

### **DIVISION OF WATER RESOURCES**

WATER DIVISION IV

Keith C. Kelper Division Engineer 1540 East Niagara. Montrose, Colorado 81402 (303) 249-6622

February 24, 1994

Hal J. Simpson, State Engineer Division of Water Resources 1313 Sherman Street, Room 818 Denver, CO 80203

Dear Mr. Simpson:

On behalf of the office and field personnel of Water Division IV, I am pleased to submit this Annual Report for 1993.

The personnel of Division IV have conducted their duties in a most professional manner during the 1993 water year. I would like to recognize their diligent efforts which have resulted in this Annual Report, and this year's diversion records.

Sincerely,

Keith C. Kepler Division Engineer

KCK: jk

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#### DIVISION IV ANNUAL REPORT

#### I. THE 1993 WATER YEAR

The 1993 Water Year was notable as one of the highest snowpack years on record. In spite of the abundant snowpack there were only a few localized flooding problems since cool spring weather allowed the runoff to occur slowly.

The ample snowpack made for an exceptional water year. In most areas, there were no shortages of water and only the most water short areas had demands for the curtailment of junior rights. In the more highly administered areas, the streams went on call approximately one month later than in the average year.

The extreme snowpack caused concerns about dam safety. The concerns were our inability to control restricted reservoirs to their safe storage level, potential spillway erosion, and spillways blocked by snow. Careful monitoring and preparation on the part of the dam owners and the Water Commissioners prevented serious dam safety problems. Some of the situations which required close surveillance are reported under the Dam Safety section of this report.

#### A. <u>Uncompandre Valley</u>

The Uncompangre Valley enjoyed a May 1 snowpack of 141 % of average at the Idarado snotel site and 115 % of average at the Red Mountain Pass snotel site.

Water District 41. Snowmelt runoff in the Uncompander valley provided a good water supply in spite of dry summer conditions. No measurable precipitation reported in Montrose during the month of July and June precipitation was low also. No calls were placed on the mainstem of the river, although the Uncompandere Valley Water Users Association experienced a period of shortage and drew storage from Ridgway reservoir. During the time of shortage UVWUA asked upstream water users to not divert more water than their decree. The upstream water users cooperated and we were able to avoid curtailment of juniors.

Ridgway reservoir was operated for flood control purposes and was drawn down considerably in anticipation of spring runoff. During the summer months when shortages existed, releases were made in excess of downstream requests for storage delivery.

In Water District 68, Ouray County, the period of shortage did not result in a River call since water users in that area cooperated with UVWUA's request to not divert more than their decrees. There was a call on Horsefly Creek which originated from WD 41.

The Fairway Pines Golf Course opened on top of Log Hill Mesa on August 2. The Golf Course is irrigated from several wells of fairly low individual yield which have been completed in the Dakota - Burro Canyon aquifer. The county is experiencing considerable growth with one irrigated ranch of 800 acres reportedly selling for \$4000 per acre. There has been some reaction to the growth which has resulted in more participation in water court applications.

### B. Upper Gunnison Basin

Snowpack was excellent in the Upper Gunnison Basin this year. In the northern part of the basin, May 1 snowpack was reported as 179 % of average at the Butte snotel (near Crested Butte), 231 % of average at the Park Cone snotel (near Taylor Park), and 146 % of average at the Schofield Pass snotel. May 1 snowpack was reported as 144 % of average at the Porphyry Creek snotel near Monarch pass. In the Southern part of the upper Gunnison area, snowpack was only near average as evidenced by the 101 % May 1 reporting for the Slumgullion snotel.

In Water District 59, there were no calls and water supplies far exceeded the average year. There was some concern over potential flooding, particularly in the Crested Butte area. Although some high flows were observed, there were fortunately no major flooding problems. In the Gunnison area, the Gunnison River stayed well within its banks. Water Commissioner Bob Drexel resigned early in the irrigation season.

In Water District 28, there were no calls for administration. However, there were several water court applications and several inquiries from water users about their water rights. Inspection of the Vouga reservoir revealed problems with the outlet pipe which we hope are fixed in the near future.

### C. <u>South Slope of Grand Mesa and North Fork of the Gunnison</u> River

The 1993 water year started off South Slope of Grand Mesa. with a very high snowpack on Grand Mesa. May 1 snowpack was reported as 227 % of average at Mesa Lakes. The snotel at Park Reservoir reported 159 % of average with a snow - water equivalent of 47.8 inches. Snow pack was also well above Surface Creek peaked at 625 average at the lower elevations. cubic feet per second at the Cedaredge gaging station. Surface Creek then leveled off at about 400 cubic feet per second and ran very even through the spring and early summer. This runoff provided excellent water supplies for most water Because of the high snowpack, the cloud seeding program was not implemented in 1993.

The large snowpack created lots of work for reservoir owners and caretakers. Many spillways were filled with hard packed snow, requiring trenches cut through the snow so the reservoirs would spill. The snow was very dense and heavy. With cooperation from dam owners and DWR personnel, no dams suffered problems resulting from the snow filled spillways. On May 11, Channel 7 News from Denver shot a video about the snow removal effort which was aired later that month.

The large snowpack caused concerns about potential flooding in the spring. Damage was mostly confined to streambanks and farm ground along the rivers. Some headgates and diversion structures did suffer minor damage. The county provided sandbags to those needing them.

The apple crop in 1993 had mixed blessings. The price was good, but several hail storms caused the quality to be below average. Growers received a premium price for good apples which were not hail damaged and also received a good price for poorer quality hail damaged apples.

The Surface Creek Valley area is experiencing growth as is the rest of Division IV.

Personnel of the Division of Water Resources considerable time in working with the Forest Service in the development of the Travel Management Plan for Grand Mesa. importance to this office is access to water structures for regulation administration and and access to dams administration, maintenance and emergency preparedness. It is important for both the personnel of this office and the water users to have reasonable access.

Overall, 1993 was an easy year for the administration of water on the south slope of Grand Mesa because of the large quantity of water available for distribution. The number one priority on Surface Creek was not cut until the first part of October compared to the first part of July in the average year. Reservoir carryover at the end of 1993 was 55 % of usable capacity, compared to 17 - 21 % for the past several years. This much reservoir carryover should allow for a good irrigation water supply next year if we can get close to average snowpack.

The North Fork of the Gunnison River was the area most impacted by high flows from spring runoff. Some flooding of agricultural lands occurred along the North Fork itself, and there was some flooding of the Smith Fork in the Crawford area. On the North Fork of the Gunnison River, Water Commissioner Cliff Davis spent many nights watching the river and keeping local emergency coordinators informed of it's status. On Minnesota Creek, we were concerned about two restricted dams, Beaver and Monument. In each case, we were unable to control the water level to the restriction and we were unsure of the safety of the dam above the restricted level. This situation resulted in substantial extra time spent monitoring the dams by the Water Commissioners and the dam owners.

### D. Lower Gunnison River, Kannah Creek and East Creek

Kannah Creek drains the west end of Grand Mesa. This area shared the exceptionally high snowpack previously reported for Grand Mesa. Below average temperatures in May and June prevented flooding. The good snowpack and slow runoff made for a very good water year. No "calls" were made until August 13. This allowed the junior water users a much longer season than in prior years. East Creek went on call and was administered for the remainder of the season.

At the Redlands diversion on the Lower Gunnison River, there was some controversy about water measurement and their FERC permit for power generation. FERC took a position that the Redlands should never divert more than their water right, even for a period of a few hours. The position they took showed a lack of understanding of the variability of water flow, the level of accuracy of water measurement, and time of response needed to adjust the headgate. This position was apparently intended to protect the endangered fish. Fortunately, with the help of several local entities, including the Grand Junction office of the U. S. Fish and Wildlife Service, Redlands was able to resolve this matter.

### E. San Miquel River

The San Miguel River and tributaries enjoyed good water supplies this year. The May 1 snotel reading at Lizard Head Pass was 148 % of average. Thanks to cool nights during the spring months the snow melted slowly and there were no significant flooding problems. There were no calls for administration of junior rights in water district 60 this year.

The Upper San Miguel Basin is growing rapidly, with the growth centered around the Telluride ski area. There is considerable water court activity associated with this growth.

This was a good year for the farming and ranching economy in the lower parts of water district 60. Because of ample irrigation water supplies, many meadows which had degraded over the drought years were replanted with small grains, alfalfa and grass. Livestock prices were very good and spring calving and lambing were excellent. Cleanup work at the Uravan site continues ahead of schedule.

### F. Paradox Creek and Dolores River Tributaries

Paradox Creek, Water District 61, had an excellent water year. The runoff was sufficient to supply all needs until July 15, at which time the creek was put on call. The first storage water was delivered on July 19. The Bureau of Reclamation has been test pumping their salinity control wells throughout the year.

Water District 63 had a snowpack of about 104 % of normal. Stream flow remained good through the summer as a result of snow-pack and rains, and no "call" was placed on West Creek this year.

Water District 73 also had a better water supply than average, with a reported snowpack of 105 % of normal. This required some increased administration over prior years since the creeks ran longer than in most years. Ranchers in this area did not have to buy hay to feed their livestock through the fall and winter months as they did in prior years.

#### II. 1993 PROGRAMS AND ACTIVITIES

A few areas received a special focus during 1993. First, we were able to complete field work to define irrigated acreage. Secondly, Division IV was very active in flood watch activities and dam safety activities during the spring runoff.

Finally, activities continued in the development of the Gunnison Basin model and spreadsheet. Endangered fish and other environmental issues continue to be a major factor in water resource matters in Division IV.

### A. Flood Watch Activities

Although not an assigned duty of this agency, we provided considerable assistance to the State and local agencies which deal with flood preparedness. In this role, some of the Montrose office staff and the Water Commissioners attended meetings and provided site specific knowledge of the streams involved. This first hand geographic knowledge was quite valuable to both the State and local agencies. As the verification contact for the flood warning system incorporated in the Satellite Monitoring System, several people in this office received many phone calls to verify automatic reportings of high water.

We were fortunate not to have worse flooding problems than we There was certainly some localized flooding on the small creeks, but the extent of flooding was small relative to the The largest and most damaging flooding occurred on snowpack. the North Fork of the Gunnison, where flows reached a peak of 8610 cubic feet per second on May 27, 1993. These high flows on the North Fork resulted in some fairly significant bank erosion causing loss of some agricultural land. Downstream, the Gunnison River through Delta rose to a peak flow of 17,400 cubic feet per second on May 28. These high flows were of concern since the City has constructed a park and a recreation center in the delta between the Gunnison and Uncompangre Rivers which could have received considerable damage if the flows were not controlled by the levees. The observed flows in Delta were controlled by the levees, but higher flows would have likely caused some damage. It should be noted that this flow is was considerably reduced by flood control storage in Blue Mesa Reservoir.

There was also some high water in the area west of Cedaredge as Tongue Creek and its tributaries Ward Creek and Dirty George Creek saw high flows which exceeded the capacity under county bridges due to snowmelt runoff.

### B. Dam Safety program

The Dam Safety Program was also greatly affected this year by the high snowpack. Most notable in this area were the efforts of the Water Commissioners on Grand Mesa in assisting the Grand Mesa Water Users in clearing snow from reservoir spillways atop Grand Mesa. Each year, it is necessary to remove snow from the reservoir spillways so that the water may find a route through the snow. Otherwise, there is potential

for these dams to overtop. This years snowpack was extreme, containing 47.8 inches of water at the Park Reservoir on May 1. Considerable digging was required to dig out the spillways. Particularly helpful in this process were Albert and Ken Mahannah who have helped the water users by developing power equipment for this use. Also to be mentioned are L. Greg Scott and Rod Hamilton who assisted the water users considerably.

The high flows of the snowmelt runoff were of concern since we would be unable to hold restricted reservoirs to the safe storage level because inflows were expected to exceeded outlet capacity. Two reservoirs which were closely monitored this spring were the Monument Reservoir on the Dry Fork of Minnesota Creek and the Beaver Reservoir on the East Fork of Minnesota Creek. Each reservoir had a condition which could be aggravated by storage in excess of the restriction level and in each case the outlet was not large enough to control the filling.

During 1993, five dams were removed from the restriction list. These dams were Thompson #1, Thompson #2, Thompson #3, Hale, and Little Giant #1. The Hale was repaired by enlargement of the spillway. For the other dams, the restriction was removed because of a partial breach and/or reclassification. Two new dams were constructed this year, Shavano Valley Flood Detention Dam and Nucla Third Avenue Reservoir. Construction to repair the outlet of Twin Lake #2 is estimated to be 55 % complete.

During the 1993 inspection season the Dam Safety Engineer, Jim Norfleet, inspected 24 Class I dams and 38 Class II dams. Due to an extra assignment to the Dam Safety Engineer this year, approximately 20 Class III dams scheduled for an engineer's inspection in 1993 were deferred to the Water Commissioners. The Water Commissioners inspected a total of 60 class III dams.

The dam safety engineer participated in Travel Management Planning for Grand Mesa being conducted by the U. S. Forest Service. This office had concerns: first, access to dams for inspection, emergency response, and for maintenance by the dam owners. second, reasonable access to water structures for administration. This process is ongoing at the time of this report.

In addition to the above duties, the dam safety engineer performed several hydrology studies to determine spillway adequacy, followed up on inspection, and provided assistance and information in trying to resolve dam safety problems.

### C. Irrigated Acreage Determination

Conclusion of the Division IV irrigated acreage project was achieved in September. Local involvement began in July, 1992 when objectives were defined, work procedures outlined, fiscal and personnel needs quantified, and quality controls implemented. Beginning August 1, 1992 two temporary employees were hired to serve in irrigated field identification. They worked in conjunction with water commissioners whenever possible.

Early in the 1993 irrigation year before spring runoff, two part-time water commissioners were allocated additional time to take advantage of local expertise. Their combined efforts were supplemented by rehiring LuAnn Beasley (one of the previous temporary employees). By September, 1993 irrigated fields in Water Division IV were identified and their respective area boundaries checked against aerial surveys and topographical maps. The complete database counts 8,536 irrigated fields within the Gunnison, San Miguel, and Whenever possible, small Little Dolores River watersheds. contiguous fields of similar crop and irrigation type were combined for simplicity. In an attempt to further quantify the consumptive use, the inspections indicated what method of Of 7,551 fields where irrigation irrigation was utilized. type was identified, sixty-six percent was by furrow, thirtytwo percent by flood, and the balance by sprinkler and drip irrigation systems.

Type of crop irrigated was determined by visual inspection on 51% of total irrigated fields. Pasture grass and alfalfa lead as the two most favored crops followed by corn, other small grains, orchards, beans, and vegetables.

Corrected mylar maps which are scaled to overlay published U.S.G.S. topographic maps were sent to the United States Bureau of Reclamation on a periodic basis. The Bureau intends to assimilate the new corrected field boundary information into their Geographic Information System and provide to us the actual number of acres irrigated. We received the final shipment of corrected irrigated field mylars back from the USBR in December with total acreage per map. Our final objective is to receive the acreage per field as defined in the database originally created.

Use of this information will be advantageous in future net consumptive use studies, assigning value in relation to historical records, and Water Court proceedings. Anticipated receipt of the concluding acreage information from U.S.B.R. is in early spring, 1994.

### D. Gunnison River Accounting Spreadsheet and Model

The Gunnison River Accounting Spreadsheet and Model are being developed under the direction of seven water interests operating in the Gunnison Basin. Those seven entities are: Uncompanger Valley Water Users Association, Upper Gunnison River Water Conservancy District, Tri-County Water Conservancy District, Colorado River Water Conservation District, U. S. Bureau of Reclamation, Colorado Water Conservation Board, and Colorado Division of Water Resources. Over the past two years these groups have met to discuss administration of the Gunnison River and set criteria for development of these two desired products.

The Gunnison River Accounting Spreadsheet is being prepared by the Bureau of Reclamation. At this point in time, they are in the final development stage and completion is expected by spring, 1994.

The Gunnison River Model is being developed by a consulting firm and is scheduled for a second 'beta' test in the February of 1994. Public release is expected sometime shortly after completion of the second beta test.

### E. Water Court activities

The number of Water Court applications is on the rise, with considerable growth throughout the division. In calendar year 1992, 216 applications were filed. In calendar year 1993, 270 applications were filed.

The primary court case of interest is the Arapahoe County proposal to divert water from Taylor park to the front range. That application is currently before the Colorado Supreme Court. Also of interest is the Telluride Company augmentation plan. This application will consolidate several prior decrees for the ski area and associated residential development.

Several pending applications showed little progress during 1993, because the proponents are involved in the Aspinall Operations EIS. The EIS will set forth a new operations plan for Blue Mesa, Crystal and Morrow Point reservoirs which gives greater consideration to maintaining desirable flow patterns in the Black Canyon of the Gunnison National Monument and in the lower Gunnison River areas where there is an effort to recover endangered fish. The CWCB application for an instream flow in the Black Canyon showed little progress in 1993. Also in 1993, the National Park Service made no public announcement of the flow amounts they would be requesting for the reserved right in the Black Canyon of the Gunnison.

### F. Hydrographic and Satellite Monitoring activities

The heavy snow pack and subsequent spring runoff was probably the most significant aspect of stream gauging and measurement this year. The National Weather Service and the Denver Office Hydro branch visited Division IV to assist in preparations for the spring runoff. Preparations for the runoff included checking the DCP's and the water levels which result in a flood warning alarm being given to the N.W.S.

Also this year, modifications were made to the battery setup at field transmission sites for the satellite monitoring system. The internal batteries were removed and exchanged with field units. The battery modification allows the current from the solar panels to be regulated through the DCP to the external battery. This should prevent over-charging the gel cell batteries and resulting in longer battery service life. Three units remain to be modified. Dick Polker, the new telecommunications technician in Denver has visited twice and bolstered the grounding at the SMS stations.

The DOMSAT system in Denver has helped with the capture of data which previously would have been sent but not received. This has helped in hydrographic records and data quality since August.

Chuck David transferred to the DOW the first of February leaving Jerry Thrush as the Div. IV hydro.

Water Commissioner Steve Tuck assists in hydro work. He has put in extra time to measure streams and ditches in Dist. 40 as well as helped in other projects.

The UVWUA installed a new gage on the Ironstone Canal. The new gage will use a county road bridge as a control, giving a better cross section for measuring.

### G. <u>Information Systems</u>

Division IV was able to make some significant progress in 1993 in our computer systems. This progress was made with good support from the Denver office. Specific accomplishments were: installation of the LC connector box to allow printer sharing and having direct printer access for all computers in the Montrose office, the acquisition of a few new computers which allowed us to now have a PC for each engineer and technician in the Montrose office, and some computer training.

As we progress, several objectives become apparent. We would like to gain LAN capabilities to allow file sharing. We hope to be able to gain better computer communication with the Denver office. We would like to upgrade computers in the Grand Junction and Cedaredge offices to Windows capable units and make the computers now located in those offices available for field commissioners.

In addition to the above considerations, several other areas for improvement of our information systems become apparent. Some of these projects could be accomplished in the division office, while others would require assistance from Denver. Generally, this office suggests that we attempt to make as much of our data (decrees, permits, etc) accessible by computer as possible and that we try to computerize as many of our processes as possible. Well permitting is an example of a process which could be computerized and decentralized.

### III. THE COMING WATER YEAR

The coming water year has the potential to bring many changes to Water Division IV. It is our hope to be able to respond to these changes and perform our duties in an effective manner. The following challenges are expected:

- O Performing our routine duty of distributing the available water supply. At the current time, there is a low snowpack and therefore a concern that we may have less than an average runoff.
- O Implementation of the Division of Water Resources long range plan will be a major effort toward achieving many goals including enhanced management and employee satisfaciton, technology support for better data management, improved records, resource allocation, improved public service and public relations.
- O The spreadsheet for the Gunnison River is expected to be completed by the spring of 1994. The ability of this office to take the reins in operating the spreadsheet for mainstem accounting and management is dependent upon future staffing.
- O The position of well technician is currently vacant, although we expect to fill that position in the near future. With a person whose prime objective is wells, we would hope that we could eventually move toward issuing permits for exempt wells directly from the division office. We believe this would greatly reduce paperwork, and turnaround time, and thereby increase customer satisfaction.
- O Continue the training program for Division IV personnel with the effort to try to help everyone benefit from the training program.

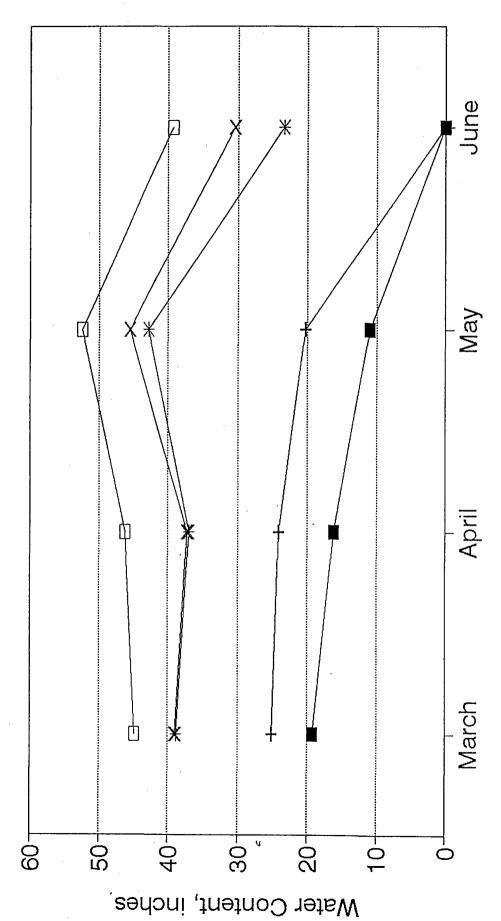
- O Further develop the quality of past and ongoing diversion records, water rights information, and streamflow data; and improve the accessibility and usability of this data to the staff and to the public.
- O Complete work in the definition of irrigated acreage for the entire Division IV by including identification of water source.

# APPENDIX A-1

			SNOW SUR GRAND ME	SNOW SURVEY REPORT 1993 GRAND MESA COLORADO	7T 1993 DO		·			
	JANUARY	25	MARCH 6		APRIL 2		APRIL30		MAY 28	
SITE NAME	WATER. CONTENT (IN.)	SNOW DEPTH	WATER CONTENT (IN.)	SNOW DEPTH	WATER CONTENT (IN.)	SNOW DEPTH (IN.)	WATER CONTENT (IN.)	SNOW DEPTH (IN.)	WATER CONTENT (IN.)	SNOW DEPTH
SHAW PASTURE	р М.	51.0	19.3	57.3	16.6	6 6 7	0.11	22.0	****	
COLE #5 RES	15.6	62.3	0.84	72.3	24.0	0.85	р. О	42.0		
MARCOTT RES	24.3	82.6	8.8	102.6	37.0	97.6	42.8	87.6	n M N	4 Խ.
PARK RES	25. 0.	0.68	0.65	106.5	M . VW	100°.	4 8.0	0.66	0°0	56.3
LEON RES	29.0	98.2	45.0	124.7	46.3	119.6	82. G	116.3	n 6	71.0
ALEXANDER RES	20.5	0.08	0.0	117.0	ი ი ო	9.96			26.3	51.0
GRANBY RES			30.8	0.58	unit then min shad the	sera Man bern wire seen	thin min erit titu dens	sam dies sam and men	then days need made pass	1

Grand Mesa Snowpack APPENDIX A-2

Division IV stations



-\*- Marcott Res. 9600 —— Leon Lake, 10400 ft —— Park Res. 10000 ft Cole # 5, 8800 ft Shaw Pastur 9320

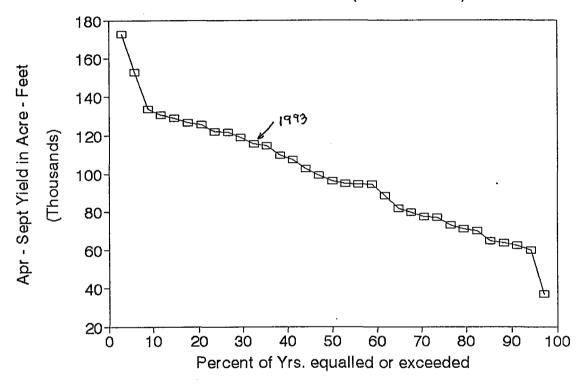
APPENDIX A-3
UNCOMPAHGRE RIVER NR RIDGWAY, CO

			ONCOMPA	IUGKE KI	ARK NK	KIDGMAI	, 00		DEDCEME
				3 CDE					PERCENT OF YEARS
				ACRE -	FEET		ממט חחג		EQUALLED
			77777	777	3.110		APR-SEP TOTAL	T) 3 NTT	OR EXCEE
YEAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL	KANK	OK EACEE
1984	9610	47060	54390	34080	18150	9390	172680	1	3 6
1983	5180	17770	54250	52160	16790	6740	152890	2	
1985	11200	25780	52950	25950	10410	7700		3	9
1965	8810	19620	39250	38840	14470	10040	131030	4	12
1975	4040	15850	44640	45900	13040	5790	129260	5	15
1986	6640	21580	45800	29120	11310	12260	126710	6	18
1979	6540	23500	49080	31490	11160	4100	125870	7	21
1973	4020	20860	46350	33000	11790	6140	122160	8	24
1982	5730	17190	38620	29010	18540	12780	121870	9	26
1978	7170	16950	53380	28550	8430	4590	119070	10	29
1993	5840	28840	43050	21580	10030	6390	115730	11	32
1970	4750	27640	36180	19290	12100	14890	114850	12	35
1987	10760	25990	38390	18480	9430	6560	109610	13	38
1968	4380	16350	48170	17750	15870	4880	107400	14	41
1962	10450	19560	35480	23340	8450	5190	102470	15	44
1992	8660	23730	31290	20980	9400	5150	99210	16	47
1964	6130	24610	30620	16870	12370	5650	96250	17	50
1969	9240	23960	24980	21280	8380	7010	94850	18	53
1991	5560	22600	35480	16700	8610	5600	94550	19	56
1971	9050	13240	35890	20220	8530	7570	94500	20	59
1961	6150	23040	32190	10170	8760	7980	88290	21	62
1980	5120	13120	36430	16130	6900	3930	81630	22	65
1974	5910	23810	26580	14130	5890	3400	79720	23	68
1966	7260	24780	23110	11870	6270	3900	77190	24	71
1988	5890	13900	30310	11660	7430	7680	76870	25	74
1967	4320	17210	22020	15050	9680	4580	72860	26	76
1976	4590	16050	26690	13010	6720	3940	71000	27	79
1990	5070	14720	28540	12290	4820	4520	69960	28	82
1963	6410	19350	16920	10160	6480	5430	64750	29	85
1981	4650	8680	22930	16550	6130	4780	63720	30	88
1972	5400	14210	24020	8840	4520	5260	62250	31	91
1989		13960	17640	9760	6870	3530	60070	32	94
1977	5110	7510	9990	5440	4500	4500	37050	33	97

TOTAL 3270310

AVERAGE 99100

## Uncomphagre River near Ridgway Flow Duration Curve (1961-1993)



### GUNNISON RIVER NEAR GUNNISON 1961-1993

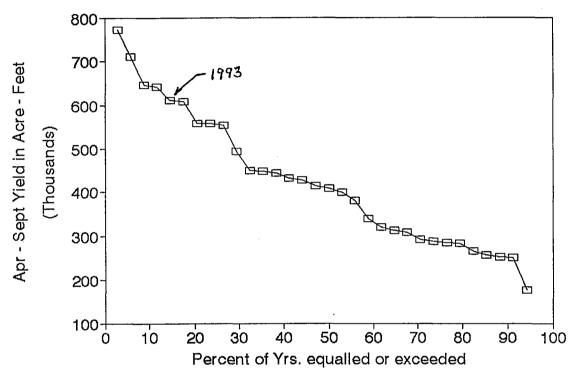
									PERCENT
			ACRE - F	EET					OF YEARS
							APR-SEP		EQUALLED
YEAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL	RANK	OR EXCEE
1984	41530	208000	249900	154400	75270	44050	773150	1	3
1965	64630	137800	202500	184100	70900	50180	710110	2	6
1986	63000	138600	197500	125500	68570	52970	646140	3	9
1962	82180	171400	183900	103500	55010	45000	640990	4	12
1993	35190	170400	195200	112400	60370	36090	609650	5	15
1985	71120	176500	172400	88500	45110	54030	607660	6	18
1979	39130	156800	177100	112400	41860	31790	559080	7	21
1980	59070	140400	192000	80040	42150	44460	558120	8	24
1970	58370	180400	151700	78490	36160	48400	553520	9	26
1983	30150	70220	181700	106100	66890	37970	493030	10	29
1978	32970	83630	183900	83750	38830	25480	448560	11	32
1971	56740	87710	137500	84510	56150	25260	447870	12	35
1987	67680	128300	116700	55300	42480	32840	443300	13	38
1969	50830	132900	97090	79440	42450	28810	431520	14	41
1982	36870	91480	141200	71810	45350	39950	426660	15	44
1968	19380	86110	151200	50810	68320	37570	413390	16	47
1975	20010	59640	144500	114900	45420	23230	407700	17	50
1973	15800	87110	127800	100600	42960	24610	398880	18	53
1991	28860	99360	120800	64740	41940	23610	379310	19	56
1972	31660	59800	120400	36990	43600	45340	337790	20	59
1967	26800	69350	105100	55100	35810	28110	320270	21	62
1974	25340	109400	85730	39950	34360	18710	313490	22	. 65
1976	31400	67480	82430	53190	40880	33040	308420	23	68
1988	31150	72450	91280	45230	31320	21900	293330	24	71
1964	12710	72090	78100	44670	43420	36940	287930	25	74
1992	34860	75150	66890	45280	37230	25220	284630	26	76
1966	35860	77800	80630	33200	34170	21640	283300	27	79
1963	31890	61420	54850	48910	47960	21810	266840	28	82
1989	47530	64000	64650	32260	31770	17150	257360	29	85
1961	15360	61970	59650	47320	45030	23870	253200	30	88
1990	15870	29230	83910	41090	62050	18940	251090	31	91
1981	14880	26350	56080	30330	25470	22850	175960	32	94
1977	16660	17370	25290	17710	19520	14810	111360	33	97

TOTAL 13582250

AVERAGE 411583

### Gunnison River near Gunnison

Flow Duration Curve (1961 - 1993)



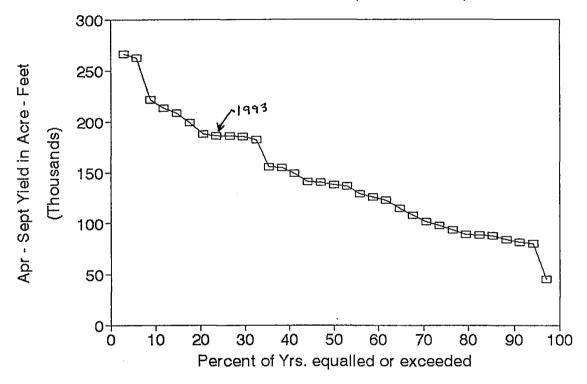
### SAN MIGUEL RIVER NEAR PLACERVILLE 1961-1993

			ACRE -	FEET					PERCENT OF YEARS
							APR-SEP		EQUALLED
YEAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL	RANK	OR EXCEEDED
1983	10100	52650	90930	73580	29730	9130	266120	1	3 6
1984	23520	91740	70740	44280	20750	11180	262210	2	
1985	31660	48530	75540	37830	14870	12970	221400	3	9
1987	33110	58120	63150	33700	17350	7990	213420	4	12
1973	8900	49360	75380	50300	17210	7630	208780	5 6	15
1965	19980	35400	50220	56350	23400	13690	199040		18
1975	570	38060	60780	64610	16320	7550	187890	7	21
1993	14220	46880	68210	34190	13690	8510	185700	8	24
1986	15810	37990	64110	40620	14400	12650	185580	9	26
1979	13720	38100	72110	41140	14190	5760	185020	10	29
1982	15600	32690	51230	38420	25280	18850	182070	11	32
1970	8860	47030	40920	23480	14910	20330	155530	12	35
1980	10580	32080	62910	29620	12560	7130	154880	13	38
1978	15860	28880	64460	27770	7550	4620	149140	14	41
1962	21940	32070	41560	28260	10350	6750	140930	15	44
1961	14800	41620	46560	13870	11320	11730	139900	16	47
1992	17130	36010	41120	25020	11620	6740	137640	17	50
1968	6180	25190	55740	22060	20560	6650	136380	18	53
1971	15890	24130	46100	23100	11510	8080	128810	19	56
1969	14390	32580	29320	27060	12260	9830	125440	20	59
1991	14160	28520	41670	18940	9840	9370	122500	21	62
1964	10490	36410	34940	14550	11660	6280	114330	22	65
1988	9730	18980	40380	17190	10630	10310	107220	23	68
1966	12550	33510	28660	13380	7550	5090	100740	24	71
1974	13230	32880	29250	12870	5930	3900	98060	25	74
1976	8870	21670	36100	14310	7030	5510	93490	26	76
1967	5990	23100	24220	15820	12250	7810	89190	27	79
1981	8160	12290	31020	19620	8260	8860	88210	28	82
1989	14560	22580	22390	13940	9780	4350	87600	29	85
1963	10860	25580	19200	9900	10360	8150	84050	30	88
1990	5930	17020	33630	12230	6260	6030	81100	31	91
1972	9970	19040	30080	9740	5130	6280	80240	32	94
1977	6210	8380	13350	6370	5560	5260	45130	33	97

TOTAL 4757740

AVERAGE 144174

## San Miguel River near Placerville Flow Duration Curve (1961-1993)



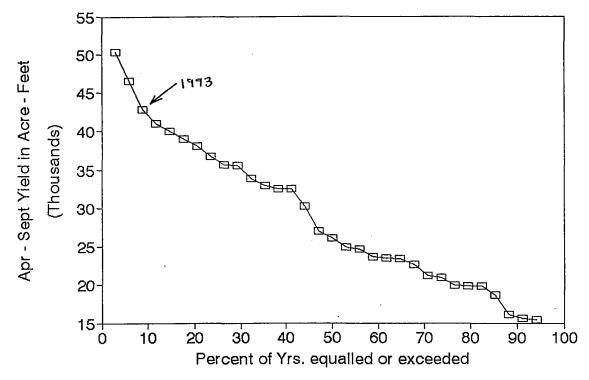
### SURFACE CREEK NEAR CEDAREDGE 1961-1993

				ACRE -	FEET			3.D.D. 6.H.	_	PERCENT OF YEARS
YE.	λD	APR	MAY	JUN	JUL	AUG	SEP	APR-SEI		EQUALLED OR EXCEED
. نشار بال	AK	AFK	PLAT	0 011		1100	OBI	101111	1411111	on bhobbb
1	983	1410	7180	20400	11720	5740	3900	50350	1	3 6
1	986	3650	13010	15630	6570	4650	2970	46480	2	
1	993	1470	11710	13480	7970	4990	3240	42860	3	9
1	984	1140	14500	12430	5810	4730	2450	41060	4	12
1	973	849	11490	14530	6390	4240	2520	40019	5 6	15
1	985	3240	11870	11130	5350	4890	2530	39010		18
1	980	1400	8480	15260	6140	4300	2470	38050	7	21
1	982	2530	8340	11110	6880	4330	3500	36690	8	24
1	987	4540	11170	9230	4990	3480	2260	35670	9	26
1	969	4080	12330	8280	4520	4720	1620	35550	10	29
1	979	1470	8640	11600	5390	4210	2530	33840	11	32
1	962	3850	7700	10330	5220	3870	1970	32940	12	35
1	975	616	5820	11120	6920	5140	2930	32546	13	38
1	978	1170	8050	12250	5020	3530	2450	32470	14	41
1	965	1110	7470	9440	5650	4090	2490	30250	15	44
1	970	709	8190	7750	4190	4010	2140	26989	16	47
	971	2780	5560	8100	4330	3350	1970	26090	17	50
	966	3020	8250	4930	4150	3020	1540	24910	18	53
	968	608	6510	7960	4130	2600	2880	24688	19	56
	991	715	6620	6250	4030	4140	1870	23625	20	59
	967	1200	6340	5930	3890	3550	2570	23480	21	62
	988	2200	6390	6240	4110	3460	982	23382	22	65
	974	2040	8480	4870	3190	2500	1540	22620	23	68
	972	2700	6470	4790	3240	2720	1250	21170	24	71
	992	3350	6450	3750	3120	3060	1240	20970	25	74
	989	3490	5240	4470	3550	2040	1170	19960	26	76
	976	823	6000	5560	3500	2380	1590	19853	27	79
	964	543	5790	4460	4000	2990	2030	19813	28	82
	961	790	5170	5000	3400	2820	1490	18670	29	85
	981	2010	4520	3530	2710	1910	1460	16140	30	88
	990	2500	3190	4090	2418	2307	1170	15675	31	91
	963	1730	5130	2530	2560	2050	1470	15470	32	94
1	977	1060	1750	525	366	539	238	4478	33	97

TOTAL 935768

AVERAGE 28357

# Surface Creek near Cedaredge Flow Duration Curve (1961 - 1993)



# A. TRANSMOUNTAIN DIVERSION SUMMARY--INFLOWS

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<del></del>			<del></del>	<del>- 7</del>	<del></del>	7
		STREAM	4660 Animas R	Animas R	Animas R	Leon Cr
		ΩI		30 4661	4662	758
田		WD	30	30	30	72
SOURCE		DAYS	84	84	26	99
	URRENT YR.	AF	70.8	67.8	19.5	1740.0
	ERAGE C	DAYS	92	45	38	80
	10-YEAR AVERAGE CURRENT YR.	AF	262	105	29. 6	1620.0
RECI PI ENT		STREAM	Uncompahgre	Uncompahgre	Uncompahgre	Surface Cr
		NAME	Carbon Lake D Uncompahgre	Mineral Point	Red Mountain	Leon Lk Tunl
		ΩI	N/A	N/A	N/A	N/A
		WD	89	68	68	40

# B. TRANSMOUNTAIN DIVERSION SUMMARY -- OUTFLOWS

17	N/A	Larkspur D	Arkansas R	158	96	153	120	28	4655	Tomichi Cr
26	N/A	Tarbell D	Saguache Cr	197	24	109	15	28	4656	Cochetopa
20	N/A	Tabor	Clear Cr	1050	144	1060	169	62	774	Cebolla Cr
45	577	Divide Ck Hi	Divide Cr	1470	51	1130	33	40	4657	Cl Fk Mud
72	N/A	City Pipeln	Colorado R	1730	361	1280	354	42	4710	Kannah Cr
72	N/A	New City Pl	Colorado R	4800	364	5820	365	42	4711	Kannah Cr
72	N/A	Redlands Can	Colorado R	518600	353	521100	358	42	4713	Gunnison R
72	N/A	Fruita Pl	Colorado R	0	0	0	0	73	4712	East Cr

					AMOUNT	OF STORAGE	GE (AF)	
				MI	MI NI MUM	MAXI MUM	IM	
WD	ID	RESERVOIR NAME	SOURCE STREAM	AF	DATE	AF	DATE	END YR
28	3590	Hot Sprgs R	Hot Springs Cr	108.0	11/01/92	610.0	06/22/93	280.0
28	3591	McDonough #1	Los Pinos Cr	388.0	09/21/92	805.0	05/13/93	388.0
28	3592	McDonough #2	Los Pinos Cr	377.0	11/01/92	887.0	05/12/93	486.0
28	3593	Needle Creek	Needle Cr	465.0	11/01/92	741.0	05/06/93	535.0
28	3594	Upper Dome R	Cochetopa Cr	243.0	11/01/92	807.0	04/12/93	492.0
28	3595	Vouga Res	Razor Cr	590.0	07/09/92	910.0	05/28/93	590.0
40	3408	Monument Res	Minnesota Res	0.0	11/01/92	423.0	07/08/93	63.0
40	3409	Reynolds Res	Reynolds Cr	10.0	11/01/92	100.0	05/14/93	60.0
40	3410	Minnesota Cr	Roeber 2 Res	0.0	11/01/92	44.0	06/01/93	0.0
40	3411	West Res	Jay Cr	104.0	11/01/92	572.0	6/60/90	124.0
40	3412	Ault Res	Muđdy Cr	0.0	11/01/92	116.0	07/20/93	58.0
40	3413	Bruce Pk Res	Hubbard Cr	0.0	11/01/92	598.0	06/07/93	0.0
40	3414	E Beckwith 1	Anthracite Cr	333.4	11/01/92	700.0	06/24/93	580.0
40	3399	Overland Res	Muddy Cr	0.0	11/01/92	6200.0	06/24/93	250.0
40	3416	Paonia Res	North Fork	642.0	11/01/92	15833.	07/01/93	6217.0
40	3417	Spatafora Res	Muddy Cr	0.0	11/01/92	100.0	07/20/93	50.0

					AMOUNT	OF STORAGE	AGE (AF)	
				MI	MI NI MUM	MAXIMUM	M	
WD	ID	RESERVOIR NAME	SOURCE STREAM	AF	DATE	AF	DATE	END YR
40	3418	Tomahawk Res	Muddy Cr	55.1	11/01/92	87.3	06/15/93	87.3
40	3419	Williams Cr R	Muddy Cr	56.0	11/01/92	100.0	06/15/93	59.0
40	3420	Bailey Res	Leroux Cr	0.0	11/01/92	423.0	05/27/93	95.0
40	3421	Brockman #1	Leroux Cr	0.0	11/01/92	16.0	05/27/93	0.0
40	3422	Brockman #2	Leroux Cr	0.0	11/01/92	41.0	05/27/93	0.0
40	3423	Carl Smith R	Leroux Cr	187.0	11/01/92	780.0	05/1593	406.0
40	3424	Dog Fish Lake	Leroux Cr	0.0	11/01/92	243.0	06/15/93	0.0
40	3425	Dowdy Res	Leroux Cr	0.0	11/01/92	264.0	05/15/93	49.0
40	3426	Ella Res	Leroux Cr	0.0	11/01/92	98.0	05/20/93	0.0
40	3427	Elk Wallows	Leroux Cr	0.0	11/01/92	218.0	05/27/93	0.0
40	3428	Ellingtn Cook	Leroux Cr	0.0	11/01/92	24.5	08/27/93	0.0
40	3429	Fairmont Pk	Leroux Cr	0.0	11/01/92	30.0	05/27/93	30.0
40	3430	Fairmount Res	Leroux Cr	0.0	11/01/92	78.0	05/20/93	0.0
40	3431	Fisher Res	Leroux Cr	10.0	11/01/92	10.0	05/27/93	10.0
40	3432	Goodenough R	Leroux Cr	230.0	11/01/92	762.0	06/15/93	491.0
40	3433	Gray Res	Leroux Cr	0.0	11/01/92	424.0	05/15/93	56.0

RESERVOIR STORAGE SUMMARY

							, ,	
				MI	MINIMUM	MAXIMUM	Ж	
WD	ID	RESERVOIR NAME	SOURCE STREAM	AF	DATE	AF	DATE	END YR
40 3	3435	Hanson R #2	Leroux Cr	230.0	11/01/92	225.0	05/18/93	0.0
40 3	3436	Holy Terror R	Terror Cr	0.0	11/01/92	146.0	05/27/93	0.0
40 3	3438	Luck Find Res	Leroux Cr	0.0	11/01/92	66.0	05/20/93	0.0
40 3	3439	Miller Res	Leroux Cr	0.0	11/01/92	20.4	05/27/93	20.4
40 3	3440	Owens Res	Leroux Cr	0.0	11/01/92	92.0	05/24/93	0.0
40 3	3441	Patterson #1	Leroux Cr	0.0	11/01/92	78.0	05/18/93	0.0
40 3	3442	Patterson #2	Leroux Cr	151.0	11/01/92	151.0	05/15/93	151.0
40 3	3443	Pine Cone	Leroux Cr	0.0	11/01/92	37.0	05/27/92	0.0
40 3	3445	Rex Res	Terror Cr	0.0	11/01/92	24.0	05/27/93	0.0
40 3	3444	Reynolds Res	Leroux Cr	0.0	11/01/92	176.0	05/20/93	88.0
40 3	3446	Skim Milk	Leroux Cr	0.0	11/01/92	90.0	05/20/93	43.0
40 3	3447	Wash Tub	Leroux Cr	0.0	11/01/92	25.0	05/24/93	0.0
40 3	3448	Water Bug Res	Leroux Cr	0.0	11/01/92	48.0	06/01/93	48.0
40 3	3449	Willow Res	Leroux Cr	128.0	11/01/92	128.0	05/01/93	128.0
40 3	3391	Bald Mt Res	Crystal Cr	0.0	11/01/92	88.8	06/29/93	0.0
40 3	3392	Bottle Stomp Res	Iron Cr	0.0	11/01/92	17.0	05/24/93	0.0

WD         ID         R           40         3553         C           40         3395         F           40         3394         D           40         3397         M           40         3400         P           40         3400         P           40         3401         R	Crawford Res Fruitland Res Don Meek #1 Meek Res Poison Spr R Rockwell R 1	SOURCE STREAM  Iron Cr Crystal Cr Crystal Cr Iron Cr		MI NI MUM	MAXIMUM	M	
1D 3553 3395 3394 3397 3400	ᆸᇪᄥᄳᇬᄬᅴᄁᄭᆈᄣ	SOURCE ron Cr rystal ( rystal ( ron Cr					
3553 3395 3394 3397 3400 3401	씨 핑 #   집 씨	ron Cr rystal C rystal C ron Cr	t t	DATE	AF	DATE	END YR
3395 3394 3397 3400 3401	tland Meek # Res on Spr	וסוס	4//1.	11/01/92	14383.	05/28/93	7835.
3394 3397 3400 3401	Meek #1 Res on Spr	וט ו	0.0	11/01/92	9004.	06/28/93	266.8
3397 3400 3401	Res on Spr well R	i	0.0	11/01/92	45.0	06/29/93	0.0
3400	지 교		0.0	11/01/92	29.0	06/29/93	0.0
3401	ፈ	1	50.0	11/01/92	123.0	05/28/93	50.0
	The state of the s	Iron Cr	0.0	11/01/92	50.8	05/24/93	25.0
40 3300 A	Alexander Lk	Ward Cr	85.0	10/31/92	157.0	07/06/93	157.0
40 3302 B	Barren Lk	Kiser Cr	109.7	10/31/92	800.0	07/06/93	800.0
40 3450 B	Basin #1	Dirty George C	4.62	10/31/92	257.5	07/06/93	31.81
40 3451 B	Basin #2	Dirty George C	11.35	10/31/92	40.6	07/06/93	0.0
40 3452 B	Battlement #1	Dirty George C	87.4	10/31/92	87.4	07/06/93	87.4
40 3453 B	Battlement #2	Dirty George C	45.9	10/30/92	597.14	07/06/93	86.7
40 3341 B	Bonita	Surface Cr	67.45	10/31/92	277.97	07/06/93	277.97
40 3304 B	Bull Finch #1	Kiser Cr	0.0	10/31/92	72. 4	07/06/93	56.59
40 3305 B	Bull Finch #2	Kiser Cr	12.34	10/31/92	39.4	07/06/93	17.21
40 3303 B	Boulder Lake	Ward Cr	0.0	10/31/92	0.0	07/06/93	0.0

					AMOUNT	OF STORAGE	GE (AF)	
				MI	MI NI MUM	MAXI MUM	М	
WD	ID	RESERVOIR NAME	SOURCE STREAM	AF	DATE	AF	DATE E	END YR
40	3342	Cabin Lake	Surface Cr	0.0	10/31/92	27.7	07/06/93	0.0
40	3378	Calumet	Surface Cr	0.0	10/30/92	16.8	07/06/93	0.0
40	3366	Carbonat Cm3	Surface Cr	0.0	10/31/92	15.5	07/06/93	0.0
40	3306	Carbonat Cm6	Youngs Cr	0.0	10/31/92	129.6	07/06/93	56.72
40	3307	Carbonat Cm7	Youngs Cr	15.16	10/31/92	107.6	07/06/93	0.0
40	3343	Cedar Mesa	Surface Cr	118.7	10/31/92	919.0	07/06/93	263.76
40	3379	Cole #1	Surface Cr	0.0	10/31/92	26.70	07/06/93	0.0
40	3380	Cole #2	Surface Cr	0.0	10/31/92	50.0	07/06/93	0.0
40	3381	Cole #3	Surface Cr	0.0	10/31/92	70.15	07/06/93	0.0
40	3344	Cole #4	Surface Cr	0.0	10/31/92	18.0	07/06/93	0.0
40	3345	Cole #5	Surface Cr	0.0	10/31/92	116.2	07/06/93	0.0
40	3308	Dan Slou Res	Kiser Cr	17.8	10/31/92	228.0	07/06/93	0.0
40	3309	Deep Slough	Ward Cr	59.8	10/31/92	498.4	07/06/93	56.0
40	3310	Deep Ward	Ward Cr	351.3	10/31/92	1700.0	07/06/93	1700.0
40	3346	Deserted Pk	Surface Cr	0.0	10/31/92	35.89	07/06/93	0.0
40	3311	Donnely Slou	Kiser Cr	70.14	10/31/92	276.9	07/06/93	139.18

RESERVOIR STORAGE SUMMARY

					AMOUNT	OF STORAGE	GE (AF)	
				MI	MI NI MUM	MAXI MUM	JM	
WD	ID	RESERVOIR NAME	SOURCE STREAM	AF	DATE	AF	DATE	END YR
40	3382	Doughty #1	Surfce Cr	0.0	10/31/92	48.2	07/06/93	0.0
40	3383	Doughty #2	Surface Cr	0.0	10/31/92	18.4	07/06/93	0.0
40	3347	Dreyfus	Surface Cr	0.0	10/31/92	42.5	07/06/93	0.0
40	3312	Eggleston Lk	Kiser Cr	304.5	10/31/92	2705.0	07/06/93	2528.0
40	3348	Elk Park	Surface Cr	46.73	10/31/92	96.8	07/06/93	96.83
40	3349	Eureka #2	Surface Cr	0.0	10/31/92	53.5	07/06/93	0.0
40	3350	Trout Lk	Surface Cr	0.0	10/31/92	76.9	07/06/93	21.66
40	3313	Forrest	Ward Cr	0.0	10/31/92	132.9	07/06/93	0.0
40	3314	Goodenough	Youngs Cr	49.78	10/31/92	152.0	07/06/93	42.62
40	3455	Granby #6	Dirty George	0.0	10/31/92	46.0	07/06/93	45.98
40	3456	Granby #7	Dirty George	34.0	10/31/92	76.1	07/06/93	51.3
40	3457	Granby #8	Dirty George	0.0	10/31/92	13.3	07/06/93	0.0
40	3458	Granby #9	Dirty George	0.0	10/31/92	72.0	07/06/93	66.31
40	3454	Granby #11	Dirty George	233.1	10/31/92	775.0	07/06/93	454.2
40	3459	Granby #12	Dirty George	170.9	10/31/92	523.0	07/06/93	358.3
40	3351	Greenwood	Surface Cr	0.0	10/31/92	61.43	07/06/93	0.0

RESERVOIR STORAGE SUMMARY

					AMOUNT	OF STORAGE	GE (AF)	
				MI	MI NI MOM	MAXI MUM	IM	
WD	ID	RESERVOIR NAME	SOURCE STREAM	AF	DATE	AF	DATE	END YR
40	3384	Hale	Surface Cr	0.0	10/31/92	33.0	07/06/93	0.0
40	3315	Hotel Twin Lk	Ward Cr	53.0	10/31/92	548.7	07/06/93	548.7
40	3316	Howard	Kiser Cr	19.0	10/31/92	72. 1	07/06/93	64.9
40	3317	Island Lk	Ward Cr	703.1	10/31/92	1426.4	07/06/93	1426.3
40	3352	Kehmeier	Surface Cr	50.28	10/31/92	319.5	07/06/93	105.06
40	3319	Kiser Slough	Kiser Cr	0.0	10/31/92	466.29	07/06/93	48.17
40	3318	Kennicott Slo	Kiser Cr	0.0	10/31/92	738.3	07/06/93	28.64
40	3353	Knox	Surface Cr	15.3	10/31/92	213.1	07/06/93	67.87
40	4520	Leon Lk	Surface Cr	307.6	10/31/92	1621.9	07/06/93	882.31
40	3385	Leon Pk	Surface Cr	0.0	10/31/92	161.0	07/06/93	0.0
40	3320	Lily Pad	Young Cr	0.0	10/31/92	18.9	07/06/93	0.0
40	3386	Litle Giant 1	Surface Cr	0.0	10/31/92	0.0	07/06/93	0.0
40	3387	Litle Giant 2	Surface Cr	0.0	10/31/92	12.0	07/06/93	0.0
40	3322	Litle Grouse	Youngs Cr	0.2	10/31/92	52.5	07/06/93	52.5
40	3321	Little Gem	Ward Cr	8.46	10/31/92	219.0	07/06/93	219.0
40	3388	Marcott	Surface Cr	0.0	10/31/92	406.14	07/06/93	67.38

					AMOUNT	OF STORAGE	GE (AF)	
				MI	MI NI MUM	MAXI MUM	IM	
WD	ΠI	RESERVOIR NAME	SOURCE STREAM	AF	DATE	AF	DATE E	END YR
40	3323	McKoon	Youngs Cr	99. 4	10/31/92	147.9	07/06/93	125.77
40	3354	Military	Surface Cr	0.0	10/31/92	236.6	07/06/93	0.0
40	3355	Park	Surface Cr	768.3	10/31/92	3383. 4	07/06/93	1868.2
40	3324	PC&G #1	Kiser Cr	0.0	10/31/93	19.4	07/06/93	19.44
40	3325	Pedro	Youngs Cr	0.0	10/31/92	194.9	07/06/93	108.78
40	3326	Pine	Youngs Cr	0.0	10/31/92	17.1	07/06/93	4.22
40	3327	Prebble	Youngs Cr	65.4	10/31/92	193.1	07/06/93	122.45
40	3328	Rim Rock Lk	Ward Cr	107.9	10/31/92	107.9	07/06/93	107.9
40	3329	Rockland	Ward Cr	12.45	10/31/92	12.45	07/06/93	0.0
40	3356	Round Lk	Surface Cr	0.0	10/31/92	20.0	07/06/93	0.0
40	3330	Ryan	Youngs Cr	40.3	10/31/93	40.3	07/06/93	40.3
40	3357	Sackett	Surface Cr	69. 2	10/31/92	108.0	07/06/93	69.84
40	3331	Safety 182	Kiser Cr	0.0	10/31/92	15.0	07/06/93	0.0
40	3332	Scotland Peak	Ward Cr	0.0	10/31/92	163.8	07/06/93	120.5
40	3333	Sheep Lk	Ward Cr	33.56	10/31/92	154.0	07/06/93	82.0
40	3358	Stell	Surface Cr	25.38	10/31/92	65.0	07/06/93	49.48

					AMOUNT	OF STORAGE	AGE (AF)	
				MI	MI NI MUM	MAXIMUM	MI	
WD	ID	RESERVOIR NAME	SOURCE STREAM	AF	DATE	AF	DATE	END YR
40	3389	Trickle	Surface Cr	0.0	10/31/92	32.7	07/06/93	0.0
40	3359	Trio	Surface Cr	61.9	10/31/92	164.3	07/06/93	62.9
40	3360	Twin Lake #1	Surface Cr	0.0	10/31/92	100.4	07/06/93	0.0
40	3361	Twin Lake #2	Surface Cr	0.0	10/31/92	126.0	07/06/93	0.0
40	3334	Upper Hotel L	Ward Cr	76.2	10/31/92	105.96	07/06/93	99. 68
40	3362	Vela	Surface Cr	61.6	10/31/92	436.6	07/06/93	227.26
40	3335	Ward Cr	Ward Cr	53.67	10/31/92	284.4	07/06/93	153.6
40	3363	Weir-Johnson2	Surface Cr	140.6	10/31/92	603.1	07/06/93	473.64
40	3336	Womack #1	Ward Cr	0.0	10/31/92	202. 4	07/06/93	40.74
40	3337	Womack 2 & 3	Kiser Cr	0.0	10/31/92	101.5	07/06/93	101.71
40	3340	Womack #5	Kiser Cr	0.0	10/31/92	23.0	07/06/93	0.0
40	3338	Young Cr 1,2	Youngs Cr	118.3	10/31/92	796.9	07/06/93	238.8
40	3339	Young Cr #3	Youngs Cr	14.56	10/31/92	200.6	07/06/93	200.62
40	3390	Y&S	Surface Cr	28.89	10/31/92	201.58	07/06/93	91.58
40	3365	Fruitgrowers	Alfalfa Run	2775.	10/31/92	4452.	07/06/93	2456.0
40	3370	Clark Res	Oak Cr	32.4	10/31/92	39.13	07/06/93	19.65

					AMOUNT	OF STORAGE	GE (AF)	
				MI	MI NI MUM	MAXI MUM	Л	
WD	ID	RESERVOIR NAME	SOURCE STREAM	AF	DATE	AF	DATE E	END YR
40	3373	Dugger Res	Oak Cr	205.3	10/31/92	212. 1	07/06/93	201.8
40	3374	Morris Res 2	Oak Cr	16.33	10/31/92	16.33	07/06/93	16.33
40	3375	Pitcairn Res	Doughspoon Cr	43.2	10/31/92	76.0	07/06/93	59.0
40	3376	Porter 1 Res	Oak Cr	170.2	10/31/92	201.76	07/06/93	201.76
40	3377	Porter 4 Res	Oak Cr	38.0	10/31/92	38.0	07/06/93	38.0
40	3368	Beaver Dam R	Escalante Cr	0.0	10/31/92	396. 5	07/06/93	86.5
40	3402	Todd Res	McDonald Cr	15.0	11/01/92	100.0	05/26/93	60.0
40	3403	Tyler Res	Iron Cr	20.0	11/01/92	169.3	05/27/93	70.0
40	3406	Beaver res	Minnesota Cr	0.0	11/01/92	1527.0	06/04/93	18.0
40	3437	Hunt Res	Leroux Cr	10.0	11/01/92	124.0	05/26/93	10.0
40	3407	Lone Cabin	Minnesota Cr	0.0	11/01/92	163.0	05/26/93	0.0
40	3714	Lucas Cline R	North Fork	0.0	11/01/92	9.0	06/01/93	0.0
40	3364	Weir Park	Surface Cr	0.0	11/01/92	40.7	07/06/93	0.0
42	3600	Anderson R l	Kannah Cr	0.0	05/01/93	486.0	06/30/93	301.0
42	3601	Anderson R 2	Kannah Cr	260.0	10/31/92	595.0	06/30/93	260.0
42	3602	Bolen AJ R2	Kannah Cr	0.0	05/01/93	240.0	06/30/93	0.0

RESERVOIR STORAGE SUMMARY

					AMOUNT	OF STORAGE	GE (AF)	
				MIN	MI NI MOM	MAXIMUM	IM	
WD	ID	RESERVOIR NAME	SOURCE STREAM	AF	DATE	AF	DATE E	END YR
40	3373	Dugger Res	Oak Cr	205.3	10/31/92	212.1	07/06/93	201.8
40	3374	Morris Res 2	Oak Cr	16.33	10/31/92	16.33	07/06/93	16.33
40	3375	Pitcairn Res	Doughspoon Cr	43.2	10/31/92	76.0	07/06/93	59.0
40	3376	Porter 1 Res	Oak Cr	170.2	10/31/92	201.76	07/06/93	201.76
40	3377	Porter 4 Res	Oak Cr	38.0	10/31/92	38.0	07/06/93	38.0
40	3368	Beaver Dam R	Escalante Cr	0.0	10/31/92	396. 5	07/06/93	86.5
40	3402	Todd Res	McDonald Cr	15.0	11/01/92	100.0	05/26/93	60.0
40	3403	Tyler Res	Iron Cr	20.0	11/01/92	169.3	05/27/93	70.0
40	3406	Beaver res	Minnesota Cr	0.0	11/01/92	1527.0	06/04/93	18.0
40	3437	Hunt Res	Leroux Cr	10.0	11/01/92	124.0	05/26/93	10.0
40	3407	Lone Cabin	Minnesota Cr	0.0	11/01/92	163.0	05/26/93	0.0
40	3714	Lucas Cline R	North Fork	0.0	11/01/92	9.0	06/01/93	0.0
40	3364	Weir Park	Surface Cr	0.0	11/01/92	40.7	07/06/93	0.0
42	3600	Anderson R l	Kannah Cr	0.0	05/01/93	486.0	06/30/93	301.0
42	3601	Anderson R 2	Kannah Cr	260.0	10/31/92	595.0	06/30/93	260.0
42	3602	Bolen AJ R2	Kannah Cr	0.0	05/01/93	240.0	06/30/93	0.0

RESERVOIR STORAGE SUMMARY

# IRRIGATION YEAR - 1993

					AMOUNT	OF STORAGE	GE (AF)	
				MIM	MI NI MOM	MAXIMUM	И	·
WD	ID	RESERVOIR NAME	SOURCE STREAM	AF	DATE	AF	DATE E	END YR
42	3603	Bolen Res	Kannah Cr	0.0	05/01/93	521.0	06/30/93	32.0
42	3604	Carson Lake	Kannah Cr	637.0	01/31/93	681.0	07/31/93	681.0
42	3606	Deep Cr R2	Kannah Cr	0.0	05/01/93	371.0	06/30/93	0.0
42	3607	Dry Cr R Sup	Kannah cr	0.0	05/01/93	236.0	06/30/93	0.0
42	3608	Flowing Pk R	Kannah Cr	0.0	05/01/93	772.0	06/30/93	320.0
42	3609	Fruita Res 1	East Cr	0.0	04/30/93	140.0	05/31/93	80.0
42	3614	Grand Mesa 1	Kannah Cr	204.0	04/30/93	560.0	06/30/93	158.0
42	3615	Grand Mesa 6	Kannah cr	0.0	05/01/93	232.0	06/30/93	0.0
42	3616	Grand Mesa 3	Kannah Cr	0.0	05/01/93	426.0	06/30/93	0.0
42	3617	Grand Mesa R9	Kannah Cr	0.0	05/01/93	153.0	06/30/93	0.0
42	3618	Hallenbeck R1	Kannah Cr	480.0	01/31/93	639.0	04/01/93	554.0
42	3619	Hallenbeck R2	Kannah Cr	101.0	04/30/93	503.0	06/30/93	0.0
42	3620	Juniata Res	Kannah Cr	5291.	12/01/92	6803.	06/30/93	5901.
42	3625	Somerville R1	Whitewater Cr	0.0	05/01/93	973.0	06/30/93	0.0
42	3630	Anderson R6	Kannah Cr	0.0	05/01/93	118.0	06/30/93	0.0
59	3666	Taylor Pk Res	Taylor River	50400	03/30/93	96700	07/14/93	72300

# RESERVOIR STORAGE SUMMARY

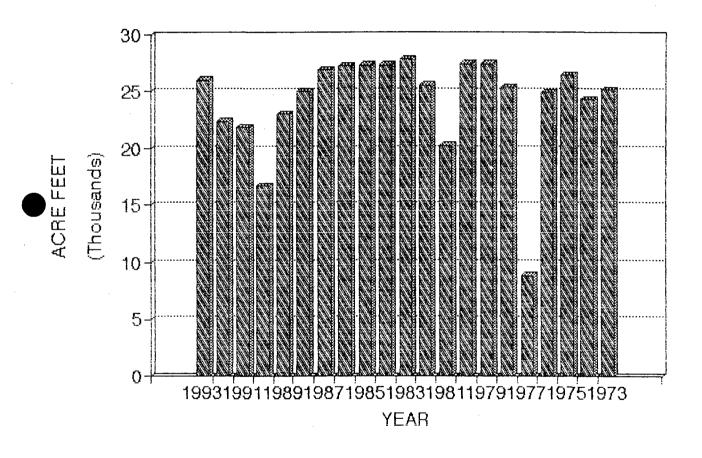
# IRRIGATION YEAR - 1993

					AMOUNT	OF STORAGE	GE (AF)	
				MIN	MI NI MOM	MAXIMUM	М	
WD	ID	RESERVOIR NAME	SOURCE STREAM	AF	DATE	AF	DATE	END YR
09	3507	Gurley R	Beaver Cr	500.0	10/31/92	9706.0	05/30/93	500.0
09	3511	Lone Cone R	Bennet Cr	260.0	10/31/92	1840.0	05/23/93	260.0
09	3510	Lilylands	Naturita Cr	66.69	10/31/92	494.0	05/26/93	69. 99
09	3512	Miramonte	W Naturita Cr	6567.	10/31/92	6567.0	05/28/93	6567.0
09	3519	Paxton Res	Horsefly Cr	487.0	10/31/92	898.0	05/20/93	487.0
61	3551	Buckeye Res	W Paradox Cr	958.0	11/01/92	2272.0	07/09/93	1300.0
62	3552	Blue Mesa	Gunnison R	410,100	04/26/93	813,900	07/22/93	690,600
62	3578	Crystal	Gunnison R	14,000	02/02/93	18,400	05/26/93	15,300
62	3545	Morrow Pt	Gunnison R	108,100	07/12/93	118,600	05/22/93	113,100
62	3548	Silverjack	Big Cimarron	5,770	09/27/93	13,520	07/21/93	5,770
68	3679	Ridgway	Uncompahgre R	50,400	05/11/93	78,598	07/13/93	75,404
						·		
						_		

YEARLY TOTAL RESERVOIR STORAGE FOR GRAND MESA WATER USERS

YEAR	PEAK STORAGE AC FT	% OF TOTAL CAPACITY	CARRY OVER AC FT	% OF THIS YEAR STORAGE	% OF TOTAL CAPACITY
1993	26067	93.5	15315	59	55
1992	22366	80.2	4702	21	17
1991	21830	78.3	4882	22	17
1990	16718	60.0	3853	23	13
1989	23089	82.8	3979	17	14
1988	25037	89.8	8490	34	30
1987	26933	96.6	10020	38	36
1986	27279	97.9	21794	80	78
1985	27349	98.1	15701	58	56
1984	27292	97.9	15964	58	57
1983	27876	100.0	16442	59	59
1982	25587	91.8	17345	. 68	- 62
1981	20273	72.7	6865	34	25
1980	27439	98.4	10292	37	37
1979	27480	98.6	9433	34	34
1978	25390	91.1	7858	31	28
1977	8837	31.7	2304	26	8
1976	24861	89.2	3653	15	13
1975	26445	94.9	7864	30	28
1974	24365	87.4	5076	21	18
1973	25185	90.4	12023	48	43

#### GRAND MESA RESERVOIR STORAGE - D40 ANNUAL PEAK STORAGE - ACRE FEET



# WATER DIVERSION SUMMARIES

	·												
TI ON	Average AF Per Acre	22.0	3.7	8.4	10.0	7.6	5.7	11.0	6.4	8.5	6.4	5.5	
TO IRRIGATION	Number of Acres Irrigated	13,815	128, 701	109,890	4, 428	35, 220	24,080	1,961	16, 561	2,777	16,548	1,495	355, 476
	Total Diversions AF	312, 375	477, 587	924, 397	44,287	266, 170	138,043	22, 447	106, 223	23,718	105,865	8, 275	2, 429, 390
-	Total Diversions to Storage AF	3, 730	4, 323	0	8, 423	46, 491	14,656	3, 176	0	0	170	31	81,000
	Total Diversions AF	316, 105	505, 375	951,640	565,387	478, 177	179, 227	27, 444	106, 233	25, 883	111,658	8, 412	3, 275, 531
	Estimate # Visits Structure	2, 737	15, 653	1,644	. 7,017	2, 103	2,621	1,595	774	1,361	1,522	248	37, 275
ALL OTHER RUCTURES	No Record (5)	490	1,079	101	0	1,391	114	0	408	0	590	0	4, 173
ALL OTHE STRUCTURES	No Info Avail (4)	0	261	353	143	0	757	7	531	30	e.	49	2, 134
REPORTI NG	No Water Taken (3)	0	148	30	45	1	133	66	16	58	69	15	614
STRUCTURES RE	No Water Avail (2)	0	6	0	0	1	m	က	0	0	9	0	22
STRI	With Record (1)	309	1,092	100	208	172	286	95	133	188	258	85	2, 926
	WD	28	40	41	42	59	9	61	62	63	68	73	

Count of structures with CIU=A and NUC=blank (4) (Count of structures with CIU=A and NUC=B (5) (Count of structures with CIU=A and NUC={A,C,D}= CIU=I Definitions: (1)
 (2)
 (3)

Count of structures with CIU=A and NUC={E,F} Count of structures with CIU=U

# WATER DIVERSION SUMMARIES TO VARIOUS USES

WD	TRANS- MOUNTAIN OUTFLOW	TRANS- BASIN OUTFLOW	MUNIC- IPAL	COMMER- CIAL	INDUS- TRIAL	RECRE- ATION	FISH- ERY	DOMES/ HOUSE- HOLD	STOCK
28	262	0	0	0	0	0	0	0	0
40	1, 130	28, 600	4,700	0	130	0	9,.840	396	8, 393
41	0	0	7, 333	0	0	0	0	0	19,910
42	528,200	295	10	0	146	0	←	က	1,142
59	0	0	1,031	232	0	0	164, 253	0	0
09	0	0	1,492	19, 675	1,846	612	2,087	511	305
61	0	0	0	0	0	0	0	134	1,646
62	1,060	1,629	0	0	0	0	0	0	0
63	0	0	0	0	0	0	က	6	1,396
89	0	1,821	920	99	0	0	0	37	4,600
73	0	0	0	0	0	0	€1	6	96
TOTAL	530, 652	32, 345	15, 476	19, 973	2, 122	612	176, 185	1,096	37, 488

WATER DIVERSION SUMMARIES TO VARIOUS USES, continued

WD	AUGMEN- TATION	EVAPO- RATI ON	GEO- THER- MAL	SNOW- MAKI NG	MIN. STREAM FLOW	POWER GENERA- TION	WILD- LIFE	RE- CHARG- ES	Отнвк
28	0	0	0	0	0	0	0	0	0
40	9	0	0	0	0	0	0	0	0
41	0	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0	0
59	0	0	0	233	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0
61	0	0	0	0	0	0	0	41	0
62	0	0	0	0	0	1, 133, 500	0	0	0
63	0	0	0	0	0	0	0	0	728
68	0	0	0	0	0	29	0	0	0
73	0	0	0	0	0	0	0	0	0
TOTAL	9	0	0	233	0	1, 133, 529	0	41	728
								i	

APPENDIX E DIVISION IV 1993 RIVER CALLS

#### Water District 28

No Calls

#### Water District 40

STREAM <u>AFFECTED</u>	NAME OF STRUCTURE	PRIORITY DATE	DATE OF CALL	DURATION OF CALL	PERSON/ CALLING
Bell Greek	North Fork Orchard	6-17-1889	7-12-93	season	W. Comm.
ىد	Cedar Can Iron Sp	6 - 17 - 1889	σ	eas	D. Mott
Dirty George	Park	6-17-1889	4-28-93	season	Ferganchick
Dirty George	Granby Ditch	5-28-1907	7-9-93	season	Bertram
Dirty George	Obert Ditch	3 - 1	7-9-93	season	C. Hawkins
Dirty George	Red Haw	-28-1	7-9-93	season	C. Hawkins
Dirty George	Eagle Ditch	~	7-6-93	season	C. Hawkins
Dry Creek	Morton Ditch	0 - 1	7-12-93	season	L. Hilson
Dry Creek	Welch Ditch	10 - 1	7-28-93	season	Burgess
Dry Creek	Dry Cr. Ditch	3-20-1908	7-12-93	season	Evergreen D.
Forkd Tongue	Orchard Ditch	28 - 1	5-4-93	season	A. Glasser
Hamilton Drw	Hixon #1	↽	0	season	D. Geyer
Hamilton Drw	Hixon #2	1	4-20-93	season	D. Geyer
Hamilton Drw	McMurray	<del>디</del>	7-29-93	season	M. Horn
Happy Hollow	Lucky 2 Ditch	9-28-1907	8-10-93	season	D. Geyer
Hubbard Ck	Deer Trail	4-12-1901	8-6-63	season	B. Barnes

# Water District 40 cont'd

PERSON/ CALLING		Schroeder Schroeder
DURATION OF CALL	see as son 110 as eas son 110 as eas son 110 as eas son 110 as con	flw chng
DATE OF CALL	4416144445454667676764446767676767777777777	7-4-93 7-26-93
PRIORITY DATE		3-191 7-188
NAME OF STRUCTURE	e Fork-48 e Fork-42 e Fork-25 e Fork-9 11 Ditch oux Cr. Ext nesota Can nesota Can nore Ditch son Ditch pper Ditch pper Ditch alfa Ditch alfa Ditch te Ditch te Ditch ar Mesa D ar Mesa D ar Mesa D d Water Di k Ditch c Johnson	Fogg Ditch A120 Fogg Ditch 10
STREAM <u>AFFECTED</u>	iser Creek iser Creek iser Creek eroux Creek innesota intace Cree	Surface Creek Surface Creek

# Water District 40 cont'd

	PERSON/ CALLING		Schroeder	England	England	McPherson	McPherson	McPherson	McPherson	McPherson	D. Peterson	σ	•		K. Butler							E. Rusch	A. Peterson		A. Peterson	0	Davis	Bull	T. Betz
	DURATION OF CALL	٠	Ϋ́	flw chng	lΨ			flw chng					ĭ¥			×	3	flw chng	season	season	Φ	season		season		season	season	season	season
cont, a	DATE OF CALL		-15-9	-17-9	1	-19-9	-17-9	-3-	-4-9	6-6-	-25-	-18-9	-2-9	-21-9	-11-9	-30-	-21-9	-1-9	-3-9	8-3-93	6-6-	-5-9	-8-9	6-9-	-8-9	-30-9	9	9 - 11 - 93	
District 40	PRIORITY DATE	,	-28 - 190	-10 - 193	-17-188	-17-188	-28-190	-28-190	-23 - 191	-28 - 190	-10 - 193	0	-17-188	-17-188	-28-190	0 - 25 - 18	-10 - 193	-17-188	-17-188	-17-188	-12 - 190	7 - 188	-28 - 190	-28 - 193	-28-190	-17-188	-28 - 190	-17 - 1	
Water	NAME OF STRUCTURE		S	Ω	Forrest D 11	e Ditch	Ditch	Lone Pine Ditch 40	Ditch	Ditch	Ξ	Omega Ditch	Orchard Ranch 4	Orchard Ranch 27	Rose Ditch	Shepherd Ditch	Sooner Ditch	Settle Ditch	Holybee	Fawcett Ditch	Terror Ditch	Carbon Ditch	Sunrise Ditch	Granby Ditch	Sunrise Ditch	Broncho	Cherokee	Childs	Santa Fe
	STREAM <u>AFFECTED</u>		Surface Creek	Surface Creek	Φ			Surface Creek				Surface Creek		Creek	Creek	Creek	Creek		reek	Creek	Creek		teek	teek	Creek	38		Youngs Creek	Youngs Creek

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STREAM	NAME OF	PRIORITY	DATE OF	DURATION	PERSON/
<u>AFFECTED</u>	STRUCTURE	DATE	CALL	OF CALL	CALLING
Horsefly Cr	Albush Ditch	7-3-1929	5-20-93	season	Sanders
	Wat	Water District 42			
STREAM	NAME OF	PRIORITY	DATE OF	DURATION	PERSON/
AFFECTED	STRUCTURE	DATE		OF CALL	CALLING
East Creek	Lurvey Ditch #1	6-1-1916	5-1-93	10-31-93	R. Tipping
Kannah Creek	Kannah Creek Extension	7-25-1888	8-13-93	10-23-93r	E. Gardner

### Water District 59

No calls

#### Water District 60

No calls

### Water District 61

PERSON/ CALLING	
DURATION OF CALL	season
DATE OF CALL	7-15-93
PRIORITY DATE	
NAME OF STRUCTURE	All Structures
STREAM AFFECTED	Paradox Creek

### Water District 62

No Calls

### Water District 63

No Calls

#### Water District 68

PERSON/ CALLING	Sanders		PERSON/ CALLING	Mtn. Island VanLoan
DURATION OF CALL	season		DURATION OF CALL	season
DATE OF CALL	5-20-93	73	DATE OF CALL	5-21-93
PRIORITY DATE	7-3-1929	Water District 73	PRIORITY DATE	6 - 1 - 1916 6 - 1 - 1916
NAME OF STRUCTURE	Albush Ditch		NAME OF STRUCTURE	Chiquito Dolor Upper Saxbury Ditch Coates Creek Mooreland Ditch
STREAM AFFECTED	Horsefly		STREAM AFFECTED	Chiquito Dolo Coates Creek

#### APPENDIX F

#### WATER COURT ACTIVITIES

Applications for Decrees	•		270			
Consultations with Referee 23						
Decrees Issued by Water Court			241			
Dismissals			10			
Complaints						
	# Cases	# Struc.				
New Cond. & Dil. on Cond. Rights	100	200				
Cancellations of Cond. Rights	27	34				
Conditional Rights Made Absolute	38	78				
Underground Water Rights Adjudicated	26	66				
Surface Water Rights Adjudicated	185	327				
Water Storage Rights Adjudicated	49	77				
Plans for Augmentation Adjudicated	13	13				
Change of Water Rights/Location	9	9				
Change of Water Rights/Use Adj.	4	4				
Instream Flow Rights Adjudicated	4	4				
Total	455	812				

WTRCT

#### ٧. TABLE OF ORGANIZATION - PERSONNEL IRRIGATION DIVISION NO. 4

Division Engineer - Keith C. Kepler Assistant Division Engineer - Kenneth W. Knox Secretary - Jean Kurtz Typist B - Bonnie Trujillo Resident Dam Safety Engineer - James G. Norfleet Hydrographer - Jerry Thrush

Water District 28	<u>Water District 40</u>	Water District 41
WATER COMMISSIONER Wesley Robinson	PR. WATER COMMISSIONER Jimmie Boyd	WATER COMMISSIONER *Crandall Howard
	SR. WATER COMMISSIONER *Robert H. Starr	
Water District 42	WATER COMMISSIONERS Gail Brooks **Cliff Davis	Water District 59
SR. WATER COMMISSIONER	Merritt Denison	WATER COMMISSIONER *Robert Drexel
WATER COMMISSIONER Jack Carter	Albert Mahannah Kenneth Mahannah John L. McHugh L. Gregg Scott Charles Stein Stephen Tuck	
Water District 60	Water District 61	Water District 62
SR. WATER COMMISSIONER Lyman Campbell	WATER COMMISSIONER Clinton L. Oliver	WATER COMMISSIONER Crandall Howard **Ed Hofmann
Water District 63	Water District 68	Water District 73
SR. WATER COMMISSIONER Richard Belden	WATER COMMISSIONER H. Roger Noble	SR. WATER COMMISSIONER Richard Belden

<sup>\*</sup>Annual

<sup>\*\*</sup>Temporary
\*\*\*Retired 7/1/93