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White River Basin Information
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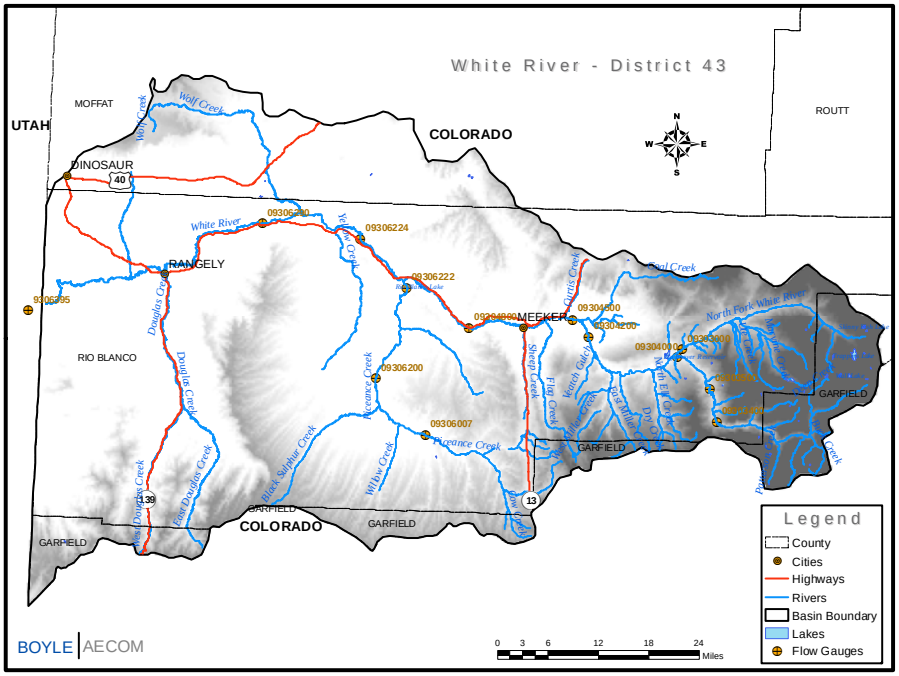

October 2008

COLORADO'S DECISION SUPPORT SYSTEMS

COLORADO WATER CONSERVATION BOARD STATE OF COLORADO 1876 1937

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1. The White River Basin

The White River basin lies between the Colorado River and Yampa River basins, in northwest Colorado. The White River is tributary to the Green River, but does not reach the Green until it has traveled into Utah. The basin within Colorado is approximately 3,750 square miles, and encompasses nearly all of Rio Blanco County as well as the southwestern fringe of Moffat County to the north, and portions of Garfield County to the south and east. **Figure 1** is a map of the basin.

1.1. Physical Geography

The North and South Forks of the White River both begin in the highlands of the Flat Tops formation at about 11,000 feet. They flow generally west, meeting near Buford shortly outside the White River National Forest. The Flat Tops are a remnant of the White River Uplift, formed over 50 million years ago, and glaciated during the Pleistocene and possibly early Holocene. As a result, the landscape in the upper White River is characterized by many glacial lakes and U-shaped valleys. The uplift is bounded on the west by the Grand Hogback, a north-south trending, nearly vertical upturn of Mesa Verde sandstones and shales. This feature forms the east boundary of the Piceance Creek basin, a major tributary of the White River that drains the Roan Plateau to the south, flowing north and entering the White River between Meeker and Rangely. At Rangely, the White River is on the edge of the Colorado Plateau physiographic province. Here the terrain is typical of that province, with impressive mesas, cliffs, and rims. The White River enters Utah about 20 miles west of Rangely.

Climate in the White River basin is similar to other western Colorado basins, varying with elevation. Average annual rainfall varies from over 40 inches in the Flat Tops to approximately 10 inches at Rangely. Temperatures vary inversely with elevation and variations in the growing season follow a similar trend. Winter brings snow and cold temperatures at the higher elevations but mild, sunny days in the west.

The various elevations in the basin define distinctive vegetation types and coverages. Lacking elevations over 12,500 feet, the White River basin has little land above treeline. At the upper, eastern end of the basin, Englemann spruce and sub-alpine fir are the dominant forest cover. Lodgepole pine, ponderosa pine, and spruce fir mingle with areas of high grasslands at slightly lower elevations. Below 9,000 feet, vegetation transitions to Gambel oak, pinion/juniper, and sagebrush-steppe communities. The western portion of the basin, at an elevation of approximately 5,500 feet, is dominated by sagebrush, grasslands, and salt desert shrublands.

Average annual streamflow in the White River at the Colorado-Utah state line is 596,000 acre-feet, based on operation of a USGS gage at the State Line from 1977 through 1985. Most of the runoff is attributable to snowmelt from the higher elevation areas. Sub-basins in the White River basin include Big Beaver Creek, Fawn Creek, Hahn Creek, the

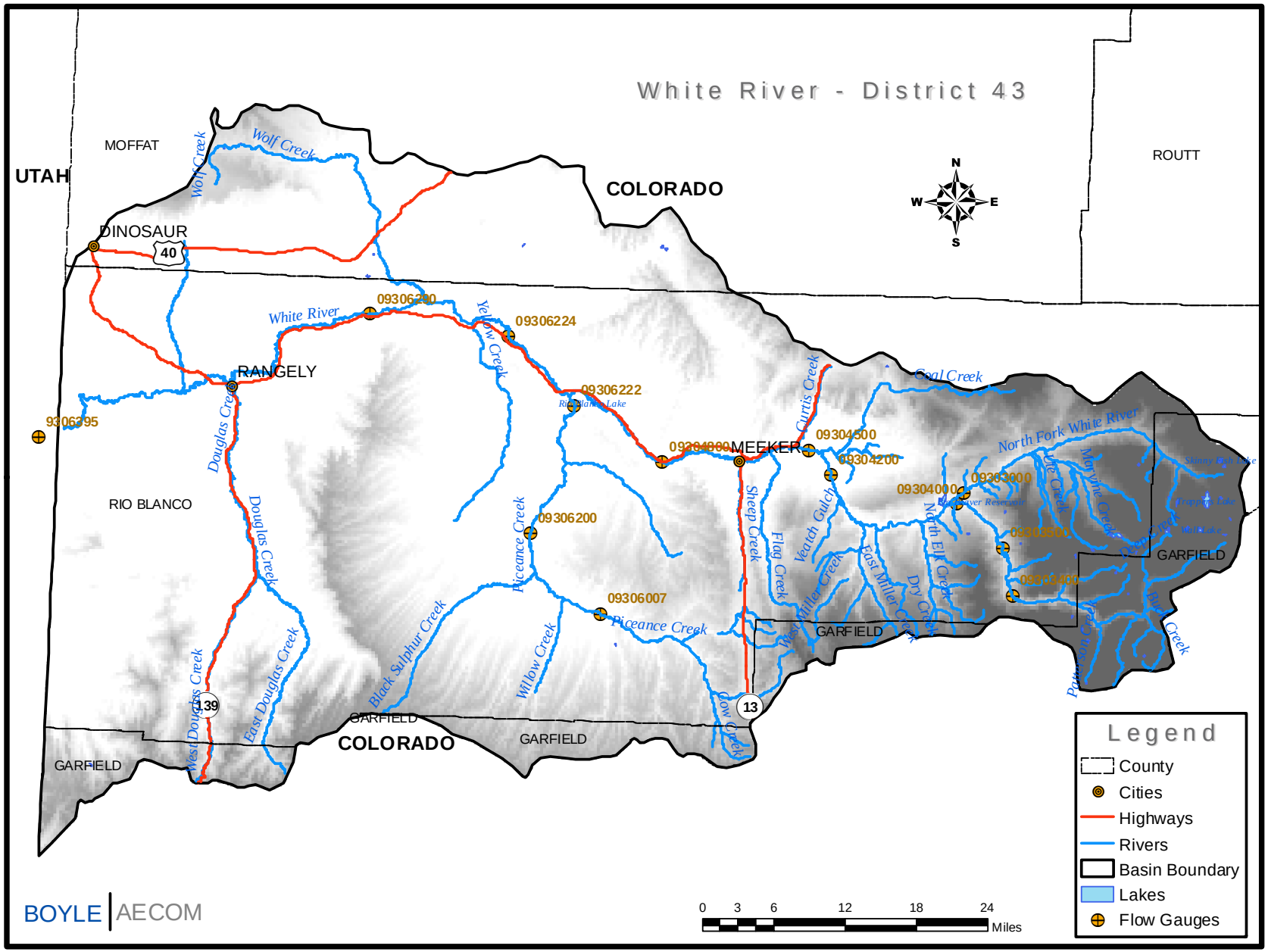

Figure 1.1 – White River Basin

North and South Forks of the White River, Piceance Creek, Yellow Creek, and Douglas Creek.

1.2. Human and Economic Factors

Trapper's Lake

Public lands, primarily federally held, comprise the majority of the White River basin. The White River National Forest, including portions of the Flattop Wilderness Area, occupies the eastern headwater area. The central and western basin is nearly all under the Bureau of Land Management; of the White River basin in Rio Blanco County, approximately 60 percent is under BLM management. Private land is located between the National Forest and the BLM holdings, more or less in the vicinity of Meeker; and in narrow bands along the White River from Powell Park, west of Meeker, to the State Line, and along Piceance Creek.

The White River basin is sparsely populated. Several sources place Rio Blanco County's population at about 6,000 in recent years. Meeker and Rangely are the only towns in the county, with populations of 2,400 and 2,200 respectively.

Farming and ranching are predominant economic activities in the eastern half of the basin. Irrigated acreage in the White River basin totals approximately 28,600 acres, of which approximately ninety percent is in pasture grass, and the remaining ten percent is in alfalfa. The greatest concentration of irrigated lands is in the river valley around Meeker. Irrigation is practiced on benches and lands adjacent to the stream, in the privately held corridors described above.

Mining and oil and gas extraction are major economic activities in the basin, particularly in the western portion. Traditional methods of extracting oil and gas have been used in the White River basin since Chevron Oil discovered the Weber Sandstone oil field there in the 1930's. The flagging economy of the day was responsible for low production there until World War II, after which Rangely became first a booming oil camp and then a town. The Roan Creek Plateau and Piceance Creek basin host some of the largest oil shale deposits and coal bed methane reservoirs known. Although oil extraction from oil shale is not practiced on a production scale, many conditional water rights have been filed in this area.

Recreational assets are abundant in the White River basin. Hunting and fishing are primary draws, as this area includes some of Colorado's best elk hunting. The Town of Meeker's website asserts that their population doubles during hunting season, and the Colorado Division of Wildlife estimated that in 1996, out-of-state hunters and anglers brought $9.7 million dollars into Rio Blanco County.

1.3. Water Resources Development

The earliest rights in White River basin are irrigation rights bearing an appropriation date of 1880, and the first general adjudication was done in 1889. Although there is some municipal and industrial use of surface water, the primary use is agricultural. Irrigation is generally practiced by individual farmers or ranchers, and there are a small number of large organized, mutual ditch or irrigation companies, compared with other basins in the state.

The towns of Meeker and Rangely draw drinking water from the White River via alluvial wells. According to the Groundwater Atlas of Colorado, about 1,000 af/yr is pumped from alluvial aquifers, primarily for municipal, domestic, and stock watering purposes.

There are no known exports of water out of the White River basin.

Reservoir storage has not been significantly developed, and in fact, there are no federal storage projects in the basin. The three largest reservoirs in the basin are:

- Taylor Draw Reservoir (also known as Kenney Reservoir) has a storage volume of 13,800 acre-feet and is used primarily for recreation and hydropower generation. It is located just east of Rangely, was constructed by the Colorado River Water Conservation District, and is now owned and operated by Rio Blanco Water Conservancy District.

- Lake Avery Reservoir (also known as Big Beaver Reservoir) has a storage volume of 7,658 acre-feet and is used primarily for recreation. It is owned and operated by the Colorado Division of Wildlife and is located about 20 miles east of Meeker.

- Rio Blanco Reservoir (also known as Johnnie Johnson Reservoir), has a storage volume of 1,036 acre-feet. It is an off-channel reservoir located about 16 miles west of Meeker.

Industrial use of water in the basin remains minor at this time, amounting to less than 1,000 af/yr, according to estimates made during early CDSS development. The long-range potential for oil shale development in the area remains an open issue, however. Should such development occur the increased demand for water could potentially be high, depending on the technology used, the extent of the project, and the urban development required to accommodate an associated influx of the industrial workers and their families.

1.4. Water Rights Administration

There are few special water rights operations, exchanges, or water user agreements on the mainstream of the White River. The key ditch structures, which are located east of Meeker, include:

- Highland Ditch
- Miller Creek Ditch
- Oak Ridge Park Ditch
- Old Agency Ditch, and
- Lowland Ditch

Historical water rights have been administered in the White River basin on the basis of direct flow priorities where senior direct flow rights will call out junior diverts elsewhere on the river. The senior direct flow rights on the mainstream of the White River between Flat Creek and Miller Creek have only had to callout junior diverters once, in 1977. Piceance Creek, a tributary to the White, is routinely subject to administrative regulation during the irrigation season.

2. White River Projects and Special Operations

This section contains information that was gathered during initial data collection efforts for the CDSS project, in 1994 and 1995, and updated in 2008. It was assembled after interviewing Division 6 personnel, as well as project owners and operators, and consulting Hydrobase. The first three sections relate to specific diversions, and the remaining sections describe reservoirs:

Section	Description
▪ 2.1	Key Municipal Systems
▪ 2.2	Coal Creek Feeder Ditch
▪ 2.3	California Company Water Pipeline
▪ 2.4	Big Beaver Reservoir
▪ 2.5	Taylor Draw Reservoir

2.1. Key Municipal Systems

The Towns of Meeker and Rangely are the only key municipal water providers in the White River basin. The Town of Meeker historically had two surface diversions structures, relatively close to the town (430180 and 430811). Beginning as early as the 1970's, according to the current Water Commissioner, water began to be delivered from an alluvial wellfield approximately 5 miles upstream, near Coal Creek. The wells (436045, 436046, and 436139) were decreed alternate points for the town's original surface diversions, and had relatively junior rights of their own. Diversions were attributed to the surface diversion structures in the State's records until 2003, despite being physically taken at the wellfield. Since 2003, the diversions have been recorded under the well structures. Meeker's active rights are listed below:

WDID	Adjudication Date	Appropriation Date	Administration Number	Amount
430810	1958-11-26	1950-05-04	36648.00000	4.00
430810	1958-11-26	1957-08-20	39313.00000	3.00
430811	1925-08-17	1904-05-10	27265.19853	3.42
436045	1976-12-31	1974-08-12	46020.45514	1.22
436046	1976-12-31	1975-08-11	46020.45878	1.33
436139	1980-12-31	1980-11-03	47789.00000	1.22

The Town of Rangely similarly originally diverted at a site identified as structure 430889 Rangely Water Plant. Since 2003, diversions have been attributed to two new surface diversion structures (432622 and 432623), although the change in operations occurred

some unknown time earlier. Both the current diversion sites, which have been made alternate points for Rangely's original rights, are near the historical diversion point. Rangely's water rights are listed below:

WDID	Adjudication Date	Appropriation Date	Administration Number	Amount
430889	1958-11-26	1947-06-26	35679.35605	2.60
430889	1958-11-26	1957-09-28	39352.00000	28.35

2.2. Coal Creek Feeder Ditch

The Coal Creek Feeder Ditch is a transbasin diversion facility which diverts water from the headwaters of Fawn Creek (a tributary of the North Fork of the White River) into the headwaters of Coal Creek (a tributary of the White River). The diversion facility is located near the top of the drainage divide in a fairly remote area. In interviews with water commissioners early in CDSS development, it was noted that the Coal Creek Feeder delivers water for these Coal Creek diverters: 1) Coal Creek Mesa Ditch (WDID 430578); Thomas Lunney Ditch (WDID 430969); and Owen Lunney Ditch (WDID 430856). However, according to the current Water Commissioner, water is not shepherded to these structures specifically. Coal Creek Mesa Ditch has been decreed an alternate point to several senior rights on the stream, and is generally not in need of supplemental water. The Owen Lunney Ditch records show no diversions for that structure since the early 1970's. Accordingly, the water is delivered to the Coal Creek and administered as natural flow.

The current Water Commissioner recently determined that a small amount of water is diverted from the Coal Creek Feeder Ditch to irrigate approximately 40 acres between Fawn Creek and Coal Creek. Because diversion records are based on observations or measurements at the end of the ditch, just ahead of the Coal Creek delivery, the diversion records do not reflect this use. The ditch begins to run around the first of June when snowmelt starts to occur.

2.3. California Company Water Pipeline

The California Company has an oil extraction operation near the Town of Rangely. Until approximately 2000, several thousand acre-feet per year were used for injection to enhance oil production. The process was 100 percent consumptive. The deep injection process was abandoned, however, and diversions in the past nine years have amounted to two or three hundred acre-feet per year. The Water Commissioner stated that these remain 100 percent consumptive, citing dust suppression as at least one use of the water. Water commissioners do not measure this diversion, but are given records maintained by the California Company.

2.4. Big Beaver Reservoir

Big Beaver Reservoir, also known as Lake Avery, is located on Big Beaver Creek, a tributary of the White River just west of Buford. Its capacity is 7,658 acre-feet, and according to construction drawings on file at the State Engineer's Office, it has no dead storage.

The Division of Wildlife (DOW) owns and operates Lake Avery. DOW does not release from Lake Avery to provide supplemental water supplies, but maintains the reservoir for recreational and piscatorial purposes. The outlet works at Lake Avery contain the Big Beaver Ditch headgate which has direct flow water rights senior to Lake Avery's storage right. The decreed water rights for Big Beaver Ditch total 5.22 cfs. Inflows to the reservoir are bypassed through Lake Avery's outlet works to satisfy the Big Beaver Ditch irrigation demands. Lake Avery has several small storage rights totaling several hundred acre-feet, all decreed prior to 1943. The decree that matches Lake Avery's current size is shown below:

WDID	Adjudication Date	Appropriation Date	Administration Number	Amount
433633	1966-11-21	1962-10-08	41188.00000	7,658

2.5. Taylor Draw Reservoir

Taylor Draw Reservoir, or "Kenney Reservoir", is on the White River just east of Rangely. The Colorado River Water Conservation District (CRWCD) built the reservoir in the early 1980's, transferring ownership to the Rio Blanco Water Conservancy District (RBWCD) in 1990. Taylor Draw Reservoir is used only for hydropower and recreation, although it is decreed for irrigation, municipal, domestic, and stock use as well. According to Dan Eddy, of RBWCD, the reservoir is operated for run-of-the-river power generation, under a FERC license requiring that they pass inflows through the reservoir. Electricity is sold to Moon Lake Electric.

Reservoir capacity is reported as 13,800 af. Discussions with personnel at the CRWCD and the construction drawings indicate that there is no dead storage volume.

Information presented in the final environmental impact statement ("Taylor Draw Reservoir Final Environmental Impact Statement", Army Corps of Engineers, June 1982) and the biological opinion (Letter, "Biological Opinion – Taylor Draw Reservoir Project, Colorado," from Fish and Wildlife Service to Army Corps of Engineers, May 20, 1982) for the Taylor Draw Project indicates that project operations would allow for the bypass of water to meet temperature and flow requirements for the Colorado squawfish. The project operating criterion related to the squawfish is that 200 cfs (or reservoir inflow if it is less than 200 cfs) must be maintained below the dam. The release condition does not normally come into play because the reservoir's FERC license requires that all reservoir

inflow be bypassed. Furthermore inflow below 200 cfs is rare, and has not been experienced by the current operators.

Taylor Draw's absolute water rights are:

WDID	Adjudication Date	Appropriation Date	Administration Number	Amount
434433	1966-11-21	1962-07-03	41091.00000	13,800
434433	1982-12-31	1980-11-20	48212.47806	3,550

3. White River Structure Information and Basin Meeting Notes

This section contains information that was gathered during the initial CDSS development phase, regarding specific, individual diversion structures. The objective at the time was to identify which structures should be included explicitly in the water resources planning model of the White River. The information is historical, reflecting the thinking at the time and conditions at the time. It is valuable, however, for its detail on specific structures from those who have observed the diversion systems and have first-hand familiarity with their operations.

3.1. Annotated Structure Listing

The number of diversion structures explicitly included in the CDSS water resources planning model for each basin was based on the State's recommendation to simulate 75 percent of the decreed water rights. In the White basin, by accumulating net absolute rights for each structure and ranking the structures, it was determined that structures with rights amounting to 4.8 cfs or more comprised 75 percent of the basin's rights. The table in this section lists structures that meet that criterion for inclusion. The list was then annotated, however, to document input from Division 6 personnel based on observations of actual practices. These observations may be generally useful to CDSS users who are trying to enhance their understanding of water use in the White River basin.

Table 3.1
White River Diversion Structures with Water Rights ≥ 5 cfs

Structure	Name	Decree Amt (cfs)	Rank	Cum. % of Total	Comment
430694	HIGHLAND DITCH	188	1	0.06479	
430809	MEEKER POWER DITCH	181.8	2	0.12743	Removed at Basin Meetings not used for several years
430848	OAK RIDGE PARK DITCH	133	3	0.17327	
430819	MILLER CREEK DITCH	124	4	0.216	
430842	NIBLOCK DITCH	83	5	0.2446	
430883	POWELL PARK DITCH	82.64	6	0.27308	
430578	COAL CREEK MESA DITCH	62.95	7	0.29477	
430849	OLD AGENCY DITCH	35.4	8	0.30697	
430888	RAINBOW LAKE DITCH	35	9	0.31903	Removed at Basin Meeting Non-Consumptive
430935	SOUTH SIDE HIGHLINE D	33	10	0.3304	
430889	RANGELY WATER PLANT	30.95	11	0.34107	
430948	SQUARE S CONS D SYS	28.8	12	0.35099	
430808	MEEKER DITCH	25.95	13	0.35993	
430867	PEASE DITCH	25.76	14	0.36881	

Table 3.1
White River Diversion Structures with Water Rights ≥ 5 cfs

Structure	Name	Decree Amt (cfs)	Rank	Cum. % of Total	Comment
430577	COAL CREEK FEEDER DITCH	25.3	15	0.37753	
430710	IMES & REYNOLDS DITCH	23.65	16	0.38568	
430681	HAY BRETHERTON DITCH	22.25	17	0.39335	
430788	MARCOTT DITCH	21.51	18	0.40076	
430872	PHILLIPS DITCH	21.42	19	0.40814	No GIS Acreage
430961	SWEEDE DITCH	20.74	20	0.41529	
430573	CHASE & COLTHARP D	20.49	21	0.42235	
430688	HEFLEY PUMP PLANT NO 2	20.04	22	0.42925	
430868	PEDRICK DITCH	19.68	23	0.43603	
431004	WHEELER DITCH	18.1	24	0.44227	No GIS Acreage
430782	M H M GERMAN CONS D	17.54	25	0.44832	
430537	BECKMAN DITCH	17.4	26	0.45431	
431272	COX PUMP NO 1	17.327	27	0.46028	
430813	MELVIN DITCH	16.42	28	0.46594	
430572	CHARLIE SMITH DITCH	15.87	29	0.47141	
430687	HEFLEY PUMP PLANT NO 1	15.74	30	0.47683	
430607	DREIFUSS DITCH	14.97	31	0.48199	
430653	GEORGE S WITTER DITCH	14.9	32	0.48713	
430696	HILL CREEK NO 2 DITCH	14.65	33	0.49218	
432099	KENNEY PUMP NO 1	14.249	34	0.49709	
430564	CALIFORNIA CO WATER PL	13.6	35	0.50177	
430546	BLAIR DITCH	13.19	36	0.50632	
431010	WHITE RIVER MESA DITCH	13.09	37	0.51083	
430527	BARBOUR SO SIDE D HG 1	13.05	38	0.51533	Removed at Basin Meeting Limited Diversions
431027	BELOT MOFFAT DITCH	12.5	39	0.51963	
430763	LEWIS RAINBOW LAKE FEED	12	40	0.52377	Removed at Basin Meeting Fishery Use - Non-Consumptive
430949	STADTMAN DITCH	11.8	41	0.52783	
430640	FORNEY CORCORAN DITCH	11.47	42	0.53179	
430856	OWEN LUNNEY DITCH	11.25	43	0.53566	Removed at Basin Meeting - Limited Diversions
430570	CALVAT DITCH	10.4	44	0.53925	
430790	MARVINE DITCH 1	10.34	45	0.54281	
430828	MOONEY DITCH	10.22	46	0.54633	
430513	B M & H DITCH 1	10.2	47	0.54985	
431494	GOFF DITCH	10.2	48	0.55336	
430954	STOREY DITCH 1	10	49	0.55681	
431257	ROBINSON WARDELL PUMP 6	9.9	50	0.56022	Removed at Basin Meeting Diverts less than 5 cfs
430769	LITTLE DITCH	9.88	51	0.56362	
430966	THOMAS DITCH 2	9.67	52	0.56696	
430695	HILL CREEK NO 3 DITCH	9.5	53	0.57023	
430851	OLDLAND DITCH 2	9.47	54	0.57349	
430789	MARTIN DITCH	9.4	55	0.57673	

Table 3.1
White River Diversion Structures with Water Rights ≥ 5 cfs

Structure	Name	Decree Amt (cfs)	Rank	Cum. % of Total	Comment
430871	PETERSON & DUNN DITCH	9.23	56	0.57991	Removed at Basin Meeting Abandoned
430613	E H IMES DITCH	9.21	57	0.58309	Removed at Basin Meeting Not active
430538	BEL AIRE HATCHERY WATER	9.06	58	0.58621	Removed at Basin Meeting Fishery Use - Non-Consumptive
430579	COAL CREEK DITCH 1	9	59	0.58931	Removed at Basin Meeting Abandoned
431262	ROBINSON WARDELL PUMP 15	9	60	0.59241	Removed at Basin Meeting Diverts less than 5 cfs
430665	GREENSTREET DITCH EXT	8.9	61	0.59548	
430530	BAR BEL MESA DITCH	8.77	62	0.5985	Removed at Basin Meeting Diverts less than 5 cfs
430980	UTE CREEK DITCH	8.58	63	0.60146	
430511	B A & B DITCH NO 1	8.55	64	0.60441	
430777	LOWLAND DITCH	8.4	65	0.6073	
430931	SKELTON DITCH	8.3	66	0.61016	
430909	RYE GRASS DITCH	8.2	67	0.61299	
430563	CALHOUN DITCH	8.17	68	0.6158	
430565	CAMPBELL CREEK DITCH	8	69	0.61856	Removed at Basin Meeting Diverts less than 5 cfs
431034	MCDOWELL DITCH	8	70	0.62131	
432017	CALDWELL DITCH	8	71	0.62407	Removed at Basin Meeting Abandoned
430554	BRUCE BAKER DITCH	8	72	0.62683	No GIS Acreage
430545	BLACKS GULCH CANAL	7.8	73	0.62952	No GIS Acreage
430881	POTHOLE DITCH	7.7	74	0.63217	
430526	BARBOUR NORTH SIDE D	7.7	75	0.63482	
430623	ELK CREEK DITCH	7.45	76	0.63739	
432272	WATT WASTEWATER DITCH	7.44	77	0.63995	Removed at Basin Meeting Abandoned
430652	G V DITCH	7.4	78	0.6425	
430575	CLOHERTY DITCH	7.25	79	0.645	
430965	THOMAS DITCH	7	80	0.64741	
430934	SOLDIER CREEK DITCH	7	81	0.64983	
432456	KARREN REEVE DITCH	7	82	0.65224	Removed at Basin Meeting Diverts less than 5 cfs
430810	MEEKER WATER SYS PL	7	83	0.65465	
432080	JOHN A STORY D NO 3	7	84	0.65706	No GIS Acreage
430753	LAKE CREEK POOL DITCH	7	85	0.65948	
430926	SHERIDAN & MORTON D	6.91	86	0.66186	
430850	OLDLAND DITCH 1	6.9	87	0.66423	
430862	PATTISON DITCH NO 1	6.5	88	0.66647	
431085	M REIGAN & P REIGAN D	6.41	89	0.66868	Removed at Basin Meeting
431295	METZ REIGAN PAT REIGAN D	6.41	90	0.67089	Removed at Basin Meeting
430845	NINE MILE RANCH IRR SYS	6.4	91	0.6731	Removed at Basin Meeting Abandoned
430903	ROBERT MCKEE DITCH	6.33	92	0.67528	

Table 3.1
White River Diversion Structures with Water Rights ≥ 5 cfs

Structure	Name	Decree Amt (cfs)	Rank	Cum. % of Total	Comment
430940	SPRING CREEK D PUMP STA	6.3	93	0.67745	Removed at Basin Meeting Diverts less than 5 cfs
430919	SAYER DITCH	6.26	94	0.67961	
430699	HOLLMAN DITCH NO 1	6.2	95	0.68174	No GIS Acreage
430784	M SCHNEIDER DITCH	6.18	96	0.68387	No GIS Acreage
430664	GREENSTREET DITCH 2	6.1	97	0.68598	Removed at Basin Meeting Abandoned
430587	COW CREEK DITCH SYSTEM	6.1	98	0.68808	Removed at Basin Meeting Abandoned
430944	SPROD DITCH 1	6	99	0.69015	
432211	UPPER SPROD DITCH	6	100	0.69221	Removed at Basin Meeting
430617	EAST DOUGLAS CREEK DITCH	6	101	0.69428	Removed at Basin Meeting Diverts less than 5 cfs
430762	LEWIS DITCH	6	102	0.69635	Removed at Basin Meeting
430543	BLACK EAGLE D NO 1	5.95	103	0.6984	
430544	BLACK EAGLE D NO 2	5.95	104	0.70045	
430608	DREYFUSS DITCH	5.89	105	0.70248	
430625	EMILY DITCH	5.85	106	0.70449	
431273	REIGAN PUMP NO 1	5.775	107	0.70648	
432132	MOON LAKE PL	5.7	108	0.70845	Removed at Basin Meeting
430989	WALKER DITCH	5.5	109	0.71034	Removed at Basin Meeting Diverts less than 5 cfs
430802	MCGRUDER DITCH 1	5.25	110	0.71215	Removed at Basin Meeting Abandoned
430841	NEW ARCHER WARNER DITCH	5.24	111	0.71396	
430539	BIG BEAVER DITCH	5.22	112	0.71576	
430657	GOEDER DITCH	5.2	113	0.71755	Removed at Basin Meeting
430928	SIMPSON DITCH	5.2	114	0.71934	
430939	SPRING CREEK D PUMP 1	5.2	115	0.72113	Removed at Basin Meeting Diverts less than 5 cfs
430941	SPRING CREEK D PUMP 2	5.2	116	0.72293	Removed at Basin Meeting Diverts less than 5 cfs
430791	MARVINE DITCH 3	5.2	117	0.72472	
430684	HAY DITCH 2	5.19	118	0.72651	
431033	LAWRENCE DITCH	5.18	119	0.72829	
431047	LAGRANGE DITCH 1	5.17	120	0.73007	Removed at Basin Meeting Diverts less than 5 cfs
430929	SIZEMORE DITCH 1	5.1	121	0.73183	
430823	MINER MARTIN DITCH	5	122	0.73355	
431036	SHERMAN TAYLOR DITCH	5	123	0.73528	Removed at Basin Meeting Abandoned
430582	COLLINS DITCH	5	124	0.737	Removed at Basin Meeting Abandoned
431009	WHITE RIVER CITY DITCH	5	125	0.73872	Removed at Basin Meeting Abandoned
430983	W H VIOLETT DITCH 1	5	126	0.74044	Removed at Basin Meeting Diverts less than 5 cfs
430758	LAWRENCE DITCH NO 1	5	127	0.74217	

Table 3.1
White River Diversion Structures with Water Rights ≥ 5 cfs

Structure	Name	Decree Amt (cfs)	Rank	Cum. % of Total	Comment
430714	IVO E SHULTS D & PUMP	5	128	0.74389	
430729	JOHNSON DITCH	4.97	129	0.7456	No GIS Acreage
430711	INDEPENDENT DITCH	4.9	130	0.74729	
430825	MISSOURI BOTTOM DITCH	4.86	131	0.74897	No GIS Acreage
430824	MIRROR CREEK DITCH	4.81	132	0.75062	No GIS Acreage
430936	SPAULDING D	4.8	133	0.75228	Added at Basin Meeting
431014	WILLOW CREEK DITCH NO 1	4.8	134	0.75393	Below Cut-Off
432305	LITTLE COLOROW PUMP	4.79	135	0.75558	Below Cut-Off
430686	HEFLEY PUMP PLANT NO 3	4.79	136	0.75723	Below Cut-Off
430521	BANTA DITCH	4.78	137	0.75888	Below Cut-Off

3.2. Basin Meeting Notes

A meeting was held on April 26, 1995 at the offices of the Division 6 engineer in Steamboat Springs. The purpose of the meeting was to discuss the development of the water rights planning model for the White River basin and to gain better understanding of the administration of water rights in this basin. In attendance at the meeting were the following:

Ed Blank	Division 6 Engineer
Kent Holt	Assistant Division 6 Engineer
Joe Brown	Water Commissioner (District 43)
Bill Dunham	Water Commissioner (Districts 43)
Ray Bennett	Division of Water Resources
Markus Ritsch	Riverside Technology, Inc.
George Fosha	W.W. Wheeler and Associates, Inc.
Jim Hyre	W.W. Wheeler and Associates, Inc.

Prior to the meeting, George Fosha and Jim Hyre prepared maps (1:100,000 scale) of the White River basin showing the locations of "key structures" (ditches and reservoirs) which are being proposed for inclusion in the CRDSS Water Rights Planning Model. The locations of the structures were based primarily on the descriptions given in the water rights tabulation database.

Also prior to the meeting, Markus Ritsch prepared a summary of the years in which there were available diversion records for the key structures. During the meeting, the group had access to the division's water rights and structures databases via "QINFO".

The meeting proceeded in a general manner in which, working with the maps showing the key structures, the water commissioners would generally discuss the following:

- Administration issues in each water district
- Irrigation practices
- Irrigation and municipal return flow locations
- Availability of diversion records
- Irrigated acreage estimates

One of the purposes of the meeting was to attempt to decide which of the key structures, if any, would not need to be included in the model, but rather be left in the historic gage record. The discussions also addressed the identification of critical, water short, river reaches within the river basins.

Interview with Joe Brown (water commissioner east of Meeker):

- Rainbow Lake (888) - small hydro plant (35 cfs) leave out of model
- Mirror Creek Ditch (824) - washed out in 1993
- Missouri Bottom (825) - difficult to get water - leave out of model
- M. Schnider (784) - fill missing diversions with zeros, leave out of model
- Blaire Hatchery leave out of model - stopped fishery 15 years ago
- Lewis Rainbow Lake (763) - leave out of model (fishery use)
- Coal Creek Feeder (577)
- Runs in spring around 1st of June
- Transbasin diversion to Coal Creek: 578, 969, and 856
- Phillips Ditch (872) - diverts from Cave Creek
- Beckman Ditch (537) - diverts from Moose Creek
- Moose Creek is tributary of Cave Creek
- Bar Bell Mesa Ditch (530) - leave out of model
- Cow Creek Ditch (587) - leave out of model
- Peter and Dunn (871) - leave out of model (inundated by Lake Avery)
- Lake Avery
- DOW owned
- No dead storage
- Stays full
- Big Beaver Ditch (539) - Lake Avery bypasses inflow to ditch
    - Combine as one structure Greenstreet Ext (665) and Greenstreet No. 2 (664) - diverting out of White River with 88 acres. (Only 665 are included in the model because it had a 1993 GIS acreage value of 93 acres. Historic diversion records were maintained at both locations. When comparing the computed demands (using the 93 acres) against the historic diversions gaged at 665, the computed efficiencies seem reasonable (15% to 40%) during the irrigation season and therefore 664 was not modeled explicitly.

- Miller Creek Ditch (819) - Long ditch, drops into Flag Creek and has flume across Flag Creek
- Highland Ditch receives tailwater from Miller Creek Ditch
- South Side Highland Ditch receives tailwater from Highland
- Irrigated land under Highland Ditch is very porous
- Lowland (777) - receives tailwater from Old Agency
- Leave Collins Ditch (582) - located on Miller Creek out of model
- Leave Coal Creek Ditch (579) - out of model
    - Martin Ditch (789) - located on Coal Creek receives a majority of its supply (99%) from Oak Ridge Park Ditch tailwater.
- Watt Waste Ditch (2272) - leave out of model - acreage under Highland Ditch
- Meeker Power Ditch (809) - leave out of model - not used for number of years
- Meeker Water System Pipeline (810):
- Converted to well field located between 777 and 935
- Diversions recorded under 810 and 811 (the diversions recorded under 810 are used in the model with average monthly values used to fill missing data)
- WWTP returns above 842
- Lagrange (1047) - leave out of model
- John A. Story No. 3 (2080):
- Dugans Draw
- Receives return flows from Miller Crk Ditch
- Do not develop baseflows (tied to Miller Crk Ditch)

Interview with Bill Dunham (water commissioner west of Meeker):

- Pease Ditch (867) - some of its returns go to Hay Bretherton (681)
- Powell Park Ditch (883) - can receive some water from Strawberry Creek (this was not modeled, Powell Park Ditch receives no water from Strawberry Creek because Strawberry Creek was not a modeled tributary)
- Independent Ditch (711) - receives some of its water supply from Powell Park tailwater
- Hey Ditch No. 2 (684) - need to add 20 acres for new sprinkler (this was not modeled, only the 1993 GIS irrigated acres were modeled)
- Sherman Taylor Ditch (1036) - leave out of model
- Blacks Gulch Canal (545) - use 35 acres diverting from Blacks Gulch (not modeled, Blacks Gulch is not a modeled tributary)

- Johnnie Johnson Res:
  - DOW off stream res
  - No dead storage
  - Stays full
- Spaulding Ditch (936) - has occasionally been shut off due to senior call
- Oldland No. 1 (850) - is a fairly long ditch and its return flows are received by Oldland No. 2 (851)
- Oldland No. 2 (851) - is a junior ditch but is one of the last ditches to be called out.
- Rye Grass (909) - receives tailwater directly into the ditch from Oldland No. 1 (850)
- Emily Ditch (625) - Very good ditch, never shut down. Diversions can be flumed across the creek to irrigate both sides
- Robert McKee Ditch (903) - can irrigate both sides of the creek
- MH&M German Ditch (782) - Actually three ditches - two divert from the Piceance (larger rights) and one diverts from Black Sulphur Creek Combine all three ditches and divert from Piceance
- Black Eagle No. 1 and No. 2 (544 and 543) - each irrigates about 20 - 30 acres. Headgates are at same location but irrigate on opposite sides of the creek. For modeling, split into two water rights (each structure was modeled explicitly)
- Square S Consolidated (948)
  - Prior to 1986 four ditches: Ryan, Case & Story, JM Cole, and Cox (none of these structures made the cut for inclusion into the model)
  - Check decree for specifics, but generally all ditches can irrigate same lands
- Structure 1295 leave out of model
- Structure 1009 has been abandoned (leave out of model)
- EH Imes (613) - is not active, headgate washed out (leave out of model)
- Leave the following structures out of model:
  - Caldwell (2017)
  - WH Violet (983)
  - McGurdy (802)
  - Karen Reese (2456)
  - Spring Creek (939)
  - 941
  - 940
- Goeder Ditch (657) - has been inundated by Taylor Draw Res
- Taylor Draw Res:
  - Owned by Rio Blanco Water Conservancy District
  - Used for recreation only

- Leave out of model:
  - East Douglas (617)
  - Moon Lake Pipeline (2132)
  - East Evacuation Creek (989)
  - Robinson (1257)
  - RW Pump (1262)
- California Co. Pipeline (564)
  - Well field injection operation
  - 100% consumption

4. White Basin Instream Flow Rights

The May 2007 instream flow right tabulation for Division 5 shows there are 29 appropriations in the White River basin. To obtain a copy of the tabulation, visit the CWCB's website at www.cwcb.state.co.us, click on "Stream and Lake Protection," and then "Related Information", "Tools & Resources", and "Instream Flow and Natural Lake Level Water Rights Database." White River instream flow rights are tabulated with Division 5.

5. White Basin Modeling Efforts

No recent (within the past 10 years) water resources modeling efforts involving the White River basin are known. Kent Holt of Division 6 developed a water allocation model based on a priority system for the White River in the early 1970s that included only the major diversion structures on the mainstream. Information from this work was considered out-dated and was not used in the CRDSS modeling efforts.

The Colorado River Simulation Model (CORSIM II) is a proprietary computer model, which was originally developed, in the early 1970's. Until CDSS was developed, the CORSIM II model was considered the most comprehensive modeling effort of hydrology and water rights for the main stem of the Colorado River and its principal tributaries (including the White). The CORSIM II model is proprietary to its sponsors and accordingly, detailed review of the databases and operational logic were not conducted prior to developing the CDSS White Basin model.