purposes.

The authorities would be financed by basin-wide property taxes plus funds from the state not exceeding half the local amount. Showalter's bill would take effect July 1.

Following lengthy testimony on the Younglund bill and limited remarks on the Showalter measure, both are continued until the next Natural Resources Committee meeting Monday.

Both Kuiper and Ken Broadhurst, an attorney for the Denver Water Board, pointed to the three ways the committee could go in authorizing a framework for better water management. And Kuiper pointed to what he saw as failings of the Younglund bill.

"I must agree with the lawyers on this bill," Kuiper told the committee. "It's too simple. It should either go further, or not so far. And I doubt you'll ever completely eliminate the potential for a call on the South Platte."

Kuiper said the bill left questions of who would pay for water delivered by a state well system and how the system would be funded, and did not speak to impact on ground-water recharge areas. He said state reservoirs might be necessary to resupply any losses to recharge areas.

Both Kuiper and Broadhurst pointed out existing law gives authority to the State Water Conservation Board to build such wells, although it has not been used.

Art Andersen Jr. of Ault, secretary-treasurer of the Weld County Underground Water Users Association, indicated general support for the bill, although he questioned one section giving the governor power to declare emergencies and use water from the wells to meet them. Andersen asked if such language might allow trans-basin pumping.

Lou Rinaldo of Sterling, a former legislator and shareholder in the Sterling No. 1 Ditch Co., said he would refuse water from state wells to meet his share of the senior stream rights held by that company.

He argued this might lead to gradual erosion of the senior surface rights. However, Kuiper noted existing state law requires senior appropriators to accept varying means of delivery in fulfilling their senior rights.

Kuiper said projects such as the Narrows Dam proposal, would be very helpful in management of South Platte water. But he echoed doubts that federal funding could be expected and said such projects may have to depend on state and local funding.

Younglund said later he had been attempting to write a simple, easily understood bill allowing the state wells. But he said he would agree to amendment of his measure.

Showalter, carrying his basin authority bill, told the committee that debate on the state well bill showed the need for basin-wide management.

Kuiper later said that as they now are written, both bills provide duplicate systems for providing a water management tool such as state wells.

Rewritten water management bill slated for introduction

TRIBUNE 4-19-73

DENVER — A bill allowing the state engineer's office to build and operate water management structures has been rewritten and will be introduced in the Colorado House Friday or Monday, according to Rep. Walt Younglund, R-New Raymer.

Younglund said the measure will replace his House Bill 1303 which would have put the state engineer in the irrigation well business for supplemental use during low-stream periods. Members of the House Natural Resources Committee conducted a hearing on that bill April 11.

The new bill, Youngland said, is far broader than HB 1303. It would allow the state engineer's office to build and operate structures such as dams, plus granting the irrigation well authority.

State Engineer C. J. Kuiper told those at the committee hearing that Younglund's bill did not go far enough.

Even with state wells supplying water to senior-right irrigators during low-stream periods, Kuiper said he doubted this would eliminate the potential for a call on a river such as the South Platte, enforcing senior water rights.

Kuiper also suggested the committee set broad policy by determining whether such management structures as dams and wells should fall under his office, the State Water Conservation Board or under a system of river basin authorities.

The basin authorities are proposed in a bill (HB 1274) sponsored by Rep. Carl Showalter, R-Greeley, which also is before the Natural Resources Committee.

Colorado Farm Show has top speaker list

TRIBUNE 1-17-73

The Colorado Farm Show (Jan. 23-24) is just around the corner and the program features a very impressive line-up of personalities.

The show, which starts with hor d'oeurves and wine for the women Monday night at seven o'clock, is structured into three main categories. These categories are designed to best meet the requirements of the people in the agricultural community. The groups are: The Ladies' Town and Country Potpourri, Dairy Days and the Farm Show.

Heading the list of scheduled speakers is C. J. Kuiper, Colorado state engineer. Kuiper will speak on water problems and frontiers of the future. The basic consideration of Kuiper's talk will concern the situation which has caused the issuance of rules and regulations on the use of wells in the state.

The regulations state that all wells shall operate only three-sevenths of the time and be curtailed from operation the remaining four-sevenths. It is the belief of the state engineer that the use of well water may have to be curtailed completely within the next few years.

The state engineer is expected to expand upon this point in his presentation at the Farm Show next Wednesday.

Other topics that will be discussed will be planning, zoning and an explanation of Senate Bill 35. This will be accomplished through a panel discussion. Members of the panel will include: Betty Schulte, former administrative assistant to the Weld County commissioners; Harry Cornell, Sate Land Use Commission; Lee Woosley, county administrator, Summit County; John Watson, Weld County Planning Commission; and Marshall Anderson, chairman of the Weld County Regional Planning Commission.

Also planned for the show will be a discussion of trust and estate planning, which will be presented by Ed Boos, senior vice-president, United Bank of Greeley.

In another presentation, Darwin Schwartz, CPA, will discuss the advantages and disadvantaes of incorporation.

L. Mack Cropsey, a member of the Premier staff, will speak on the subject of new breeds in integrated beef production.

"Diethylstilbestrol, and the need for education," will be the topic of a presentation by Don Svedman, deputy commissioner, Colorado Department of Agriculture.

These are just a sampling of the speakers and topics which will be covered at this year's Colorado Farm Show. For further information on the Farm Show, contact the Chamber of Commerce or the Extension Office.

Appropriation of water for stream flow OKd

TRIBUNE 2-6-73

DENVER (AP) — A bill which would allow the State of Colorado to appropriate water to maintain the flow of streams was reported favorably late Monday by the Senate's Committee on Agriculture, Livestock and Natural Resources.

The prime sponsor of the bill, Sen. Fred Anderson, R-Loveland, is the committee chairman.

Before the measure was reported, the committee tacked on an amendment changing the word "diversion" to "appropriation" at the suggestion of Director Felix L. Sparks of the Water Conservation Board.

The measure is intended to carry out by law a proposal recommended by Gov. John A. Love as a constitutional amendment. Anderson has said that if the courts declare the bill illegal there still will be time next year to put a constitutional amendment on the 1974 ballot.

Anderson also introduced another water bill into the Senate—one which would repeal a law excluding Denver from any river basin authority. The same law allows other municipalities to join or stay out of the authorities.

The measure, if adopted, would have the effect of requiring Denver to help pay basin administrative costs.

Discuss Water management

Senator Hank Brown of Greeley, left, sponsor of Senate Bill 75, and state engineer Clarence Kuiper discuss the necessity of water management at a hearing of the [illegible] committee Wednesday. Action on the measure was deferred pending a series of hearings on basin management proposals. (Tribune photo by Lynn Heinze) 1-31-73

Cache la Poudre administrator

Official controls river flow

By ALAN STARK
Of the Coloradoan
7-29-73

The man who controls the Cache La Poudre River is John W. Neutze.

His official title is water commissioner for the third district of the first water division. "I think of myself as the river administrator," he said. "I am responsible for the flow of water from a variety of sources to the headgates of ditch companies."

As a state employe, working for the state engineer, Neutze is responsible for the Cache la Poudre Watershed. "I deliver water according to decrees," he said.

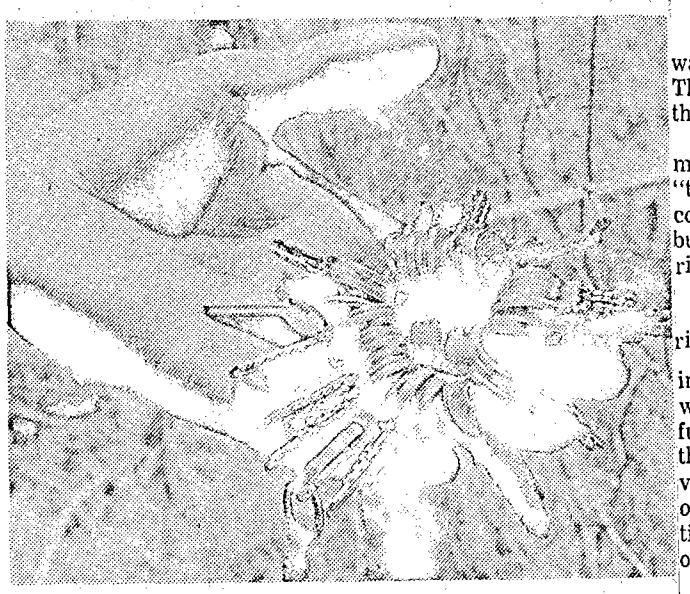
The appropriation of water is based on an adjudicated decree. This decree entitles the holder to a certain amount of water that he can put to beneficial uses.

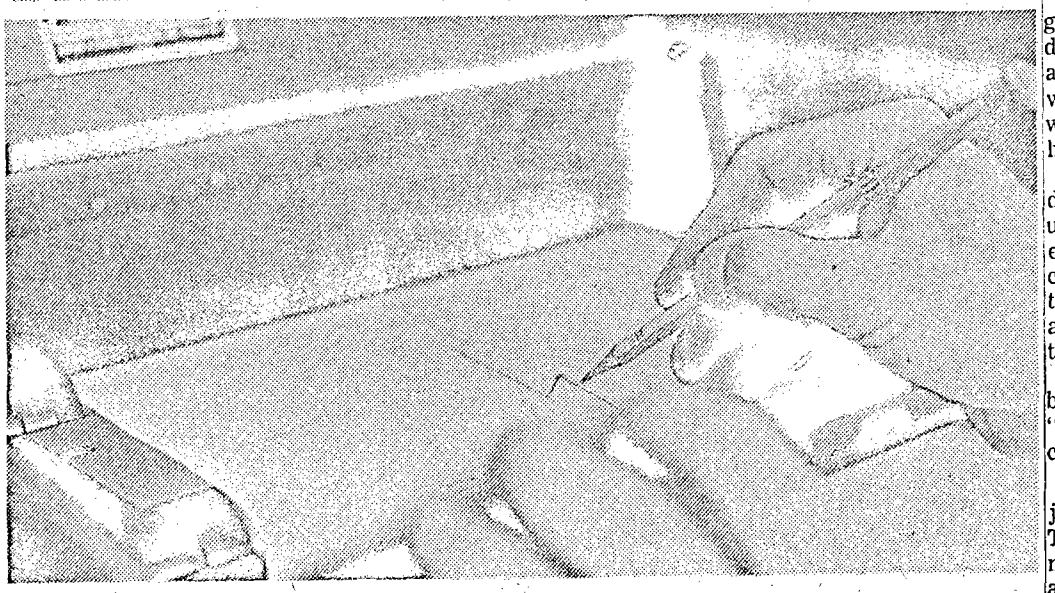
The priority of who gets water first is based on the date the adjudication of the decree took place.

IN A LEAN year the individual or company holding the earliest decree may get his full appropriation of water, whereas the individual or company holding the latest decree may not get any water at all.

The use of the water falls into three basic categories — irrigation, municipal or domestic and recreation.

Water for these uses is transmitted by ditch companies, which own and operate transmission facilities. In general, ditch companies are owned by shareholders who get water according to the number of shares they hold in the company. Ditch companies also hold decrees on reservoir water





ADMINISTRATIVE TOOLS — Water Commissioner John W. Neutze holds the tools of his trade. The keys are for the locked recording stations of the ditch companies where a recorder measures the water diversion in cubic feet per second.

Neutze said that his job has changed from that of an overjob involves a management system, he said. "In the past such and such amount of water' they say, 'we are going to deliver want so many feet of water'. They leave it to me as to where the water comes from."

"My work has become more management oriented," he said, "to the point where I have become sort of a river lord — but I'd prefer to be called a river administrator."

NEUTZE ADMINISTERS the river through the use of recording stations. These stations, which the ditch companies must furnish by state law, monitor the amount of water being diverted in cubic feet per second. Neutze unlocks these stations and checks the amount of water diverted on a graph.

He said a ditch company may get more or less water on a daily basis than what they can appropriate by its decrees. "All we're interested in is giving the water on an overall average," he said.

"I have no problems with the ditch companies," he said, "We used to have some police powers, but not anymore. If a ditch company is trying to steal water, I'll shut them clear off and turn the problem over to the legal department."

Neutze noted that this has been a good year for water. "We have more water than we can use this year," he said.

"Another part of my job is judging the snow pack," he said. The amount of snow in the mountains is a major determinant of the amount of water that will be available.

"Last spring, I estimated that the snow pack contained 330,000 acre-feet of water," Neutze said. An acre-foot is the amount of water it takes to cover an acre of land to a depth of one foot. The average amount of water in the river during a year is around 250,000 acre-feet Neutze said. This year he estimates that 350,000 acre-feet will pass through the river.

"THIS IS AN exceptional year," he said. "I usually administer 500,000 acre-feet during a year. This year I might administer up to 700,000 acre-feet. The amount of water administered is greater than the total volume of the river because of the transfer of water among ditch companies.

The river administrator likes his job. "I like the variation more than anything else," Neutze said; "I never have two days that are alike."

"The amount of time I spend on the job only totals 100 hours a week," he said, "from the time I get up to the time I go to bed. But I'm on call 168 hours a week."

NEUTZE WORRIES aboot the fact that water commissioners are hard to replace for vacations and illnesses. "There's really no time to take a vacation," he said, "And no one to run the river in the case of illness. The division engineer has a roving water commissioner to fill in, but there is the problem of that individual not knowing the district."

He thinks the hardest part of his job is record keeping. "The state is putting all water records on a data bank," he said, which is supposed to decrease my book work. At least that's what they told me. My bookwork has increased three times with the new computer system."

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VOLUME 2, NUMBER 3, SUMMER 1973

DIVISION OF PLANNING

COLORADO POPULATION TRENDS

COLORADO POPULATION PROJECTIONS FOR 1975 AND 1980

David E. Monarchi

INTRODUCTION

Planning requires some form of projections or guesses about the future. Planning activities in the areas of health, education, transportation, land-use, recreation, and economic development require information about the future size and composition of the population.

Ideally, this information would be projected for small geographical areas such as cities and towns for time spans of 30 to 50 years and would separate the population into subgroups such as age, race, and sex. Unfortunately, the reliability of population projections seems to be inversely related to their time span and the size of the population groups being projected. As the time period increases, so does the probability that the assumptions underlying the projections will be violated. Small population groups (i.e., small cohorts in an age-race-sex split) create problems in applying fertility and survival rates which are derived for large groups of people.

This issue presents in capsule form the results of a research effort aimed at projecting the population of all 63 Colorado counties stratified by age, race, and sex for the 10-year period 1971 through 1980. The complete text of the report is entitled *Colorado Population Estimates—1970 To 1980; Methods and Results*, Colorado Division of Planning, June 1973. In this research we tried to mitigate the above difficulties by limiting the projections to a 10-year span from 1970 to 1980 and by using a set of state projections as a check on the county projections. Nevertheless, many counties have only a few people in some subgroups (especially the nonwhite) and the reliability of the births and deaths calculated for these groups at the county level is questionable, especially for the 1975-1980 period. However, the absolute size of these errors is probably relatively small.

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METHODOLOGY

The research employed two methodologies: (1) a simulation model which projected total state population and employment for 1975 and 1980 and (2) a cohort-survival program which was calibrated to reflect county differences and which "allocated" the projections from the simulation model for 1975 and 1980. The results were then linearly interpolated to yield yearly county population projections by age, race, and sex. Only the results for 1975 and 1980 are presented in this report, and only total population figures are shown for the counties. A complete set of projections is contained in the original report.

The first model served as a guide and indicated a set of reasonable fertility and survival rates together with migration estimates for the state as a whole. The second utilized the same state fertility and survival rates as the first and was adjusted until the total state migration was approximately equal to the first. Individual county adjustments were also made to reflect county differences. Although the total population was not explicitly constrained in the second model, the results from the two differed by only 1 percent in 1975 and by 1.4 percent in 1980. This indicates that the county adjustments are reasonable in the sense that as a set they produce results comparable to projecting the state as a whole.

RESULTS

Before presenting the results, we must remind the reader that these figures are projections based on particular assumptions (e.g., fertility rates) which are thought to be reasonable. As such, they are conditional upon those

assumptions being fulfilled. To the extent that they are fulfilled, the projections become predictions. (The complete list of assumptions and documentation is contained in the report cited earlier.) In addition, some of the data used in making the projections is already "dated" in that recent changes have taken place in some counties which are not reflected in the projections. This situation is regrettable but unavoidable because of our reliance upon data supplied by many state agencies. Time and money constraints prohibit any attempts at primary data collection in each county to determine the current conditions in them.

Of the two models, we feel that the first offers more reliable and more detailed information at the state level so we will use its output in the following discussion. Table 1 presents age-race-sex splits for the state for 1970, 1975, and 1980. The total population of the state is projected to increase by 443,834 to 2,651,093 in 1975 for an average annual increase of about 89,000. This is a gain of 20.1 percent or an average annual gain of about 4 percent. The population shows a significant decline in the number of 5-9 year olds due to declining fertility rates. The largest increase occurs in the 20-24 year old age group (102,165) and is due primarily to net employment-related migration of 65,493 in that age group for this period. There is a sizable proportionate increase in the number of people 50-75 due, mainly, to assumed increases in net retirement-related migration. Employment (not shown in Table 1) in 1975 is projected at 1,123,514, an increase of 234,914 for an average annual compound rate of increase of 4.8 percent. A total of 191,694 births and 112,720 deaths is projected for the five-year period together with net employment-related migration of 362,519.

TABLE 1. HISTORICAL AND PROJECTED STATE POPULATION FIGURES FOR 1970, 1975, AND 1980

1970[a]

Age Group	White		Nonwhite	
	Males	Females	Males	Females
0-4	90,006	86,397	5,037	4,928
5-9	108,414	104,438	5,712	5,607
10-14	113,534	109,191	5,521	5,433
15-19	105,572	102,401	4,834	4,644
20-24	97,369	96,091	6,552	4,496
25-29	73,694	76,309	3,720	3,697
30-34	62,882	64,482	3,143	3,277
35-39	60,165	61,013	2,863	3,075
40-44	60,585	62,608	2,487	2,828
45-49	58,751	61,638	2,210	2,306
50-54	52,450	53,412	1,713	1,720
55-59	43,769	46,894	1,211	1,290
60-64	36,729	40,306	972	992
65-69	27,460	33,035	712	869
70-74	20,637	27,473	512	744
75-79	14,664	21,400	338	458
80-84	8,864	13,973	227	283
85 and Over	5,819	9,927	249	247
Totals[c]	1,041,364	1,070,988	48,013	46,894
Race Totals	2,112,352		94,907	
Year Totals	2,207,259			

TABLE 1, Continued

1975[b]

Age Group	White		Nonwhite	
	Males	Females	Males	Females
0-4	100,653	97,944	6,186	5,798
5-9	100,670	96,677	5,585	5,391
10-14	124,736	119,610	6,090	6,026
15-19	132,342	125,353	6,294	5,887
20-24	151,405	139,252	9,377	6,639
25-29	99,445	119,901	5,231	4,968
30-34	90,992	94,790	3,880	4,235
35-39	77,499	76,013	3,393	3,509
40-44	67,006	69,915	2,630	3,213
45-49	64,295	67,270	2,502	2,867
50-54	61,063	63,129	2,156	2,267
55-59	50,068	53,419	1,592	1,707
60-64	41,342	46,980	1,217	1,355
65-69	32,444	38,680	959	1,034
70-74	22,472	30,318	671	863
75-79	15,166	23,226	460	708
80-84	9,280	15,743	269	414
85 and Over	5,953	10,068	266	333
Totals[c]	1,246,831	1,288,291	58,758	57,212
Race Totals	2,535,122		115,970	
Year Totals	2,651,093			

1980[b]

Age Group	White		Nonwhite	
	Males	Females	Males	Females
0-4	122,464	119,051	7,286	6,808
5-9	108,377	105,432	6,087	5,676
10-14	119,129	113,817	6,059	5,910
15-19	163,772	137,765	9,664	6,571
20-24	181,453	165,723	11,026	8,042
25-29	155,133	166,056	8,134	7,199
30-34	118,739	140,467	5,429	5,591
35-39	105,982	107,650	4,154	4,512
40-44	85,220	85,949	3,169	3,685
45-49	71,214	75,088	2,666	3,297
50-54	66,861	69,024	2,449	2,832
55-59	59,276	64,031	2,174	2,408
60-64	47,618	53,849	1,596	1,786
65-69	36,830	45,337	1,225	1,414
70-74	26,734	35,718	898	1,062
75-79	16,732	25,968	600	868
80-84	9,777	17,364	373	646
85 and Over	6,649	11,358	318	506
Totals[c]	1,501,960	1,539,648	73,307	68,817
Race Totals	3,041,607		142,123	
Year Totals	3,183,730			

[a]1970 Census of Population
Vol. PC(1)-B7-Colorado
Table 19, Single Years of Age by Race & Sex: 1970
[b]Projected by CPE model.
[c]Totals may not add due to rounding.

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In 1980, the projected population is 3,183,730, an increase of 532,638 from 1975. Although the actual increase for 1975-1980 is greater than for 1970-1975, the average annual rate of increase is about 4 percent within each period. The 1975 reduction in the 5-9 year age group has moved into the 10-14 cohort for 1980, and the large 20-24 year age group has aged to 25-29 years old. The 20-24 year old group increased by 59,570 for 1975-1980, but there was a net employment-related contribution of 73,035 indicating that there would have been an absolute decrease in the size of the cohort otherwise. Total employment in 1980 (again, this is not shown in Table 1) is projected at 1,403,403, an increase of 279,889 for an average annual compound rate of growth of 4.5 percent. There are 236,678 births and 131,849 deaths projected for the 1975-1980 period together with net employment-related migration of 402,125.

So, for the decade we have a total population change of 976,472 including 428,372 births and 244,569 deaths. Net employment-related migration totals 764,644 and is the largest single component of change.

Table 2 presents total county population figures for 1975 and for 1980 as projected by the cohort-survival program (1970 figures are included for reference). Percent increases from 1970 to 1975 and 1975 to 1980 are also shown in this table as are the county population proportions for 1970, 1975, and 1980. The totals from this table differ from those in Table 1 because the methodologies vary.

At the county level, Clear Creek, Douglas, Gilpin, Hinsdale, Park, and Pitkin counties are all projected to at least double in size during the 1970-1980 decade. Summit County shows a projected growth of 220 percent for the period. Fifty-two of the 63 counties will grow during the period although most will grow at a decreasing rate. Exceptions to this are Cheyenne, Conejos, Costilla, Kiowa, Lake, Las Animas, Logan, Montrose, Otero, Prowers, and Rio Grande, all of which are projected to grow at an increasing rate. Eleven counties show a decline in population over the period but only one, Moffat County, shows an increasing rate of decline and this increase is only marginal. The decrease in the other 10 appears to be slowing down. In fact, Saguache and San Miguel counties experience a reversal, showing a decline in the 1970-1975 period and a growth in the 1975-1980 period. Seven of the large urban counties—Adams, Arapahoe, Boulder, El Paso, Jefferson, Larimer, and Weld—are projected to grow by 50 to 75 percent over the decade. Denver shows only a moderate growth of about 20 percent for the decade and Pueblo only 15 percent.

Although 52 counties increased their population during the decade, only 20 grew at a rate faster than the state as a whole (i.e., faster than about 20 percent for the decade). They are Adams, Arapahoe, Boulder, Clear Creek, Douglas, Eagle, Elbert, El Paso, Gilpin, Grand, Jackson, Jefferson, Larimer, Mineral, Park, Pitkin, Routt, Summit, Teller, and Weld.

CONCLUSION

Colorado appears to be heading into a decade of substantial growth. The largest absolute increases in the population will take place principally in the large urban counties although many smaller counties will grow at a rapid rate. The growth will reverse or at least slow down the decline in population in a number of rural counties. The growth in the state population is closely related to its continued economic growth indicating a potential area for legislative policies concerning growth.

TABLE 2. TOTAL COUNTY POPULATION FOR JULY 1, 1975 AND 1980 FROM THE COHORT-SURVIVAL PROGRAM

County	County Population					County Population Percentage		
	1970	% Change	1975	% Change	1980	1970	1975	1980
1. Adams	185,789	23.93%	230,256	21.20%	279,071	8.41%	8.60%	8.65%
2. Alamosa	11,422	14.35	13,061	13.41	14,813	.52	.49	.46
3. Arapahoe	162,142	28.13	207,750	24.82	259,322	7.35	7.76	8.03
4. Archuleta	2,733	—22.76	2,111	—21.60	1,655	.12	.08	.05
5. Baca	5,674	.81	5,693	.53	5,723	.26	.21	.18
6. Bent	6,493	— .69	6,448	— .11	6,441	.29	.24	.20
7. Boulder	131,889	34.78	177,762	31.06	232,967	5.98	6.64	7.22
8. Chaffee	10,162	14.56	11,642	13.21	13,180	.46	.43	.41
9. Cheyenne	2,396	1.29	2,427	1.69	2,468	.11	.09	.08
10. Clear Creek	4,819	50.90	7,272	44.38	10,499	.02	.27	.33
11. Conejos	7,846	9.51	8,592	10.59	9,502	.36	.32	.29
12. Costilla	3,091	6.86	3,303	7.72	3,558	.14	.12	.11
13. Crowley	3,086	— 5.57	2,914	— 5.46	2,755	.14	.11	.09
14. Custer	1,120	15.63	1,295	15.44	1,495	.05	.05	.05
15. Delta	15,286	11.06	16,977	9.68	18,621	.69	.63	.58
16. Denver	514,678	10.47	568,542	9.71	623,748	23.32	21.22	19.32
17. Dolores	1,641	— 9.14	1,491	— 7.84	1,374	.07	.06	.04
18. Douglas	8,407	56.85	13,186	50.26	19,814	.38	.49	.61
19. Eagle	7,498	32.37	9,925	28.88	12,791	.33	.37	.40
20. Elbert	3,903	24.88	4,874	22.26	5,959	.17	.18	.18
21. El Paso	235,972	33.47	314,946	30.32	410,424	10.69	11.76	12.72
22. Fremont	21,942	16.49	25,561	15.27	29,463	.99	.95	.91

TABLE 2, Continued

County	County Population 1970	% Change	1975	% Change	1980	County Population Percentage 1970	1975	1980
23. Garfield	14,821	14.82%	17,018	13.30%	19,281	.67%	.64%	.60%
24. Gilpin	1,272	47.96	1,882	42.72	2,686	.06	.07	.08
25. Grand	4,107	38.91	5,705	33.30	7,605	.19	.21	.24
26. Gunnison	7,578	17.41	8,897	16.21	10,339	.34	.33	.32
27. Hinsdale	202	43.56	290	40.68	408	.01	.01	.01
28. Huerfano	6,590	— 2.32	6,437	— 2.02	6,307	.30	.24	.20
29. Jackson	1,811	24.52	2,255	22.53	2,763	.08	.08	.09
30. Jefferson	235,300	35.80	319,526	32.59	423,665	10.56	11.95	13.13
31. Kiowa	2,029	3.70	2,104	4.04	2,189	.09	.08	.07
32. Kit Carson	7,530	7.13	8,067	6.12	8,561	.34	.30	.27
33. Lake	8,282	.74	8,343	1.56	8,473	.37	.31	.26
34. La Plata	19,199	12.64	21,625	11.72	24,159	.87	.81	.75
35. Larimer	89,900	34.92	121,290	31.31	159,262	4.07	4.53	4.93
36. Las Animas	15,744	6.91	16,832	7.77	18,140	.71	.63	.56
37. Lincoln	4,836	10.13	5,326	9.59	5,837	.22	.20	.18
38. Logan	18,852	3.36	19,485	3.55	20,176	.85	.73	.63
39. Mesa	54,374	9.41	59,489	8.33	64,444	2.46	2.22	2.00
40. Mineral	786	38.80	1,091	34.22	1,463	.04	.04	.05
41. Moffat	6,525	— 2.04	6,392	— 2.33	6,243	.30	.24	.19
42. Montezuma	12,952	8.03	13,992	7.66	15,064	.59	.52	.47
43. Montrose	18,366	.63	18,482	1.06	18,678	.83	.71	.58
44. Morgan	20,105	18.02	23,728	17.29	27,831	.91	.89	.86
45. Otero	23,523	.77	23,705	.97	23,934	1.07	.88	.74
46. Ouray	1,546	18.82	1,837	17.31	2,155	.07	.07	.07
47. Park	2,185	59.54	3,486	51.66	5,287	.10	.13	.16
48. Phillips	4,131	1.91	4,210	1.52	4,274	.19	.16	.13
49. Pitkin	6,185	55.88	9,641	48.07	14,275	.28	.36	.44
50. Prowers	13,258	6.40	14,107	6.41	15,011	.60	.53	.47
51. Pueblo	118,238	7.49	127,092	7.41	136,513	5.36	4.74	4.23
52. Rio Blanco	4,842	—15.08	4,112	—13.57	3,554	.22	.15	.11
53. Rio Grande	10,494	7.50	11,281	7.74	12,154	.48	.42	.38
54. Routt	6,592	32.37	8,726	28.65	11,226	.30	.33	.35
55. Saguache	3,827	— 1.28	3,778	.16	3,784	.17	.14	.12
56. San Juan	831	4.21	866	4.27	903	.04	.03	.03
57. San Miguel	1,949	— .92	1,931	.62	1,943	.09	.07	.06
58. Sedgwick	3,405	— .76	3,379	— .26	3,369	.15	.13	.10
59. Summit	2,665	79.88	4,794	77.12	8,491	.12	.18	.26
60. Teller	3,316	38.36	4,588	34.11	6,153	.15	.17	.19
61. Washington	5,550	— 2.38	5,418	— 2.09	5,305	.25	.20	.16
62. Weld	89,297	25.82	112,357	25.16	140,628	4.05	4.19	4.36
63. Yuma	8,544	6.00	9,057	5.34	9,541	.39	.34	.30
Total	2,209,528[a]	21.23%	2,678,647	20.50%	3,227,718	99.99%[b]	100.01%[b]	100.04%[b]

[a]Correct current Bureau of the Census total for Colorado.
[b]Totals do not equal 100.00 percent due to rounding.

COLORADO POPULATION TRENDS
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Boulder, Colorado 80302

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A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

CURRENT POPULATION REPORTS 131

FEDERAL-STATE COOPERATIVE PROGRAM FOR

Population Estimates

Series P-26, No. 17
February 1973

U. S. DEPARTMENT OF COMMERCE • Social and Economic Statistics Administration • BUREAU OF THE CENSUS

ESTIMATES OF THE POPULATION OF COLORADO COUNTIES JULY 1, 1971 AND JULY 1, 1972

This series of reports presents population estimates prepared under the auspices of the Federal-State Cooperative Program for Local Population Estimates. The objective of this program is the development and publication of State-prepared estimates of the population of counties using uniform procedures largely standardized for data input and methodology. The methods used have been mutually agreed upon by the individual States and the Bureau of the Census and were selected on the basis of the results of an extensive test of methods against the 1970 census conducted in late 1971 and early 1972.[1]

The revised estimates for July 1, 1971 and provisional estimates for July 1, 1972, shown here for Colorado counties were prepared by the Colorado Division of Planning. This agency was designated by the Governor to work with the Bureau of the Census in implementing and carrying out the Federal-State Cooperative Program.

The estimates shown for July 1, 1971, are based on an average of:

1. Regression (ratio-correlation) method, in which a multiple regression equation is used to relate changes in a number of different data series to change in population distribution. The series of data used in the regression method for Colorado are average daily school attendance (X_1), automobile registration (X_2), births (X_3), sales tax (X_4), covered employment (X_5), and deaths (X_6). The prediction equation for Colorado for the 1970's is given by

$$\hat{Y}=0.0057 + 0.3362X_1 + 0.6640X_2 - 0.0019X_3 - 0.0274X_4 - 0.0200X_5 + 0.0530X_6$$

2. The Census Bureau's Component Method II, which employs vital statistics to measure natural increase and school enrollment as a basis for measuring net migration. The estimates made by the Census Bureau's Component Method II are specific to the civilian population under 65, with Medicare statistics used to estimate the resident population ages 65 and over. The total resident population is derived by adding estimates of the military station strength in each county to the estimates of the civilian resident population.

The provisional July 1, 1972 estimates for counties in the Denver metropolitan area were developed by adding the average change between 1971 and 1972 Housing Unit Method and Component

[1]For a more detailed description of the program, see Meyer Zitter, "Federal-State Cooperative Program for Local Population Estimates," The Registrar and Statistician, U.S. Department of Health, Education, and Welfare, January 1968, and "Federal-State Cooperative Program for Local Population Estimates: Status Report, January 1971," The Registrar and Statistician, U.S. Department of Health, Education, and Welfare, April 1971. For a detailed analysis of the test results, see the forthcoming Current Population Reports, Series P-26, "Federal-State Cooperative Program for Local Population Estimates: Test Results--April 1, 1970."

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, 25cents.
Current Population Reports issued in Series P–20, P–23, P–25, P–26, P–27, P–28 (summaries only), P–60, and P–65 are sold as a single consolidated subscription at $30.50 per year, $7.75 additional for foreign mailing.

ESTIMATES OF THE POPULATION OF COLORADO COUNTIES, JULY 1, 1971 AND JULY 1, 1972—Continued

(State estimates are shown to the nearest thousand, county estimates to the nearest hundred)

County	July 1, 1972 (provisional)	July 1, 1971	April 1, 1970 (census)[1]	Change, 1970 to 1972	
				Number	Percent
Pueblo	120,700	119,700	118,238	2,500	2.1
Rio Blanco	4,700	4,800	4,842	-100	-2.6
Rio Grande	10,600	10,300	10,494	100	1.2
Routt	7,800	7,300	6,592	1,200	18.7
Saguache	4,000	3,900	3,827	100	3.5
San Juan	800	800	831	-100	-8.8
San Miguel	1,900	2,000	1,949	-100	-3.4
Sedgwick	3,500	3,400	3,405	100	1.7
Summit	3,800	3,300	2,665	1,200	43.7
Teller	4,700	3,700	3,316	1,400	41.5
Washington	5,500	5,500	5,550	(Z)	-0.6
Weld	96,200	92,700	89,297	6,900	7.8
Yuma	8,400	8,400	8,544	-100	-1.2

Z Less than 50.

[1]Total does not agree with the sum of the counties due to corrections made to the county populations after release of the official State counts.

APPENDIX

OTHER ESTIMATES PUBLISHED IN SERIES P-26 REPORTS

Report No.	State	Estimate date(s)
9	Idaho	July 1, 1971 and July 1, 1972
10	Utah	July 1, 1971 and July 1, 1972
11	Arizona	July 1, 1971
12	South Dakota	July 1, 1971
13	Vermont	July 1, 1971
14	Indiana	July 1, 1971 and July 1, 1972
15	Delaware	July 1, 1971 and July 1, 1972
16	Louisiana	July 1, 1971

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

CURRENT POPULATION REPORTS

Population Estimates and Projections

Series P-25, No. 508
November 1973

U. S. DEPARTMENT OF COMMERCE - Social and Economic Statistics Administration - BUREAU OF THE CENSUS

ESTIMATES OF THE POPULATION OF STATES: JULY 1, 1972 AND 1973 (Advance report)

This report presents revised estimates of the population of States for July 1, 1972, and provisional estimates for July 1, 1973. The 1972 estimates here supersede the provisional 1972 numbers published in Current Population Reports, Series P-25, No. 488. Estimates are shown both for the resident and the civilian populations.

The population estimates were developed by averaging the results of two methods: (a) the Census Bureau's Component Method II, which employs vital statistics to measure natural increase and uses elementary school enrollment (or school census) data and expected cohort survivors to this age group as a basis of net civilian migration; and (b) a regression method in which changes in four sets of symptomatic indicators (but only two variables for 1973) are used to estimate changes in population. These indicators are (1) elementary school enrollment, (2) automobile registration, (3) Federal income-tax returns, and (4) civilian work force.

Data on automobile registration and Federal income tax returns for 1973 are not available at this time. Therefore, the provisional 1973 regression estimate was derived by using a regression equation based on school enrollment and civilian work force alone, comparing this with a 1972 regression estimate using only these two series, and adding this 1972-73 change to the 1972 regression estimate based on all four indicators. Thus, the provisional 1973 estimates are based completely on current symptomatic data series. Previously, the net civilian migration component for the last year in the provisional series was based either in part or in total on an extrapolation of recent past trends.

These estimates will be contained in a full report to be published in Series P-25 which will show annual estimates for July 1, 1970, through 1973 and components of change for the period April 1, 1970, to July 1, 1973, together with a full description of methodology.

The estimates presented in the table have been rounded to the nearest thousand without being adjusted to group totals, which are independently rounded. Percentages are based on unrounded numbers.

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, 25 cents.
Current Population Reports issued in Series P–20, P–23, P–25, P–26, P–27, P–28 (summaries only), P–60, and P–65 are sold as a single consolidated subscription at $30.50 per year, $7.75 additional for foreign mailing.

ESTIMATES OF THE POPULATION OF STATES: JULY 1, 1972 AND 1973

(Population in thousands. Resident population includes estimated Armed Forces personnel residing in each State)

Region, division, and State	Resident population					Civilian population				
	July 1, 1973 (provisional)	July 1, 1972	April 1, 1970 (census)	Change, 1970 to 1973		July 1, 1973 (provisional)	July 1, 1972	April 1, 1970	Change, 1970 to 1973	
				Number	Percent				Number	Percent
United States	209,851	208,230	203,235	6,616	3.3	208,094	206,457	201,064	7,030	3.5
REGIONS:										
Northeast	49,678	49,726	49,051	628	1.3	49,521	49,556	48,847	674	1.4
North Central	57,601	57,410	56,577	1,024	1.8	57,433	57,232	56,366	1,067	1.9
South	66,005	65,059	62,798	3,206	5.1	65,146	64,194	61,721	3,425	5.5
West	36,567	36,036	34,809	1,758	5.0	35,994	35,476	34,130	1,864	5.5
NORTHEAST:										
New England	12,151	12,105	11,847	303	2.6	12,069	12,023	11,750	319	2.7
Middle Atlantic	37,528	37,621	37,203	325	0.9	37,452	37,533	37,097	355	1.0
NORTH CENTRAL:										
East North Central	40,897	40,793	40,253	645	1.6	40,822	40,713	40,152	670	1.7
West North Central	16,704	16,617	16,324	379	2.3	16,611	16,520	16,214	396	2.4
SOUTH:										
South Atlantic	32,459	31,921	30,671	1,787	5.8	31,935	31,377	29,988	1,948	6.5
East South Central	13,289	13,156	12,805	484	3.8	13,185	13,059	12,675	510	4.0
West South Central	20,257	19,982	19,322	935	4.8	20,026	19,757	19,059	967	5.1
WEST:										
Mountain	9,149	8,880	8,284	866	10.5	9,025	8,759	8,160	865	10.6
Pacific	27,417	27,156	26,526	892	3.4	26,969	26,717	25,969	1,000	3.8
NEW ENGLAND:										
Maine	1,028	1,026	994	35	3.5	1,018	1,015	982	36	3.7
New Hampshire	791	774	738	53	7.2	786	770	734	52	7.2
Vermont	464	460	445	19	4.4	464	460	445	19	4.4
Massachusetts	5,818	5,796	5,689	129	2.3	5,795	5,773	5,658	137	2.4
Rhode Island	973	969	950	23	2.5	945	941	915	30	3.3
Connecticut	3,076	3,080	3,032	44	1.4	3,061	3,064	3,016	45	1.5
MIDDLE ATLANTIC:										
New York	18,265	18,367	18,241	24	0.1	18,236	18,337	18,210	27	0.1
New Jersey	7,361	7,349	7,168	193	2.7	7,326	7,302	7,109	216	3.0
Pennsylvania	11,902	11,905	11,794	108	0.9	11,890	11,893	11,778	112	1.0
EAST NORTH CENTRAL:										
Ohio	10,731	10,722	10,652	79	0.7	10,716	10,707	10,632	84	0.8
Indiana	5,316	5,286	5,194	123	2.4	5,309	5,279	5,186	123	2.4
Illinois	11,236	11,244	11,114	122	1.1	11,200	11,204	11,058	142	1.3
Michigan	9,044	9,013	8,875	169	1.9	9,029	8,998	8,860	170	1.9
Wisconsin	4,569	4,526	4,418	152	3.4	4,568	4,524	4,416	152	3.4
WEST NORTH CENTRAL:										
Minnesota	3,897	3,877	3,805	92	2.4	3,894	3,873	3,800	93	2.5
Iowa	2,904	2,884	2,825	79	2.8	2,903	2,883	2,824	79	2.8
Missouri	4,757	4,747	4,677	79	1.7	4,731	4,718	4,639	92	2.0
North Dakota	640	634	618	22	3.5	626	622	606	20	3.3
South Dakota	685	680	666	18	2.7	678	673	661	17	2.6
Nebraska	1,542	1,528	1,484	59	4.0	1,530	1,516	1,472	58	4.0
Kansas	2,279	2,268	2,249	30	1.4	2,248	2,235	2,212	36	1.6
SOUTH ATLANTIC:										
Delaware	576	571	548	27	5.0	570	565	542	28	5.2
Maryland	4,070	4,048	3,922	147	3.8	4,013	3,990	3,849	165	4.3
District of Columbia	746	752	757	-11	-1.4	737	742	745	-8	-1.1
Virginia	4,811	4,765	4,648	162	3.5	4,665	4,612	4,455	210	4.7
West Virginia	1,794	1,795	1,744	50	2.9	1,793	1,795	1,744	49	2.8
North Carolina	5,273	5,221	5,082	191	3.8	5,181	5,128	4,958	223	4.5
South Carolina	2,726	2,688	2,591	135	5.2	2,657	2,615	2,513	144	5.7
Georgia	4,786	4,733	4,590	196	4.3	4,732	4,676	4,498	233	5.2
Florida	7,678	7,347	6,789	888	13.1	7,587	7,255	6,683	904	13.5
EAST SOUTH CENTRAL:										
Kentucky	3,342	3,306	3,219	123	3.8	3,309	3,274	3,171	139	4.4
Tennessee	4,126	4,072	3,924	202	5.2	4,106	4,055	3,899	207	5.3
Alabama	3,539	3,521	3,444	95	2.8	3,514	3,497	3,410	104	3.1
Mississippi	2,281	2,256	2,217	64	2.9	2,256	2,233	2,195	60	2.7
WEST SOUTH CENTRAL:										
Arkansas	2,037	2,008	1,923	113	5.9	2,029	1,998	1,915	114	6.0
Louisiana	3,764	3,738	3,643	121	3.3	3,735	3,706	3,601	134	3.7
Oklahoma	2,663	2,633	2,559	103	4.0	2,635	2,607	2,521	113	4.5
Texas	11,794	11,604	11,197	597	5.3	11,628	11,446	11,022	606	5.5
MOUNTAIN:										
Montana	721	716	694	26	3.8	714	710	688	26	3.8
Idaho	770	755	713	57	7.9	764	750	708	56	7.9
Wyoming	353	346	332	21	6.3	349	343	329	20	6.1
Colorado	2,437	2,364	2,207	230	10.4	2,387	2,317	2,157	230	10.6
New Mexico	1,106	1,076	1,016	90	8.9	1,089	1,060	999	90	9.1
Arizona	2,058	1,963	1,772	285	16.1	2,030	1,934	1,744	286	16.4
Utah	1,157	1,127	1,059	98	9.2	1,153	1,122	1,056	97	9.2
Nevada	548	533	489	59	12.1	539	523	479	60	12.4
PACIFIC:										
Washington	3,429	3,418	3,409	20	0.6	3,383	3,378	3,338	45	1.3
Oregon	2,225	2,185	2,091	134	6.4	2,223	2,182	2,088	135	6.4
California	20,601	20,411	19,953	648	3.2	20,285	20,096	19,559	726	3.7
Alaska	330	325	302	28	9.3	303	297	270	33	12.3
Hawaii	832	816	770	62	8.1	776	764	715	61	8.5