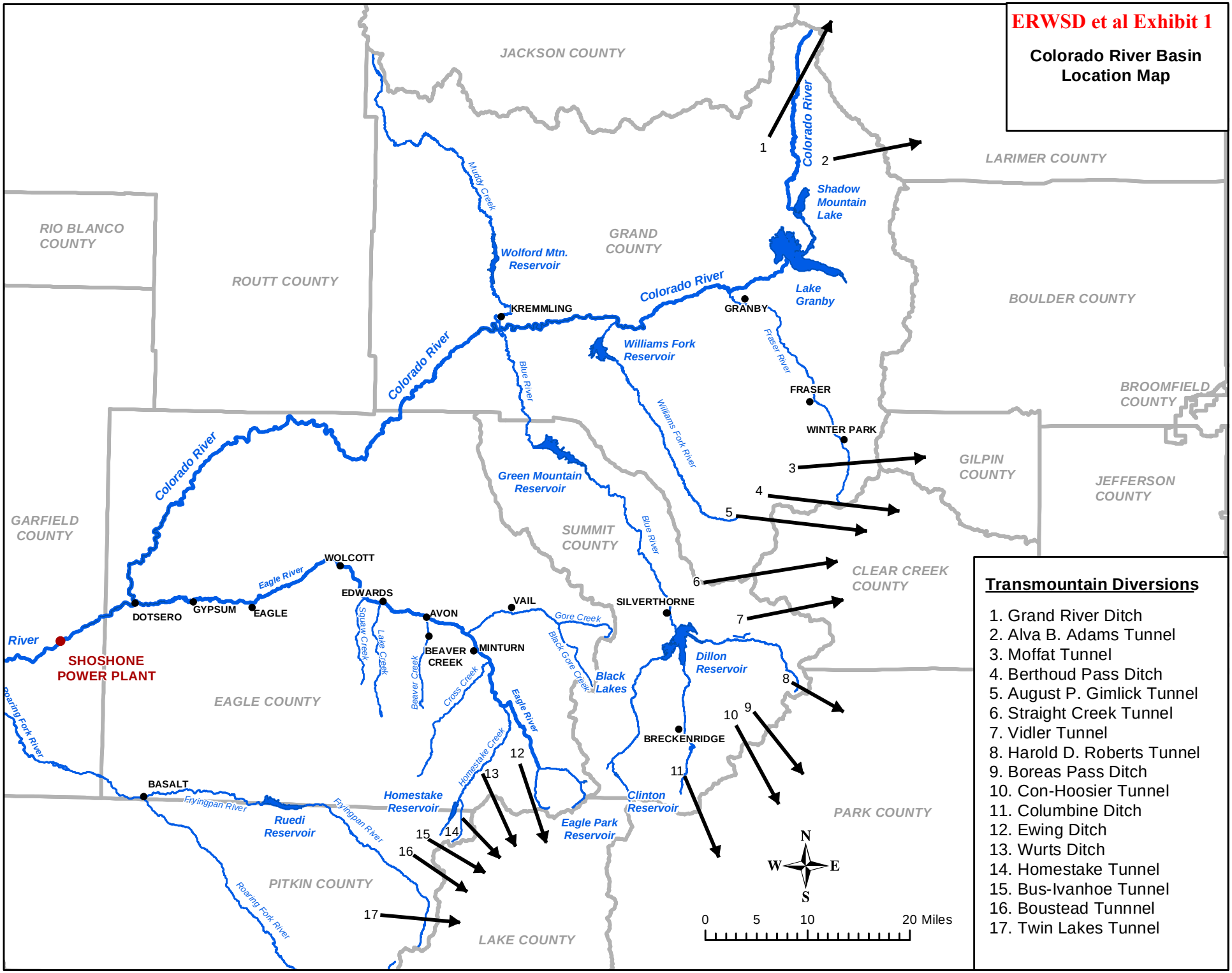

ERWSD et al Exhibit 1
Colorado River Basin Location Map
JACKSON COUNTY
LARIMER COUNTY
RIO BLANCO COUNTY
ROUTT COUNTY
GRAND COUNTY
BOULDER COUNTY
BROOMFIELD COUNTY
GILPIN COUNTY
JEFFERSON COUNTY
GARFIELD COUNTY
SUMMIT COUNTY
CLEAR CREEK COUNTY
EAGLE COUNTY
PARK COUNTY
PITKIN COUNTY
LAKE COUNTY
Colorado River
Muddy Creek
Wolford Mtn. Reservoir
Shadow Mountain Lake
Lake Granby
Williams Fork Reservoir
Fraser River
Williams Fork River
Blue River
Green Mountain Reservoir
Eagle River
Roaring Fork River
Fryingpan River
Ruedi Reservoir
Homestake Creek
Homestake Reservoir
Eagle Park Reservoir
Clinton Reservoir
Dillon Reservoir
Black Lakes
Gore Creek
Black Gore Creek
Cross Creek
Beaver Creek
Lake Creek
Straw Creek
KREMMLING
GRANBY
FRASER
WINTER PARK
WOLCOTT
EDWARDS
AVON
VAIL
BEAVER CREEK
MINTURN
SILVERTHORNE
BRECKENRIDGE
DOTSERO
GYPSUM
EAGLE
BASALT
SHOSHONE POWER PLANT
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
N
W
E
S
0 5 10 20 Miles
Transmountain Diversions
1. Grand River Ditch
2. Alva B. Adams Tunnel
3. Moffat Tunnel
4. Berthoud Pass Ditch
5. August P. Gimlick Tunnel
6. Straight Creek Tunnel
7. Vidler Tunnel
8. Harold D. Roberts Tunnel
9. Boreas Pass Ditch
10. Con-Hoosier Tunnel
11. Columbine Ditch
12. Ewing Ditch
13. Wurts Ditch
14. Homestake Tunnel
15. Bus-Ivanhoe Tunnel
16. Boustead Tunnnel
17. Twin Lakes Tunnel

## *Summary of Major[1] Transmountain Diversion Projects from Grand County*

| **Project** | **Amounts[2]** | **Appropriation Date** | **Constructed** |
|---|---|---|---|
| Grand River Ditch | 524.6 cfs | 9/1/1890 | Started 1894 Completed 1934 |
| Moffat Tunnel | 1280 cfs[3] | 7/4/1921 | Started 1922 Completed 1927[4] |
| Williams Fork Tunnel[5] | 620 cfs[6] | 7/4/1921 | Started 1937 Completed 1940 |
| Cabin - Meadow Creek[7] | 95 cfs[8] | 7/2/1932 | Started 1960s Completed 1970s[9] |
| Colorado - Big Thompson | 550 cfs[10] | 8/1/1935 | Started 1938[11] Completed 1957 |
| Windy Gap[12] | 600 cfs | 6/6/1969[13] | Started 1981 Completed 1985[14] |

[1] Does not include the: 1) Berthoud Pass Ditch owned by the City of Northglenn/Golden for 53.4 cfs with a June 30 1902 appropriation date (junior to Shoshone's 1/27/1902 right) that diverts water from the Fraser headwaters through a tunnel under Berthoud Pass parking lot; 2) the now defunct Eureka Ditch for 0.85 cfs owned by the City of Longmont but traded for CBT shares in 1995 with Rocky Mountain National Park; 3) exchanges to the Henderson Tunnel Pipeline for 9 cfs and 20 cfs (conditional) with an appropriation date of September 20, 1994 owned by Climax limited to 730af/yr and supplemental to other water delivered to Golden under an April 4, 1978 agreement (Case No. 96CW3681); 4) the Environmental Flow application in 11CW152 for 1,775 af to, in part, implement the CRCA, or 5) diversions by TMD from the Blue River and its tributaries.

[2] Flow rate in cfs not including storage. Absolute unless noted

[3] Partially absolute for 928 cfs and conditional for 352 cfs

[4] Pilot bore completed in 1927 and first water delivered in 1936

[5] A/K/A Gumlick Tunnel or Jones Pass Tunnel

[6] Partially absolute for 406 cfs and partially conditional for 214cfs

[7] Operated by Denver Water and water is taken thorough Moffat Tunnel

[8] 70 cfs from Hamilton Creek and 25 cfs from Extension and Enlargement

[9] Englewood bought the rights in 1955, entered an agreement with Denver in 1964 to use the Moffat Collection System and constructed Meadow Creek Reservoir along with AMAX in the early 1970s.

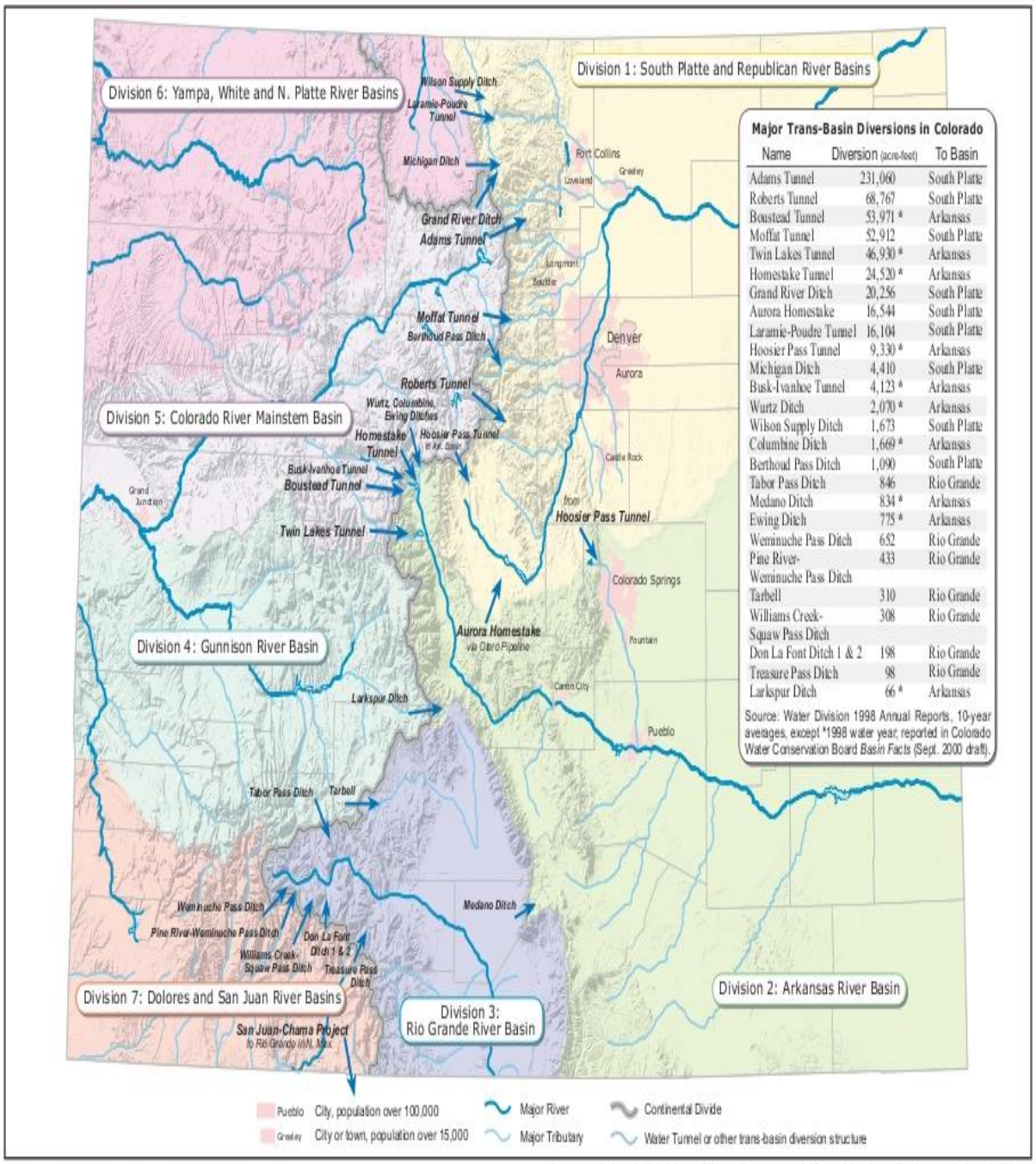
[10] Alva B. Adams Tunnel

[11] Construction on Green Mountain Reservoir started in 1938. Granby Reservoir started in 1940 and completed in 1949. Adams Tunnel bored through in 1944, first delivery of water through the tunnel in 1947

[12] Diverted from Colorado River; delivered through Adams Tunnel

[13] 300 cfs is 6/6/1969; 100 cfs is 7/9/1976; and 200 cfs is 4/30/1980

[14] First water delivered in July 1985




**Major Trans-Basin Diversions in Colorado**

| Name | Diversion (acre-foot) | To Basin |
|---|---|---|
| Adams Tunnel | 231,060 | South Platte |
| Roberts Tunnel | 68,767 | South Platte |
| Boustead Tunnel | 53,971 * | Arkansas |
| Moffat Tunnel | 52,912 | South Platte |
| Twin Lakes Tunnel | 46,930 * | Arkansas |
| Homestake Tunnel | 24,520 * | Arkansas |
| Grand River Ditch | 20,256 | South Platte |
| Aurora Homestake | 16,544 | South Platte |
| Laramie-Poudre Tunnel | 16,104 | South Platte |
| Hoosier Pass Tunnel | 9,330 * | Arkansas |
| Michigan Ditch | 4,410 | South Platte |
| Busk-Ivanhoe Tunnel | 4,123 * | Arkansas |
| Wurtz Ditch | 2,070 * | Arkansas |
| Wilson Supply Ditch | 1,673 | South Platte |
| Columbine Ditch | 1,669 * | Arkansas |
| Berthoud Pass Ditch | 1,090 | South Platte |
| Tabor Pass Ditch | 846 | Rio Grande |
| Medano Ditch | 834 * | Arkansas |
| Ewing Ditch | 775 * | Arkansas |
| Weminuche Pass Ditch | 652 | Rio Grande |
| Pine River-Weminuche Pass Ditch | 433 | Rio Grande |
| Tarbell | 310 | Rio Grande |
| Williams Creek-Squaw Pass Ditch | 308 | Rio Grande |
| Don La Font Ditch 1 & 2 | 198 | Rio Grande |
| Treasure Pass Ditch | 98 | Rio Grande |
| Larkspur Ditch | 66 * | Arkansas |

Source: Water Division 1998 Annual Reports, 10-year averages, except *1998 water year, reported in Colorado Water Conservation Board *Basin Facts* (Sept. 2000 draft).

Figure 7. Major Trans-Basin Diversions

Sources: Colorado Division of Water Resources, Office of the State Engineer; Colorado Water Conservation Board; U.S. Bureau of Reclamation; U.S. Geological Survey. Map by Thomas Dickinson.

Grand Exhibit 4

75TH CONGRESS
1st Session

SENATE

DOCUMENT
No. 80

# COLORADO-BIG THOMPSON PROJECT

## SYNOPSIS OF REPORT

ON

## COLORADO-BIG THOMPSON PROJECT, PLAN OF DEVELOPMENT AND COST ESTIMATE PREPARED BY THE BUREAU OF RECLAMATION, DEPARTMENT OF THE INTERIOR

PRESENTED BY MR. ADAMS

JUNE 15, 1937—Ordered to be printed without illustrations

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1937

# CONTENTS

## LETTER OF TRANSMITTAL

FEBRUARY 3, 1937.

From Senior Engineer Porter J. Preston.
To Chief Engineer.
Subject: Colorado-Big Thompson project.

1. Transmitted herewith is a synopsis of the report of plan of development and cost estimate of the Colorado-Big Thompson project.

2. The plans and designs upon which the estimates are based are shown in the full report to follow this synopsis.

3. The detail estimates have been worked out in the Denver office under the following divisions:

Canals: H. R. McBirney.
Reservoirs: K. B. Keener.
Power: L. N. McClellan.
Hydraulics: E. B. Debler.

4. The field work was done under the supervision of M. E. Bunger.

5. The economic study was carried on by R. L. Parshall, senior irrigation engineer, Bureau of Agricultural Engineering, United States Department of Agriculture. This study is later proposed to be issued as a separate document.

PORTER J. PRESTON.

Revised synopsis of report submitted June 11, 1937.

## LETTERS OF SUBMITTAL

JUNE 11, 1937.

Hon. HAROLD L. ICKES,
*Secretary of the Interior.*

MY DEAR MR. SECRETARY: There is attached hereto the portion of the report on the Colorado-Big Thompson project in Colorado covering the principles and stipulations governing the construction and operation of said project for the protection of the rights and interests dependent on the Colorado River in Colorado.

The provisions contained therein have been considered by the Northern Colorado Water Users' Association, representing the irrigation and other interests on the eastern slope in Colorado, and we respectfully submit that they are satisfactory and meet the approval of said association.

We ask that acknowledgment be made of this communication.

Respectfully yours,

NORTHERN COLORADO WATER USERS' ASSOCIATION,
CHAS. HANSEN, *President.*
MOSES E. SMITH, *Vice President.*
THOMAS A. NIXON, *Attorney.*

---

JUNE 11, 1937.

Hon. HAROLD L. ICKES,
*Secretary of the Interior.*

MY DEAR MR. SECRETARY: There is attached hereto the portion of the report on the Colorado-Big Thompson project in Colorado covering the principles and stipulations governing the construction and operation of said project for the protection of the rights and interests dependent on the Colorado River in Colorado.

The provisions contained therein have been considered by the Western Slope Protective Association, representing the irrigation and other interests on the western slope in Colorado, and we respectfully submit that they are satisfactory and meet the approval of said association.

We ask that acknowledgment be made of this communication.

Respectfully yours,

THE WESTERN SLOPE PROTECTIVE ASSOCIATION,
SILMON SMITH, *Secretary.*
CLIFFORD H. STONE, *Director.*
A. C. SUDAN,
*Special Representative of Grand County.*

# SYNOPSIS OF REPORT, COLORADO-BIG THOMPSON PROJECT

## OUTLINE OF CONSTRUCTION AND OPERATING CONDITIONS

The Colorado-Big Thompson project in Colorado contemplates the diversion of surplus waters from the headwaters of the Colorado River on the Pacific or western slope to lands in northeastern Colorado on the Atlantic or eastern slope greatly in need of supplemental irrigation water.

To accomplish this diversion, the following features are required:

### ON COLORADO RIVER

(1) Storage on the Blue River in what is called Green Mountain Reservoir located about 16 miles southeast of Kremmling, Colo., where the Blue enters the Colorado River. This reservoir is to be used to replace water diverted to the eastern slope that would be required by prior rights along the Colorado River.

(2) A hydroelectric plant below the Green Mountain Dam to utilize the flow of the Blue River and water stored in the reservoir for the generation of electrical energy.

(3) A storage reservoir located on the Colorado River about 6 miles northeast of Granby, Colo., to be known as Granby Reservoir. This reservoir will store the flow of the Colorado at this point as well as water diverted from Willow Creek, a tributary of the Colorado and Strawberry and Meadow Creeks, tributaries of the Fraser River.

(4) A diversion dam located about one-half mile below the junction of the North Fork and Grand Lake outlet and about 3 miles south of the village of Grand Lake. This dam will create a lake known as Shadow Mountain Lake which will have the same elevation as Grand Lake and will aid in supplying the transmountain diversion tunnel with water pumped from Granby Reservoir. This lake together with Grand Lake is to be kept at nearly constant level.

(5) An electrically driven pumping plant on the shore of Granby Reservoir, where water will be pumped into a canal feeding Shadow Mountain and Grand Lakes. The length of the canal is 4½ miles.

(6) An outlet channel at the east end of Grand Lake connecting the lake with the portal of a transmountain diversion tunnel and provided with control features that will regulate the level of Grand Lake within a fluctuating range of 1 foot.

(7) A transmountain diversion tunnel under the Continental Divide 13.1 miles in length extending from Grand Lake to a point in Wind River about 5 miles southwest of Estes Park village.

### ON EASTERN SLOPE

(8) A conduit 5.3 miles in length extending from diversion tunnel outlet to penstock of a power plant on the Big Thompson River just below Estes Park village. This conduit will be made up of buried

pipe, siphons, tunnels, and open canal. It will be entirely concealed through the area authorized to be taken into Rocky Mountain National Park.

(9) The waste rock from the tunnel is to be terraced and landscaped and all structures connected with the tunnel will be constructed to blend into their natural surroundings.

(10) A power plant known as power plant no. 1 constructed along the Big Thompson River just below the village of Estes Park utilizing the western slope water.

(11) Four additional power plants down the Big Thompson Canyon to utilize all available fall and also all water available for power in the Big Thompson River in addition to the western slope water diverted.

(12) A diversion dam on Big Thompson River about 12 miles west of Loveland to divert the water by means of a canal 9 miles in length to a storage reservoir known as Carter Lake.

(13) Carter Lake Reservoir located 8 miles northwest of Berthoud, Colo., to store water brought over during winter months. Water is released from this reservoir through a 4-mile canal into the Big Thompson River and through a 9-mile canal into the St. Vrain River for irrigation purposes.

(14) A siphon across the Big Thompson River, 9 miles west of Loveland, Colo., and a canal 10 miles in length to convey water from the fourth power plant to a storage reservoir, located about 5 miles west of Fort Collins, known as Horsetooth Reservoir.

(15) A canal from Horsetooth Reservoir to the Cache La Poudre River and extended north to a pumping plant which lifts water high enough to serve the North Poudre Canal.

(16) A storage reservoir near the mouth of Buckhorn Creek to be known as Arkins Reservoir, supplied from a canal diverting from the Big Thompson River just below the last power plant. It is to be used to aid in balancing the demands for power and irrigation, also storing excess water available in the Big Thompson River. Water will be released from the reservoir for supplemental irrigation in the South Platte area.

(17) Transmission lines connecting the Valmont steam plant of the Public Service Co. with all the hydroelectric plants contemplated, also connecting with the transmountain tunnel portals and the Granby and North Poudre pumping plants. The line connecting power plant no. 1 and Granby pumping plant will run east, and south of the outside boundaries of the Rocky Mountain National Park, crossing the Continental Divide at Buchanan Pass.

In order to carry out the construction, operation, and maintenance of the project as outlined above, it will be necessary to comply with the following requirements as agreed to by representatives of the eastern and western slopes in Colorado and here made as a part of this report.

## MANNER OF OPERATION OF PROJECT FACILITIES AND AUXILIARY FEATURES

The construction and operation of this project will change the regimen of the Colorado River below the Granby Reservoir. The project contemplates the maximum conservation and use of the waters of the Colorado River, and involves all of the construction features

heretofore listed. In addition thereto certain supplemental construction will be necessary. This will be for the primary purpose of preserving insofar as possible the rights and interests dependent on this water, which exist on both slopes of the Continental Divide in Colorado. The project, therefore, must be operated in such a manner as to most nearly effect the following primary purposes:

1. To preserve the vested and future rights in irrigation.
2. To preserve the fishing and recreational facilities and the scenic attractions of Grand Lake, the Colorado River, and the Rocky Mountain National Park.
3. To preserve the present surface elevations of the water in Grand Lake and to prevent a variation in these elevations greater than their normal fluctuation.
4. To so conserve and make use of these waters for irrigation, power, industrial development, and other purposes, as to create the greatest benefits.
5. To maintain conditions of river flow for the benefit of domestic and sanitary uses of this water.

In order to accomplish these purposes the project should be operated by an unprejudiced agency in a fair and efficient manner, equitable to all parties having interests therein, and in conformity with the following particular stipulations:

(*a*) The Green Mountain Reservoir, or similar facilities, shall be constructed and maintained on the Colorado River above the present site of the diversion dam of the Shoshone power plant, above Glenwood Springs, Colo., with a capacity of 152,000 acre-feet of water, with a reasonable expectancy that it will fill annually. Of said capacity, 52,000 acre-feet of water stored therein shall be available as replacement in western Colorado, of the water which would be usable there if not withheld or diverted by said project; 100,000 acre-feet shall be used for power purposes; and all of said stored waters shall be released under the conditions and limitations hereinafter set forth.

(*b*) Whenever the flow in the Colorado River at the present site of said Shoshone diversion dam is less than 1,250 cubic feet per second, there shall, upon demand of the authorized irrigation division engineer or other State authority having charge of the distribution of the waters of this stream, be released from said reservoir as a part of said 52,000 acre-feet, the amount necessary with other waters available, to fill the vested appropriations of water up to the amount concurrently being diverted or withheld from such vested appropriations by the project for diversion to the eastern slope.

(*c*) Said 100,000 acre-feet shall be stored primarily for power purposes, and the water released shall be available, without charge, to supply existing irrigation and domestic appropriations of water, including the Grand Valley reclamation project, to supply all losses chargeable in the delivery of said 52,000 acre-feet of water, and for future use for domestic purposes and in the irrigation of lands thereafter to be brought under cultivation in western Colorado. It shall be released within the period from April 15 to October 15 of each year as required to supply a sufficient quantity to maintain the specified flow of 1,250 cubic feet per second of water at the present site of said Shoshone diversion dam, provided this amount is not supplied from the 52,000 acre-feet heretofore specified. Water not required for the above purposes shall also be available for disposal to agencies for the development of the shale oil or other industries.

(*d*) The cost of construction and perpetual operation and maintenance of said reservoir or reservoirs shall be a charge against the project and shall be paid from revenues collected from this project as may be provided in contracts between the Secretary of the Interior and the beneficiaries of the project in eastern Colorado, and any other contracting parties.

(*e*) In the event said reservoir or reservoirs are not maintained with a capacity of 52,000 acre-feet, the Secretary of the Interior should withhold the diversion of water from the western to the eastern slope of Colorado until such storage capacity is made available.

(*f*) The Secretary of the Interior shall have the option to require the transfer to the United States of any and all rights initiated or acquired by the appropriation or use of water through the works of the project in eastern Colorado, at any time: *Provided, however,* That the title so taken shall be subject to a beneficial use of such water as may be provided in the repayment contract or contracts; and the rights to store water to the extent of said 152,000 acre-feet shall be initiated, acquired, and held by the appropriate authorities for use in western Colorado, for replacement of water diverted to the eastern slope, and for other purposes contemplated for this project.

(*g*) The Secretary of the Interior shall operate this project in accordance with the following stipulations as to priorities of water use as between the parties claiming or using project water and within the limits of his legal authority. Said 52,000 acre-feet of replacement storage in Green Mountain or other reservoirs shall be considered to have a date of priority for the storage and use of replacement water earlier than that of the priorities for the water diverted or stored for delivery to the eastern slope. The 100,000 acre-feet of storage in said reservoir shall be considered to have the same date of priority of appropriation as that for water diverted or stored for transmountain diversion.

(*h*) Said Green Mountain Reservoir, or such other replacement reservoirs as provided in paragraph (*a*) herein, as are planned as a part of the project, shall be constructed at the same time as the other parts of the project and shall be completed before any water is diverted to the eastern slope of the Continental Divide by means of said project.

(*i*) Inasmuch as the State of Colorado has ratified the Colorado River Compact, and inasmuch as the construction of this project is to be undertaken by the United States, the project, its operation, maintenance, and use must be subject to the provisions of said Colorado River Compact of November 24, 1922 (42 Stat. 171), and of section 13 of the Boulder Canyon Project Act, dated December 21, 1928 (45 Stat. 1057–1064). Notwithstanding the relative priorities specified in paragraph (*g*) herein, if an obligation is created under said compact to augment the supply of water from the State of Colorado to satisfy the provisions of said compact, the diversion for the benefit of the eastern slope shall be discontinued in advance of any western slope appropriations.

(*j*) An adequate system, as determined by the Secretary of the Interior, shall be provided for the irrigation of the lands in the vicinity of Kremmling, now irrigated by either natural or artificial means, and the installation made therefor shall be a part of this project. The rights to the use of water for the irrigation of these lands shall be considered to have a date of priority earlier than that of the rights to the use of water to be diverted through the works of this project to the eastern slope. This system shall be designed and built in a manner requiring the least possible continuing annual expense for operation

and maintenance but the cost thereof shall not exceed $300,000; and said system shall be provided and in operation before any water is stored for transmountain diversion. In addition, the Secretary shall protect, add to, or improve the source of supply of domestic waters for the municipalities of Kremmling and Hot Sulphur Springs in the manner and to the extent which he may determine to be necessary to provide a source of supply not less than that now available for these municipalities. The cost of these features shall be included in the total project cost.

(*k*) To compensate Grand County for the loss of taxes through the transfer of property to the United States for the construction of this project, $100,000 shall be paid to said Grand County. This payment shall be made in 10 annual installments of $10,000 each, commencing upon the date when 10 percent of the total property in Grand County required for said project has been removed from taxation.

(*l*) The project and all of its features shall be operated in a manner determined by the Secretary of the Interior as necessary to provide the water to preserve at all times that section of the Colorado River between the reservoir to be constructed near Granby and the mouth of the Fraser River as a live stream, and also to insure an adequate supply for irrigation, for sanitary purposes, for the preservation of scenic attractions, and for the preservation of fish life. The determination of the need for and the amount and times of release of water from Granby Reservoir to accomplish these purposes shall be made by the Secretary of the Interior, whose findings shall be final.

In order to facilitate compliance with the stipulation in paragraphs (*j*), (*k*), and (*l*) hereof a representative may be selected and designated by the interests dependent thereon in Grand County, Colo., and when so designated he will be recognized as the official spokesman of said interests in all matters dealing with project operations affecting Grand County.

The principles and provisions expressed in these stipulations have been approved by the Western Colorado Protective Association, representing interests in western Colorado, and the Northern Colorado Water Users Association as evidenced by the letters hereto attached.

## SUMMARY

The Colorado-Big Thompson project comprises 615,000 acres of irrigated lands, out of approximately 800,000 acres lying under the canal systems in the northern and northeastern portions of Colorado.

The water supply for the area is to be derived from a portion of 782 square miles of drainage area above Hot Sulphur Springs lying west of the Continental Divide in Grand County, Colorado, and varying in elevation from 8,050 to 14,000 feet.

## HISTORY

The first irrigation in northeastern Colorado occurred about 1860 where the early settlers plowed out small ditches with sufficient grade and length to irrigate a few acres of land in the first bottom—i. e lands not far above the high-water line of the streams and adjacent to them.

The first irrigation of the higher or second bench lands along the Cache La Poudre River was by the Old Union Colony, of Greeley, in

1870. This colony was organized by Horace Greeley, then editor of the New York Tribune, who will be remembered here especially for his advice to eastern young men to "Go west and grow up with the country."

This colony irrigated about 12,000 acres under their first project and it was a success from the start, due in a large measure to the fact that they were people of considerable means and were then able to finance themselves over the period required to bring raw prairie land into profitable cultivation.

This colony was soon followed by others along the Poudre at Fort Collins, on the Big Thompson, at Loveland and the St. Vrain near Longmont.

The difficulties experienced by these colonists in distributing the water between them led to the creation of Colorado's irrigation laws which have been copied by most of the irrigation States of the West.

This irrigated area of six hundred to eight hundred thousand acres was developed by means of individual initiative and by small scale cooperative enterprises. Today there are 6,400 irrigated farms, served by 124 canals and ditches and 60 storage reservoirs.

## IRRIGATION USE

In the early days irrigation in this area was confined to growing crops to supply local needs, the lack of transportation contributing to high prices for the home-grown production and prohibiting shipping to distant points. The crops grown were mainly the grains and hay for local consumption, with some vegetables. Such irrigation corresponded with the run-off of the streams.

As mining developed in the State, Denver and other towns grew into cities, and after these cities were connected to the East by railroads the markets demanded a more diversified agriculture to supply their needs. Thus a gradual demand developed for late water which the streams could not supply.

This change created a need for storing the flood waters for late irrigation. From 1890 to 1910 was a period of reservoir construction, during which storage was provided for all the available water supply of the streams over and above the direct irrigation requirements for the area here under discussion. Much of this development took place during a decade of more than normal run-off on the eastern slope and also during a period expanding the agricultural area throughout the West.

Attempts to maintain the area under cultivation with the depleted run-offs during the past 10 years have spread the water supply to such an extent that much acreage has had an insufficient water supply to produce full crops or crops producing the higher values. Attempts have been made to supplement the individual farm water supply by the development of the underground sources by pumping from numerous wells throughout the region. This is lowering the water table and already is affecting the water supply of the lower South Platte Valley which receives its irrigation supply largely from return waters.

## NEED OF SUPPLEMENTAL WATER

Under such conditions only the older water rights have any assurance of an adequate water supply, and in the dryer years the owners of junior rights are forced to confine their farming to crops that can

be matured by the early flood flow or that require a minimum amount of water. In years when the supply is not correctly estimated considerable loss results. Ordinarily the crops raised in this and other irrigated areas do not compete with those grown under rainfall conditions, but a shortage of water always leads to the raising of more of the competing crops. Such crops also cut the income of the irrigation farmer below what he can earn with the higher type, noncompetitive crops.

On fully three-fourths of the 615,000 acres in this area the water supply is inadequate, in spite of every effort to conserve, store flood water, or otherwise add to the water supply that has been within the financial ability of the farmer. This inadequacy is due not only to a development probably too large for the period when run-off of the streams was much higher than at present, but to the fact that the last 10 years have seen a very marked decrease in the stream flow. It must be emphasized that the additional water supply here contemplated is to be used for a supplemental supply and not to create a large new additional irrigated acreage.

There has been expended in this area to date for various types of irrigation works, including nearly $750,000 for pumping plants, most of which have been installed in the last 10 years, about $35,000,000 against which there is an outstanding indebtedness of only $1,510,650. These people, however, have about reached their limit as individuals and mutual irrigation companies to provide for themselves a supplemental water supply so badly needed to make their present water supply secure and are obliged to seek Government aid to bring this about.

It has been conceded by a majority of the irrigation interests in this section of the State that the water supply in 1926 was ample for all their present acreage now irrigated. In order, therefore, to determine the normal shortage in acre-feet over a period of years a comparison of the supply in these years with that of 1926 was made and the difference obtained. These differences are set up in the following table:

TABLE 1.—*Showing water districts, acreage irrigated, deficiencies 1925 to 1935 with tentative allocation of total supplemental supply*

| Water district no. | Area irrigated | 1926 diversion, acre-feet | Average diversion, 1925–35 | Difference, 1926, 11-year average required supplementary water in acre-feet | Tentative allocation of supplemental supply | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Colorado-Big Thompson project water | Moffat and Jones Pass tunnel water return | Present seepage return, acre-feet | Total supplemental supply, acre-feet |
| (1) | (2) | (3) | (7) | (15) | (16) | (17) | (18) | (19) |
| 3 | 213,640 | 530,000 | 398,000 | 132,000 | 104,000 | ---------- | 49,500 | 153,500 |
| 4 | 68,408 | 235,000 | 163,000 | 72,000 | 44,100 | ---------- | 21,000 | 65,100 |
| 5 | 81,806 | 113,000 | 94,000 | 19,000 | 38,800 | ---------- | 18,500 | 57,300 |
| 1 | 92,394 | 663,000 | 457,000 | 206,000 | 81,400 | 11,000 | 83,000 | 175,400 |
| 2 | 37,899 | 170,000 | 154,000 | 16,000 | 5,000 | 4,500 | 5,100 | 14,600 |
| 64 | 121,289 | 513,000 | 383,000 | 130,000 | 36,700 | 14,500 | 37,400 | 88,600 |
| Total | 615,436 | 2,224,000 | 1,649,000 | 575,000 | 310,000 | 30,000 | 214,500 | 554,500 |

It will be noted from column no. 15 that the total average shortage in this project area which comprises water districts 3, 4, 5, 1, 2, and 64 is 575,000 acre-feet. Column no. 16 is a tentative allocation of the proposed supplemental supply to the various districts. Column no. 18 is the estimated usable return flow that would arise from the addition of 310,000 acre-feet of new water to this area. Column no. 19 is the total usable supplemental supply amounting to 554,520 acre-feet, an amount within 5 percent of the 10-year average shortage. The sale or rental of supplemental water, when available, in the Poudre Valley has averaged $4.50 per acre-foot over a period of years. In extreme cases it has sold as high as $9 per acre-foot.

The deficiency in water supply for the period 1925 to 1934, inclusive, reflected a direct economic loss in crop production of approximately $42,355,000.

The following shows the approximate annual loss in value of crops because of inadequate water supply:

| | |
|---|---|
| Sugar beets | $1,900,000 |
| Alfalfa | 948,000 |
| Small grain | 470,000 |
| Beans | 302,000 |
| Corn | 228,000 |
| Potatoes | 425,000 |
| All other crops | 444,000 |
| Total | 4,700,000 |

This average annual direct crop loss is about 19 percent of the $24,800,000 estimated cost of the Colorado-Big Thompson irrigation project.

The crop loss in 1934, due to shortage of water, as compared to 1926, after variation in price and acreage factors had been accounted for, amounted to $12,400,000, or just one-half the cost of the project.

The losses here given are the farm losses and do not include the losses that are due to processing, transporting, or handling of that quantity of production, which would add several million dollars to the loss of the community as a whole.

The effect of such inadequate water supply for the period 1925–35 is shown graphically on drawing no. 1 following.

## SUPPLEMENTAL WATER SUPPLY

In 1929 the State engineers of Colorado, in cooperation with the Platte Valley Water Conservation League, and the United States Army engineers, made a comprehensive study of the water resources of the South Platte Basin in northeastern Colorado. This study included the Cache La Poudre River in water district no. 3, the Big Thompson River in water district no. 4, and the St. Vrain River in district no 5. The investigators determined the excess water available on these streams above present normal demands and also above the normal demands on the South Platte River proper below where these streams enter.

The investigators also determined the location, capacity, and cost of the most feasible reservoir sites for the storage of this excess water.

The results are shown in the following table and have been brought up to date by using the same demands for irrigation as set up in the report and using the water-supply records furnished by the State engineer's office.

| Stream | Excess supply available for storage, average, 1918–35 | Capacity proposed reservoir by Army engineers | Average annual yields at reservoirs | Total reservoir costs | Cost per acre-foot capacity | Cost per acre-foot yield |
|---|---|---|---|---|---|---|
| | *Acre-feet* | *Acre-feet* | | | | |
| Cache La Poudre | 30,000 | 52,000 | 25,500 | $2,747,000 | $72 | $147 |
| Big Thompson | 16,000 | 32,700 | 11,300 | 2,006,000 | 61 | 178 |
| St. Vrain | 16,000 | 30,000 | 14,000 | 2,186,000 | 73 | 156 |

From the foregoing table it is evident that there is not sufficient excess water available that originates in this area to supply the demands for supplemental water, and the cost of making use of what is available is prohibitive. It will be shown, however, that 16,000 acre-feet of this surplus is available for storage in the Colorado-Big Thompson project reservoirs on the eastern slope with no additional cost.

The water users in northeastern Colorado have now exhausted every possible source of obtaining supplemental water or augmenting their present supply either by storage, transmountain diversion within their individual cooperative means, and by pumping. Fortunately, however, there exists a surplus of water on the headwaters of the Colorado River west of this area and separated from it by the Continental Divide.

In the spring of 1935, $150,000 was allocated to the Bureau of Reclamation to make surveys and prepare plans and cost estimates for bringing water from the headwaters of the Colorado River into the area in northeastern Colorado in need of supplemental water.

In August 1935 the Bureau of Reclamation started surveys for the project and previously there had been started a land classification to determine the irrigated and arable land in the Colorado River Basin in Colorado in order to arrive at the approximate amount of water now used in the area and how much might be used when full development has been made. Both surveys have been completed, insofar as this project is involved, and the following is the result of the land classification.

### LAND CLASSIFICATION—COLORADO RIVER AREA

Since the quantity of water available for diversion from the headwaters of Colorado River might be limited now by the water rights of lands already irrigated, or might in the future limit in turn the development of lands in the Colorado Basin within the State, all the land on Colorado River and its tributaries above the Colorado-Utah line, except the Gunnison River area, has been classified to show the location and extent of irrigated lands and of lands capable of irrigation.

This classification was undertaken in all areas covered by former reports, supplemented by local information as to possible projects and by reconnaissance. For localities with no records of water supply it was assumed to exist unless the contrary was obvious, and doubtful areas were included rather than excluded from the classification. The land was measured by plane-table survey except some small isolated areas which were estimated.

Land that had customarily been irrigated was so classed, no matter how inadequate the supply. Land capable of irrigation was

tested according to a set of standards which fairly represent the experience on this area and others as to what constitutes arable land. Where pumping for irrigation was involved land was classified up to 200 feet above the source of supply.

The result of the survey of the irrigated and arable land appears in the following table.

It should be stated, that, as will be shown under the discussion of water supply which follows, the present irrigated area above the Utah State line does not limit the diversion possible at the location chosen. It is also true that the diversion when in operation, and replacing the summer flow of Colorado River in the manner contemplated by the project plan, will not limit the future development of all the arable land on Colorado River and its tributaries above Gunnison River.

*Colorado River drainage—Gunnison excepted—Colorado (land classification according to streams)*

| Stream name | Irrigated | Arable | Total |
|---|---|---|---|
| | *Acres* | *Acres* | *Acres* |
| Colorado River: | | | |
| 1. To Granby Dam | 2,600 | 1,100 | 3,700 |
| 2. Granby Dam to Hot Sulphur Springs | 1,300 | 350 | 1,650 |
| 3. Hot Sulphur Springs to Kremmling | 3,200 | 1,200 | 4,400 |
| 4. Kremmling to Glenwood Springs | 1,100 | 260 | 1,360 |
| 5. Glenwood Springs to Palisade | 7,000 | 2,500 | 9,500 |
| 6. Palisade to State line | 70,600 | 32,800 | 103,400 |
| Total | 85,800 | 38,210 | 124,010 |
| Tributaries: | | | |
| Willow Creek | 860 | 120 | 980 |
| Fraser River | 7,100 | 650 | 7,750 |
| South Fork Colorado River | 610 | 30 | 640 |
| Small streams [1] | 2,300 | 4,000 | 6,300 |
| Williams Fork River | 3,600 | 10,900 | 14,500 |
| Troublesome Creek | 4,200 | 7,200 | 11,400 |
| Muddy Creek | 4,900 | 5,100 | 10,000 |
| Blue River | 8,400 | 3,100 | 11,500 |
| Small streams [2] | 610 | 570 | 1,180 |
| Sheephorn Creek | 1,200 | 50 | 1,250 |
| Piney Creek | 790 | 50 | 840 |
| Egeria Creek | 5,700 | 9,300 | 15,000 |
| Cabin Creek area | 5,700 | 2,600 | 8,300 |
| Catamount Creek | 1,000 | 10 | 1,010 |
| Sweetwater Creek area | 1,100 | 380 | 1,480 |
| Eagle River | 16,400 | 5,000 | 21,400 |
| Small streams [3] | 930 | 60 | 990 |
| Roaring Fork River | 33,100 | 9,400 | 42,500 |
| Garfield Creek | 2,100 | | 2,100 |
| Elk Creek | 3,000 | 130 | 3,130 |
| Divide and Mam Creeks | 13,700 | 9,100 | 22,000 |
| Rifle Creek | 11,100 | 3,200 | 14,300 |
| Parachute Creek | 1,700 | 370 | 2,070 |
| Roan Creek | 5,600 | 3,300 | 8,900 |
| Plateau Creek | 24,000 | 7,000 | 31,600 |
| Small streams [4] | 10,200 | 3,000 | 13,200 |
| Grand total | 256,300 | 122,830 | 379,130 |

[1] Above Hot Sulphur Springs.
[2] Between Hot Sulphur Springs and Kremmling.
[3] Between Kremmling and Glenwood Springs.
[4] Between Glenwood Springs and Palisade.

## WATER SUPPLY

The stream flow records at the different stations in the Colorado River Basin show the amount of water passing the stations after all present irrigation has taken place above, so there is no need for any further adjustment of stream flow to take care of water consumed in this irrigation.

It is assumed that all arable lands as shown will be irrigated some time in the future, notwithstanding the fact that quite a percentage

is so located that it would never be feasible to irrigate. It is also further assumed that reservoirs would be built on the tributaries to conserve a portion of the flood flows to make the irrigation of these arable lands possible.

With the above assumptions it has been found that in a year like 1931, with the run-off only 40 percent of the average for a 31-year period, and the lowest year of record, the Colorado-Big Thompson project would only have to supply approximately 53,000 acre-feet to replace water diverted by the proposed project that could have been used by the Colorado River water users for power and irrigation, provided the project was in operation at that time.

The average run-off of the Colorado for the years of record are: Hot Sulphur, 31 years, 523,000 acre-feet; Glenwood Springs, including Roaring Fork, 3,413,000 acre-feet, Fruita, 6,300,000 acre-feet. These amounts are exclusive of supply consumed in present irrigation of Colorado River Basin lands.

The following is the estimated amount of water available for diversion from the drainage area above the Colorado-Big Thompson collection system at 8,260 feet elevation.

### YIELD OF GRANBY RESERVOIR

Stream-flow records available on the Colorado River near the Granby Dam site for the years 1908–11 and 1935–36, and on Willow Creek for the years of 1935 and 1936, were supplemented by estimates based on available stream-flow records on the Colorado River at Hot Sulphur Springs and Glenwood Springs to cover the 37-year period, 1900 to 1936, inclusive.

A capacity of 482,000 acre-feet was selected as the best capacity for the Granby Reservoir, considering cost and use. Of this capacity, 20,000 acre-feet were set aside for dead storage to reduce pumping lifts for waters delivered to Shadow Mountain Reservoir. A further objective is to keep to the lowest practicable area the exposure of reservoir bed when storage is exhausted. This leaves an active capacity of 462,000 acre-feet.

Reservoir operating studies are based on the following conditions:

(*a*) Recorded (or estimated) past flows of Colorado River at Shadow Mountain and Granby Dams reduced by 27 percent prior to 1906, and 13 percent thereafter, of the flow of the North Fork at Grand Lake to allow for increasing diversions by the Grand River ditch.

(*b*) Willow Creek diverted to reservoir to the extent of 90 percent of the flow of Willow Creek and other streams intercepted by the diversion canal from May to October, inclusive, of each year.

(*c*) Strawberry, Meadow, and Walden Hollow Creeks also diverted whenever practicable. The flow of these streams, together with some additional waters capturable from Willow Creek at times, are expected to offset evaporation and seepage losses in excess of present losses from the Granby and Shadow Mountain Reservoir sites.

(*d*) No releases from Granby Dam for any reason.

(*e*) Transmountain tunnel to be operated at full capacity from October 1 until March 31 following, with operations thereafter gaged to fit run-off conditions so as to avoid spills and yet concentrate flows in the period of July 15 to September 15, for the purposes of best

distribution in power production and to minimize reregulating storage requirements on the eastern slope. The computations assumed infallible forecasts of run-off.

(*f*) A minimum storage hold-over of 100,000 acre-feet on September 30 of each year to assure dependable power production in winter.

Under these conditions, a yield of 320,000 acre-feet of primary water is secured as follows:

*Unit 1,000 acre-feet*

| Run-off year (October to September) | Inflow to Granby Reservoir | | Tunnel diversion | Spills | Shortages |
|---|---|---|---|---|---|
| | Colorado River | Willow Creek | | | |
| 1899-1900 | 242.8 | 52.4 | 320.0 | | |
| 1900-1901 | 246.9 | 53.4 | 320.0 | | |
| 1901-2 | 164.9 | 34.7 | 255.1 | | 64.9 |
| 1902-3 | 222.0 | 48.8 | 270.8 | | 49.2 |
| 1903-4 | 253.5 | 51.2 | 304.7 | | 15.3 |
| 1904-5 | 287.9 | 64.9 | 310.2 | | 9.8 |
| 1905-6 | 292.4 | 58.7 | 320.0 | | |
| 1906-7 | 381.0 | 78.3 | 320.0 | | |
| 1907-8 | 190.6 | 25.6 | 320.0 | | |
| 1908-9 | 323.8 | 91.5 | 320.0 | | |
| 1909-10 | 200.1 | 32.5 | 320.0 | | |
| 1910-11 | 268.5 | 53.6 | 320.0 | | |
| 1911-12 | 350.4 | 79.3 | 320.0 | | |
| 1912-13 | 215.4 | 40.3 | 320.0 | | |
| 1913-14 | 371.0 | 85.1 | 320.0 | | |
| 1914-15 | 223.2 | 43.8 | 320.0 | | |
| 1915-16 | 249.5 | 47.8 | 320.0 | | |
| 1916-17 | 348.3 | 79.7 | 320.0 | | |
| 1917-18 | 322.9 | 81.2 | 356.4 | 18.7 | |
| 1918-19 | 189.6 | 36.4 | 320.0 | | |
| 1919-20 | 301.2 | 78.4 | 345.6 | | |
| 1920-21 | 347.9 | 90.7 | 368.6 | 70.0 | |
| 1921-22 | 196.8 | 39.5 | 320.0 | | |
| 1922-23 | 280.3 | 60.2 | 320.0 | | |
| 1923-24 | 262.2 | 54.4 | 320.0 | | |
| 1924-25 | 202.6 | 36.7 | 320.0 | | |
| 1925-26 | 346.4 | 70.0 | 320.0 | | |
| 1926-27 | 275.0 | 54.8 | 320.0 | | |
| 1927-28 | 317.5 | 61.9 | 338.3 | | |
| 1928-29 | 297.1 | 61.2 | 358.3 | | |
| 1929-30 | 247.4 | 42.9 | 320.0 | | |
| 1930-31 | 171.5 | 36.6 | 320.0 | | |
| 1931-32 | 243.9 | 48.0 | 320.0 | | |
| 1932-33 | 239.6 | 54.5 | 320.0 | | |
| 1933-34 | 128.9 | 26.2 | 320.0 | | |
| 1934-35 | 209.2 | 41.8 | 252.5 | | 67.5 |
| 1935-36 | 279.7 | 53.8 | 310.0 | | 10.0 |
| Average | 263.6 | 55.4 | 318.7 | 2.5 | 5.5 |

Operating results cannot be expected to result so favorably. The operating conditions enumerated imply superhuman ability to forecast stream flow. Occasional releases will be required from Granby Reservoir although small in amount. Interruptions in tunnel operation cannot always be arranged so as to lose no water.

In view of these conditions, it is concluded that the firm yield of tunnel water from the Granby and Shadow Mountain Reservoirs should be taken as 300,000 acre-feet annually. Shortages of 5 percent may be expected on an average of once every 5 years and shortages of 25 percent may be expected on an average of once every 20 years. Secondary water may be expected to be available in some years in amounts up to 50,000 acre-feet.

## EFFECT OF THE PROPOSED TRANSMOUNTAIN DIVERSION ON FUTURE WESTERN SLOPE DEVELOPMENT

Most of the diverted water is derived from the spring floods, when there is an excess of water over all present and future requirements along the Colorado River in the State. To permit full use of the inflow to the Granby Reservoir, Ranch Creek Reservoir may be constructed near Tabernash to store water locally surplus. The waters there conserved would in part be utilized to replace the waters withheld at Granby Dam, but the greater part of the conserved water would be used to augment irrigation supplies down to Hot Sulphur Springs and to maintain a satisfactory stream flow in this locality for recreational purposes.

With the region above Hot Sulphur Springs taken care of by the Ranch Creek Reservoir, the critical points along the Colorado River, from the standpoint of present and future use of water, are at Glenwood Springs, where the Shoshone power plant of the Public Service Co. uses present stream-flows up to 1,250 second-feet, and near Palisades at the head of the Grand Valley, where the Government high-line canal diverts water for irrigation and power purposes. The present irrigated area along the Colorado River between Palisades and the Colorado-Utah State line is 70,600 acres.

The additional arable area in this region, not now irrigated, is as follows:

| | *Acres* |
|---|---|
| Under constructed canals | 13,800 |
| Pumping unit of Grand Valley project, for which canal capacity has been provided | 10,000 |
| Lands on Mack Flat, no present provision for water service | 9,000 |
| Total | 32,800 |

Maximum irrigation demand at the head of the Grand Valley for the present irrigated area and for the additional area of 23,800 acres for which provision has been made in the constructed canals, is estimated as 1,700 second-feet, and this amount is being demanded in the pending adjudication proceeding.

With maximum irrigation demands there is a full water supply for the Orchard Mesa pumping plant and for the Grand Valley power plant. In the nonirrigation season the controlling requirement is for power with a total demand of 800 second-feet for power and for domestic needs under the higher canals. With the new area of 9,000 acres developed, the future demands are then estimated as 1,800 second-feet in the months of May to August, inclusive, tapering off uniformly to 800 second-feet on April 1 and on November 30.

In determination of the effect of the Colorado-Big Thompson transmountain diversion on the western slope, the past stream flows at Glenwood Springs and at the head of the Grand Valley were first depleted to show the resulting stream flows with the following developments:

(*a*) Full irrigation development of 276,000 acres of irrigated and arable lands along the Colorado River and tributaries above Palisades (the present irrigated area is 186,000 acres).

(*b*) Full development of Moffat Tunnel diversion from Fraser River and tributaries, Jones Pass diversion from Williams River, and Independence Pass diversion from the Roaring Fork, including

replacement storage so that these projects may divert all flows interceptible.

From the reconstructed flows, thus computed, there was subtracted the water estimated to be withheld at the Granby Reservoir site. The reductions in stream flow at Glenwood Springs and at the head of the Grand Valley, during those periods of each year when the resulting stream flows would be less than the future demands above described, then represents the effect of the project on the western slope if no replacement storage were provided. These computations were made for the years 1926 to 1936, inclusive, at Glenwood Springs, and for the entire period of record, 1902 to 1936, inclusive, at the head of the Grand Valley, with the following results:

| Year | Shortages at Glenwood Springs (acre-feet) | | | Shortages at head of Grand Valley (acre-feet) | | |
|---|---|---|---|---|---|---|
| | End of flood season, Oct. 31 [1] | Nov. 1 to flood season of following year [2] | Total | Before flood season in spring [3] | After flood season to Oct. 31 | Total |
| 1902 | (4) | (4) | | 6,000 | 39,000 | 45,000 |
| 1903 | (4) | (4) | | 3,000 | 12,000 | 15,000 |
| 1904 | (4) | (4) | | None | 2,000 | 2,000 |
| 1905 | (4) | (4) | | None | 14,000 | 14,000 |
| 1906 | (4) | (4) | | None | None | None |
| 1907 | (4) | (4) | | None | None | None |
| 1908 | (4) | (4) | | None | 6,000 | 6,000 |
| 1909 | (4) | (4) | | None | None | None |
| 1910 | (4) | (4) | | None | 12,000 | 12,000 |
| 1911 | (4) | (4) | | None | 1,000 | 1,000 |
| 1912 | (4) | (4) | | None | None | None |
| 1913 | (4) | (4) | | None | 7,000 | 7,000 |
| 1914 | (4) | (4) | | None | None | None |
| 1915 | (4) | (4) | | None | 9,000 | 9,000 |
| 1916 | (4) | (4) | | None | None | None |
| 1917 | (4) | (4) | | None | None | None |
| 1918 | (4) | (4) | | None | 1,000 | 1,000 |
| 1919 | (4) | (4) | | None | 7,000 | 7,000 |
| 1920 | (4) | (4) | | 2,000 | None | 2,000 |
| 1921 | (4) | (4) | | None | None | None |
| 1922 | (4) | (4) | | None | None | None |
| 1923 | (4) | (4) | | None | None | None |
| 1924 | (4) | (4) | | None | 4,000 | 4,000 |
| 1925 | (4) | (4) | | None | None | None |
| 1926 | 16,000 | 19,000 | 37,000 | None | 2,000 | 2,000 |
| 1927 | 7,000 | 32,000 | 39,000 | None | None | None |
| 1928 | 10,000 | 18,000 | 28,000 | None | None | None |
| 1929 | None | 20,000 | 20,000 | None | None | None |
| 1930 | 12,000 | 14,000 | 26,000 | None | None | None |
| 1931 | 37,000 | 16,000 | 53,000 | 1,000 | 27,000 | 28,000 |
| 1932 | 14,000 | 24,000 | 38,000 | None | 3,000 | 3,000 |
| 1933 | 23,000 | 21,000 | 44,000 | 5,000 | 15,000 | 20,000 |
| 1934 | 31,000 | 17,000 | 48,000 | None | 28,000 | 28,000 |
| 1935 | 20,000 | 15,000 | 35,000 | 2,000 | 11,000 | 13,000 |

[1] Encroachment on irrigation supplies.
[2] Encroachment on winter power waters.
[3] These shortages occur in years of late run-off when irrigation requirements rise faster than stream flow. Winter flows are always adequate Nov. 1 to Apr. 1.
[4] Not computed.

## DIVERSION PLAN AND STRUCTURES

### REPLACEMENT

In order to protect the water users in the Colorado River Basin against any depletion of their water supply by diversions through the Continental Divide tunnel to northeastern Colorado, a storage reservoir is planned on the Blue River about 16 miles southeast of Kremmling, Colo. This reservoir is to be known as the Green Mountain.

The dam site is located in the E ½ of sec. 15, T. 2 S., R. 80 W., sixth principal meridian, near the head of a box canyon, between Green and Little Green Mountains, caused by the river cutting through a porphyry sill. The foundation bedrock consists of sedimentary rocks, either Dakota sandstone or Morrison shales, and the intrusive porphyry.

The irrigation outlet capacity is 1,000 cubic feet per second, and the power outlet capacity is 1,500 cubic feet per second. The spillway capacity is 25,000 cubic feet per second.

The reservoir will flood 2,100 acres of land and will have a capacity of 152,000 acre-feet.

From the water-supply studies it was found, assuming that full development had taken place in the Colorado River Basin and that the Big Thompson project had been in operation the last 35 years, that in the year 1931, the lowest year of dependable run-off record, the Colorado Basin users above Glenwood Springs would have been shorted 37,000 acre-feet for irrigation use and the Public Service Co. would have been shorted 16,000 acre-feet at their power plant at Shoshone during the nonirrigation season, or a total shortage of 53,000 acre-feet. Accordingly, 50,000 acre-feet of Green Mountain storage have been allocated to replacement purposes for which the water users in northeastern Colorado will pay $1,500,000. The remaining 100,000 acre-feet are allocated to power and will be paid for out of power revenues.

Since the average shortage for both power and irrigation for the last 10 years, the lowest 10 years of run-off record is 36,000 acre-feet. There would be the 16,000 acre-feet difference, and a portion of the 100,000 acre-feet let out for power that could be used by the Colorado Basin users to supply shortages that might occur in their irrigation use in years of extreme low run-off, these shortages not being caused by the transmountain diversion.

The total estimated cost of the dam and reservoir is $3,776,032, $2,276,032 of which will be paid for from power revenues.

### GRANBY RESERVOIR AND STORAGE

The storage of Colorado River waters for the project is to be made in what is known as Granby Reservoir which is located in Tps. 2 and 3 N., Rs. 75 and 76 W., sixth principal meridian, in Grand County, Colorado. The reservoir basin occupies the valleys of Stillwater Creek, the south fork or Arapaho Creek, and the main Colorado River.

The damsite is located about 4 miles northeast of the town of Granby, Colo., in the NE¼ of sec. 11, T. 2 N., R. 76 W., in Grand County, Colo. It is located at the head of a short canyon which the river has cut through pre-Cambrian rocks forming a spur of the main Rocky Mountain mass. At the damsite the canyon at river-bottom level is 200 feet wide, while at elevation 8,275 it is 720 feet in width.

The dam is to be a combination earth and rockfill structure with a maximum height of 223 feet. The outlet capacity is 300 cubic feet per second and the spillway capacity is 12,000 cubic feet per second.

With the high-water line at elevation 8,275 feet the reservoir has a capacity of 482,860 acre-feet, and will flood an area of 6,943 acres.

This reservoir will not only intercept the flow of the Colorado at that point, but the flow of Willow Creek will be intercepted near Dexter, Colo., and brought into the reservoir through a canal of 1,000

cubic feet per second capacity. Willow Creek enters the Colorado about 2 miles below Granby Dam.

It is estimated that Willow Creek will supply an average of about 60,000 acre-feet per year, and that the total estimated cost of this diversion is $733,203.

The storage in Granby Reservoir will also be augmented by the flow of Meadow and Strawberry Creeks, tributaries of Fraser River which enters the Colorado about 5 miles below the dam. The canal intercepting these two creeks will have a capacity of 500 cubic feet per second, and it is estimated they will produce an average of 12,000 acre-feet a year. The total estimated cost of this diversion is $133,600.

If water supply records kept in the future show there is sufficient water supply left in the Fraser River below the City of Denver's diversion, a canal could be taken out of it just below the mouth of St. Louis Creek near the town of Fraser, Colo., and extend from there to Granby Reservoir, intercepting Ranch, Meadow, and Strawberry Creeks on the way. A small regulating reservoir should be built on Ranch Creek above where the Canal intercepts it. ,

### NORTH FORK DIVERSION DAM AND SHADOW MOUNTAIN LAKE

In order to divert the water of the North Fork of the Colorado into Grand Lake and thence to the channel extending from it to the west portal of the Continental Divide tunnel, it is planned to construct a concrete overflow dam 35 feet in height, above streamed, across the North Fork about one-half mile below its junction with the Grand Lake outlet.

The dam site proper is located in the NW¼ of sec. 19, T. 3 N., R. 75 W., and is a glacial morain cut through by the river.

The water backed up by this dam will form a lake called Shadow Mountain, the name of a nearby mountain, which will have a surface area of 1,356 acres. The elevation of this lake will be the same as Grand Lake and connected with it by means of the present outlet.

### NORTH FORK DIVERSION DAM

The dam proper is a concrete gravity overflow spillway section, 90 feet long, with crest elevation at 8,370. This spillway is designed for maximum discharge of 1,800 cubic feet per second. On each side of the overflow section is a concrete gravity section containing three automatic siphon spillways on each side. The total spillway capacity is 9,400 cubic feet per second.

The total estimated cost is $483,928.

### GRANBY PUMPING PLANT

As stated before, the water surface elevation of Granby Reservoir is 8,275 and the water surface of Shadow Mountain and Grand Lakes is 8,369. In order to get the water stored in Granby Reservoir into Shadow Mountain Lake and available for delivery through the Continental Divide tunnel, a pumping plant is located on the north shore of Granby Reservoir about one-half mile above the junction of the South Fork with the Colorado. A granite spur juts out into the reservoir site at that point making it ideal for the intake tunnels and a shaft for the pump.

The proposed pumping plant will contain three motor-driven vertical-shaft pumping units having a total capacity of 900 cubic feet per second with full reservoir and 550 cubic second-feet at low water. At normal water surface the capacity will be 870 cubic feet per second.

Each pump will be driven by a 6,500-horsepower synchronous motor.

Power will be delivered to the plant from a 69,000-volt transmission line extending from power plant no. 1 just below Estes Park, around the Rocky Mountain National Park, and crossing the Continental Divide at Buchanan Pass about 5 miles south of the park boundary.

The water from the pumps empties into a canal of 900 cubic second-feet capacity and runs by gravity into Shadow Mountain Lake. It is planned to operate this canal all winter when temperatures get as low as 40° below zero. The latent heat in the water and the friction heat absorbed from the pumps will prevent this water from freezing and will keep quite an area open after the water reaches Shadow Mountain Lake.

The total estimated cost of the pumping plant is $1,250,000.

The total estimated cost of the pump canal is $417,553.

### CONTINENTAL DIVIDE TUNNEL

The west tunnel portal is connected with Grand Lake by means of a channel constructed 67.5 feet in width and 15 feet in depth. At the lake end of this channel a permanent concrete barrier or weir will be placed with a crest elevation at 8,368 which would be the minimum elevation to which the water in Grand Lake could be drawn. Since the barrier is so constructed that it requires the water to be 1 foot in depth over it to supply the normal capacity of the tunnel, the normal elevation of Grand and Shadow Mountain Lakes would be 8,369 feet.

The present maximum fluctuation of Grand Lake is about 4 feet, or from an elevation of 8,368 in winter to 8,372 feet during the peak run-off from melting snow. The automatic control gates at the North Fork Diversion Dam and at tunnel inlet will so control the elevation of the water surface in Grand Lake that it would never fluctuate more than 1 foot.

The Continental Divide tunnel extends from the easterly end of Grand Lake to Wind River, southwest of Estes Park, with an azimuth of 242° 20′ 30″, and length of 69,023 feet. It is to be horseshoe shape 9.5 feet in diameter and lined throughout with a 9-inch concrete lining.

It will be located entirely in pre-Cambrian rock consisting of the Longs Peak and related granites and the gneisses and schists of the Idaho Springs formation. The granites are strong massive rocks. Gneisses predominate over schists and only a small proportion have prominent and continuous cleavage planes. The proportion of granite to gneiss and schist is approximately 4 to 1.

From a detailed geological survey of the tunnel and comparing it with conditions actually encountered in the Moffat Railroad tunnel, which was built under the Continental Divide for the Denver & Salt Lake Railroad, and about 25 miles due south of this one, it was estimated there would be only 400 feet of bad ground and 5,200 feet of ground needing support. However, for purposes of estimate, it was figured there would be 6,900 feet of bad ground and 17,500 feet of ground needing support.

The total estimated cost is $7,271,371.

### POWER CONDUIT NO. 1

Power conduit no. 1 extends from the east portal of the Continental Divide tunnel in Wind River to the penstock of power plant no. 1 on the northeast slope of Prospect Mountain.

Both ends of the Continental Divide tunnel are without the national-park boundaries but the area east of the east portal is authorized by Congress to be taken in, through that area. The water will be taken through a closed conduit consisting of a 10-foot reinforced concrete pipe completely buried. The total length of power conduit is 5.36 miles, of which 1.86 miles is closed conduit, 1.19 miles is concrete lined tunnel, 0.98 mile is siphon, and the remainder is open canal.

The total estimated cost of power conduit no. 1 is $1,101,000.

### POWER PLANT NO. 1

Power plant no. 1 will be located on the south bank of the Big Thompson River about one-half mile east of Estes Park. It will contain two 15,000 kilovolt-ampere generating units with auxiliaries. Each unit will consist of a vertical-shaft, single-runner, spiral-casing type hydraulic turbine operating under an effective head of 705 feet direct connected to a 15,000 kilovolt-ampere water-wheel type generator. A complete description with cost estimate will be found in Power and Pumping Summary.

Until there has developed a sufficient market for power to justify the construction of power plants nos. 2 and 3, the water will be turned into the Big Thompson at power plant no. 1 and carried by that stream to a diversion dam located in SE¼ sec. 1, T. 5 N., R. 71 W., about midway between the present diversion dam and power plant for the town of Loveland, Colo.

### POWER CANAL NO. 4

From this diversion dam the water will be carried in a canal of 750 cubic second-feet capacity on the south side of the stream a distance of 4.93 miles to a point just above the mouth of the Big Thompson Canyon. At this point a portion of the water will drop direct into the Big Thompson River to supply the supplemental water demands of that stream and a portion will be siphoned across to elevation 5,450 to supply the canal going to the Poudre River, which will be described later. Power plants nos. 4 and 4–A will be constructed at this point to take advantage of a fall of 550 feet into the Thompson and 358 feet to the Poudre Canal when the power market justifies.

### CARTER LAKE SUPPLY CANAL

About 3.07 miles below the diversion dam mentioned above, a canal of 300 cubic feet per second takes off toward the south and supplies Carter Lake.

This canal is 8.78 miles in length, of which 7,040 feet is tunnel 1,878 feet siphon, and the remainder is open canal.

The estimated cost of this supply canal is $710,629.

### CARTER LAKE RESERVOIR

This site is located in Ts. 4 and 5 N., R. 70 W., of sixth principal meridian, about 1 mile north and 7 miles west of Berthoud, Colo.

The reservoir will occupy a valley about 2¾ miles long and from one-half to 1 mile wide. The northern portion of the area is a natural

basin called Carter Lake. This lake dried up during the last 5 drought years, for the first time within the memory of the white settlers.

The proposed maximum water surface in the reservoir is at elevation 5,760 with a capacity of 111,963 acre-feet. The area of high water line is 1,150 acres. For this water surface three dams will be required. Dam no. 1 is located at the natural outlet of the valley and will contain the outlet works for the reservoir; the other two dams will occupy saddles. These dams are earth and rock fill; the main dam is 243 feet high, and the saddles 43 and 48, respectively.

The capacity of the outlet to St. Vrain supply canal is 300 cubic feet per second, the outlet to the Big Thompson has a capacity of 1,000 cubic feet per second.

The total estimated cost of the reservoir is $1,822,202.

### ST. VRAIN FEEDER CANAL

A canal of 300 cubic feet per second capacity will extend from the small outlet of Carter Lake to the St. Vrain, reaching the St. Vrain high enough to supply all ditches.

The length of this canal is 9.76 miles with 3,445 feet in tunnel, 1,575 feet of siphons, and the remainder open canal.

The estimated cost of the St. Vrain feeder is $368,951.

### BIG THOMPSON FEEDER

About one-half mile below Carter Lal e Dam a canal will be taken out of the draw leading from the dam, and will run into Cottonwood Creek, a tributary of the Big Thompson. This canal will have a capacity of 1,000 cubic feet per second and be 5.37 miles in length.

The cost is estimated at $155,246.

### HORSETOOTH SUPPLY CANAL

This canal starts at the end of a siphon across the Big Thompson from power conduit no. 4. This water will pass through power plant no. 4-A when constructed. The canal starts at elevation 5,450 with a capacity of 250 cubic feet per second. The structures, however, are designed for a capacity of 400 cubic feet per second on the theory that some time in the future it might be necessary to increase the capacity of the canal to that amount. The length of this canal is 9.88 miles, of which 12,863 feet is tunnel, 3,296 feet is siphons, and the remainder open canal.

The elevation of 5,450 was chosen because it not only puts the water above all present diversions on the Poudre River, but it afforded the most direct and economical route.

The estimated cost of this feeder is $1,208,391.

### HORSETOOTH RESERVOIR

The proposed Horsetooth Reservoir will occupy a valley 6 miles long and from one-quarter to three-quarters miles wide, extending in a north-south direction, formed by the erosion of soft red beds of Lykens formation between harder ridges of Lyons on the west and Dakota sandstone on the east. There are three natural outlets to the east through the Dakota hogback, namely, Soldier, Dixon, and

Spring Canyons, which are the sites of three proposed dams of the same names. The fourth proposed dam, Horsetooth, will cross the valley at the north end on a low saddle separating the valley from drainage to the north into the Poudre River. The outlet will be through the Horsetooth Dam saddle. There are no outlets through the other dams. The proposed water surface is at 5,400 feet in elevation which gives a capacity of 96,756 acre-feet. The area flooded will be 1,513 acres. The outlet capacity was designed for 1,200 cubic feet per second with reservoir full. This large capacity is necessary as the irrigation use requires that the entire amount of supplemental water be delivered at a rate that would supply it in 60 days.

The advantages of a reservoir at this point are: It is high enough to supply all users from the main Cache La Poudre River and is located close to it. It takes the place of 6 miles of canal through rough country and allows a canal of 250 cubic second-feet to be constructed from the Big Thompson instead of one for 1,000 cubic feet per second.

The estimated cost of the reservoir is $3,625,021.

### POUDRE FEEDER CANAL

From the outlet of Horsetooth Reservoir a canal of 1,000 cubic second-feet capacity will extend north to Lewstone Creek, a tributary of the Poudre. The water will run down this creek to the Poudre above all the diversions except the Poudre Valley.

### POUDRE VALLEY FEEDER CANAL

A canal will extend from Lewstone Creek to the Poudre Valley Canal about 1 mile below its headgate, crossing the Poudre River in a siphon. This canal will have a capacity of 400 cubic feet per second to take care of the supplemental demands of the Poudre Valley Canal and also the demands of the North Poudre irrigation district. The total length of the two canals is 5.48 miles.

The cost of the Poudre Feeder and Poudre Valley Canals is estimated at $632,843.46.

### NORTH POUDRE FEEDER CANAL

It is planned to enlarge the Poudre Valley Canal for a distance of 3.58 miles from the point the supply canal enters to the location of the pumping plant for the North Poudre district. This will enlarge the canal from a capacity of 500 to 750 cubic feet per second and the estimated cost is $11,436.

### NORTH POUDRE PUMPING PLANT

This pumping plant, constructed on the banks of the Poudre Valley Canal, will consist of two 75 cubic second-feet capacity vertical synchronous motor driven single stage pumps, operating against an effective head of 187 feet.

The estimated cost is $200,000.

### NORTH POUDRE FEEDER CANAL

This canal of 150 cubic second-feet capacity extends from the pressure outlets of the pumping plant to the North Poudre Canal, a distance of 9.98 miles.

The estimated cost is $128,889.

### ARKINS RESERVOIR

This reservoir is located on Buckhorn Creek, a tributary of the Big Thompson, in Tps. 5 and 6 N. R. 70 W., sixth principal meridian, and about 8 miles northwest of Loveland, Colo. The object of this reservoir is to provide storage for Colorado River waters brought over in the wintertime and to be used to supply supplemental water on the lower South Platte in water districts 1, 2, and 64. It will also serve in connection with the use of the 16,000 acre-feet of floodwater now available on the Big Thompson.

The bringing of more of the supplemental water over in the wintertime aids materially in the production of a maximum amount of power out of the waters of the Big Thompson River. For that reason the entire cost of the inlet to Arkins Reservoir and one-half the cost of the reservoir itself is assessed against power and paid for out of power revenues from plant no. 1.

The capacity of Arkins Reservoir is 50,000 acre-feet with a high water line at 5,275 feet elevation and floods 929 acres of land.

The dam site occupies a notch cut through the Dakota sandstone ridge by Buckhorn Creek.

The main dam is an earth- and rock-fill structure 155 feet in height with an outlet capacity of 650 cubic feet per second and a spillway of 10,000 cubic second feet capacity.

There is a saddle dam, in addition to the main dam of earth- and rock-fill construction, 50 feet maximum height, built across a saddle at the southern extremity of the reservoir.

The total estimated cost of the reservoir and dam is $1,740,737.

The estimated cost of the Arkins Reservoir inlet is $351,488.

This inlet diverts from the Big Thompson River just below the dam of the Handy Canal and follows around the north side of the river a distance of 2.33 miles to Arkins Reservoir.

### ROCKY MOUNTAIN NATIONAL PARK

Every effort has been made in the survey and design of this project to not disturb the natural beauties of the Rocky Mountain National Park and its surrounding areas. The Continental Divide tunnel was lengthened 1.6 miles in order that its extremities should fall outside the boundaries of the park. The conduit leading from the east portal of the tunnel to power plant no. 1 is to be buried and the surface landscaped through the area authorized by Congress to be added to the park. The waste from the east portal of the tunnel placed in this area is to be terraced and planted with evergreen trees. The waste from the west portal is to be used to fill up some low areas and render the area suitable for the building of summer homes.

The approach to the Western Gateway of the Rocky Mountain National Park will be along the shores of Shadow Mountain Lake with

its fluctuation of only 1 foot instead of the swampy area that now breeds mosquitoes and exposes mud flats in low water.

The bill authorizing the creation of the Rocky Mountain National Park reserved the right for the Bureau of Reclamation to survey and construct an irrigation project within the boundaries of the park.

## OPERATION OF THE SYSTEM

### IRRIGATION PROJECT OPERATIONS

The system is planned and it is anticipated that it will be operated in a manner to have the water available in Carter Lake, Horsetooth and Arkins Reservoirs available by July 1, to the full capacity of those reservoirs, 256,000 acre-feet.. The usual demand for supplemental water begins July 1 to 15 and extends to September 15 to 30. The outlets of the reservoirs are planned to deliver the water from the reservoirs in 60 to 75 days, including the water that must pass through them for direct delivery that may be in the way of being transferred from the Colorado River Basin to the eastern slope during the period of irrigation application. The balance of the 310,000 acre-feet, or 54-000 acre-feet, will be available for direct irrigation use as brought over during the above period or to some extent may be required prior to July 1.

The run-off of the waters of the Colorado River here contemplated to be used will largely be secured from the melting snows during May, June, and early July and stored in the Granby Reservoir. During the fall of that year, winter and spring of the following year, the water will be transferred from the Granby Reservoir through the Continental Divide tunnel at a uniform rate and restored in the Carter Lake, Horsetooth, and Arkins Reservoirs. This will permit a flow that is well suited to the development of firm power through the five power plants that will eventually be constructed along the Big Thompson as shown on the map of the general layout.

Granby Reservoir will act as a hold-over reservoir to carry the water from years of excessive run-off to years of subnormal flow.

### POWER PROJECT OPERATION

Water will be carried through the Continental Divide tunnel at a uniform flow for the generation of power at the several power plants, except that the quantity will be reduced during the summer season when some water from the Big Thompson is available for power purposes in power plants nos. 2, 3, 4, and 4–A. At this period there will be little or no demand for power for pumping at the Granby pumping plant, which will permit the cutting down of the quantity of water to take care of the commercial power load.

It is planned to construct the Granby pumping plant and the Granby pump canal 150 percent of the capacity of the Continental Divide tunnel. This will permit the operation of the pumping plant at full capacity with off-peak power, and reduce the amount of pumping with firm power. The varying discharge of the pump ditch during the 24-hour period will be equalized by the Shadow Mountain and Grand Lakes, so that a uniform discharge will be maintained through the Continental Divide tunnel. The range in height of water surface in Shadow Mountain and Grand Lake to equalize this

flow will not exceed two-tenths of a foot, and will be greatest in the winter and early spring months.

There is an average of 16,000 acre-feet of surplus water on the Big Thompson available for storage in the system mainly in May and June. In order to take this water into the reservoirs it will be necessary to reserve capacity in the three reservoirs on the eastern slope until toward the latter part of June. The snowfall, the main source of this water supply, will be known well in advance so that operations of the several parts of the system, including the production of power at the several power plants, can be adjusted to take care of this water and hold back an equal amount in Granby Reservoir.

## TENTATIVE PROJECT FINANCIAL SET-UPS

This proposed development consists of two projects: first, the irrigation project, and second, the power project.

It is planned that those features of the development that are used mainly for irrigation are grouped under the irrigation project set-up, while those used entirely, or are made of a greater capacity because of power development, are grouped in whole or in part in the power project set-up.

### IRRIGATION PROJECT

The following major features with their appurtenant structures are given with the estimated field costs including 10 percent for engineering and 15 percent for contingencies. The full capacity of Arkins Reservoir is necessary to develop a larger portion of firm power than would otherwise be possible without it. At the same time, a reservoir of half its capacity or additional capacity in Horsetooth or Carter Lake Reservoirs would be necessary to provide capacity to deliver the irrigation water as needed. It is, therefore, deemed equitable to divide the cost of this reservoir equally between the irrigation and power projects.

The Green Mountain Reservoir, with a capacity of 152,000 acre-feet, is larger than is necessary to furnish replacement for a like amount of water diverted by the project above Granby Dam at a time when it would be required for irrigation, present and future, and to furnish the Shoshone power plant 1,250 second-feet or such lesser amount that they would be entitled to receive if the proposed project was not operating. From studies made, it appears that 50,000 acre-feet will be sufficient to replace all the water that the proposed project will take at a time when required for use lower down in the stream within the State. Therefore 52,000 acre-feet of the Green Mountain Reservoir capacity is allocated for replacement (including evaporation losses) and charged to the irrigation project. The balance of the capacity or 100,000 acre-feet is allocated to the power project and is to be paid for out of power revenues.

The following is a summary of the irrigation project costs:

*Estimated cost chargeable to irrigation feature*

| | |
|---|---|
| Willow Creek feeder canal | $733,203 |
| Granby Reservoir | 2,813,703 |
| Granby pumping plant | 1,250,000 |
| Granby pump canal | 417,553 |
| North Fork diversion dam | 483,928 |
| Continental Divide tunnel | 7,271,371 |

*Estimated cost chargeable to irrigation feature*—Continued

| | | |
|---|---|---|
| Carter Lake supply canal | | $710,629 |
| Horsetooth supply canal | | 1,208,391 |
| St. Vrain feeder canal | | 368,951 |
| Big Thompson feeder canal | | 155,246 |
| Poudre feeder canal | | 632,843 |
| Poudre Valley feeder canal | | 11,436 |
| North Poudre feeder canal | | 128,889 |
| North Poudre pumping plant | | 200,000 |
| Horsetooth Reservoir | | 3,625,021 |
| Arkins Reservoir | | 1,859,323 |
| Carter Lake Reservoir | | 1,925,253 |
| Green Mountain Reservoir (52,000 acre-feet replacement) (100,000 acre-feet for power) | | 3,776,032 |
| Improvement of Colorado River above Kremmling to maintain fishing and to adjust the present irrigation system to the altered conditions | | 300,000 |
| | | 27,871,772 |
| Less the following items tentatively chargeable to power: | | |
| One-half cost of Arkins Reservoir | $929,661 | |
| Portion of cost of Green Mountain Reservoir for 100,000 acre-feet | 2,276,032 | |
| | | 3,205,693 |
| Cost of irrigation features | | 24,666,079 |
| Say | | 24,800,000 |

## REPAYMENT

Twenty-four million eight hundred thousand dollars upon 310,000 acre-feet at $80 per acre-foot.

Two dollars per acre-foot on 40-year repayment basis.

In the above repayment is predicated upon the contracts to be made upon a basis of 310,000 acre-feet. Beside the 320,000 acre-feet available from the Colorado River drainage there is an average of 16,000 acre-feet available for storage on the Big Thompson, making 336,000 acre-feet in all, leaving 26,000 acre-feet for losses on the eastern slope and for the uncertain, heretofore mentioned in operations on the western slope.

The power costs are shown under the heading "Power and pumping system."

The construction of power plant no. 1 as shown in the power set-up is a necessary development in order to secure power for pumping purposes at the Granby pumping plant.

## POWER AND PUMPING SYSTEMS

The ultimate power and pumping system is proposed to consist of the major pumping plant at Granby, power plant no. 1 near the town of Estes Park, power plant no. 2 near Drake post office, power plant no. 3 at Cedar Cove, power plants nos. 4 and 4–A near the mouth of the Big Thompson Canyon, and power plant no. 5 at the Green Mountain Reservoir. If conditions justify, there may also be a pumping plant on the Poudre River near the point where the proposed Poudre supply canal crosses the river. Power plant no. 5, Granby pumping plant, and power plant no. 1, would be interconnected by a single circuit 69,000-volt transmission line. Power plants nos. 1 to 4–A, inclusive, would be interconnected by two 115,000-volt transmission lines and these same lines would extend to one or more load centers where the power could be disposed of commercially.

The buildings for the power and pumping plants would be of reinforced concrete construction of suitable size to house the machinery and provide space for such facilities as would be required for efficient and economical operation. For scenic reasons, special care would be taken in the architectural design of the buildings to make them blend in with the beauties of the surrounding territory so as to be both as inconspicuous as possible and also as artistic as feasible without undue expenditure. An artist's sketch of one of these buildings is included with the report.

Following is a tabulation covering the essential data for each of the power and pumping plants:

*Power plants*

| Plant designation | Effective head in feet | Turbine capacity in cubic feet per second | Power available in horsepower | Number of units | Size of each unit in horsepower | Installed power in kilowatts |
|---|---|---|---|---|---|---|
| No. 1 | 704 | 550 | 38,800 | 2 | 20,000 | 30,000 |
| No. 2 | 1,195 | 550 | 65,800 | 2 | 34,000 | 50,000 |
| No. 3 | 328 | 550 | 18,000 | 2 | 9,000 | 13,500 |
| No. 4 | 550 | 400 | 22,000 | 1 | 22,000 | 16,000 |
| No. 4-A | 381 | 250 | 9,500 | 1 | 9,500 | 7,000 |
| No. 5 | 225 | 1,500 | 33,800 | 2 | 17,000 | 26,000 |
| Total installed power in kilowatts | | | | | | 142,500 |

*Pumping plants*

| Plant designation | Head in feet | Pump capacity in cubic feet per second | Capacity of each pump in cubic feet per second | Number of pumps | Rating of each motor in horsepower | Power required in kilowatts |
|---|---|---|---|---|---|---|
| Granby | 130 | 870 | 290 | 3 | 6,500 | 15,000 |
| Poudre | 187 | 150 | 75 | 2 | 2,000 | 3,000 |
| Total installed pumping, kilowatts | | | | | | 18,000 |

## POWER PLANT NO. 1

Power plant no. 1 will be located on the south bank of the Big Thompson River about one-half mile east of the village of Estes Park and will contain two 15,000 kilovolt-ampere generating units with auxiliaries. Each unit will consist of a vertical-shaft, single-runner, spiral casing type hydraulic turbine operating under an effective head of approximately 705 feet and direct connected to a 15,000 kilovolt-ampere water-wheel type generator with direct connected exciter and pilot exciter. Water would be supplied to each turbine through a steel penstock approximately 5,000 feet long, with synchronous bypasses provided so that the flow through the penstock can be discharged either through the turbines or the bypasses into the Big Thompson River. The bypasses will be mechanically connected to the turbine gate operating mechanism so that rapid governing of the units under varying load conditions can be effected without creating excessive water hammer. Trashracks with shut-off gates for

each penstock will be provided in the forebay structure. The headgates will be controlled from the power plant. A spillway will be provided to care for the flow when the headgates are closed and the penstocks inoperative. The plant will be equipped with all necessary auxiliaries, including a traveling crane for handling the large pieces of equipment. A small machine shop will be provided for making minor repairs. An outdoor type substation with self-cooled transformers will be provided for stepping the voltage up to 69,000 for transmission to the Granby pumping plant, and to 115,000 volts for transmission to commercial markets. The substation structure will be of the conventional structural steel type with high voltage oil circuit breakers, lightning arresters and necessary auxiliaries. The control of the oil circuit breakers will be from the main power plant switchboard. Operators' quarters, a warehouse, and a large machine shop for general project repairs will be provided in the vicinity of the power plant.

### POWER PLANT NO. 2

Power plant no. 2 will be located about one-half mile northwest of Drake, on the south bank of the north fork of the Thompson River just above its junction with the Big Thompson. The plant will contain two 25,000-kilovolt-ampere generating units of the horizontal shaft type. The net head will be approximately 1,195 feet. Each unit will consist of a double overhung impulse wheel hydraulic turbine with the generator mounted in the center, between the two runners. A direct connected exciter and pilot exciter will be mounted at one end. Water will be delivered to the turbines through two steel penstocks about 4,150 feet long. Each penstock will be provided with two branches to the turbine nozzles and each branch will be provided with a synchronous bypass arranged so that the flow through the penstock can be discharged through either the nozzles of the bypasses to the river. The bypasses will be mechanically connected to the turbine nozzle operating mechanism so that rapid governing can be effected under varying load conditions without excessive water hammer. The head-gate structure will be provided with trash racks and sliding gates at the end of the penstocks and a spillway to care for the flow when the gates are closed. The plant will be complete with all necessary auxiliaries for station service requirements and with a crane for handling the machinery. A structural steel outdoor type substation will be provided with self-cooled transformers for stepping the voltage to 115,000 volts, and with outdoor type oil circuit breakers, lightning arresters, and other necessary auxiliaries. The operation of the substation will be handled from the main switchboard of the power plant. Quarters for the operators will be provided adjacent to the power plant.

### POWER PLANT NO. 3

Power plant no. 3 will be located about one-half mile east of the Loveland power-diversion dam on the north bank of the Big Thompson River. The plant will contain two 6,500 kilovolt-ampere generating units, each consisting of a vertical hydraulic turbine direct connected to a generator with main exciter and pilot exciter. The effective head will be approximately 328 feet. Water from the head-gate structure will be delivered to the turbines through steel

pen stocks about 650 feet long. Each pen stock will be provided with a synchronous bypass arranged so that the flow through the pen stock can be discharged either through the turbines or the bypasses to the Big Thompson River, and to allow rapid governing of the units without excessive water-hammer. The head-gate structure will be provided with trash racks and sliding gates at the head of the pen stocks and a spillway to care for the flow when the gates are closed. The plant will be complete with all necessary auxiliaries for station-service operation, and with a crane for handling equipment. The plant will be provided with a structural-steel outdoor-type substation similar to that proposed for plant no. 2.

### POWER PLANTS NOS. 4 AND 4–A

Power plant no. 4 will be located about 2 miles east of Cedar Cove on the south bank of the Big Thompson River, while power plant no. 4–A will be located a short distance upstream from plant no. 4, and at an elevation about 175 feet above the river. The capacity of plant no. 4 will be 16,000 kilovolt-amperes and of plant no 4–A, 7,000 kilovolt-amperes. One unit only will be provided at each plant and will consist of a vertical-shaft, single-runner, spiral-casing type turbine direct connected to a vertical water wheel generator with direct connected main and pilot exciters. Plant no. 4 will have an effective head of about 550 feet, and plant no. 4–A, 380 feet. Plant no. 4 will receive its water through a single steel penstock about 1,960 feet long, and plant no. 4–A, through a similar pipe about 1,400 feet long. Each plant will be provided with synchronous bypasses similar to those in plants nos. 1 and 3. Plant no. 4 will discharge directly into the Big Thompson River. Plant no. 4–A will be siphoned under the river through a pressure tunnel to the proposed Poudre supply canal, but will have provisions so that if so desired, the water may be discharged directly into the Big Thompson River. The headgate structure will be provided with trashracks, sliding gates, and spillways similar to those in plants nos. 1, 2, and 3. A single outdoor structural steel type switchyard will be provided for the two plants. The equipment in this substation will be similar to that for plants nos. 1, 2, and 3. Plant no. 4–A will be remotely controlled from plant no. 4, so that the two plants can be operated with one set of operators. The plant will be complete with auxiliaries and cranes similar to that in other plants. Quarters for the operators will be provided in the vicinity of the plants.

### POWER PLANT NO. 5

Power plant no. 5 will be located about 12½ miles southeast of Kremmling, on the east bank of the Blue River, immediately downstream from the dam forming the proposed Green Mountain Reservoir. The plant will contain two 13,000 kilovolt-ampere generating units of the vertical hydraulic-turbine driven type, with direct connected generator with main and pilot exciters. The plant will have a varying head depending upon reservoir water surface, but it is expected that the average head will be about 225 feet. The trashrack and intake structure will be located immediately upstream from the dam and a single steel penstock installed in the tunnel will conduct the water to the power plant. Each turbine will be provided with a

pressure regulator or relief valve to limit the water hammer under sudden change of load conditions. The plant will be complete with necessary auxiliaries for station service, a small machine shop for minor repairs, and a crane for handling equipment. An outdoor structural steel substation will be provided complete with equipment for stepping the voltage up to 69,000 volts for transmission and with oil circuit breakers and other necessary auxiliaries for the control and protection of the lines and equipment. The oil circuit breakers will be controlled from the main switchboard of the power plant. Quarters for operators will be constructed in the vicinity of the power plant.

### GRANBY PUMPING PLANT

The Granby pumping plant will be located approximately 6 miles south of the village of Grand Lake on the north shore of the proposed Granby Reservoir. The plant will contain three motor-driven vertical-shaft pumping units having a total capacity of 900 second-feet at full reservoir, and 550 second-feet at low water. The total capacity at the normal water surface will be approximately 870 second-feet. The motors will be of the synchronous type and arranged for semi-magnetic operation. That is, the operator will be required only to close the main switch to the unit in order to place it in operation, and to open the same switch to discontinue operation. The motors will be equipped with direct connected exciters. The water from the Granby Reservoir will be delivered to the pumps through tunnels about 155 feet long. A channel in the reservoir will convey the water to the mouth of the intake tunnels in extreme low water. Water from each pump will be discharged through about 175 feet of tunnel, and 165 feet of steel pipe to the canal at elevation approximately 8,381. This canal, which will be approximately 4 miles in length, will discharge into the proposed Shadow Mountain Lake. The center line of each pump and propeller will be at approximately elevation 8,145, with the base of the motor driving the pump 135 feet above, or at elevation 8,280. Vertical shafts in the rock between the underground pump room and the motor room on the surface will accommodate the shafts connecting the pumps to the motors. Each pump will have a capacity of 290 second-feet when operating under a total dynamic head of 130 feet and will be driven by a 6,500-horsepower synchronous motor.

The entrances to the intake tunnels will be provided with trashrack and stop-log structures, and sliding gates will be installed at the intake and discharge of each pump. The intake gates will be located in the gallery adjoining the pump room and will be hydraulically operated. The discharge gates will be located at the head of the canal and will be of a type which will close automatically in the event power service is interrupted, so as to prevent water in the canal from running back down through the pump.

The pumping plant will be complete with auxiliary pumping units for unwatering the intake and discharge tunnels and the drainage sump. It will also be complete with all other necessary station auxiliaries, including a crane for handling the equipment. A small machine shop will be provided for making minor repairs. Quarters for the operators will be provided in the vicinity of the plant.

Power will be delivered to the plant from a 69,000-volt transmission line, through an outdoor structural steel type substation containing self-cooled transformers, together with all necessary protective appa-

ratus and auxiliaries. The operation of the substation will be handled from the main switchboard of the pumping plant.

### POUDRE PUMPING PLANT

The Poudre pumping plant will be located on the Poudre Valley Canal at a point about 3 miles below the crossing of the proposed Poudre supply canal. It is proposed to have a capacity of 150 second-feet, composed of two 75-second-foot vertical synchronous-motor-driven single-stage pumps, operating against an effective head of 187 feet. The plant will be complete with all necessary auxiliaries, including a crane for handling the equipment. An outdoor substation will be provided for stepping the voltage down from transmission voltage to motor voltage. Due to the relatively short periods of operation, it is not probable that it will be necessary to construct operator's quarters at this plant.

### TRANSMISSION SYSTEM

The transmission system will consist of a single 69,000-volt circuit connecting power plant no. 5 with the Granby pumping plant and power plant no. 1. Power plants nos. 1 to 4–A, inclusive, will be connected by two 115,000-volt lines and two 115,000-volt lines will continue to market. For the purpose of this report only, and to include a sufficient amount in the cost estimates for any probable transmission set-up, this market has been assumed as the valmont steam plant of the Public Service Co. of Colorado. Power plant no. 4 will be connected with the Poudre pumping plant by one 34,500-volt transmission line. The number of lines and mileage involved in each are as shown in the following tabulation:

| From— | To— | Number of lines | Number of miles | Voltage |
|---|---|---|---|---|
| Power plant no. 5 | Ka Rose | 1 | 36 | 69,000 |
| Granby pumping plant | Grand Lake | 1 | 10 | 69,000 |
| Do | Power plant no. 1 | 1 | 36 | 69,000 |
| Power plant no. 1 | Power plant no. 2 | 2 | 12 | 115,000 |
| Power plant no. 2 | Power plant no. 3 | 2 | 3 | 115,000 |
| Power plant no. 3 | Power plant no. 4 | 2 | 4 | 115,000 |
| Power plant no. 4 | Valmont | 2 | 27 | 115,000 |
| Do | Poudre pumping plant | 1 | 18 | 34,500 |

The line to the Poudre pumping plant would be a wood-pole line with pin-type insulators. All other lines would be of the wood-pole, H-frame type, with suspension insulators, and combining all of the most modern features for continuity of service, ease of maintenance, and long life. The line from power plant no. 1 to the Granby pumping plant will probably require special construction to give added strength in the mountainous region near the Continental Divide.

In order to provide power for construction, it is proposed that one of the first features of the project would be to build one of the permanent 115,000-volt circuits from the Valmont plant to plant no. 1, the permanent 69,000-volt lines from plant no. 1 to Granby pumping plant and from Ka Rose to the Green Mountain dam site, and an extension from the Granby Pumping Plant to the west portal of the pro-

posed tunnel. Initially this entire line would be operated at 69,000 volts, and under such operation would be adequate for all contemplated construction activities. In connection with supplying construction power it would also be necessary to install a substation at the Valmont steam plant to step voltage up to 69,000 volts for transmission. Preliminary studies indicate that it would be advisable to make this substation of approximately 5,000 kilovolt-ampere capacity.

The estimated cost of installing the facilities to provide construction power are as indicated in the following tabulation:

| From— | To— | Miles | Cost | |
|---|---|---|---|---|
| | | | Per mile | Total |
| Valmont | Power plant no. 2 | 34 | $6,750 | $229,500 |
| Power plant no. 2 | Power plant no. 1 | 12 | 4,100 | 49,200 |
| Power plant no. 1 | Granby pumping plant | 36 | 3,600 | 129,600 |
| Granby pumping plant | Grand Lake | 10 | 3,200 | 32,000 |
| Ka Rose | Power plant no. 5 | 36 | 3,600 | 129,600 |
| Total transmission lines | | 128 | | 569,900 |
| Substation at Valmont | | | | $61,300 |
| Total to supply power for construction | | | | 631,200 |

The transmission system as provided to furnish construction power would be adequate for transmission of power to markets from power plant no. 1 or power plant no. 5 if either were built individually, but the additional complete system would probably be constructed when two or more plants are constructed. The additional costs of the lines involved in this construction are shown in the following tabulation:

| From— | To— | Miles | Cost | |
|---|---|---|---|---|
| | | | Per mile | Total |
| Power plant no. 1 | Power plant no. 2 | 12 | $4,100 | $49,200 |
| Power plant no. 2 | Valmont | 34 | 6,750 | 229,500 |
| Power plant no. 4 | Poudre pumping plant | 18 | 1,800 | 32,400 |
| Total additional cost of permanent transmission system | | 64 | | 311,100 |

In addition to the transmission lines required for the disposal of power, it may be necessary that the Government also construct a substation at the point of power disposal. As a market survey has not been conducted to establish the points at which this power can be disposed of, or the quantities involved at each point of disposal, it is assumed for the purpose of this report that the substations will average in cost $10 per kilowatt of capacity. Assuming that provision is made to dispose of a peak capacity of 140,000 kilowatts, this will involve an additional expenditure of $1,400,000.

## POWER OUTPUT

Water supply studies indicate that with power plant no. 1 only constructed, there is available, above all requirements for pumping purposes, a constant power output at 100 percent load factor of 120,000,000 kilowatt-hours per year. Since the pumping plant capac-

ity proposed is sufficient to allow pumping to be done in 16 hours of each day it will be possible to handle peak commercial power requirements without undue interference. With this in mind, it has been assumed for the purpose of this report that a market can be found which has a load factor such that 60 percent of this power or 72,000,000 kilowatt-hours per year can be absorbed as firm energy. The balance of this energy, or 48,000,000 kilowatt-hours per year, plus about 40,000,000 kilowatt-hours additional, which is available during various parts of the year, is classed as secondary energy.

Since the Valmont steam plant of the Public Service Co. of Colorado has an installed capacity of 75,000 kilowatts, it appears that the 88,000,000 kilowatt-hours of secondary energy could be absorbed as a fuel saving measure if the price does not exceed fuel costs. Allowing 10 percent for line losses, this is equivalent to an average load of about 9,000 kilowatts.

## FINANCIAL OPERATION OF POWER SYSTEM

It is contemplated that the initial power development would consist of the construction of power plant no. 1 only, together with such transmission lines and substations as are required to supply power to the Granby pumping plant and to commercial markets. The estimated construction cost of the strictly power features, as well as items which it is expected that power revenues will repay, is given below.

It is assumed that 5 mills per kilowatt-hour can be secured for firm energy and 1.8 mills per kilowatt-hour for secondary energy with delivery at the market. In each case 10 percent loss is allowed for transmission. The following gives the financial set-up for power plant no. 1, operation costs and returns.

While for the purpose of this report the allocation of construction cost to irrigation and power has been made on the basis set out below, it is understood that this allocation is not thereby fixed, and the same may be changed as further information may warrant until such time as the contract for repayment of the cost of the irrigation features has taken final form.

*Power plant no. 1 construction costs*

| | |
|---|---|
| Power plant no. 1 near Estes Park | $1,778,000 |
| Conduit from east portal continental divide tunnel to power plant no. 1 | 1,101,000 |
| Transmission lines connecting power plant no. 1 with Granby pumping plant—with Valmont and line to North Poudre pumping plant | 440,000 |
| Commercial substation (30,000 kilowatts) | 300,000 |
| Headquarters at power plant no. 1 for operation of power system | 100,000 |
| Subtotal | 3,719,000 |
| Interest during construction, 3 percent | 112,000 |
| Total repayable in 50 years with interest | 3,831,000 |
| One-half cost of Arkins Reservoir | 929,661 |
| Portion of cost Green Mountain Reservoir, for 100,000 acre-feet allocated to power | 2,276,032 |
| Payable on 40-year basis without interest | 3,205,693 |
| Total cost power plant no. 1 including other items that are required to be accomplished with the initial development | 7,036,693 |

*Annual revenues from power plant no. 1*

| | |
|---|---|
| From sale of 65,000,000 kilowatt-hours firm power, at $0.005 | $325,000 |
| From sale of 79,000,000 kilowatt-hours secondary power, at $0.0018 | 142,000 |
| From rental of water for power development to privately owned plants | 20,000 |
| Gross annual income | 487,000 |

*Annual operation and maintenance plus retirement of principal*

| | |
|---|---|
| Brought forward | $487,000 |
| 3.887 percent, on $3,831,000, interest and retirement of investment on basis of 50 years | 148,000 |
| Repayment of $3,205,693 on basis of 40 years without interest | 80,000 |
| Operation and maintenance of power plant | 36,000 |
| Operation and maintenance Granby pumping plant | 27,000 |
| Operation and maintenance of transmission lines | 13,800 |
| Operation and maintenance conduit, tunnel, and canals | 15,000 |
| Depreciation, 1.5 percent, on $3,831,000 | 57,000 |
| General expense | 18,200 |
| Total annual costs | 395,000 |
| Annual surplus during 40 years repayment period of the non-interest-bearing obligation | 92,000 |

## FULL POWER DEVELOPMENT

The results of this study indicate that the initial installation proposed is sufficient from a financial standpoint to return all necessary costs of operation and repayments.

There are five additional plants that can be developed in the future in a manner that will keep pace with the power requirements of the section that may be served and not have a large unearning investment tied up for some years.

The following is an estimate of the cost of the additional power plants that may be constructed in the future, but are not a part of the initial development.

| | |
|---|---|
| Power plant no. 5 | $1,190,000 |
| Green Mountain-Ka Rose transmission line | 130,000 |
| Operators' quarters | 60,000 |
| Substation (20,000 kilowatts) | 200,000 |
| Subtotal | 1,580,000 |
| Interest during construction, 3 percent | 47,400 |
| | 1,627,400 |

The above plant, together with plant no. 1, will produce: 113,000,000 kilowatt-hours firm power annually; 92,000,000 kilowatt-hours secondary power annually.

The following are the construction costs of developing power plants nos. 2, 3, 4, and 4–A with appurtenant structures:

| | |
|---|---|
| Power plant no. 2 | $2,325,000 |
| Power plant no. 3 | 665,000 |
| Power plant no. 4 | 760,000 |
| Power plant no. 4–A | 420,000 |
| Power canal no. 2 | 2,444,000 |
| Power canal no. 3 | 493,000 |
| Power canal no. 3–A | 113,000 |
| Power canal no. 4 | 1,194,000 |
| Operators' quarters | 150,000 |

| | |
|---|---|
| Substations (90,000 kilowatt hours) | $900, 000 |
| Additional transmission lines | 311, 000 |
| Subtotal | 9, 775, 000 |
| Interest during construction, 3 percent | 293, 250 |
| Total repayable in 50 years with interest | 10, 068, 250 |
| Arkins Canal feeder, payable in 40 years without interest | 351, 000 |
| Total power plants nos. 2, 3, 4, and 4–A | 10, 419, 250 |
| Total power plant no. 5 | 1, 627, 400 |
| Total second-stage development | 12, 046, 650 |
| Primary development plant no. 1 | 7, 036, 693 |
| Cost of full power development | 19, 083, 243 |

The total salable output of the full development is estimated as follows, exclusive of that used for pumping:

| | *Kilowatt-hours* |
|---|---|
| Firm power, annually | 360, 000, 000 |
| Secondary power, annually | [1] 200, 000, 000 |

[1] Out of an available production of 387,000,000 kilowatt-hours secondary power.

## CONCLUSIONS

(1) There is a large area (615,000 acres) of irrigated land in northeastern Colorado, the major portion of which has an inadequate water supply.

(2) The feasible storage possibilities with the available water supply in the drainage area has been exhausted.

(3) There is at least an available water supply of 310,000 acre-feet on the upper drainage area of the Colorado River that can be diverted to supplement the present water supply on the eastern slope.

(4) That the diversion of this quantity of water from the Colorado River watershed will not interfere with or encroach upon the present or future irrigation along the Colorado River and tributaries within the State, with the protection provided in the Green Mountain Reservoir.

(5) That the plan for the project here laid out appears entirely feasible from a construction point of view.

(6) That the cost of construction estimated at $2 per acre-foot per annum over the repayment period of 40 years is less than storage water is now commanding and that it will increase the crop values five or more times this annual cost, showing its economic worth.

(7) That the power developments that may be made in the six power plants will produce a large quantity of cheap hydroelectric power that will materially benefit Colorado.

(8) That the revenues from the commercial power generated at power plant no. 1 will pay for the power features as set up under the initial power development, in addition to the power required for pumping at Granby pumping plant, and in lieu of the irrigation features used in power development, the operation of the system to a point where the water leaves the tailrace of the lower power plants can be taken care of by the power development.

(9) That the cost of the irrigation feature of the project is within the ability of the water users to pay.

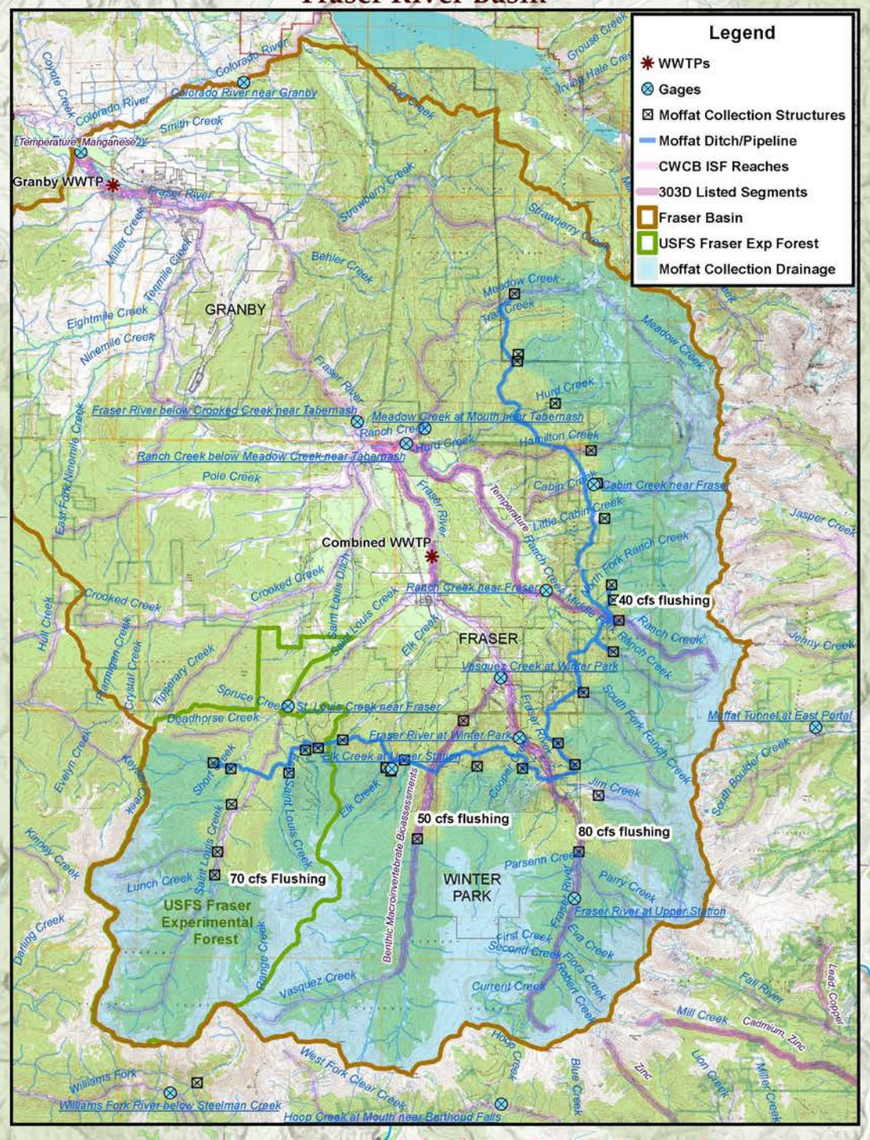
# Grand Exhibit 5

# Moffat and Windy Gap Firming Mitigation and Enhancements

COLORADO RIVER DISTRICT
PROTECTING WESTERN COLORADO WATER SINCE 1937

GRAND COUNTY colorado · est. 1874

## Fraser River Basin




## * 1961 Principles

Flow Enhancements will be most keenly felt from Granby Dam to Williams Fork confluence in late summer. Without enhancements, flows below Granby Dam are dictated by the "1961 Principles" as shown below.

| Dates | Flow from Granby Dam (cfs) | Drought Year 30% Reduction (cfs) |
|---|---|---|
| May 1 - Aug 1 | 75 | 53 |
| Aug 1 - Sep 1 | 40 | 28 |
| Sep 1 - Apr 30 | 20 | 14 |

## Wolford Mountain Reservoir

The 1000 acre feet of environmental water from DWB may be stored in Wolford Mountain Reservoir

## Channel Maintenance

* 600 cfs for 50 hours every 3 years
* 1,200 cfs for 72 hours every 6 years

## Northern/Subdistrict Enhancements

* Up to 4,500 acre feet in Grand County "Bucket"
  - 3.8% of Windy Gap pumping in excess of 15,000 up to 1,500 acre feet
  - Unused MPWCD firm water may be transferred (WGFP IGA)
  - End of year pumping
* 3,000 acre feet MPWCD "Bucket"
  - 2,300 acre feet firm water
  - Up to 700 acre feet variable water subject to MPWCD paying for pumping
  - All uses of water subject to provisions of the 1980 Azure-Windy Gap Agreement

## Grand Lake Clarity

Bureau of Reclamation, Northern and Grand County agree to improve clarity

## Temperature

Reduced or curtailed WG diversions to comply with temperature standard

## Upper Colorado River Habitat Project

$6 million for stream restoration of 14.4 miles (Denver and Northern)

## Gore Race

WGFP diversions suspend during August Race targeting 1250 cfs

## RICD Non-opposition

recreational in channel diversion Grand County

## Minimum Flow Assurance

60 cfs minimum bypass flow below Green Mountain Reservoir

## Green Mountain Reservoir

* Fish and Wildlife Service (FWS) can call for 5412 acre feet from Granby for endangered fish flows. If not needed for fish this water can be "booked back" to Green Mountain Reservoir until FWS calls for it
* The 1000 acre feet of environmental water from DWB may be stored in Green Mountain Reservoir

## Windy Gap Reservoir

* $250,000 for bypass study
* $2 million for bypass construction or stream enhancement
* $5.68 million NRCS funding
* $2.2 million State funding and
* $300,000 Private funding

## Williams Fork Reservoir

* 1,000 acre feet environmental water from Denver Water may be carried over from year to year up to a total of 2,500 acre feet, subject to Williams Fork Reservoir spills

## Granby Reservoir

5412 acre feet for Endangered Fish

## Denver Enhancements

$9 million for stream restoration, water quality, and water related infrastructure

## Channel Maintenance

to improve channel stability and sediment transport in Fraser River, Ranch, Vasquez, and St.Louis Creeks (see insert)

## Denver Enhancements

* 1500 acre feet of continued bypass flow during drought unless Denver Water bans outdoor watering
* 375 acre feet in-basin consumptive use
* 1,000 acre feet environmental benefit

## Denver Mitigation

* 250 acre feet foregone diversions for maximum temperature standard exceedances in non-drought years

## Shoshone Outage Protocol

Reservoirs operated as if call were on when plant is not operational

## RICD Non-opposition

Recreational in channel diversion Glenwood Springs

## Shoshone Permanency

Implementation of a mechanism to preserve the Shoshone Call Flows on a permanent basis

## No Future West Slope Water Rights Development

Denver and Northern will not undertake any future water development projects, appropriations or acquisitions of water rights located in Grand County without prior approval of the Grand County BOCC and the River District.

M:\PROJECTS\COLORADO\UPPER COLORADO\GC_FiringEnhancementMitigation\GC_FiringEnhancementMitigation.aprx

# COLORADO RIVER COOPERATIVE AGREEMENT

This Agreement is entered into among the following listed Signatories, to become effective upon the first business day at least seven days after the last Signatory has signed this Agreement. The Effective Date of this Agreement is the 26th day of September, 2013. The Signatories acknowledge the mutual exchange of consideration in entering into this Agreement.

City and County of Denver, acting by and through its Board of Water Commissioners (Denver Water)
Board of County Commissioners, County of Eagle
Board of County Commissioners, County of Grand
Board of County Commissioners, County of Summit
Colorado River Water Conservation District
Middle Park Water Conservancy District
Clinton Ditch and Reservoir Company
Eagle Park Reservoir Company
Eagle River Water and Sanitation District
Upper Eagle Regional Water Authority
Grand Valley Water Users Association
Orchard Mesa Irrigation District
Ute Water Conservancy District
Palisade Irrigation District
Mesa County Irrigation District
Grand Valley Irrigation Company
City of Glenwood Springs
City of Rifle

This Colorado River Cooperative Agreement consists of the 51-page agreement dated May 15, 2012 (pages 44, 45, 50, and 51 dated January 7, 2013); Attachments A through T, which have varying dates; and the CRCA Addendum dated April 5, 2012.

# COLORADO RIVER COOPERATIVE AGREEMENT

## ARTICLE I
## Limitations on Denver Water's Water Supply Obligations

A. Geographic Limit on Service Area. All water available to Denver Water under its existing absolute and conditional water rights listed in Attachment A ("Attachment A Rights") shall be used within the City and County of Denver and Denver Water's current Service Area described in Attachment B ("Service Area"), except as provided in Article I.B. The Service Area shall not be expanded beyond the boundaries depicted in Attachment B.

B. Limits on Use of Attachment A Water Rights Outside Service Area.

1. Fixed-Amount Contracts. The Attachment A Rights may be used outside the current Service Area to provide up to 67,927 acre-feet of water under the existing contracts listed in Attachment C ("2010 Contracts"). In addition, Denver Water may enter into contracts to deliver an additional 4,000 acre-feet of water annually to be used in new permanent contractual arrangement not listed in Attachment C.

Of the 67,927 acre-feet currently obligated under 2010 Contracts, Denver Water may transfer up to 45,000 acre-feet from a pre-existing water delivery obligation under a 2010 Contract to a different recipient under a new permanent contract ("Future Contract"), subject to the following limitations.

a. Previously Delivered Water. The amount of water transferred to a Future Contract recipient must fall within the volume of water previously delivered to the 2010 Contract holder during a prior calendar year, and Denver Water's obligation to the 2010 Contract holder must be reduced by a like amount. Some 2010 Contracts include an amount of water not previously delivered by Denver Water ("Unused 2010 Water") A 2010 Contract holder may not substitute Unused 2010 Water for transferred water. The 2010 Contract holder may access the volume of Unused 2010 Water only at a rate equivalent to growth in demand in the holder's service area after the date of the transfer.

b. Future Contract Service Area. The service area of any Future Contract recipient must be located in Adams, Arapahoe, Broomfield, Douglas or Jefferson County.

c. Drought Reductions. All Future Contracts must provide for reductions in deliveries during such times as Denver Water imposes mandatory water use restrictions as part of a drought response program.

d. Reuse Under Future Contracts. If the 2010 Contract did not expressly grant to the recipient of the water the right of reuse or successive use, then the Future Contract may grant the right of reuse and successive use of the transferred water only if such reuse is subject to the provisions of Article I.B.2.e and Article II. Nothing in this paragraph shall prevent a recipient of a Future Contract from making an initial fully consumptive use of the transferred water that will not generate effluent or return flows.

e. Recycle Water Contracts. Any water transferred from one of the Recycle Water contracts listed on Attachment C shall retain recycled water as the source of water delivered under the Future Contract.

f. Payment of West Slope Charge. As a condition of receiving water under a Future Contract, any Future Contract holder shall enter into a West Slope Charge Agreement in substantially the form of Attachment D, and shall pay a West Slope Charge of 12.5%.

g. Prohibition on Seeking West Slope Supplies. Any recipient of water under a Future Contract must agree to comply with the Abstention Provisions.

2. Other Contractual Water Supply Obligations. Some of Denver Water's supply obligations to entities or areas outside the Service Area present unique circumstances or opportunities and are not included within the volumetric limit established in Article I.B.1. Denver Water may use the Attachment A Rights outside the Service Area to provide water under the following circumstances:

a. Obligations to Littleton under Littleton's Total Service Distributor Contract dated March 9, 2011.

b. Water to be provided to Public Service Company and to West Slope entities in the event of a relaxation of the Shoshone Call under the provisions of the 2007 Shoshone Agreement or the provisions of Article VI of this Agreement.

c. Use of Denver Water's water rights on the West Slope: (1) for beneficial use by the West Slope entities; or (2) to meet regulatory obligations required for Denver Water's operations or projects; or (3) for other purposes specifically authorized under this Agreement.

d. Water delivered from the potable water distribution system at Denver International Airport that would otherwise need to be discharged from the system to maintain the chlorine residual and avoid nitrification within the potable water system.

e. Reusable return flows in excess of Denver Water's obligations under Article II or not committed to a 2010 Contract may be used in Joint Use Projects, subject to the following limitations in this subsection. The use of reusable return flows under this section does not in any way diminish Denver Water's obligations under Article II. As a condition of such use, East Slope lessees or purchasers of Denver Water's reusable return flow for use outside the Service Area:

i. Shall enter into a West Slope Charge Agreement in substantially the form of Attachment D, and shall pay a West Slope Charge of 12.5%.

ii. Must comply with the Abstention Provisions.

iii. Will maximize using best efforts the reuse or successive use of reusable water available to them.

iv. Will adopt and implement a conservation plan that would achieve results similar or proportionately the same as Denver Water's.

3. Deliveries of Water on a Temporary Basis. Denver Water may use the Attachment A Rights to deliver water on a temporary basis outside the Service Area, as limited by the following provisions.

a. For spot sales, subject to the following limitations:

i. Definition. The definition of a spot sale for purposes of this agreement is a lease of water available to Denver Water on a sporadic basis as a result of temporary hydrologic conditions or operational constraints, which is delivered to the recipient over a period no longer than 14 consecutive days.

ii. Holiday Restrictions: Spot sales of Blue River water will not be made for use during the Memorial Day, Fourth of July and Labor Day weekends. For purposes of this paragraph 11, Memorial Day and Labor Day weekends means Friday, Saturday, Sunday and Monday of that holiday. Fourth of July weekend means (1) if the holiday falls on a Thursday then the weekend is Thursday, Friday, Saturday, and Sunday; (2) if the holiday falls on either Friday, Saturday, Sunday, or Monday, then the weekend is Friday, Saturday, Sunday, and Monday; (3)

if the holiday falls on a Tuesday then the weekend is Saturday, Sunday, Monday, and Tuesday; and (4) if the holiday falls on a Wednesday, then the weekend is only on Wednesday.

iii. Reservoir Level Restrictions: Spot sales of Blue River water will be made only when: (1) the Dillon Reservoir lake level is projected to be at or above the Frisco Marina elevation from June 18 to Labor Day weekend, and will not be reduced below that elevation as a result of the spot sales. For purposes of this paragraph 11, the Frisco Marina elevation means the elevation at which the Frisco Marina can be fully operational. At the time of execution of this agreement, the Signatories agree that the Frisco Marina elevation is 9012. However, Summit County and Denver Water may later agree that a lower elevation has become suitable as the result of physical changes to the Marina or the Reservoir.

If Denver Water makes a spot sale of Blue River water during the runoff season prior to June 18 based on projections of reservoir level, and the reservoir level fails to reach the Frisco Marina elevation by June 18 or falls below that elevation prior to Labor Day, then Denver Water will forfeit the revenue received from the spot sale and deposit an equivalent amount into the West Slope Fund for water supply and water quality projects.

iv. Dillon Outflow Restrictions. Spot sales of Blue River water will not be made:

a) From Memorial Day weekend to the end of July, if outflow from Dillon Reservoir is less than 300 cfs during any diversion and delivery of spot sale water; or

b) At other times of the year, if outflow from Dillon Reservoir is less than 100 cfs during any diversion and delivery of spot sale water.

v. Limit on Temporary Water Deliveries. The total combined volume of all spot sales and temporary leases of water resulting from the Attachment A Rights will not exceed a three-year running average of 7,300 acre feet, with an annual maximum of 12,300 acre-feet in a given year.

vi. Payment by Recipients. Purchasers of spot sale water shall enter into a West Slope Charge Agreement in substantially the form of Attachment D, and shall pay a West Slope Charge of

15%.

vii. Shoshone Call Restriction. Spot sales will not be made when the senior Shoshone call is subject to relaxation under the provisions of the 2007 Shoshone Agreement or the provisions of Article VI.E of this Agreement.

b. For temporary leases, subject to the following limitations:

i. The definition of temporary leases for purposes of this agreement is a lease of water for a duration not to exceed five consecutive years.

ii. Any lessee would be limited to no more than five years of water delivery in any ten year period under one or more temporary leases.

iii. The total volume of spot sales and temporary leases of water from west slope sources will not exceed 3,300 acre-feet in any given year.

iv. The total combined volume of all spot sales and temporary leases of water resulting from the Attachment A Rights will be limited as described in paragraph I(B)(3)(v).

v. Lessees shall enter into a West Slope Charge Agreement in substantially the form of Attachment D, and shall pay a West Slope Charge of 15%.

vi. All temporary leases must provide for reductions in deliveries during such times as Denver Water imposes mandatory water use restrictions as part of a drought response program.

4. WISE Partnership Agreement. The Attachment A Rights may be used to provide water under the WISE partnership agreement with the City of Aurora and the South Metro Water Authority, so long as the use of the rights is otherwise authorized under this Article I.B, and subject to the following limitations:

a. The recipients of WISE water shall enter into a West Slope Charge Agreement in substantially the form of Attachment D, and shall pay a West Slope Charge of 12.5% on all water provided by Denver Water, regardless of which provision of Article I.B authorizes the use.

b. The recipients of WISE water must comply with the Abstention Provisions.

c. The recipients of WISE water must maximize using best efforts the reuse or successive use of reusable water available to them.

d. The recipients of WISE water must adopt and implement a conservation plan that would achieve results similar or proportionately the same as Denver Water's.

C. Other Water Rights.

1. Joint Use Projects. Denver Water may use its existing East Slope water rights listed in Attachment E in Joint Use Projects on the Front Range, so long as such use of the water rights does not result in a decrease in the supply of water available to Denver Water under the Attachment A Rights or in an increase in diversions of water by participants in the Joint Project, including Denver Water, from the West Slope to the East Slope. Participants in these projects must agree to comply with the Abstention Provisions.

2. New East Slope Water Rights. Denver Water may use outside the Service Area any water made available: (a) as a result of East Slope water rights appropriated or acquired after execution of this Agreement or (b) by means of contractual arrangements with East Slope entities entered into after execution of this Agreement involving East Slope water rights. Such use of the water shall not result in a decrease in the supply of water available to Denver Water under the Attachment A Rights, or in an increase in diversions of water by participants in the project, including Denver Water, from the West Slope to the East Slope.

3 West Slope Water Rights. After the Effective Date of this Agreement, Denver Water will not seek to: (a) develop any of its Division 5 water rights listed in Attachment E; or (b) create any new depletion, not caused by the exercise of the Division 5 water rights listed in Attachment A, from the Colorado River and its tributaries, for diversion to the East Slope; or (c) acquire any water right on the West Slope that would increase the yield Denver Water currently calculates based on the full use of the Division 5 water rights listed in Attachment A, without the prior approval of the River District and the County Commissioners for each county in which a new facility would be located or in which a new water right would be exercised.

Denver Water will not seek to appropriate or acquire any other water right on the West Slope, without first consulting in good faith with potentially affected

West Slope Signatories in order to identify and attempt to mitigate any potential adverse effect on West Slope interests, subject to the other provisions of this Agreement. The West Slope Signatories reserve the right to oppose any such development, appropriation or acquisition of water rights in water court, permit proceedings, or other forums.

## ARTICLE II
## Denver Water's Conservation and Reuse Commitments

A. Reuse of Blue River Water. Denver agrees to reuse its Blue River water and other lawfully available reusable water through exchanges into its South Platte diversion and storage facilities and through its recycled water treatment plant that provides water for nonpotable purposes. For use within the Service Area and to provide up to 6,400 acre-feet of recycled water outside the Service Area under the Recycle Water contracts listed in Attachment C or Future Contracts resulting from the transfer of those contracts pursuant to Article I.B.1, Denver Water will fully construct its recycled water system with the capacity to provide 17,500 acre-feet annually and will maximize its exchanges within legal and water availability constraints.[1] To achieve this level of reuse, Denver Water will complete construction of at least 30,000 acre-feet of gravel pit storage or other functionally equivalent storage.[2] The fully constructed recycled water plant is scheduled to be operational in 2020. The 30,000 acre-feet of gravel pit storage is also anticipated to be completed in 2020. However, the timing of development of gravel pit storage is directly related, in part, to the need for aggregate for construction purposes in the metro area, and is not within Denver Water's control. Denver Water commits to construct sufficient infrastructure to achieve the volumes listed in this paragraph subject to the uncertainties of timing described in this paragraph.

B. Conservation Plan. Denver Water's 1996 IRP predicted that 29,000 acre-feet of water could be saved through active conservation efforts by 2045. In 2006, the Denver Water Board mandated an accelerated conservation program to accomplish that level of savings by the end of 2016. Denver Water agrees to continue to implement its existing conservation program described in Attachment F to achieve the savings of 29,000 acre-feet contemplated by the 1996 IRP, in addition to natural replacement, consistent with its goal of achieving the targeted savings by the end of 2016. (It is often not possible to measure precisely the volume of water saved as a result of a specific action, e.g., requiring soil amendment, but Denver will implement the

[1] The volume of water that can be reused is determined by legal, regulatory and hydrologic conditions that vary significantly from year to year and over time, and may be fundamentally different in the future. Over the past 20 years with an annual average demand of 285,000 acre-feet, Denver Water's reuse by exchange and replacement has averaged 16,300 acre-feet per year, with a maximum of 29,900 acre-feet and a minimum of 5,800 acre-feet. With regard to future exchanges, Denver Water's computer simulation model predicts that, with an annual average demand of 345,000 acre-feet and completion of the storage described in this Article II.A, the annual average for exchanges and replacement will be 38,000 acre-feet. These modeled predictions are based on historic hydrology, past administrative practices and numerous operational assumptions, and consequently may not be construed as any sort of mandated or targeted operational requirement.

[2] If Denver Water's water rights cannot be exercised as anticipated to operate exchanges, making a portion of the proposed 30,000 acre-feet of storage not useful in maximizing Denver Water's exchanges, then Denver Water will notify the West Slope Signatories and identify the functionally equivalent storage, other infrastructure, or other means that it proposes to utilize to maximize its exchanges and the parties shall discuss in good faith whether to modify the provisions of this Article II.A.

conservation measures necessary to result in the volume of savings described in this paragraph.) Denver Water will inform the West Slope Signatories in an annual progress report if it decides to substitute a different conservation measure than the ones listed in Attachment F. Once Denver Water determines the conservation goal has been met, it will retain a reputable and qualified third party to confirm that the methodology used to quantify savings was reasonable. If the third party determines the methodology was not reasonable, Denver Water will correct the identified defects in the methodology, and if necessary, undertake additional conservation measures to achieve the goal.

C. Commitment to Additional Efforts. In addition to taking actions necessary to achieve the results described in Articles II.A and II.B, Denver Water agrees to develop, for use within the Service Area and to satisfy the obligations listed in Article I.B, an additional 10,000 acre-feet on an average annual basis through reuse, including use of reusable sources of water for augmentation, and/or conservation measures not described in Articles II.A and II.B. The development of the additional 10,000 acre-feet will commence no later than the completion of the efforts described in Articles II.A and II.B, and are anticipated to be completed by the end of calendar year 2030. Once Denver Water determines the additional 10,000 acre-feet has been attained, it will retain a reputable and qualified third party to confirm that the methodology used to quantify the attainment was reasonable. If the third party determines the methodology was not reasonable, Denver Water will correct the identified defects in the methodology, and if necessary, undertake additional reuse or conservation measures to achieve the goal.

## ARTICLE III
## Denver Water's Other Commitments

### A. General

1. Denver Water agrees to make a good faith effort to identify which of its West Slope conditional water rights might be needed and to abandon those conditional water rights that it deems are not needed.

2. As used in this Article III, "Resolution of Blue River Decree Issues" means the entry of final judgments and decrees no longer subject to appeals which make absolute 654 cfs in 06CW255, Water Division 5, and in 49-cv-2782, U.S. District Court, and 141,712 acre-feet in 03CW039, Water Division 5, in accord with the Amended Application to Make Absolute, filed with the court on February 16, 2006.

3. Use of Denver Water's Water Rights on West Slope.

   a. Denver Water will be responsible for providing substitution water and power interference charges to Green Mountain Reservoir and replacement water to other senior downstream water rights as necessary to ensure that West Slope recipients of the water provided by Denver Water under this Article III may use the water as provided in this Agreement.

   b. The signatories to this Agreement will cooperate to obtain such court decrees and approvals as are necessary to ensure that Denver Water's water that is made available to West Slope users under this Agreement, the 1985 Summit Agreement and the 1992 Clinton Agreement may be used on the West Slope for all uses, including but not limited to, fully consumptive uses, reuse and successive uses.

4. Replacement Water. Certain provisions of this Article III require recipients of water deliveries from Denver Water to make available to Denver Water "Replacement Water." Replacement Water may be made available to Denver Water from Green Mountain Reservoir, Wolford Mountain Reservoir, West Slope supplies of Windy Gap Project water, water made available to the West Slope from relaxation of the Shoshone Call pursuant to the 2007 Shoshone Agreement or the provisions of Article VI.E, water stored in Old Dillon Reservoir, water made available to West Slope water users pursuant to the 2003 Colorado Springs Substitution Agreement including return flows of such water, decreed consumptive use credits and reusable return flows, water diverted from Straight Creek into Dillon Reservoir by Summit County users, or any other substitution source reasonably acceptable to the Bureau of Reclamation and the Signatories. Where Replacement Water is required, Denver Water's delivery of water is contingent upon the Replacement Water

being on hand and physically and legally available for Denver Water's use for substitution purposes and will be provided to Denver Water for each acre foot of water delivered.

5. Escalation. The amounts of money that Denver Water is committed to pay under this Article III will be subject to escalation beginning on the fourth anniversary of the Effective Date of this Agreement, based on changes in the Consumer Price Index for All Urban Consumers ("CPI-U") for the Denver-Boulder-Greeley Metropolitan Area.

**B. Summit County – Blue River**

1. Payment by Denver Water. $11 million will be paid by Denver Water, subject to the terms set forth below.

2. Waste Water Treatment Plant Fund. $1 million of the $11 million shall be deposited into an interest-bearing fund to be administered by Summit County to offset the impacts of lower Dillon Reservoir levels or reduced outflows from Dillon Dam on permitted wastewater dischargers in Summit County.

3. Environmental Enhancement Fund. $1 million of the $11 million shall be deposited into an interest-bearing fund to be used as 50% matching funds for Environmental Enhancement projects in Summit County. The Environmental Enhancement projects shall be selected by a committee composed of one representative from each of the five entities listed in Article III.B.4 below. If these entities cannot unanimously agree on a project or projects, then each entity will be entitled to use one-fifth of the funds for a 50% match for an Environmental Enhancement project selected by that entity.

4. Payments for Projects in Summit County. $9 million of the $11 million will be distributed in five equal shares to the following entities to offset the costs of the projects listed in Attachment G:

- Town of Dillon
- Town of Silverthorne
- Town of Frisco/Frisco Sanitation District
- Town of Breckenridge
- Summit County/other water districts listed in Attachment G

5. Reallocation of Funds. Denver Water will not object to the reallocation of the $9 million as may be agreed by these entities, and these entities will determine the allocation of these funds for the projects described in Attachment G without restrictions imposed by Denver Water. Funds can be used to reimburse the sponsoring entity for project costs incurred before the funding is to be provided by Denver Water under Article III.B.6 below.

6. Timing of Payments. The schedule for payment of the $11 million is as follows:

   a. $4.5 million of the $9 million described in Article III.B.4 above within one year of Resolution of Blue River Decree issues.

   b. $4.5 million of the $9 million described in Article III.B.4 above within six months upon Issuance and Acceptance by Denver Water of Permits Necessary for the Moffat Project.

   c. The $1 million for Environmental Enhancements under Article III.B.3 will be deposited into the interest-bearing fund at the time of execution of the Agreement. These funds would be immediately available as matching funds whenever an Environmental Enhancement project is selected pursuant to Article III.B.3.

   d. The $1 million dedicated to assisting wastewater treatment plants under Article III.B.2 will be deposited into the interest-bearing fund at the time of execution of this Agreement.

7. 250 Acre Feet of Dillon Storage Water. Upon Resolution of Blue River Decree Issues, Denver Water will provide an additional 250 feet per year of water from Dillon Reservoir with a yield as reliable as the yield available to Denver Water at Dillon Reservoir. This water will be allocated as follows:

| | | |
|---|---|---|
| Town of Silverthorne | = | 60 acre feet |
| Summit County | = | 56 acre feet |
| Snake River Water District | = | 45 acre feet |
| Town of Dillon | = | 45 acre feet |
| Copper Mt. Metro District | = | 29 acre feet |
| Dillon Valley Metro District | = | 15 acre feet |

   There shall be no Replacement Water or other compensation for this Dillon storage water.

8. Montezuma Shaft.

   a. Denver Water is willing to consider, on a case-by-case basis, use of the Montezuma Shaft by the Snake River Water District, East Dillon Water District and Summit County Government on a space available basis when the Roberts Tunnel is operating. Any such future use will be subject to written acknowledgement by all water users that the supply is interruptible and will be subject to Denver Water's ability, in its sole discretion, to take the Roberts Tunnel out of service for maintenance, inspection and operational needs.

b. Any water resulting from use of the Montezuma Shaft as described in the preceding paragraph will come out of the users' allocations of water under the 1985 Summit Agreement, the 1992 Clinton Agreement or this Agreement.

9. Old Dillon Reservoir. Denver Water will not object to the construction and operation of Old Dillon Reservoir in accordance with permits issued by the U.S. Forest Service and U.S. Army Corps of Engineers. Nothing herein shall be construed as a subordination to the operation of this project of any of Denver Water's decreed water rights and exchanges. Upon execution of the agreement between Denver Water and Old Dillon Reservoir Water Authority, Denver Water will withdraw its statements of opposition to all pending Old Dillon Reservoir water court applications by Summit County and Towns of Dillon and Silverthorne.

10. Dillon Reservoir Levels. Denver Water agrees to use its best efforts to maintain the water level of Dillon Reservoir for recreational and aesthetic purposes at or above 9012 feet in elevation, above mean sea level, from June 18 to Labor Day of each year. This is a target elevation that may not be achieved, depending upon various factors, and is subject to Denver Water's water supply obligations. Under the Blue River Decree, Denver Water's diversions are limited to municipal purposes only. Denver Water will continue to comply with the Blue River Decree and to operate the Roberts Tunnel to meet its water supply obligations and not solely for recreational or hydropower purposes.

11. Town of Frisco. Denver Water has allowed the Town of Frisco to use its Future Dillon Water under the 1985 Summit Agreement as a source of augmentation supply for snowmaking at its winter sports area pursuant to the Future Dillon Water Agreement dated November 18, 2009 between Denver Water and Frisco. Denver Water and Frisco agree to participate in a joint study on the amount and timing of snowmaking return flows from the winter sports area and to cooperate in maximizing the amount of snowmaking return flows in any Water Court proceeding.

12. Additional Exchanges. Denver Water will allow additional exchanges through Dillon Reservoir for the benefit of Summit County users, so long as Denver Water's firm yield is kept whole, such exchanges do not interfere with Denver Water's operations, and Denver Water is afforded an opportunity to protect its interests in any legal or administrative proceeding.

13. Temporary Storage. At its sole discretion, Denver Water will allow Summit County entities to temporarily store additional water in Dillon Reservoir on a space available basis.

14. Additional 1493 Acre Feet.

a. Upon resolution of Blue River Decree issues, Denver Water will provide to the entities listed below 1493 acre feet per year from Dillon Reservoir with a yield as reliable as the yield available to Denver Water at Dillon Reservoir. This water shall be made available directly in Dillon Reservoir each year or, at the option of an individual recipient, the portion of this water to which the recipient is entitled shall be provided in Clinton Gulch Reservoir (the Clinton Bookover Water") in lieu of an equal amount of water that would be available to such recipient in Dillon Reservoir, by operating Denver Water's Blue River Diversion Project water rights to allow storage of the Clinton Bookover Water in Clinton Reservoir. In the event Denver Water does not have an account balance in Clinton Gulch Reservoir pursuant to the terms of the 1992 Clinton Agreement, the Clinton Bookover Water shall be booked over to the recipient from water in storage in Clinton Gulch Reservoir, pursuant to separate operating procedures to be agreed upon by Denver Water and the Reservoir Company. In the event Denver Water has an account balance in Clinton Reservoir pursuant to the terms of the 1992 Clinton Agreement, the Clinton Bookover Water shall be booked over to that recipient from Denver Water's account in Clinton Gulch Reservoir. Any Clinton Bookover Water may not be carried over in Clinton Gulch Reservoir from year to year. Such water will be allocated as follows:

- Vail Summit Resorts (Keystone) = 302 acre feet (1)
- Unallocated future supply pool = 175 acre feet (2)
- Copper Mountain Resort = 142 acre feet (1)
- Town of Silverthorne = 140 acre feet
- Summit County = 134 acre feet
- Vail Summit Resorts (Breckenridge) = 126 acre feet (1)
- Town of Breckenridge = 108 acre feet (3)
- Town of Dillon = 105 acre feet
- Snake River Water District = 105 acre feet
- Copper Mountain Metropolitan District = 69 acre feet
- Arapahoe Basin Ski Area = 52 acre feet (1)
- Dillon Valley Metro District = 35 acre feet

[1]This water may be used for snowmaking purposes and is entitled to a snowmaking ratio of not more than 5 to 1 (or such other ratio based on the amount of credited snowmaking return flows established by subsequent decrees.) Denver Water and each ski area agree to participate in joint studies on the amount and timing of snowmaking return flows from each ski resort using the foregoing water, and to cooperate in maximizing the amount of snowmaking return flows in any Water Court proceeding. The combined

volume of water for snowmaking amounts under this Article III, excluding snowmaking by the Town of Frisco under Article III.B.11, and the 1992 Clinton Agreement shall not exceed the 6000 acre feet limit on snowmaking water contained in the 1992 Clinton Agreement.

[2]The unallocated pool will be administered by a board consisting of one representative from the Towns of Breckenridge, Dillon, Frisco and Silverthorne and the Summit County Commissioners

[3]A portion of this water is entitled to the snowmaking ratio described in note 1 above. Denver Water and the ski area agree to participate in a joint study on the amount and timing of snowmaking return flows from the ski resort, and to cooperate in maximizing the amount of snowmaking return flows in any Water Court proceeding. The combined volume of water for snowmaking amounts under this Article III, excluding snowmaking by the Town of Frisco under Article III.B.11, and the 1992 Clinton Agreement shall not exceed the 6000 acre feet limit on snowmaking water contained in the 1992 Clinton Agreement.

b. The recipients of this water shall provide to Denver Water Replacement Water for each acre foot of the yield water. The ratio shall be 1 acre foot of Replacement Water for each acre foot of water delivered above or into Dillon Reservoir and 1.4 acre feet of Replacement Water for each acre-foot made available below Dillon Reservoir.

c. The Summit County users shall be responsible for accounting for the use of all water provided by Denver Water under this Agreement. This accounting will be coordinated by a single engineering firm with accounting under the 1985 Summit Agreement and the 1992 Clinton Agreement.

15. Place of Use. The place of use of any of the water provided under this Article III.B will be a matter of internal agreement among Summit County water users and will not be limited by Denver Water, provided that any water booked over to Denver Water under the 1992 Clinton Agreement will be retained in Clinton Reservoir.

16. Dillon Bypass Flows. Denver Water's release of water from Dillon Reservoir is subject to the terms of its 1966 right-of-way from the Department of Interior for Dillon Reservoir. Upon resolution of Blue River Decree issues, Denver Water agrees: (1) to waive its right to reduce releases under section 2 (C) of the 1966 right-of-way; and (2) to add the following new limitation upon its ability to reduce releases in addition to the conditions described in the right of way: Denver Water will not reduce releases below those required by section 2 (A) of the right of way unless an emergency

declaration banning residential lawn watering during the irrigation season is in force within its Service Area. Nothing herein shall alter or amend Denver's ability to reduce bypasses under paragraph 2(A) of the right of way during an emergency or during temporary periods of time involving maintenance or repairs on the water facilities involved. Nothing herein shall alter or amend any other obligation of Denver Water with respect to releases from Dillon Reservoir, including, without limitation, the terms of the Record of Decision for the Wolford Mountain (Muddy Creek) Reservoir; the Memorandum of Agreement among the U.S. Bureau of Reclamation, Northern Colorado Water Conservancy District, Colorado River Water Conservation District, and Denver Water dated December 30, 1991, regarding substitutions from Wolford Mountain Reservoir (MOA No. 2-AG-60-01550); the decree in Case No. 91CW252, Water Division No. 5 (also entered in Consolidated Case Nos. 2782, 5016, and 5017, U.S. District Court, District of Colorado); and the 1992 Clinton Agreement.

17. Silverthorne's Dillon Storage Water. Upon resolution of Blue River Decree issues, Denver Water and Summit County will amend the 1985 Summit Agreement to eliminate the current restrictions on the use of the 300 acre feet of Dillon Storage Water made available to the Town of Silverthorne. A form of the revisions to the 1985 Summit Agreement to accomplish this result is attached as Attachment H. The Silverthorne RICD will not be used to prevent or otherwise limit the exchange or substitution of any replacement or exchange water into Dillon Reservoir under this Agreement, the 1985 Summit Agreement or the 1992 Clinton Agreement.

18. Colorado Springs Substitution Agreement. Denver Water will agree to support extension of the Colorado Springs substitution agreement adjudicated in Case No. 03CW320, Water Division 5, as long as it is in substantially the same form as the present agreement.

**C. Clinton Reservoir Agreements.**

1. Upon the execution of this Agreement, the 1992 Clinton Agreement shall be amended to add a new whereas clause after the second whereas clause to read as follows:

Whereas, by decree of the District Court in and for Water Division No. 5, State of Colorado, in Case No. 98CW57, Clinton Reservoir was granted a Use Enlargement and Second Filling in the amount of 4,250 acre feet for domestic, municipal, industrial, snowmaking, recreation, fish and wildlife propagation and augmentation purposes, both on the eastern and western slopes of Colorado, and an application is pending in Case No. 06CW252 for Clinton Gulch Reservoir 1st Enlargement and Refill Right for an additional

210 acre feet. All references to Clinton Reservoir herein collectively refer to the storage rights decreed in Case Nos. W-2559, 98CW57 and 06CW252;

2. Upon the execution of this Agreement, paragraph 1(b) of the 1992 Clinton Agreement shall be amended to read as follows:

(b) Clinton Reservoir will retain for the uses set forth in paragraph 1(c) below any water stored in an accounting year if an allowable fill occurs. An allowable fill occurs each year except: (i) when Green Mountain Reservoir does not fill under its own right and the Water Board is required to provide substitution water to Green Mountain Reservoir in order to retain water diverted at Dillon Reservoir; or (ii) when the contents of Dillon Reservoir are less than 100,000 acre feet on August 1 for reasons other than the Water Board's maintenance or repair of its Dillon Reservoir facilities and the total combined contents of the Water Board's Dillon, Gross, Cheesman, Eleven Mile and Antero Reservoirs are less than 51% of their total usable capacity on August 1. Subject to the provisions of Paragraph 9 below, if an allowable fill does not occur in a given accounting year, the water stored in Clinton Reservoir during that accounting year will be credited to the Water Board's account and retained in Clinton Reservoir until the contents of Dillon Reservoir as measured above the invert of the west portal of the Roberts Tunnel are 100,000 acre feet or less, in which event the water shall be released from Clinton Reservoir to Dillon Reservoir when requested by the Water Board, or until an allowable fill occurs, whereupon the Water Board's account balance of water stored in Clinton Reservoir will be reset to zero. The release of the Water Board's water stored in Clinton Reservoir shall be scheduled in such a manner as to meet the Water Board's needs in a timely manner and also to avoid the erosion of the Clinton Canal.

3. Clinton Flood Control Exchanges. At its sole discretion, Denver Water will allow the Clinton Ditch & Reservoir Company to temporarily store Clinton Reservoir water released from storage for flood control purposes in Dillon Reservoir, limited to a space available basis, and to use the stored water as an exchange supply, pursuant to operating procedures to be agreed upon at the time of the proposed exchange.

4. Clinton Reservoir Dead Storage Pool. Upon execution of this Agreement, Denver Water and the Clinton Ditch & Reservoir Company will enter into the Interim Agreement regarding the Clinton Reservoir dead storage pool attached hereto as Attachment I. Upon Resolution of Blue River Decree Issues, Denver Water and the Clinton Ditch & Reservoir Company will enter into the permanent Agreement regarding the Clinton Reservoir dead storage pool attached hereto as Attachment J. The interim agreement will renew on a

year-to-year basis so long as the Signatories are still engaged in efforts to achieve Resolution of Blue River Decree Issues.

5. Denver Water Opposition. Upon the execution of this Agreement, Denver Water will consent to the decree in Water Division No. 5 Case No. 06CW252 attached hereto as Attachment K for a total reservoir capacity of 4460 acre feet which includes a dead storage pool of 801 acre feet.

6. Spillway Enlargement Water. Upon Resolution of Blue River Decree Issues, Denver Water and the Clinton Ditch & Reservoir Company will modify their existing 1992 Clinton Agreement to add the spillway enlargement water (up to a maximum of 500 acre feet). The water from the total reservoir capacity, including the dead storage pool and spillway enlargement, will be allocated to existing shareholders of the Clinton Ditch & Reservoir Company on a pro rata basis as either fourth year supply, or one-third of that amount will be so allocated as an increase in the "Reservoir Yield" of Clinton Reservoir, as that term is defined in the1992 Clinton Agreement.

7. Upon the execution of this Agreement, paragraph 10(a) of the 1992 Clinton Agreement shall be amended to read as follows:

(a) Whenever water cannot be diverted from the Snake River or its tributaries because of decreed instream flows, or the operation of the instream flow memorandum of agreement between Keystone Resorts Management, Inc. ("Keystone") and the Department of Natural Resources, or the water quality of the Snake River, Keystone may pump up to 1500 acre feet of water from September 1 of each year to March 31 of the following year from the Montezuma Shaft of the Roberts Tunnel, subject to the provisions of this paragraph.

**D. Eagle County**.

1. Any development and use of Wolcott Reservoir shall be in compliance with the terms of the settlement agreement between Denver Water and the Eagle River Water & Sanitation District and Upper Eagle Regional Water Authority and the subsequent decrees in Water Division No. 5 Case Nos. 02CW125 and 07CW126.

2. Denver Water will not seek any new appropriation of water in the Eagle River basin or pursue or participate in any acquisition of water rights or any project that would result in any new depletion from the Eagle River basin without the prior approval of the Eagle County Commissioners, the River District, the Eagle Park Reservoir Company, the Eagle River Water & Sanitation District, and the Upper Eagle Regional Water Authority.

In addition, the Abstention Provisions applied in Article I of this Agreement provide that any entity receiving water from Denver Water under any Future Contract or any contract for Reusable Return Flows will not seek any new appropriation of water, or pursue or participate in any project that would result in any new depletion from the Eagle River basin.

3. Denver Water will not oppose any future interconnect between Clinton and Eagle Park Reservoirs, provided that the water in Clinton Reservoir that has been booked over to Denver Water pursuant to the terms of the 1992 Clinton Agreement remains in Clinton Reservoir.

4. Upon execution of this Agreement, Denver Water will withdraw its pending motion and statement of opposition in Water Division No. 5 Case No. 02CW403.

## E. Grand County and Fraser, Williams Fork and Upper Colorado River Basins

1. General Provisions for Article III.E.

a. Relationship to Moffat Project Permitting Process. Denver Water has applied for a permit for the Moffat Project from the Corps of Engineers ("COE") under Section 404 of the Clean Water Act. The Moffat Project involves enlargement of Gross Reservoir located in Boulder County and the diversion of additional water from the Upper Colorado, Williams Fork and Fraser River watersheds in Grand County. Grand County is a consulting agency in that permitting process and has submitted comments to COE that are a part of the regulatory record. As part of the permitting process, the COE will approve a Mitigation Plan designed to avoid, minimize, or mitigate any new impacts to the stream environment that might be caused by the Moffat Project.

i. Mitigation. The provisions of this Article III.E are not intended to define and do not substitute for the Mitigation Plan that will be required by COE. Denver Water will comply with the Mitigation Plan approved by COE in addition to fulfilling the commitments contained in this Article III.E. The funds committed by Denver Water in Articles III.E.2 and III.E.3 are subject to proportional reduction if the Mitigation Plan required in the permitting process mandates funds for the purposes described in those sections.

ii. Improvements. Denver Water's commitments in sections E.5 through E.24 include several measures designed to improve current stream conditions ("Improvements") and do not represent mitigation for the Moffat Project. The Signatories agree that they shall not represent

that the Improvements are designed or intended to avoid, minimize, or mitigate any impacts associated with the Moffat Project..

b. Water Rights Issues. The Signatories to this Agreement will cooperate to implement such legal mechanisms and to obtain such administrative and judicial approvals as Denver Water, Grand County, the River District, and Middle Park agree are necessary to ensure that the water provided under this Article III.E will be physically and legally available for the intended purposes of protecting and enhancing stream flows in the Fraser, Williams Fork, and Colorado Rivers and their tributaries. Denver Water agrees not to divert any water through the Moffat Project for storage in an enlarged Gross Reservoir until such time that the water committed by Denver Water pursuant to this Article III.E is legally available for use by Grand County.

c. Responsibility for Infrastructure. Several provisions of this Article III.E require Denver Water to deliver or make water available for various uses within Grand County. Except for the funding for water projects pursuant to Article III.E.14, Denver Water will not be responsible for the costs of any new infrastructure required to deliver or make the water available.

2. $2 million to Address Water Quality Upon Issuance and Acceptance by Denver Water of Permits Necessary for the Moffat Project, Denver Water will provide $2 million to pay for measures to address water quality, including but not limited to improvements to the capacity of wastewater treatment plants. If the Mitigation Plan required in the permitting process for the Moffat Project mandates funds for nutrient removal/water quality, then the direct funding to Grand County under this paragraph would be proportionately reduced. For example, if the mitigation plan requires the expenditure of $500,000 for nutrient removal/water quality, then the direct funding to Grand County would be reduced to $1.5 million. The water quality funds will be allocated and administered by a board consisting of one representative from each of the following entities: Grand County Commissioners, Town of Fraser, Grand County Water and Sanitation District No. 1, Winter Park Water and Sanitation District, Tabernash Meadows Water and Sanitation District, Granby Sanitation District, and Winter Park Ranch Water and Sanitation District.

3. $1 Million for Aquatic Habitat. Upon Issuance and Acceptance by Denver Water of Permits Necessary for the Moffat Project, Denver Water will provide $1 million to be used in the Cooperative Effort process described in Article III.E.6 for the purpose of improving aquatic habitat in the Upper Colorado, Fraser and Williams Fork River basins. If the Mitigation Plan required in the permitting process for the Moffat Project mandates funds for this purpose, then the direct funding to Grand County under this paragraph would be proportionately reduced.

4. Berthoud Pass Sedimentation Pond. Denver Water has entered into an agreement with CDOT to construct a sediment catch basin above Denver's diversion structure on the Fraser River. Denver Water has agreed to operate and maintain the project

and has also contributed $50,000 for this effort. Grand County agrees that Denver Water may seek mitigation credit for sediment removal in the Fraser River from COE for its participation in the sediment project.

5. Environmental Pool in Gross Enlargement. Denver Water has entered into an agreement with the Cities of Boulder and Lafayette dated February 24, 2010, to create a 5,000 acre-foot Environmental Pool within the enlargement of Gross Reservoir as part of the Moffat Project. Denver Water agrees not to store water, directly or by exchange, any of its West Slope water rights listed in Attachments A and E in the Environmental Pool in Gross Reservoir, unless the River District, Middle Park and Grand County have agreed in advance and in writing.

6. Cooperative Effort for Aquatic Environment. Denver Water, the River District, Middle Park, and Grand County agree to execute an intergovernmental agreement establishing the Learning by Doing Cooperative Effort ("Cooperative Effort") to protect, restore, and when possible enhance, the aquatic environment in the Upper Colorado, Fraser and Williams Fork River basins. Denver Water and Grand County will jointly request that the COE acknowledge the Learning by Doing IGA in the Record of Decision for the Moffat Project.

7. Additional $1 Million for Aquatic Habitat. Upon Issuance and Acceptance by Denver Water of Permits Necessary for the Moffat Project, Denver Water will provide $1 million to Grand County, in addition to the funds committed in Article III.E.3, to be used in the Cooperative Effort process for the purpose of improving aquatic habitat.

8. $2 Million for Future Environmental Enhancements. Denver Water will place $2 million in an interest bearing account acceptable to the Management Committee established as part of the Cooperative Effort within two years after the Moffat Project becomes operational to address potential future environmental enhancements in Grand County as part of the Cooperative Effort.

9. Funds for Windy Gap Pumps to Provide Environmental Flows. Beginning with the year the Moffat Project becomes operational, Denver Water will place $500,000 into an interest bearing fund (WG Pumping Fund) acceptable to and controlled exclusively by Grand County. Two years after the fund is established, Denver Water will place a second $500,000 into the Fund. The WG Pumping Fund shall be used by Grand County for the sole purpose of paying up to 50% of the annual costs for using the Windy Gap Pumps to pump water for environmental purposes. The WG Pumping Fund may increase over time due to interest income and lower-than-expected use of the Fund, and will be capped at $2 million dollars. Any amount in excess of $2 million at the end of a calendar year will be transferred to the Cooperative Effort established in Article III.E.6 above for environmental improvement projects identified in that process. Grand County, in its sole discretion, can elect to transfer all or a portion of the WG Pumping Fund to the Cooperative

Effort if Grand County determines that such a transfer would provide greater environmental value.

10. Annual Bypasses on Fraser River Collection System. Each calendar year beginning with the year the Moffat Project becomes operational, Denver Water agrees to make available to Grand County 1,000 acre feet of water from its Fraser Collection System ("Fraser 1,000 af") for use for environmental purposes and any incidental recreational benefit. The Fraser 1,000 af shall be in addition to bypasses of water by Denver Water required under the Amendatory Decision and existing contracts.

    a. As referenced in Article III.E.1.b, Denver Water will cooperate with Grand County and the other Signatories to implement such legal mechanisms, including the possibility of augmenting instream flows and making deliveries to downstream demands, and to obtain such court decrees and approvals as are necessary to protect the Fraser 1,000 af in the Fraser and Colorado Rivers so that it reaches critical stream segments and is not diverted directly or by exchange by intervening structures within Grand County.

    b. The Fraser 1,000 af shall be bypassed from Denver Water's existing facilities in coordination with the Cooperative Effort, at times, in locations and in the amounts requested by Grand County for environmental purposes. As part of the Cooperative Effort and on a case-by-case basis, Denver Water agrees to consider making available more than 1000 acre feet in a calendar year.

    c. The Fraser 1,000 af shall be measured at appropriate points of measurement for bypasses from the Fraser Collection System and shall be converted to acre feet with the standard factor, i.e.1 cfs for 24 hours = 1.983 af.

    d. Upon Issuance and Acceptance by Denver Water of Permits Necessary for the Moffat Project, Denver Water will undertake voluntary pilot projects using the Fraser 1,000 af for environmental purposes.

11. Annual Releases from Williams Fork. Each calendar year beginning with the year the Moffat Project becomes operational, if a portion of the Fraser 1,000 af is made available during a call on the river or when a Shoshone Outage Protocol is in effect as described in Article VI, Denver Water agrees to make available for release a like amount of water, up to 1,000 acre feet of water per year, from Williams Fork Reservoir ("Williams Fork 1,000 af") to Grand County for environmental purposes and any incidental recreational benefit. The Williams Fork 1,000 af shall be in addition to releases of water by Denver Water required under pre-existing contracts and other legal obligations.

    a. As referenced in Article III.E.1.b, Denver Water agrees to cooperate with Grand County and the other Signatories to implement such legal mechanisms, including augmenting instream flows and deliveries to downstream demands, and to obtain such court decrees and approvals as are necessary to protect the

Williams Fork 1,000 af in the Williams Fork and Colorado Rivers so that it reaches critical stream segments and is not diverted directly or by exchange by intervening structures within Grand County.

b. The Williams Fork 1,000 af releases shall be coordinated with the Cooperative Effort and shall be made available at times and in the amounts requested by Grand County for use in the stream.

c. The Williams Fork 1,000 af shall be measured at the gage immediately below Williams Fork Reservoir and converted to acre feet with the standard factor, i.e.1 cfs for 24 hours = 1.983 af.

d. All or part of the Williams Fork 1,000 af, up to 2500 acre-feet, may be carried over in Williams Fork Reservoir by Grand County into subsequent years, subject to space available, payment of pro rata evaporative loss, and so long as the carryover does not count against the Reservoir's fill or otherwise jeopardize Denver Water's decreed water rights. The Williams Fork 1,000 af and any amount carried over shall be the first to spill from Williams Fork Reservoir. Denver Water will notify Grand County as soon as it reasonably can that Williams Fork Reservoir is anticipated to spill, so that Grand County can determine whether to request a release prior to the anticipated spill.

e. In addition to carrying over all or part of the Williams Fork 1,000 af, as described in Article III.E.11.d above, Grand County may also exchange or substitute into the 2,500 acre-feet of carryover capacity in Williams Fork Reservoir, water Grand County has introduced to the river upstream of the confluence of the Colorado and the Williams Fork Rivers. The additional water stored in the carryover capacity will be subject to all the provisions of Article III.E.11.d.

f. Upon Issuance and Acceptance by Denver Water of Permits Necessary for the Moffat Project, Denver Water will undertake voluntary pilot projects using up to 1,000 acre-feet of releases from Williams Fork Reservoir, for environmental purposes.

12. Limits on Ability to Reduce USFS Bypass Flows. Denver Water is required by the United States Forest Service or the Bureau of Land Management to bypass the natural inflow at its points of diversion on the Fraser River, Vasquez Creek, St. Louis Creek and Ranch Creek under the stipulations 3(a), 3(b), 3(c), and 3(d) of the Amendatory Decision dated April 22, 1970, Serial No. 027914 (the "Amendatory Decision"). Beginning with the year the Moffat Project becomes operational, Denver Water agrees not to reduce bypasses of water as authorized by stipulations 3(e) and 5 of the Amendatory Decision, except when Denver Water has banned residential lawn watering during the irrigation season. However, Denver Water will not reduce the bypass flow on a particular stream to an extent that would cause a municipal water provider in Grand County to impose mandatory restrictions on

indoor water use, unless Denver Water is also imposing mandatory restrictions on indoor water use within its Service Area. Prior to the Moffat Project becoming operational, Denver Water agrees to undertake voluntary pilot projects limiting its ability to reduce bypass flows as described in this paragraph.

13. Ditch Operational Changes. Denver has acquired several irrigation water rights in Grand County and agrees to make those water rights available to enhance environmental flows.

    a. Big Lake Ditch. Upon execution of this Agreement, Denver Water will participate in a joint study of how to maintain the historic agricultural uses of the Big Lake Ditch so as to maximize the environmental benefits, while substantially preserving the yield for Denver Water that it has paid for and is counting on by retiring the Big Lake Ditch demand. If the study finds the balance described in this paragraph, then Denver Water will implement the study beginning with the year the Moffat Project becomes operational.

    b. Rich Ditch and Hammond No. 1 Ditch. Upon Issuance and Acceptance by Denver Water of Permits Necessary for the Moffat Project Denver Water and Grand County agree to fund a study to determine how best to enhance stream flows with Denver Water's rights in the Rich Ditch and Hammond No.1 Ditch. Any enhancements would be in addition to the Fraser 1,000 af and would begin with the year the Moffat Project becomes operational.

14. Financial Contribution to Infrastructure Projects in Grand County. Denver Water agrees to pay the following amounts to offset the costs of the water supply projects listed in Attachment L. The funds will be distributed by Grand County.

    a. Denver Water will place $1.95 million in the water supply project fund upon execution of an Article III Implementation Agreement in the form set forth in Attachment M by the recipients of those funds.

    b. Denver Water will place $2 million in the water supply project fund within six months after Issuance and Acceptance by Denver Water of Permits Necessary for the Moffat Project or Resolution of the Blue River Decree issues, whichever occurs later.

15. Year-Round Deliveries of Clinton Bypass Water. Upon the signing of an Article III Implementation Agreement by all recipients of Clinton Bypass Water, Denver Water will provide Clinton Bypass Water under the 1992 Clinton Agreement on a year round basis if the Grand County Water Users provide replacement water in accordance with the Replacement Water criterion of 4/3 to 1 in the summer, and if that water is in-hand and usable by Denver Water. Grand County Water and Sanitation District No. 1, Winter Park Water and Sanitations District, Town of Granby and Town of Fraser have previously dedicated to Denver Water Replacement Water in Wolford Mountain Reservoir at a ratio of 2/3 to 1 for winter use. If any of

those entities opts to take their Clinton Bypass Water in the summer, that entity would be credited with the previously dedicated 2/3 acre-foot, and would only owe an additional 2/3 of an acre-foot of Replacement Water for summer releases. Denver Water agrees that the Grand County Operating Plan can be amended to add the Jim Creek diversion as a point of delivery for the Clinton Bypass Water.

16. Twenty Percent Water. Denver Water has had a policy whereby any party who purchases water rights for conveyance to the east slope through Denver Water's system will make 20% of that water available to in-basin users in the Fraser River Basin. Denver Water agrees to make the temporary 20% contracts permanent after the snowmaking return flow recapture plan described in the Grand County Operating Plan is implemented, and provided that snowmaking is within the 6,000 acre-foot limit established by the 1992 Clinton Agreement.

17. Municipal Use of Denver's Facilities. On a case-by-case basis, Denver Water may allow water treatment plants on the Fraser River to use Denver Water's Fraser River Collection System to convey water as a temporary source of supply, if a back up supply is available and the necessary infrastructure has been installed.

18. Use of Unused Capacity. Denver Water is willing to explore, on a case-by-case basis, the possibilities for using its system to benefit Grand County if Denver Water's yield and operational needs are not impacted and its costs are not materially increased.

19. Future West Slope Water Rights Development. In addition to the limitations on Denver Water provided by Article I.C.3, Denver Water further agrees that it will not undertake any future water development projects or appropriations or acquisitions of water rights located in Grand County without the prior approval of the Grand County Commissioners and the River District.

20. Grand County 375 Acre-Feet of Water. Upon Issuance and Acceptance by Denver Water of Permits Necessary for the Moffat Project, Denver Water agrees to make an additional 375 acre feet of water available to Grand County Water Users, to be managed in accordance with the 2012 Grand County Operating Plan with a Replacement Water ratio of 4/3 to 1 summer and 2/3 to 1 winter.

    a. One hundred acre feet of the 375 acre feet will be allocated to the Winter Park Recreational Association for use in connection with the Winter Park Ski Area and Resort. Any use of the 100 acre-feet for snowmaking will be governed by the provisions of footnote 1 in Article III.B.14; and snowmaking return flows must be above the Denver Water system.

    b. The remaining 275 acre feet will be allocated in equal shares of 68.75 acre feet to the Town of Fraser, the Town of Granby, the Grand County Water and Sanitation District No. 1, and the Winter Park Water and Sanitation District.

21. Water Supply for Grand County from Vail Ditch Shares. A group of governmental entities in Grand County has formed the Grand County Mutual Ditch and Reservoir Company (GCMD&RC), which has acquired shares in the Grand County Irrigated Land Company (Vail Ditch shares), and may acquire additional shares in the future. Upon execution of an Article III Implementation Agreement by GCMD&RC, Denver Water agrees to allow GCMD&RC's Vail Ditch shares to be traded for a like amount of water in Denver Water's Fraser Collection System and carried through that system for delivery and use in the headwaters of the Fraser River Basin, without any increase or decrease in yield to Denver Water's system, provided that GCMD&RC pays for any necessary new infrastructure and reimburses Denver Water for any additional operational costs.

    Denver Water agrees not to oppose any changes of Vail Ditch shares or such other legal or administrative mechanisms that allow the GCMD&RC to use this water. Denver Water may file statements of opposition to such change applications for the limited purpose of ensuring compliance with the obligations of this agreement. Denver Water will cooperate in seeking Englewood's approval for use of its system to transport Vail Ditch shares. If GCMD&RC is able to divert the Vail Ditch shares at other locations, Denver Water agrees not to object to such alternative diversions, provided that there is no adverse impact to Denver Water's supply or operations.

22. Denver Water Lands for Habitat or Access. Denver Water and Grand County will study which of Denver Water's lands in Grand County may have potential value for wildlife habitat and public fishing access without impacting present and future operational needs. Within one year of Issuance and Acceptance by Denver Water of Permits Necessary for the Moffat Project, Denver Water will decide which identified lands should be set aside for these purposes and what mechanism should be used.

23. Support for CWCB Filing. If information made available on the locations being considered, the impacts of the Wild and Scenic River issues, and the purpose and amounts of the filing demonstrates the lack of an impact on Denver Water's operations, Denver Water agrees not to oppose CWCB instream flow filings on those segments of the Colorado River below the confluence of the Blue River where currently there are no instream flow rights.

24. Support for RICD. If information made available on the locations being considered, the impacts to the Wild and Scenic River issues, and the purpose and amount of the filing demonstrate the lack of an impact on Denver Water's operations, Denver Water agrees not to oppose a Recreational In-Channel Diversion ("RICD") filing for the Colorado River below Gore Canyon in the Pumphouse reach above the Grand/Eagle County line.

**F. Grand Valley**.

Denver Water shall pay $1.5 million into a fund (the "Grand Valley Fund") to be designated by and controlled by the Grand Valley Signatories to this Agreement (the "Grand Valley Entities"). The following provisions shall apply to the Grand Valley Fund:

1. The Grand Valley Fund and any accruals to the Grand Valley Fund shall be used for water supply, water quality and/or water infrastructure projects in or benefiting the Grand Valley. Subject to such limitation, the projects for which the money in the Grand Valley Fund will be used shall be determined in the sole discretion of the Grand Valley Entities.

2. Denver Water shall pay the $1.5 million into the Grand Valley Fund pursuant to the following schedule:

   a. $1 million shall be paid within 2 years after resolution of Blue River Decree issues.

   b. $500,000 shall be paid within 2 years after the Effective Date of this Agreement.

G. **Middle Colorado River**.

1. Within two years after the Effective Date of this Agreement , Denver Water shall place $500,000 in an interest-bearing account to offset additional operation and maintenance costs or the costs of upgrading diversion structures of water treatment plants in Garfield County, pursuant to the provisions of Article VI.E.3.

2. Within one year of issuance of an acceptable permit for the Moffat Project, Denver Water agrees to place $1 million in a fund for flow-related projects to protect Wild & Scenic Outstandingly Remarkable Values, and to propose this contribution as an element of the Mitigation Plan described in Article III.E.1.a.

## ARTICLE IV
## Agreements Regarding Denver Water's Water Rights

A. Blue River Decree. The West Slope Signatories shall support and cooperate in any legal or administrative proceedings necessary to implement the provisions of this Agreement related to the Blue River Decree.

1. Current Water Court Proceedings. The West Slope Signatories shall not contest and the Signatories that are parties to the case will stipulate to the entry of the proposed decrees included in Attachment N in Case No. 2006CW255 (Roberts Tunnel) making 654 cfs absolute and finding diligence for the remaining conditional amount; and Case No. 2003 CW039 (Dillon Refill) making 141,712 acre-feet absolute in accord with the Amended Application to Make Absolute, filed with the court on February 16, 2006, and finding diligence for the remaining conditional amounts and uses.

2. Waiver of Claims Related to Blue River Decree. The West Slope signatories agree that claim preclusion applies to all claims and objections to Denver Water's operations under the Blue River Decrees raised or which could have reasonably been raised in Case Nos. 06CW255 and 03CW039, or which could have reasonably been raised in previous diligence proceedings for these water rights. The Signatories agree that the resolution of the current diligence proceeding constitutes an adjudication on the merits of their statements of opposition.

3. Claims Not Precluded. The West Slope signatories may file statements of opposition in future proceedings under the Blue River Decree limited to: 1) Denver Water's compliance with this Agreement, and 2) claims that were not and could not reasonably have been raised in prior proceedings.

B. East Slope Storage of Blue River Water. " Imported Blue River Water" means any water transported through the Roberts Tunnel that was diverted under the Blue River Diversion Project direct flow or Dillon Reservoir storage priorities decreed in C.A. Nos. 1805 and 1806 and Civil Nos. 2782, 5016 and 5017, including water diverted under the decrees in Case Nos. 87CW376 and 91CW252 and water exchanged pursuant to paragraph IV.C.1 below. Denver Water may store any Imported Blue River Water, whether released from Dillon Reservoir or diverted directly through the Roberts Tunnel at any existing or future storage facility on the East Slope; provided that the amount of Imported Blue River Water in storage on the East Slope does not exceed 400,000 acre feet at any point in time. This provision and limitation on the amount of Imported Blue River Water does not apply to the storage of return flows from the use or reuse of Imported Blue River Water either directly or by exchange to any existing or future storage facility.

C. Denver Water's Exchanges.

1. Decreed Exchanges. The West Slope Signatories agree that Denver Water may operate its exchanges from Williams Fork Reservoir to Dillon Reservoir decreed in the Blue River Decrees, Civil Action No. 657, and C.A. 1430, and Case No. 88CW382; and from Williams Fork Reservoir to Williams Fork Diversion Project (Jones Pass) and to the Fraser River Diversion Project decreed in Civil Action Nos. 657 and 1430).

2. Undecreed Exchanges from Dillon Reservoir . The West Slope Signatories will not object to Denver Water's continued operation of and a decree for exchanges from Dillon Reservoir to Williams Fork Reservoir with an appropriation date of April 25, 1983, and to existing points of diversion for the Fraser River and Williams Fork Diversion Projects with an appropriation date of September 20, 1966, provided that the exchanges are exercised and operated and the decree contains terms and conditions that are at least as protective as the following;

a. An application for the exchanges was filed in Case No. 11CW21, the exchanges will be administered with a priority date of 2010, and the priority date or dates of the exchanges will not be antedated pursuant to C.R.S. § 37-92-305(10). The West Slope Signatories may file a statement of opposition but shall limit their opposition to ensuring that the protective conditions in this paragraph are part of the decree.

b. The maximum amount of the exchange to the Williams Fork Reservoir is limited to a rate of 148 cfs (absolute) based on diversions on April 25, 1983 and an annual volume of 6,095 af (absolute) based on diversions in water year 1990. The maximum amount of the exchange to the existing points of diversion on Fraser River and Williams Fork River Diversion Projects is limited to a rate of 56 cfs (absolute) based on diversions on September 9, 1985 and an annual volume of 8,747 af (absolute) based on diversions in water year 1967.

c. The exchanges from Dillon Reservoir to Williams Fork Reservoir or from Dillon Reservoir to the Fraser River and Williams Fork River Diversion Projects shall not be exercised or operated if the Division 5 Engineer advises Denver Water that curtailment of the exchanges is required to satisfy all senior instream flows existing in 2009, and located in the applicable stream reach affected by the diversion, including the following CWCB instream flow decrees:

1) Colorado River (80CW448, 80CW446, 80CW447)

2) Williams Fork River 79CW185, 79CW183, 79CW181, 79CW180, 79CW175, 79CW173, 79CW172, 79CW170, 79CW169, 79CW168, 79CW165)

(a) Bobtail Creek (79CW164, 79CW163)

(b) Steelman Creek (79CW167, 79CW166).

3) Fraser River (90CW308B, 90CW308, 90CW315, 90CW307, 90CW302, 90CW289)

(a) St. Louis Creek (90CW316, 90CW317A, 90CW317, 90CW304)
(b) Vasquez Creek (90CW318)
(c) Ranch Creek (90CW305, 90CW306A, 90CW306, 90CW314)
(d) Cabin Creek (90CW312)
(e) Hamilton Creek (90CW311)
(f) Meadow Creek (90CW310, 90CW309)

d. The provisions in this paragraph IV. C.2. shall apply irrespective of whether any of the CWCB instream flow decrees listed in Article IV.C.2.c above contain provisions that might otherwise protect Denver Water's existing exchanges through these reaches from impairment by CWCB instream flows in the reaches.

D. 1978 Judgment and Decree. The Signatories agree that operations by which Denver Water diverts under its 1946 Roberts Tunnel direct flow right prior to the completion of the annual fill of Green Mountain Reservoir are consistent with the Blue River Decree, including the Supplemental Judgment and Decree entered in the Consolidated Cases on February 9, 1978, so long as such operations are in accordance with the Green Mountain Reservoir Administrative Protocol (Attachment R-1). The Signatories will cooperate to obtain such administrative and judicial approvals as are necessary to ensure that the Protocol is made legally binding and enforceable and is implemented.

E. Substitution Agreements. The West Slope Signatories agree to support and execute, as appropriate, all future renewals of the Memorandum of Agreement among the U.S. Bureau of Reclamation, Northern Colorado Water Conservancy District, Colorado River Water Conservation District, and Denver Water dated December 30, 1991, regarding substitutions from Wolford Mountain Reservoir (MOA No. 2-AG-60-01550), provided that such renewals are consistent with this Agreement and are reasonably the same in form and substance as the existing MOA, as modified by the July 21, 1992 Agreement Amending Lease Agreement between Colorado River Water Conservation District and City and County of Denver. The West Slope Signatories reserve the right to object to the addition of new substitution, exchange or replacement sources, or amounts other than those specified in Article III.A.4 not currently decreed for such use by Denver Water

F. Straight Creek Project. Summit County agrees to extend and not challenge the validity of the 1041 permit for Denver Water's Straight Creek project dated July 17, 1985, so that a new permit will not be required for Denver Water to proceed with the project as permitted in 1985 as described in Attachment O. Consistent with its 1996 Resource Statement, Denver Water agrees that it will develop the Straight Creek project only with the prior approval of the Summit County Commissioners and the River District.

G. Wolford Mountain Reservoir.

1. Repayment Water. With regard to the 1000 acre feet of Repayment Water ("WMR 1KAF") referenced in paragraph 20(b) of the Agreement Amending Lease Agreement between the River District and Denver Water, dated July 12, 1992 ("Wolford Agreement"), the River District and Denver Water agree that the River District shall provide and account for the WMR 1KAF as follows:

a. The first 500 acre feet of the WMR 1KAF, along with the 613 acre feet of water available to Denver Water under paragraph 20(c) of the Wolford Agreement, shall be made available every year and used by Denver Water for substitution purposes.

b. The remaining 500 acre-feet of the WMR1KAF shall be stored and used for substitution purposes in the same manner as the water storage attributable to Denver Water's 40% interest in the Wolford Mountain Reservoir water right and storage space (a volume of 24,000 acre-feet), on a pro rata basis (500 acre-feet = 0.83% of 60,000 acre-feet, so water would be stored at a rate of 40.83%).

2. Second Enlargement of Wolford. Denver Water agrees to waive any right to participate in the second enlargement of Wolford Mountain Reservoir, in the same or **a** lesser amount as claimed in Case No. 03CW302, Water Division 5. The River District agrees that Denver Water is not obligated to pay any capital or OM&R costs associated with a second enlargement.

3. 1041 Permit for Wolford. The River District and Denver Water agree to work cooperatively as co-permittees to obtain any amendment to the Grand County 1041 permit for Wolford Mountain Reservoir that may be necessary (1) to address current operations of Wolford Mountain Reservoir under the Wolford Agreement; and (2) to effectuate the applicable provisions of this Agreement. Upon application for such a permit amendment, Grand County agrees to cooperate to process an amendment as quickly as possible.

4. Replacement Water. In addition to water in Wolford Mountain Reservoir that Denver Water is currently entitled to use for substitution and other purposes, this Agreement requires that Replacement Water be available to Denver Water as a condition of several water deliveries under Article III.

The estimated maximum volume of Replacement Water that might be required under this Agreement is 2,590 acre-feet in any single substitution year. Under the 1992 Clinton Agreement and the 1985 Summit Agreement, West Slope entities have agreed to provide Replacement Water to Denver Water in an amount estimated to be 1,249 acre-feet annually, which could be supplied from Wolford. The Signatories wish to ensure that Wolford Mountain Reservoir could be used to provide the full 3,839 acre feet of Replacement Water, even though it is anticipated that Replacement Water will be provided to Denver Water from other sources. The Signatories agree to cooperate to implement acceptable amendments or approvals as might be necessary to ensure that the 1991 MOA between the Bureau of Reclamation, Denver Water, the Colorado River Water Conservation District and the Northern Colorado Water Conservancy District; the decree in Case No. 91CW252; and the 1041 permit for Wolford Mountain Reservoir allow the use of the full 3,839 acre feet of Replacement Water, in addition to the water in Wolford the Denver Water is currently entitled to use for substitution and other purposes**.**

The West Slope Signatories agree that Replacement Water provided by the West Slope to Denver Water from Wolford Mountain Reservoir as Replacement Water under the 1985 Summit Agreement, the 1992 Clinton Agreement and this Agreement is a permissible use of Wolford Mountain Reservoir by Denver Water.

H. Storage in Gross and Ralston Reservoirs. The West Slope Signatories shall not contest Denver Water's storage of Williams Fork and Cabin-Meadow Creek water as decreed in Case No. 657, in Gross and Ralston Reservoirs. The agreement of the West Slope Signatories in this paragraph is premised on circumstances and consideration unique to this Agreement.

I. Deliveries of Water to the City of Golden. The West Slope Signatories shall not contest whether Denver Water's delivery of water to the City of Golden under the contract dated May 10, 2007, is consistent with Denver's water rights decrees.

J. Moffat Project Permitting. With the exception of Grand County (which is a consulting agency in the NEPA process for the Moffat Project), the West Slope Signatories agree that the concerns raised in the comment letters they submitted on the October 2009 Draft EIS for the Moffat Project will be resolved by the combination of (1) the benefits that will accrue to the West Slope pursuant to the terms of this Agreement, plus (2) the environmental mitigation requirements and conditions that will be imposed by the federal and state permitting agencies in the permits and approvals issued for the Moffat Project. Accordingly, the West Slope Signatories other than Grand County agree not to oppose the issuance of any local, state and federal approvals for the Moffat Project, including those permits listed in Attachment P. Nothing in this paragraph IV.J shall affect Grand County's continuing actions as a consulting agency in the NEPA process on the Moffat Project. Nor shall anything in this paragraph IV.J be deemed a waiver of rights a Signatory may have

upon any breach of this Agreement.

K. Water Rights in Eagle River Basin. The West Slope Signatories that are parties to the cases involving Denver Water's Eagle-Colorado water rights agree to implement the settlement of Denver Water's Eagle-Colorado diligence case and to facilitate the water court case changing the location of Denver Water's Piney River water right to State Bridge. All the West Slope Signatories agree not to oppose a water court application changing the location of Denver Water's Piney River water right to State Bridge.

L. Water Rights in Williams Fork Basin. The West Slope Signatories shall not contest and West Slope Signatories that are parties to the cases will stipulate to the entry of the proposed decrees included as Attachment Q in Case No. 2007CW031 (Jones Pass) making 245 cfs absolute and finding diligence for the remaining conditional amount; and finding diligence in Case Nos. 2007CW030 (Carr Ditch) and 2007CW029 (Darling Creek, Williams Fork Power, Moffat Tunnel.

1. Waiver of Claims. The West Slope Signatories agree that claim preclusion applies to all claims and objections to Denver Water's operations under the decrees listed in this Article IV.L raised or which could have reasonably been raised in the cases listed above, or which could have reasonably been raised in previous diligence proceedings for these water rights. The signatories agree that the resolution of the current diligence proceeding constitutes an adjudication on the merits of their statements of opposition.

2. Claims Not Precluded. The West Slope Signatories may file statements of opposition in future proceedings under the water rights listed above limited to: 1) Denver Water's compliance with this Agreement, and 2) claims that were not and could not reasonably have been raised in prior proceedings.

## ARTICLE V
## Green Mountain Reservoir Administration

A. Resolution of Disputes. The Signatories agree that resolution of long-standing disputes regarding the proper administration of water rights adjudicated in the Blue River Decree, including the water rights of Green Mountain Reservoir and the Green Mountain Powerplant, will provide significant benefits for water users on both the east and west slopes of Colorado, including maximizing beneficial use of the waters of the state, reducing litigation costs, and providing clarity as to water rights administration. Certain Signatories have negotiated with other entities a protocol to resolve the long-standing disputes, entitled the Green Mountain Reservoir Administrative Protocol ("Protocol"), a copy of which is attached to this Agreement as Attachment R-1.

The primary purpose of the Protocol is to clarify and implement certain provisions of the Blue River Decree by (1) setting forth a protocol for, among other things: (a) the preparation, review, and modification of a fill schedule for Green Mountain Reservoir; (b) definition and administration of the fill season for the 1935 First Fill Storage Right; (c) administration of water rights during the fill season; and (d) operation of the Green Mountain Reservoir Water Rights and the Cities' water rights in response to downstream calls senior to the Cities' water rights; (2) making as much water as possible available for upstream use, including use by the Cities, without impairment of the fill of Green Mountain Reservoir; (3) providing a clear definition of the Cities' replacement obligation operations, including Denver Water's obligations to the City Contract Beneficiaries as defined in Attachment R-1; (4) ensuring that the administration of water rights does not allow the water rights of the Cities to "hide behind" or otherwise benefit from the Green Mountain Reservoir Water Rights; (5) eliminating or reducing as much as possible, the extent to which the Green Mountain Reservoir 60 cfs bypass is accounted against the fill of the Green Mountain Reservoir Storage Rights; and (6) addressing the relative priority of the Green Mountain Water Rights, the Cities' water rights, and the Climax's C.A. 1710 rights in a manner agreed by the Blue River Decree parties and Climax; all in a manner that is consistent with the Blue River Decree.

B. Implementation of Green Mountain Administrative Protocol. The following Signatories are among the parties to an agreement entitled the Green Mountain Reservoir Administrative Protocol Agreement (the "Protocol Agreement", a copy of which is attached to this Agreement as Attachment R-2: Denver Water, the River District, Middle Park Water Conservancy District, Grand Valley Water Users Association, Orchard Mesa Irrigation District, Ute Water Conservancy District, Palisade Irrigation District, and Grand Valley Irrigation Company. The Protocol Agreement provides, among other terms and conditions, that these Signatories (and certain other parties to the Protocol Agreement) approve the Protocol and agree to its implementation. Nothing in this Agreement shall modify the obligations of the parties to the Protocol Agreement in accordance with the terms and conditions contained therein.

C. Non-opposition to Green Mountain Administrative Protocol. The following Signatories are not parties to the Protocol Agreement: the Boards of County Commissioners of Eagle, Grand, and Summit Counties, Clinton Reservoir Company, Eagle Park Reservoir Company, Eagle River Water and Sanitation District, Upper Eagle Regional Water Authority, Mesa County Irrigation District, City of Glenwood Springs, and City of Rifle. These Signatories agree not to oppose the implementation of the Protocol in any adjudication or other proceeding deemed necessary by the parties to the Protocol Agreement to make the Protocol legally binding and effective, or to confirm the consistency of the Protocol with the Blue River Decree, so long as the Protocol is substantially consistent with Attachment R-1. These Signatories may support the Protocol in any proceedings in which they have standing to participate.

## ARTICLE VI
## Shoshone Call

A. Shoshone Call.

1. The Shoshone Power Plant, which is owned and operated by Public Service Company of Colorado, d/b/a/ Xcel Energy ("Xcel"), is located on the mainstem of the Colorado River in Glenwood Canyon. The Shoshone Power Plant produces hydroelectric energy by means of two water rights, the 1902 Shoshone Senior Right in the amount of 1250 cfs and the 1929 Shoshone Junior Right in the amount of 158 cfs (together, "Shoshone Water Rights").

2. When the Shoshone Power Plant is operating, the Shoshone Water Rights command the flow in the river by exercising the Senior Shoshone Call against upstream junior water rights. When the Senior Shoshone Call is on, upstream reservoirs cannot store water and junior water rights cannot divert unless they provide an equal volume of replacement water to the stream. Over the years, many water users have come to rely on the river flow regime created by the Senior Shoshone Call ("Shoshone Call Flows").

3. Whenever the Shoshone Power Plant is subject to a shutdown for repair, maintenance, or other reasons ("Shoshone Outage"), the Shoshone Call cannot be exercised, and Shoshone Call Flows may not be present in the river.

4. The Signatories agree that a Shoshone Outage could adversely affect water users and recreation interests on the Colorado River. Accordingly, the Signatories agree to implement the operational procedures described in this section during a Shoshone Outage (the "Shoshone Outage Protocol") to mitigate such potential adverse effects. The Signatories also agree to cooperate to achieve permanent management of the flows of the Colorado River as described in Article VI.C, whether or not the Shoshone Power Plant remains operational.

B. Shoshone Outage Protocol.

1. Outage During Irrigation Season. If a Shoshone Outage occurs during the period from March 25 through November 10 (Irrigation Season) and results in a flow of the Colorado River at the Dotsero Gauge below 1,250 cfs (not including any water released for endangered fish species purposes), then the River District, Middle Park and Denver Water agree that they will operate their systems as if the Senior Shoshone Call were on the River, resulting in a flow of not more than 1250 cfs at the Dotsero Gauge (not including any water released for endangered fish species purposes). The Shoshone Outage Protocol

will not apply to Shoshone Outages that occur during certain very dry Irrigation Seasons, as described in the following subparagraphs.

a. The very dry Irrigation Seasons occur when the two conditions for a water shortage, as defined in paragraph 2 of the 2007 Shoshone Agreement, are met. Denver Water will make projections in March prior to March 25, and again in early May and late June to determine whether a water shortage is occurring.

b. If a projection made under subparagraph a above in March or May meets the conditions for a water shortage, then the Shoshone Outage Protocol will not apply during the period from that projection to the next projection. If a projection made in March or May does not meet the conditions for a water shortage, then the Shoshone Outage Protocol will apply during the period from that projection to the next projection; provided, however, that the Shoshone Outage Protocol will not apply during any period when the Shoshone Call is relaxed under the 2007 Shoshone Agreement.

c. If the projection made in June under subparagraph a above meets the conditions for a water shortage, then the Shoshone Outage Protocol will not apply during the remainder of the Irrigation Season that year. If the projection made in June does not meet the conditions for a water shortage, then the Shoshone Outage Protocol will apply during the remainder of the Irrigation Season that year.

2. Green Mountain Reservoir. The Signatories will cooperate with one another and use their best efforts to negotiate a separate agreement with the U. S. Bureau of Reclamation ("Reclamation") pursuant to which Reclamation would agree that if a Shoshone Outage occurs, it will continue to operate Green Mountain Reservoir as if the Senior Shoshone Call were on the river. Such agreement with Reclamation shall be subject to terms and conditions as to which the Signatories and Reclamation shall agree, including the following

a. Any water released from storage in Green Mountain Reservoir would be debited to the appropriate account within the reservoir's 100,000 Acre-Foot Pool to which the releases were attributed, e.g., the historic users pool identified in paragraph 2 of Reclamation's January 23, 1984 Operating Policy for Green Mountain Reservoir,

b. Water that would have been released from the 52,000 Acre-Foot Replacement Pool had the Senior Shoshone Call been on the river shall be debited as discretionary power releases from the 100,000 Acre-Foot

Pool, unless other arrangements are made with Reclamation and the Northern Colorado Water Conservancy District.

c. Reclamation will not be obligated to make releases from storage pursuant to this provision if water is not available in the 100,000 Acre-Foot Pool or if the total volume of Green Mountain Reservoir storage accounts is less than an amount to be agreed upon by the West Slope Signatories and Reclamation.

3. Outage During Winter Season. If a Shoshone Outage occurs during the period from November 11 to March 24 (Winter Season): (1) as a result of conditions other than scheduled maintenance on the Shoshone power plant facilities, and (2) if flows at the Dotsero Gauge are at or below 900 cfs, the River District and Denver Water agree that they will operate their systems as if the Senior Shoshone Call were on the river, subject to the following:

The Shoshone Outage Protocol will not apply fully to Shoshone Outages that occur during certain very dry Winter Seasons, when the overall storage in Denver Water's system is less than 79% of capacity on November 1. For purposes of this paragraph, the reservoirs that will be considered in determining overall storage are those reservoirs listed in Exhibit A to the 2007 Shoshone Agreement, but excluding any reservoirs under storage restrictions due to maintenance, repairs or orders from the Colorado State Engineer.

a. If the storage is less than 79%, but more than 63%, then the Shoshone Outage Protocol will be applied at half the normal effect during that Winter Season. For example, if Denver Water would be required to bypass or replace 60 c.f.s. under the full operation of the Shoshone Outage Protocol, Denver Water would be required to bypass or replace 30 c.f.s. if the Shoshone Outage Protocol is applied at half the normal effect.

b. If the storage is equal to or less than 63%, but more than 49%, then the Shoshone Outage Protocol will be applied at one-fourth the normal effect during that Winter Season.

c. If the storage is equal to or less than 49%, then the Shoshone Outage Protocol will not be applied during that Winter Season.

4. The Signatories will cooperate with one another and use their best efforts to:

a. Obtain the agreement of other diverters to participate in the Shoshone Outage Protocol.

b. Obtain the agreement of the State of Colorado water administration officials to shepherd water released from upstream reservoirs or

otherwise bypassed from upstream water rights under the Shoshone Outage Protocol to the Grand Valley under a donated instream flow, a municipal recreation delivery contract or other acceptable arrangement, and to refrain from accounting for releases from storage under the Shoshone Outage Protocol as storable inflow.

C. Permanency of Shoshone Call Flows.

1. It is the goal of the Signatories to achieve permanent management of the flow of the Colorado River so that the flow mimics the Shoshone Call Flows, whether or not the Senior Shoshone Call is on the river and whether or not the Shoshone Power Plant remains operational.

2. Denver Water and the River District agree to operate their systems on a permanent basis under the Shoshone Outage Protocol described in Article VI.B, even if the Shoshone Power Plant ceases operations altogether, and regardless of whether the plant is acquired under Article VI.D, subject to the following conditions:

a. The relaxation provisions described in Article VI.E below remain in full force and effect.

b. The Shoshone Outage Protocol would not apply for 17 cumulative days during the Winter Season, to duplicate the effect of the current scheduled outages for maintenance.

3. The Signatories agree to use their best efforts to work with Xcel Energy, other diverters, Reclamation and the State of Colorado water administration officials to devise and implement a mechanism or combination of mechanisms that will permanently preserve the Shoshone Call Flows. In addition to the amounts provided in Article VI.E.1.c., Denver Water agrees to pay one-third of the costs, not to exceed $100,000, incurred by West Slope Signatories to begin the process of implementing a mechanism to preserve the Shoshone Call Flows on a permanent basis. If total costs exceed $300,000, the Signatories will confer with regard to further actions.

D. West Slope Acquisition of Shoshone Assets

1. West Slope water users believe that one means to ensure the permanent maintenance of the Shoshone Call is the acquisition and operation of the Shoshone Power Plant and Shoshone Water Rights (the “Shoshone Assets”) by a West Slope governmental entity that is mutually acceptable to the West Slope Signatories (“West Slope Governmental Entity”).

2. Within twenty-four (24) months after the effective date of this Agreement (“Investigation Period”), any of the West Slope Signatories may agree among

themselves and at their own cost, to undertake and complete an investigation of the viability of purchasing the Shoshone Assets and operating the Shoshone Power Plant (the "Initial Investigation"). The Initial Investigation may include direct negotiations with Xcel; the hiring of consultants necessary to evaluate the Plant's physical and financial condition and the value of the Shoshone Assets; an evaluation of the legal and regulatory requirements that must be met in order to transfer the Shoshone Assets to a West Slope Governmental Entity; an evaluation of the appropriate West Slope Governmental Entity to acquire and operate the Shoshone Assets and the steps necessary to create such an entity, if a new entity is to be created; and any other matters that the West Slope Signatories believe are necessary or desirable. Denver Water shall assist the West Slope Signatories upon request in undertaking and completing the investigations during the Investigation Period. The West Slope Signatories may agree among themselves to extend the Investigation Period.

3. If the Initial Investigation determines that it is feasible for a West Slope Governmental Entity to acquire and operate the Shoshone Assets and if Xcel is willing to sell or otherwise transfer the Shoshone Assets to a West Slope Governmental Entity, the West Slope Governmental Entity may pursue the transfer of the Shoshone Assets. Denver Water agrees that it will support such acquisition and will take such reasonable actions as may be necessary to assist the West Slope Governmental Entity in completing the acquisition of the Shoshone Assets. Upon notification by any of the West Slope Governmental Entity of its intent to acquire the Shoshone Assets, Denver Water agrees not to assert its right under paragraph 13 of the 2007 Shoshone Agreement regarding the method of disposition of the Shoshone Water Rights.

4. Denver Water shall not be obligated to pay any of the purchase price for the Shoshone Assets if other mechanisms are reasonably available to preserve the Shoshone Call Flows. If other mechanisms are not reasonably available, and purchase of the Shoshone Assets is determined to be the best viable option to preserve the Shoshone Call Flows, then Denver Water agrees to contribute to the purchase price in a negotiated amount that is proportionate to its share of the overall benefits created by the purchase, and reasonable as compared to the financial contributions to the purchase price by other parties.

5. If a West Slope Governmental Entity acquires the Shoshone Assets, the Shoshone Call relaxation provisions described in Section VI.E below, shall remain permanently in effect.

E. Relaxation of Shoshone Call.

1. Existing Call Relaxation Agreement. Denver Water and Xcel are parties to the 2007 Shoshone Agreement, a copy of which is attached as Attachment S.

The 2007 Shoshone Agreement currently is set to expire on December 31, 2032. The Signatories agree that the Shoshone Call relaxation provisions of the 2007 Shoshone Agreement shall remain in effect during its term and any renewal thereof.

a. Denver Water agrees that, except as provided in Articles V and VI.E.2, it will not seek any relaxation of the Shoshone Call, other than a renewal of the specific provisions of the 2007 Shoshone Agreement beyond the year 2032.

b. The West Slope Signatories will not oppose a renewal of the 2007 Shoshone Agreement, provided that the Shoshone Outage Protocol remains in effect.

c. If the relaxation of the Shoshone Call is made permanent and Denver Water's yield is increased as a result, Denver Water agrees that 500 acre-feet of the increased yield (Relaxation Water) will be made available as potable water for use as blending water in a project using reusable return flows as described in Article I.B.2.e. The water supply created by the Relaxation Water will be added to the list of permissible fixed-amount contracts listed in Article I.B.1. In return for the availability of the Relaxation Water, the recipients must agree to pay the 2010 System Development Charge (SDC) applicable to potable water served outside the Combined Service Area. Denver Water will transmit the SDCs attributable to the Relaxation Water into a Relaxation Water Fund to be used (a) to contribute to the acquisition of the Shoshone Assets under Article VI.D; or (b) to implement a mechanism or combination of mechanisms that will permanently preserve the Shoshone Call Flows. It is anticipated that advance financing may be needed to accomplish the purposes described in this paragraph. The Signatories agree to consult with each other on an appropriate financing mechanism, should one be needed. It is also anticipated that the SDCs for the Relaxation Water may be paid pursuant to a payment schedule. If the Relaxation Water Fund is not fully expended for the purposes described in this paragraph, the money shall be used to contribute to the costs of a future cooperative project, determined by the River District and Denver Water to be beneficial to both the West Slope and the East Slope.

2. Expansion of Call Relaxation Period for Severe Drought Conditions. The 2007 Shoshone Agreement provides that the Shoshone Call may be relaxed during the period from March 14 until May 20, inclusive ("Call Relaxation Period"), under the conditions specified in the 2007 Shoshone Agreement. Denver Water desires to extend the Call Relaxation Period back into the winter months during extreme drought periods. The West Slope Signatories agree to support the amendment of the 2007 Shoshone Agreement to provide

for the relaxation of the Senior Shoshone Call down to 704 cfs (a "one-turbine call") for an expanded period during the winter months ("Expanded Call Relaxation Period"), subject to the following terms and conditions:

a. An Expanded Call Relaxation Period may occur under either of the following circumstances:

   i. The Senior Shoshone Call may be relaxed to a one-turbine call beginning on November 11 if Denver Water has banned outdoor residential lawn watering beginning no later than August 1, and the ban has remained in effect continuously from its inception through November 11.

   ii. The Senior Shoshone Call may also be relaxed to a one-turbine call beginning three (3) days after the date that the Denver Water Board formally adopts a drought declaration requiring that outdoor residential lawn watering be prohibited during the following irrigation season. The call relaxation under this section only applies to the period from November 11 until March 14 of the following year.

b. Denver Water will pay for power replacement costs as provided for in the 2007 Shoshone Agreement.

c. Denver Water will provide ten percent (10%) of the net water savings as defined in the 2007 Shoshone Agreement for use by West Slope Signatories. The West Slope Signatories will allocate the 10% as they may determine pursuant to any future agreement among them.

d. The Expanded Call Relaxation Period will end the earlier of:

   i. The date Denver Water rescinds its ban on outdoor residential lawn watering; or

   ii. The date a Cameo Call is placed on the river; or

   iii. March 14 of the year following implementation of the Extended Call Relaxation Period if implementation occurs on or prior to December 31; or March 14 of the year in which the Expanded Call Relaxation Period was implemented if implementation occurs on or after January 1.

e. Any relaxation of the Shoshone Call after March 14 of any given year shall occur only as provided in the 2007 Shoshone Agreement.

3. Call Relaxation Mitigation. The $500,000 to be placed in a special fund by Denver Water pursuant to Article III.G of this Agreement shall be managed and utilized as follows:

a. The proceeds of this fund will be used to help offset the impacts of, or prepare for, a call relaxation pursuant to the 2007 Shoshone Agreement or during the Expanded Call Relaxation Period, or a Shoshone Outage during the Winter Season pursuant to Section VI.B.3, above.

b. In order for a municipal water provider to access the funds described in this subsection, the provider must either be a signatory to this Agreement or must be located in Garfield County and agree to be bound by the terms and conditions of this Agreement.

c. The West Slope Signatories at their discretion may utilize funds available to any of them pursuant to Article III of this Agreement or the West Slope Fund to either replace or increase the funding for this special fund as may be necessary or desirable from time to time.

F. Environmental and Recreational Pilot Project. The Signatories agree to evaluate a pilot project to determine the feasibility of implementing a partial Shoshone Call relaxation in non-critical winter months and dedicating the saved water to environmental and recreation purposes.

G. Support for Glenwood Springs RICD. The City of Glenwood Springs currently has whitewater features located below the confluence of the Colorado River and the Roaring Fork River near Glenwood Springs, Colorado. Glenwood Springs currently does not have an adjudicated water right for these white water features but anticipates filing for one at some point in the future. In addition, Glenwood Springs anticipates creating additional white water features on the reach of the Colorado River between the Shoshone Power Plant and South Canyon on the main stem of the Colorado River. Denver Water will not oppose the filing of a water rights application for a Recreational In-Channel Diversion ("RICD") for the existing and proposed structures by Glenwood Springs; provided that any such application filed for any proposed structure above the confluence of the Roaring Fork and Colorado Rivers does not: (1) Claim a flow rate that exceeds the amount of water needed to satisfy the senior Shoshone Call for 1,250 cfs at the Dotsero gage; (2) Seek an amount of water in excess of that needed to replicate historic operations under the Senior Shoshone Call; or (3) Impair Denver's ability to divert under Article VI.

As to structures located below the confluence of the Roaring Fork and Colorado Rivers, Denver and Glenwood Springs recognize that the contributing flows of the two rivers make it difficult to predict the exact effect of a RICD on flows above the confluence. Glenwood Springs agrees to consult with Denver regarding such application prior to filing.

## ARTICLE VII
## Bilateral Commitments

A. Water Rights Peace Pact. With regard to all conditional water rights presently owned by the Signatories to this Agreement, and listed in Attachment T, the Signatories agree to withdraw any statements of opposition in each others' pending diligence filings and not to oppose each other's pending or future diligence applications, including applications to make the listed conditional rights absolute, provided, however, that the parties may file statements of opposition to such applications for the limited purpose of ensuring compliance with the obligations of this agreement.

B. Water Conservation. The Signatories to this Agreement will cooperate to develop and promote best management practices for water conservation appropriate for the various types of water use and regional geographic locations within the state. The Signatories agree to adopt any best management practices developed under this paragraph for their own water uses.

C. Compact Curtailment Plan. The Signatories agree to cooperate in good faith toward the development of a plan to avoid a potential curtailment of existing Colorado water rights under the provisions of the 1922 Colorado River Compact and the 1948 Upper Colorado River Compact, and to mitigate the impacts of any unavoidable curtailment. If joint efforts do not result in agreement on such a plan, each Signatory will take such actions as it may deem necessary to protect its water rights from curtailment.

D. Freedom to Operate. So long as the Signatories meet all of their obligations under this Agreement, their independent legal obligations and any contemporaneous implementing agreements, the Signatories agree that they do not have an obligation to operate their system or to conduct their decision-making in any particular way.

E. No Third Party Beneficiaries. It is expressly understood and agreed that enforcement of the terms and conditions of this Agreement, and all rights of action relating to such enforcement, shall be strictly reserved to the Signatories, and nothing contained in this Agreement shall give or allow any such claim to a right of action by any third person. It is the expressed intention of the Signatories that any person other than a signatory receiving services or benefits under this Agreement shall be deemed to be an incidental beneficiary only.

F. No Precedent. The various commitments and agreements of the Signatories to this agreement are premised on circumstances and considerations unique to this Agreement. Nothing in this Agreement shall be construed as establishing any legal precedent regarding any matters not expressly addressed in this Agreement. The Signatories agree that they do not intend this Agreement to have the effect of precedent or preclusion on any factual or legal issues in any matter not expressly addressed in this Agreement.

G. Risk Sharing. A fundamental premise of this Agreement is that the Signatories will not actively seek to undermine, or encourage others to undermine, the Signatories' respective interests and resources that have been committed, compromised, dedicated, or otherwise addressed in this Agreement. For purposes of this paragraph, "Adverse Action" means an action of a legislature, court, administrative agency, regulatory body or other governmental

entity that would cause a material adverse impact to a Signatory's interests or resources that have been committed, compromised or otherwise addressed in this Agreement. In the event that an Adverse Action is proposed or is likely to occur, the Signatory whose interests or resources would suffer a material adverse impact will notify the other Signatories. The Signatories will meet and discuss in good faith the potential detrimental effect of such Adverse Action, with the goal of determining whether any action by one or more Signatories could avoid the Adverse Action or mitigate its impact on the affected Signatory. Each party agrees to evaluate in good faith whether it can implement changes in its operations or undertake other efforts that would achieve this goal, and to implement any such efforts as may be agreed to by the Signatories.

H. Preservation of Governmental Powers. Except as specifically provided herein, nothing in this Agreement shall be construed as a limitation on or waiver of any review, approval, or permit authority, or a predetermination of any action taken thereunder, by any governmental or quasi-municipal entity including, without limitation, the legislative or quasi-judicial power or authority of Eagle, Grand and Summit Counties and the City and County of Denver, acting by and through its Board of Water Commissioners.

I. No Property Interest Created. Any rights created by this Agreement are contractual rights. This Agreement does not create and shall not be construed to create or convey any property interest, including any covenant, easement or servitude, in the real property of any Signatory.

J. Implementation of this Agreement.

1. In Article IV.A.1, the West Slope Signatories agree not to contest or to stipulate to the entry of the two proposed decrees included in Attachment N, in Case No. 2006CW255 (Roberts Tunnel – N1) and Case No. 2003 CW039 (Dillon Refill – N2), and to support and cooperate in any proceedings necessary to implement the provisions of this Agreement related to the Blue River Decree. The Signatories agree that, upon execution of this Agreement, Denver Water will file an amended application in 2006CW255 (Roberts Tunnel) for approval of the proposed Roberts Tunnel decree in Attachment N1 and publish supplemental notice thereof in the Division 5 Water Court. The Signatories agree that the amended application in Case No. 2006CW255 and the proposed Roberts Tunnel decree in Attachment N1 are among the mechanisms that will be used to implement Article III.A.3. If statements of opposition are filed as a result of the supplemental notice, the Signatories agree to cooperate to resolve any issues raised by such statements and to finalize the proposed Robert Tunnel decree in 2006 CW255.

2. The Signatories agree that the proposed Roberts Tunnel decree in Attachment N1 will not be presented to the federal court for entry of final judgment until the earlier of the following:

   a. The U. S. Bureau of Reclamation has executed the "separate agreement" described in Article VI.B.2, pursuant to which it agrees "that if a Shoshone

Outage occurs, it will continue to operate Green Mountain Reservoir as if the Senior Shoshone Call were on the river."

b. The Signatories agree that the goal of Article VI.C.3 has been achieved, such that the Signatories, other water users, and the State of Colorado water administration officials have devised and implemented "a mechanism or combination of mechanisms that will permanently preserve the Shoshone Call Flows." If the agreed-upon mechanism requires a water court application, achievement of the goal for purposes of this paragraph 2.b is defined as the entry of a final decree approving the mechanism by the water court, which is no longer subject to appeals.

3. Several provisions of this Agreement are contingent upon the Resolution of Blue River Decree Issues, which is defined in Article III.A.2 and the Definitions as the entry of final judgments and decrees no longer subject to appeals in 06CW255 and 03CW039. The Signatories acknowledge that any delay required by Article VII.J.2 above in the entry of a final judgment will cause an equivalent delay in implementing the various provisions of this Agreement that are contingent upon Resolution of Blue River Decree Issues.

4. The Signatories acknowledge that they are contractually bound upon the Effective Date of this Agreement, regardless of any delay in the entry of a final judgment in Case No. 06CW255 required by Article VII.J.2 above.

5. The Signatories agree to coordinate and provide reasonable assistance to each other in obtaining any necessary license, permit or approval to carry out this Agreement, including those described in this Article VII.J. The Signatories agree that not every issue and problem can be foreseen and dealt with in advance, and that cooperation will be needed to handle future events that might impair implementation of particular provisions of this Agreement. If such an impairment of a particular provision occurs, the Signatories agree to cooperate in good faith in a reasonable manner to develop alternative means to accomplish as nearly as possible the desired outcome of the provision in question.

K. Severability or Reform of Invalid Provisions. Wherever possible each provision of this Agreement shall be interpreted and implemented in such manner as to be effective and valid under applicable law. If any provision or portion of this Agreement is determined to be invalid or unenforceable, the remaining provisions shall remain in full force and effect unless the remaining provision's effectiveness is explicitly dependent upon the invalid or unenforceable provision. The Signatories agree to reform this Agreement to replace any such invalid or unenforceable provision with a valid and enforceable provision that comes as close as possible to the intention of the stricken provision. The provisions of this Agreement shall be reasonably and liberally construed to achieve the intent of the Signatories.

L. Venue. Venue for resolution of any dispute of water matters under this Agreement resulting in litigation shall be the District Court, Colorado, for the appropriate Water Division or federal district court, as appropriate under the Blue River Decree. Venue for all other matters under this Agreement resulting in litigation shall be the Colorado District Court for the county in which any defendant resides.

M. Conflict Resolution. The Signatories agree that if a dispute arises between Denver Water and a West Slope Signatory, the affected Signatories will confer in good faith and endeavor to resolve the concern. If the affected Signatories reach an impasse, they will select a neutral third party mediator who would seek an acceptable voluntary solution to the conflict. For conflicts that involve a technical or scientific matter, the neutral third party mediator may select an independent technical or scientific expert, acceptable to the Signatories involved in the mediation, to review and make a recommendation on the matter. If the conflict cannot be resolved through the efforts of the mediator, then the affected Signatories may pursue any available legal or administrative recourse.

N. Information Sharing. The Signatories shall maintain records in accordance with their normal procedures with regard to their respective obligations under this Agreement, and shall make such records available to each other upon reasonable request.

## Article VIII
## Definitions

| TERM | DEFINITION |
|---|---|
| 1985 Summit Agreement | Agreement between Summit County Board of Commissioners and Denver Water, dated September 19, 1985 |
| 1992 Clinton Agreement | Clinton Reservoir - Fraser River Water Agreement, dated July 21, 1992 |
| 2007 Shoshone Agreement | Agreement between Denver Water and Public Service Company of Colorado d/b/a Xcel Energy, effective January 1, 2007, concerning reduction of the Shoshone Call |
| Abstention Provisions | a. Abstain permanently from pursuing or participating in any project that would result in any new depletion from the Colorado River and its tributaries above the confluence with the Gunnison River, including without limitation the Eagle River (with the exception of the Eagle River MOU for Aurora and the Upper Colorado Cooperative Project). Pursuing or participating in a project means seeking formal approval of any aspect of a project in a regulatory or judicial forum, but does not include conducting various planning activities such as feasibility studies.<br><br>b. Abstain from pursuing or participating in any project that would result in diversions from the Colorado River Basin within Water Divisions Nos. 4 and 6, or downstream from the confluence of the Gunnison and Colorado Rivers in Water Division No. 5 for a period of 25 years. Pursuing or participating in a project means seeking formal approval of any aspect of a project in a regulatory or judicial forum, but does not include conducting various planning activities such as feasibility studies. This abstention period would be reduced to 15 years if, within the first 10 years following execution of this agreement, the NEPA permitting process for the Upper Colorado Cooperative Project has not been initiated. If construction of a cooperative project commences within 20 years from the date of this agreement, then the abstention period under this paragraph would be extended for an additional 10 years (a total of 35 years). |
| Blue River Decree | The stipulations, judgments, decrees and orders entered in Consolidated Civil Nos. 2782, 5016 and 5017, United States District Court, District of Colorado including determinations of diligence and to make absolute. |
| Cameo Call | A request to the state water officials to curtail diversions of junior water rights to satisfy any or all of the water rights legally divertible for irrigation and power purposes at the headgates of the Grand Valley Project's Government Highline Canal near Cameo and the Grand Valley |

| | |
|---|---|
| | Irrigation Company's Grand Valley Canal near Palisade. The water rights divertible at these headgates are owned and/or operated by Grand Valley Irrigation Company, Grand Valley Water Users Association, Mesa County Irrigation District, Palisade Irrigation District and Orchard Mesa Irrigation District and are listed on Exhibits A and B to the Stipulation and Agreement dated as of September 4, 1996, in the "Orchard Mesa Check Case," Case No. 91CW247. |
| Eagle River MOU | The agreement effective December 1, 1997 among the Cities of Aurora and Colorado Springs, Colorado River Water Conservation District, Cyprus Climax Metals Company, and the Vail Consortium consisting of the Eagle River Water and Sanitation District, Upper Eagle Regional Water Authority and Vail Associates, Inc. |
| Effective Date | The first business day at least seven days after the last Signatory has signed this Agreement. |
| Environmental Enhancement Project | A project that involves aquatic and riparian species habitat protection or enhancement; wetland creation or enhancement for (1) mined land reclamation or (2) other water quality protection; or watershed protection, including, without limitation, fuel reduction, erosion control or revegetation. |
| Fraser Collection System | Denver's Water system of diversions, canals, tunnels and other infrastructure located in the headwaters of the Fraser River Basin in Grand County |
| Grand County Operating Plan | Exhibit B to the 1992 Clinton Agreement |
| Grand County Water Users | Those entities listed in paragraph 4(c) of the Clinton Agreement |
| IRP | Denver Water's Integrated Resource Plan, prepared pursuant to the Denver Water Board's October 15, 1996 water resource statement, published in 1997 and updated in 2002 |
| Issuance and Acceptance by Denver Water of Permits Necessary for the Moffat Project | The permits necessary for the Moffat Project are defined to be the 404 permit by the Corps of Engineers; the license amendment by FERC; the section 4(e) conditions and special use permit by the U. S. Forest Service; the 401 certification from the Colorado Water Quality Control Division; and the Boulder County 1041 permit, if one is required. The Denver Water Board must decide, in its sole discretion, whether to accept the permits within 6 months after the last final agency action regarding the permits on this list. If a permit is appealed during the six-month approval period, the deadline for Denver Water to decide whether to accept the permits will be extended until 30 days after the final resolution of the appeal. |
| Joint Use Project | A water supply project located on the East Slope agreed to by Denver Water and one or more East Slope water suppliers |

| | |
|---|---|
| Moffat Project | Denver Water's Moffat Collection System Project, which is the subject of permit application NWO-2002-80762-DEN, filed with the U. S. Army Corps of Engineers |
| Moffat Project becomes operational | The capacity of Gross Reservoir has been enlarged, and water has been diverted and stored in the enlarged portion of Gross Reservoir |
| Resolution of Blue River Decree Issues | The entry of final judgments and decrees in 06CW255, Water Division 5, and in 49-cv-2782, U.S. District Court, and in 03CW039, Water Division 5, that are no longer subject to appeals, in the form of the proposed decrees set forth as Attachment N to this Agreement. |
| Reusable Return Flows | Flows that return to the river system after the initial beneficial use of water, including reusable effluent, which may be reused or successively used, either directly or by exchange. |
| Reuse | Use of return flows or effluent directly or by exchange for the same or a different purpose as the initial use. |
| Senior Shoshone Call | A request to the state water officials to curtail diversions of junior water rights to produce a flow at the Dotsero Gauge of 1250 cfs for power purposes at the Shoshone Power Plant |
| Service Area | Denver Water's 2010 Service Area as depicted in the map in Attachment B. |
| Shoshone Call | A request to the state water officials to curtail diversions of junior water rights to produce a flow at the Dotsero Gauge of 1408 cfs for power purposes at the Shoshone Power Plant. |
| Shoshone Junior Rights | The water rights decreed for and associated with the Shoshone Power Plant (aka the Glenwood Power Canal), adjudicated for 158 cfs on February 7, 1956, with an appropriation date of May 15, 1929. |
| Shoshone Senior Right | The water right decreed for and associated with the Shoshone Power Plant (aka the Glenwood Power canal), adjudicated for 1,250 cfs on December 9, 1907 with and appropriation date of January 7, 1902. |
| Signatories | Denver Water, Colorado River Water Conservation District, Middle Park Water Conservancy District, Boards of County Commissioners of Eagle, Grand, and Summit Counties, Clinton Reservoir Company, Eagle Park Reservoir Company, Eagle River Water and Sanitation District, Upper Eagle Regional Water Authority, Grand Valley Water Users Association, Orchard Mesa Irrigation District, Ute Water Conservancy District, Palisade Irrigation District, Mesa County Irrigation District, Grand Valley Irrigation Company, City of Glenwood Springs, and City of Rifle. |
| Upper Colorado Cooperative Project | A water supply project located on the West Slope, agreed to by Denver Water and the West Slope Signatories to this Agreement, and designed to |

| | |
|---|---|
| | produce water for use on the East and West Slopes, including at least 20,000 acre-feet of average annual diversions for use on the East Slope. |
| West Slope Charge | A per-acre-foot charge that East Slope recipients of water under Articles I.B.1, I.B.2.e, I.B.3, and I.B.4 agree to pay into the West Slope Fund, to be collected by Denver Water pursuant to a West Slope Charge Agreement, in substantially the form of Attachment D. The payment will be equivalent to the stated percentage of the then-current standard rate for nonpotable or potable water, as applicable, charged by Denver Water to customers outside its Service Area. |
| West Slope Fund | A fund to be established within six months of the Effective Date of this Agreement to serve as the depository of payments of the West Slope Charge. The West Slope Fund will be managed by the Colorado River Water Conservation District, or other manager acceptable to the parties, and will be used solely for water supply, watershed and water quality projects that benefit the West Slope. No money from the West Slope Fund may be used for litigation costs.<br><br>a. One-fifth of the West Slope Charge imposed under Articles I.B.1, I.B.2.e, and I.B.4, or 2.5% of the 12.5% (Forest Restoration Funds) will be dedicated to accomplishing the following activities in the watersheds in which Denver Water's facilities in Grand and Summit counties are located:<br>Forest thinning, prescribed fire, tree planting, riparian vegetation improvements, road decommissioning, road improvements, mine reclamation, and other forest and watershed health treatments that benefit water flows or water quality within and below the watershed; and<br>Aquatic restoration or improvement activities that address sediment loading or other water flow or water quality issues caused directly or indirectly by the pine beetle infestation or other forest health issues.<br><br>b. The Forest Restoration Funds shall be split equally into two interest-bearing accounts, one for Summit County and one for Grand County, to be managed by the River District. The River District shall distribute Forest Restoration Funds from the accounts as directed by the counties.<br><br>c. During the term of the Memorandum of Understanding between Denver Water and the USDA, Forest Service Rocky Mountain Region (USFS) dated July 29, 2010 (MOU), the Forest Restoration Funds shall be used for projects consistent with USFS activities in the Sulphur and Dillon Ranger Districts that are included in the August 19, 2010 5-Year Operating Plan that supports the MOU, as determined by agreement between Denver Water and the Board of |

| | |
|---|---|
| | County Commissioners of each county for projects located in that county. This use of Forest Restoration Funds will be in addition to, and will not reduce the total amount of planned contributions of Denver Water and USFS under the MOU and the Operating Plan. The Forest Restoration Funds may be used on non-USFS lands.<br><br>d. Following termination of the MOU, Forest Restoration Funds from Grand County's account will be added to the resources available for use in the Learning by Doing Cooperative Effort established in Article III.E.6. Decisions on how best to use the funds will follow the decision process outlined in the Learning by Doing IGA. The use of Forest Restoration Funds from Summit County's account will be determined by agreement between Summit County and Denver Water. |

Colorado River Cooperative Agreement
Counterpart Signature Page

ATTEST:

Secretary

**CITY AND COUNTY OF DENVER,**
acting by and through its
**BOARD OF WATER COMMISSIONERS**

President

REGISTERED AND COUNTERSIGNED:
Dennis J. Gallagher, Auditor
CITY AND COUNTY OF DENVER

By:

APPROVED AS TO FORM:

General Counsel

**BOARD OF COUNTY COMMISSIONERS, COUNTY OF SUMMIT**

By:
Chairman

ATTEST:

By:
Gary Martinez, Summit County Manager

**BOARD OF COUNTY COMMISSIONERS, COUNTY OF GRAND**

By:
Chairman

ATTEST:

By:
Grand County Clerk and Recorder

**CLINTON DITCH & RESERVOIR COMPANY**

By:
Chairman

AND ITS ATTORNEYS

By:
General Counsel

**MIDDLE PARK WATER CONSERVANCY DISTRICT**

By:
President

AND ITS ATTORNEYS

By:
Cazier, McGowan & Walker

5/15/2012

**Colorado River Cooperative Agreement**
**Counterpart Signature Page**

**BOARD OF COMMISSIONERS OF EAGLE COUNTY**

By: _____
Chairman Pro Tem

AND ITS ATTORNEYS

By: _____

**EAGLE RIVER WATER AND SANITATION DISTRICT**

By: _____
Chairman of the Board of Directors

AND ITS ATTORNEYS

By: _____
Glenn E. Porzak
Porzak Browning & Bushong LLP

**UPPER EAGLE REGIONAL WATER AUTHORITY**

By: _____
Chairman of the Board of Directors

AND ITS ATTORNEYS

By: _____
Glenn E. Porzak
Porzak Browning & Bushong LLP

**EAGLE PARK RESERVOIR COMPANY**

By: _____
President

AND ITS ATTORNEYS

By: _____
Glenn E. Porzak
General Counsel

Colorado River Cooperative Agreement
Counterpart Signature Page

**COLORADO RIVER WATER CONSERVATION DISTRICT**

By: _____
President

AND ITS ATTORNEYS

By: _____
General Counsel

**CITY OF GLENWOOD SPRINGS**

By: _____
Mayor

ATTEST:

By: _____
City Clerk

APPROVED AS TO FORM:

By: _____
Karp Neu Hanlon PC

**CITY OF RIFLE**

CITY OF RIFLE SEAL GARFIELD COUNTY, COLORADO

By: _____
Mayor

ATTEST:

By: _____
City Clerk

APPROVED AS TO FORM:

By: _____
Karp Neu Hanlon PC

Colorado River Cooperative Agreement
Counterpart Signature Page

**GRAND VALLEY IRRIGATION COMPANY**

By: Robert Raymond 9-19-13
President Date

AND ITS ATTORNEYS

By: _____
Frederick G. Aldrich
Aldrich Law Firm, LLC

**GRAND VALLEY WATER USERS ASSOCIATION**

By: D. Kim Albertson 8/28/2013
President Date

AND ITS ATTORNEYS

By: Mark A Hermundstad 9/6/2013
Mark A. Hermundstad
Williams, Turner & Holmes, P.C.

**MESA COUNTY IRRIGATION DISTRICT**

By: Dave Voorhees 9/9/13
President Date

AND ITS ATTORNEYS

By: Nathan A. Keever 9/5/13
Nathan A. Keever
Dufford, Waldeck, Milburn & Krohn, LLP

**PALISADE IRRIGATION DISTRICT**

By: John Kryman 9/9/13
President Date

AND ITS ATTORNEYS

By: Nathan A. Keever 9/5/13
Nathan A. Keever
Dufford, Waldeck, Milburn & Krohn, LLP

**ORCHARD MESA IRRIGATION DISTRICT**

By: Larry Luller 8-29-13
President Date

AND ITS ATTORNEYS

By: Mark A Hermundstad 9/6/2013
Mark A. Hermundstad
Williams, Turner & Holmes, P.C.

**UTE WATER CONSERVANCY DISTRICT**

By: _____ 8/30/13
President Date

AND ITS ATTORNEYS

By: Mark A Hermundstad 9/6/2013
Mark A. Hermundstad
Williams, Turner & Holmes, P.C.

Windy Gap Firming Project Intergovernmental Agreement (WGFP IGA)

The Municipal Subdistrict, Northern Colorado Water Conservancy District and its Windy Gap Firming Project Water Activity Enterprise, Board of County Commissioners of Grand County, Colorado, Middle Park Water Conservancy District, Colorado River Water Conservation District and Northwest Colorado Council of Governments enter into this Windy Gap Firming Project Intergovernmental Agreement ("WGFP IGA") as of the latest date of execution of this WGFP IGA by the Parties.

**I) Definitions.**

A. "1980 and 1985 Agreements" are the April 30, 1980 "Agreement Concerning the Windy Gap Project and the Azure Reservoir and Power Project" ("1980 Agreement") and the March 29, 1985 "Supplement to Agreement of April 30, 1980" ("1985 Agreement").

B. "Accounting Year" for the Middle Park Water Apportionment will begin on August 1st and end on July 31st the following calendar year. Middle Park's Accounting Year shall become effective on August 1 following execution of this WGFP IGA.

C. "Active Storage" for Chimney Hollow Reservoir is that reservoir capacity contained between the invert of the reservoir outlet works and the normal high water line in Chimney Hollow Reservoir, or in the case of Alternative Reservoirs, the total capacity available for storage and release for the benefit of the WGFP.

D. "Amendatory Contract" is the Amendatory Contract for the Introduction, Storage, Carriage, and Delivery of Water for Municipal Subdistrict, Northern Colorado Water Conservancy District, Colorado-Big Thompson Project, Colorado dated March 1, 1990 among Reclamation, the Subdistrict and Northern Water and any amendments, replacements, or supplements thereto necessary to implement the WGFP.

E. "Carryover Balance" is a portion of a Water Apportionment that is available for use pursuant to this WGFP IGA that can be stored for multiple years.

F. "Carryover Balance Limitation" is the maximum total Carryover Balance that can be credited to Middle Park or Grand County at any point in time.

G. Chimney Hollow Reservoir ("Chimney Hollow Reservoir") is that reservoir located on the East Slope identified in the Final Environmental Impact Statement for the Windy Gap Firming Project as the proposed action and any reservoir or reservoirs on the East Slope that are constructed as an alternative or in addition to the reservoir identified in the Final

Environmental Impact Statement ("Alternative Reservoir"), provided that the cumulative active storage capacity of Chimney Hollow Reservoir and any Alternative Reservoirs does not exceed 90,000 acre feet.

H. Colorado River Water Conservation District, ("River District") is a political subdivision of and a body corporate under the laws of Colorado, created by the provisions of C.R.S. §§ 37-46-101, et seq., for the purposes stated therein.

I. Grand County ("Grand County") is a county of the State of Colorado created by Article XIV of the Colorado Constitution and C.R.S. § 30-5-128, for the purposes stated therein.

J. Middle Park Water Conservancy District ("Middle Park") is a political subdivision of the State of Colorado, created under the provisions of C.R.S. §§ 37-45-101, et seq., for the purposes stated therein.

K. Municipal Subdistrict, Northern Colorado Water Conservancy District, ("Subdistrict") is a political subdivision of the State of Colorado, and formed under the provisions of C.R.S. §§ 37-45-101, et seq., for the purposes stated therein and as created by the Decree dated July 6, 1970, Weld County District Court, State of Colorado.

L. Municipal Subdistrict, Northern Colorado Water Conservancy District, Windy Gap Firming Project Water Activity Enterprise ("WGFP Enterprise") is a water activity enterprise of the Subdistrict organized under and pursuant to Article X, Section 20, of the Colorado Constitution and C.R.S. §§ 37-45.1-101 et seq.

M. "Net Credited Storage," is the amount of Windy Gap Project Water pumped at the Windy Gap Pumping Plant and conveyed to Granby Reservoir less any losses charged pursuant to the Amendatory Contract.

N. Northern Colorado Water Conservancy District ("Northern Water") is a political subdivision of the State of Colorado, created under the provisions of C.R.S. §§ 37-45-101, et seq., for the purposes stated therein, and is referenced in but not a party to this WGFP IGA.

O. Northwest Colorado Council of Governments ("NWCCOG") is a regional planning commission organized pursuant to C.R.S. § 30-28-105, and an association of local governments contracting pursuant to Article XIV, Section 18 of the Colorado Constitution and C.R.S. §§ 29-1-201, et seq., comprising municipalities and counties within the geographic boundaries of the Colorado counties of Grand, Eagle, Summit, Jackson, Routt, and Pitkin.

P. "Prepositioning" is the manner of integrated operations of the Colorado-Big Thompson Project and WGFP described in the Final Environmental Impact Statement for the WGFP and as may be authorized by Reclamation in the Amendatory Contract and/or Reclamation's Record of Decision for the WGFP.

Q. "Pumping Costs" incurred by Middle Park or Grand County pursuant to this WGFP IGA are 110% of the average electrical power costs of pumping for the Windy Gap Project for that year on a per acre-foot basis for Net Credited Storage.

R. United States Army Corps of Engineers ("USACE") is referenced in but not a party to this WGFP IGA.

S. United States Bureau of Reclamation, Department of the Interior ("Reclamation") is referenced in but not a party to this WGFP IGA.

T. "Water Apportionment" is Windy Gap Project Water that is made available for use by West Slope Parties pursuant to this WGFP IGA.

U. "West Slope Parties" are Grand County, Middle Park, the River District, and NWCCOG.

V. Windy Gap Firming Project ("WGFP") is a proposed project that will use the Windy Gap Water Rights and that is described in the Final Environmental Impact Statement and Record(s) of Decision.

W. "WGFP Completion" is the first time that the combined volume of Windy Gap Project Water stored in Chimney Hollow Reservoir and Windy Gap Project Water stored on behalf of WGFP Participants in Granby Reservoir is equal to 32% of the Active Storage of the constructed capacity of Chimney Hollow Reservoir.

X. WGFP Participants ("WGFP Participants") are those entities identified in the Final Environmental Impact Statement for the Windy Gap Firming Project, and also their successors and assigns, that hold a water allotment contract for the Windy Gap Project and own or are otherwise allocated a portion of the storage capacity of Chimney Hollow Reservoir.

Y. "Windy Gap Project" is an existing water supply system defined in Part II.A. of the 1980 Agreement.

Z. "Windy Gap Project Participants" are those entities that hold a water allotment contract for the Windy Gap Project.

AA. "Windy Gap Project Water" is any water stored or diverted pursuant to the Windy Gap Water Rights. Both the Windy Gap Project and the Windy Gap Firming Project will divert and store Windy Gap Project Water. Windy Gap Project Water will be diverted under the Grand County 2012 WGFP ("1041") Permit unless the Subdistrict notifies Grand County that it will divert under the original 1980 Windy Gap Project Permit. Only Windy Gap Project Water diverted under the terms and conditions of the 2012 WGFP ("1041") Permit may be stored in Chimney Hollow Reservoir.

BB. "WG Volumetric Limits" shall be those limitations set forth in Paragraph 34 of the 1980 Agreement, as modified by Paragraph 2 of the 1985 Supplemental Agreement. The WG Volumetric Limits are not affected or modified by this WGFP IGA.

CC. "Windy Gap Water Rights" are defined in the Decrees entered on October 27, 1980 in Civil Action No. 1768, District Court, Grand County, State of Colorado and Case Nos. W-4001, 80CW108, and 85CW135, District Court, Water Division No. 5; the Decree entered on February 6, 1989 in Case No. 88CW169, District Court, Water Division No. 5, State of Colorado; and the Decree entered on July 19, 1990, in Case No. 89CW298, District Court, Water Division No. 5, State of Colorado ("Windy Gap Decrees") and any subsequent diligence or other related decrees or amendments thereto.

## II) Relationship to 1980 and 1985 Agreements.

This WGFP IGA supplements and partially amends the 1980 Agreement and the 1985 Agreement. The 1980 Agreement, as amended and supplemented by the 1985 Agreement, and the 1985 Agreement, remain valid and enforceable except as explicitly modified by this WGFP IGA. In the event of a termination of this WGFP IGA for any reason the 1980 and 1985 Agreements shall be enforceable according to their terms as if this WGFP IGA did not exist. While there are several signatories to the 1980 Agreement in addition to the undersigned parties, the rights of those additional signatories under the 1980 Agreement are not altered by this WGFP IGA.

## III) Terms of the Agreement

A. Enhancements. The benefits provided in this WGFP IGA are in addition to and are not a substitute for the mitigation required by governmental agencies with jurisdiction over the WGFP.

B. Notification of Intent to Proceed with Windy Gap Firming Project.

1) The Subdistrict will proceed as expeditiously as reasonably possible using its best efforts to cause the construction of Chimney Hollow Reservoir. The Subdistrict shall notify the West Slope Parties in writing whether or not it intends to proceed with the Windy Gap Firming Project within 10

years of the issuance of the 404 Permit for the WGFP by the United States Army Corps of Engineers ("USACE") or upon execution of construction contracts for Chimney Hollow Reservoir, whichever occurs first.

2) This WGFP IGA shall terminate upon written notice to the West Slope Parties that the Subdistrict does not intend to proceed with the WGFP.

3) If the Subdistrict notifies the West Slope Parties that it intends to proceed with the WGFP, then it shall have the right under this WGFP IGA, but not the obligation, to construct and operate a total of 90,000 acre feet of storage on the Front Range. If the Subdistrict proceeds with the WGFP, then it shall provide all of the West Slope mitigation required by the Records of Decision for the WGFP and satisfy all of the obligations set forth in this WGFP IGA, regardless of the storage capacity that is authorized by the 404 Permit issued by the USACE, or the storage capacity that is ultimately constructed or utilized for the WGFP.

C. Except as necessary to ensure compliance with this WGFP IGA, all parties agree not to take any official action that results in a restriction of the right of the Subdistrict to construct, operate and use the full 90,000 acre feet of storage capacity of the Chimney Hollow Reservoir or Alternative Reservoir.

1) In the event of a breach of this obligation by Grand County, Paragraph IV. H. 2) of this WGFP IGA shall terminate and be of no further force or effect and the benefits provided to Grand County pursuant to Paragraph III.F. of this WGFP IGA and to Middle Park pursuant to Paragraph III.E. of this WGFP IGA shall be subject to the proportional reduction determined using the methods described in III.D.1.

2) In the event of a breach of this obligation by the River District, Paragraph IV. H. 2) of this WGFP IGA shall terminate and be of no further force or effect and the benefits provided to Grand County pursuant to Paragraph III.F. of this WGFP IGA and to Middle Park pursuant to Paragraph III.E. of this WGFP IGA shall be subject to the proportional reduction determined using the methods described in III.D.1.

3) In the event of a breach of this obligation by Middle Park, Paragraph III.E. of this WGFP IGA shall terminate and Middle Park shall receive water pursuant to the 1980 and 1985 Agreements, and the benefits provided to Grand County pursuant to Paragraph III.F. of this WGFP IGA shall be subject to the proportional reduction determined using the methods described in III.D.1 .

4) In the event of a breach of this obligation by NWCOG, Paragraph IV. H. 2) of this WGFP IGA shall terminate and be of no further force or affect and the benefits provided to Grand County pursuant to Paragraph III.F. of

this WGFP IGA and to Middle Park pursuant to Paragraph III.E. of this WGFP IGA shall be subject to the proportional reduction determined using the methods described in III.D.1.

5) The consequences provided for in Paragraphs III.C.1), III.C.2), III.C.3), and III.C.4) shall be suspended in the event that the Subdistrict later obtains the right to construct, operate, and use the full 90,000 acre feet of storage capacity of the Chimney Hollow Reservoir or Alternative Reservoir.

D. Proportional Reduction.

1) If a binding regulatory event, judicial determination, other implementation of existing or future legal requirements or restrictions, or other formal action of any entity causes or results in a permanent reduction in firm yield of the WGFP, other than a prohibition on prepositioning, then the West Slope Parties agree that the amount of water they receive pursuant to Paragraph III of this WGFP IGA will be subject to proportional reduction. The Parties agree to jointly determine the amount of said proportional reduction at the time the event takes effect or, as an alternative to the proportional reduction, identify measures that can be implemented to mitigate the reduction in firm yield of the WGFP. A proportional reduction shall be made to the Middle Park Water Apportionment and to the Grand County Water Apportionment under this WGFP IGA. In the event that the Parties cannot jointly determine what the proportional reduction should be, the issue of what constitutes a proportional reduction shall be resolved by a panel of three experts, one selected by the West Slope Parties, one selected by the WGFP Enterprise, and the third selected by the experts selected by the West Slope Parties and the WGFP Enterprise. If the determination of the expert panel is not acceptable, any Party may pursue any available judicial remedies.

2) If a binding regulatory event, judicial determination, other implementation of existing or future legal requirements or restrictions, or other formal action of any entity causes or results in a prohibition of prepositioning , then the West Slope Parties agree that the amount of water they receive pursuant to Paragraph III of this WGFP IGA shall be reduced in accordance with this Paragraph III.D.2).

(a) Middle Park Variable Water Supply will be reduced by reducing the 700 acre feet option in spill years in proportion to the amount of Windy Gap Project Water stored on August 1 in Chimney Hollow and Granby Reservoir, combined, as compared to the full storage capacity of Chimney Hollow Reservoir. If Middle Park elects to receive its portion of pumping in spill years, there shall be no reductions.

(b) Grand County Variable Water Supply shall not be subject to reductions.

(c) Middle Park Annual Water Supply shall not be subject to reductions.

(d) Grand County annual amount of Transfer Water shall be reduced by 15%.

E. Middle Park Water Apportionment.

1) Middle Park Election to Receive Water.

The provisions of the 1980 and 1985 Agreements which relate to the operation of the Windy Gap Project and the rights and interests of Middle Park shall remain in place until such time as WGFP Completion, and the approval of this WGFP IGA by the Water Court, Water Division No. 5 by Decree not subject to appeal.

(a)

Middle Park shall have the right, within 1 year of WGFP Completion, to make a one-time and irrevocable election as to whether it will receive water pursuant to this WGFP IGA or receive water pursuant to the 1980 and 1985 Agreements.

(b) If a binding regulatory event, judicial determination, or other implementation of existing or future legal requirements or restrictions occurs as provided in Paragraph III. D. then Middle Park shall have the right to make an election as to whether it will receive water pursuant to this WGFP IGA, or receive water pursuant to the 1980 and 1985 Agreements. Subdistrict shall notify Middle Park within 60 days of each regulatory event, judicial determination, or other implementation of existing or future legal requirements or restrictions and shall explain to Middle Park the effect(s) of the event, determination, or implementation on water available to Middle Park pursuant to this WGFP IGA. If Middle Park has not made this election pursuant to a previous event, this election will be made by Middle Park within one year after written notification of each event.

(c) In the event that Middle Park elects to continue to receive water pursuant to the 1980 and 1985 Agreements following WGFP Completion, such water shall be available for use on August 1 of the Accounting Year immediately following pumping (except that any water pumped in August will be credited to the current Accounting Year), and any such water, which is unused on July 31$^{st}$ of that Accounting Year shall be transferred to Grand County on August 1$^{st}$ for use in accordance with Paragraph III. F. 2) and Paragraph III.F.4).

2) If Middle Park elects to receive water in accordance with this WGFP IGA, its apportionment will consist of the Middle Park Annual Water Supply and the Middle Park Variable Water Supply.

3) Middle Park Annual Water Supply.

(a) For the purposes of this WGFP IGA, Middle Park's Annual Water Supply is the combination of the 850 acre feet of Water defined in Section III.E.3)(b) and the 1,450 acre feet of Water defined in Section III.E.3)(c). Middle Park Annual Water Supply is not eligible to become a part of or contribute to the Middle Park Carryover Balance.

(b) 850 acre feet of Water. The Subdistrict and WGFP Enterprise will dedicate and set aside annually, but not cumulatively, at no cost to Middle Park, 850 acre feet of Windy Gap Project Water, which shall be available each and every year.

(c) 1,450 acre feet of Water.

(i) If the combined amount of Windy Gap Project Water stored in Chimney Hollow Reservoir and Windy Gap Project Water stored on behalf of WGFP Participants in Granby Reservoir at any time between the start of pumping of the Windy Gap Project and August 1st of any year is equal to or greater than 32% of the constructed capacity of Chimney Hollow Reservoir, the Subdistrict and WGFP Enterprise will dedicate and set aside at no cost 1,450 acre feet of water for Middle Park.

(ii) If the combined amount of Windy Gap Project Water stored in Chimney Hollow Reservoir and Windy Gap Project Water stored on behalf of WGFP Participants in Granby Reservoir at any time between the start of pumping of the Windy Gap Project and August 1st of any year does not equal or exceed 32% of the constructed capacity of Chimney Hollow Reservoir, the 1,450 acre feet of water will be reduced at the same proportion as the maximum amount of storage of Windy Gap Project Water stored in Chimney Hollow Reservoir and Windy Gap Project Water stored on behalf of the WGFP Participants in Granby Reservoir during the period between the start of pumping and August 1 is to 32% of the constructed capacity of Chimney Hollow Reservoir.

(iii) The Subdistrict and WGFP Enterprise shall provide Middle Park with the April 1st water supply forecast and any subsequent forecasts, which shall be used for planning

purposes to estimate the amount, if any, of the reduction in the 1,450 acre feet of water.

(iv) In the event that Middle Park receives less than 1450 acre feet of water pursuant to paragraph III.E.3)(c)(ii), Middle Park may retain and use any unused Annual Water Supply from the prior Accounting Year to make up the difference between the amount which it receives pursuant to paragraph III.E.3)(c)(ii) and 1450 acre feet of water.

(d) The Middle Park Annual Water Supply is available to Middle Park during the Accounting Year. Unused water from the Middle Park Annual Water Supply from the prior Accounting Year will transfer on August 1st to Grand County pursuant to Paragraph III.F.2) unless some portion of the water from the prior year is required to make up for the reduction in the 1450 acre feet of Water pursuant to Paragraph III.E.3)(c)(iv). Grand County shall, subject to the limitations in Paragraph III.F.4), have the right to use Middle Park Annual Water Supply transferred from Middle Park to Grand County in accordance with this Paragraph III.E.3)(d).

(e) Middle Park's Annual Water Supply will not be reduced by any losses charged pursuant to the Amendatory Contract.

4) Middle Park Variable Water Supply.

(a) Middle Park's Variable Water Supply is the water supply defined in this Paragraph III.E.4). Only Middle Park's Variable Water Supply is eligible to become part of or contribute to Middle Park's Carryover Balance and will be credited immediately upon pumping.

(b) The Subdistrict and WGFP Enterprise will provide a water supply forecast to Middle Park on April 1st.

(c) If the April 1st forecast does not anticipate a spill of Windy Gap Project Water, Middle Park may, on May 1st of that year, elect to receive 3.8% of the Windy Gap Project Water that will be diverted in the current water year in excess of 15,000 acre feet Net Credited Storage, up to a maximum of 1,500 acre feet Net Credited Storage as further limited by Middle Park's Carryover Balance Limitation. If the Windy Gap Project Participants have a need for additional water but do not wish to pay for the costs of additional pumping prior to such time as Middle Park has received 1,500 acre feet of Variable Water Supply, and the Windy Gap Water Rights are still in priority, Middle Park may request that the Subdistrict continue diversions of Windy

Gap Project Water up to the 1,500 acre feet maximum, as limited by Middle Park's available Carryover Balance Limitation.

(d) If the April 1st forecast anticipates a spill of Windy Gap Project Water or if a spill has actually occurred, Middle Park shall, by May 1st, elect whether it will:

(i) Receive 3.8% of the Windy Gap Project Water diverted and stored in the current water year in excess of 15,000 acre feet Net Credited Storage, up to a maximum of 1,500 acre feet of Net Credited Storage, and as further limited by Middle Park's available Carryover Balance Limitation. If the Windy Gap Project Participants have a need for additional water but do not wish to pay for the costs of additional pumping prior to such time as Middle Park has received 1,500 acre feet of Variable Water Supply, and the Windy Gap Water Rights are still in priority, Middle Park may request that the Subdistrict continue diversions of Windy Gap Project Water up to 1,500 acre feet maximum, as limited by Middle Park's Carryover Balance Limitation; or

(ii) Receive from the Subdistrict and WGFP Enterprise by substitution such additional amount of Windy Gap Project Water stored in Chimney Hollow Reservoir as is required to result in a total Carryover Balance of 700 acre feet of Middle Park Variable Water Supply, which 700 acre feet shall not be subject to spill; or

(iii) Middle Park may elect to not receive any Middle Park Variable Water Supply.

(e) Middle Park shall pay to the Subdistrict the Pumping Costs for pumping the Middle Park Variable Water Supply which it elects to receive pursuant to Paragraph III.E.4).

5) The Subdistrict will release Middle Park Annual Water Supply and Middle Park Variable Water Supply at the request of Middle Park for all beneficial uses allowed by the 1980 Agreement and 1985 Agreement. Such uses shall include direct use or use by substitution, augmentation, or exchange, including but not limited to, exchange into Wolford Mountain Reservoir or replacement to Denver Water by entities that have Middle Park Contracts, and any other use authorized in a subsequent written agreement between Middle Park, the Subdistrict, and WGFP Enterprise.

F. Grand County Water Apportionment.

1) For the purposes of this WGFP IGA, the Grand County Water Apportionment consists of the Grand County Transfer Water, the Grand County Interim Transfer Water, and the Grand County Variable Water Supply described in this Paragraph III.F. The Grand County Water Apportionment shall be used as directed by Grand County and consistent with this WGFP IGA.

2) Grand County Interim Transfer Water and Grand County Transfer Water.

(a) Grand County Transfer Water is any of the Middle Park Water Apportionment received by Middle Park which is transferred to Grand County on August 1st of each year pursuant to Paragraph III.E.1)(c) and Paragraph III.E.3)(d).

(b) Commencing on the first day of August, but no less than 12 months after the execution of this WGFP IGA, the Subdistrict shall make available for Grand County's use 50% of any of the Middle Park Water Apportionment that is unused from the previous year (the "Grand County Interim Transfer Water"). Upon WGFP Completion, the Grand County Interim Transfer Water shall vest as 100% of the water provided by Paragraph III.E.1)(c) and Paragraph III.E.3)(d). In the alternative, the Subdistrict's provision of the Grand County Interim Transfer Water will cease upon notice pursuant to III.B.2) that the Municipal Subdistrict does not intend to proceed with the WGFP.

(c) Grand County Transfer Water must be either: (1) used between August 1st and October 15th of the then current water year, or (2) on October 15th become Grand County Carryover Balance, as limited by Grand County's available Carryover Balance Limitation.

(d) Grand County's Transfer Water shall not be subject to any losses charged pursuant to the Amendatory Contract until such water is transferred to Grand County's Carryover Balance, at which time it will be assessed the appropriate losses, if any, specified in the Amendatory Contract.

3) Grand County Variable Water Supply shall include the following elements:

(a) Concurrent Pumping.

(i) Grand County Concurrent Pumping shall become available at WGFP Completion.

(ii) Grand County may, by May 1st of each year, elect to receive 3.8% of the Windy Gap Project Water diverted and stored in the current water year in excess of 15,000 acre feet Net Credited Storage, up to a maximum of 1,500 acre feet Net Credited Storage, and as further limited by Grand County's available Carryover Balance Limitation.

(b) Additional Pumping.

(i) Grand County Additional Pumping shall become available at WGFP Completion.

(ii) If Windy Gap Project Participants and WGFP Participants have a need for additional water but do not wish to pay for the costs of additional pumping prior to such time as Grand County has received 1,500 acre feet of water from Concurrent Pumping and the Windy Gap Water Rights are still in priority, Grand County may request that the Subdistrict continue Windy Gap Project Water diversions up to a combined maximum of 1,500 acre feet of Concurrent and Additional Pumping, as further limited by the available Grand County Carryover Balance Limitation. The Subdistrict and WGFP Enterprise will make best efforts to provide five (5) days advance notice of the anticipated end of pumping for Windy Gap Project Participants and WGFP Participants.

(c) End of Year Pumping.

(i) Prior to WGFP Completion, Grand County may request that the Subdistrict continue Windy Gap Project Water diversions if the Windy Gap Project Participants have a need for additional water but do not wish to pay for the costs of additional pumping and the Windy Gap Project Water Rights are in priority, as limited by the Grand County Carryover Balance Limitation.

(ii) After WGFP Completion, Grand County may request that the Subdistrict continue Windy Gap Project Water diversions if the Windy Gap Project Participants, WGFP Participants, and Middle Park have a need for additional water but do not wish to pay for the costs of additional pumping and the Windy Gap Project Water Rights are in priority, as limited by the Grand County Carryover Balance Limitation.

(d) Grand County's Variable Water Supply shall be credited to Grand County's Carryover Balance immediately upon pumping.

(e) Grand County shall pay pumping costs for the Grand County Variable Water Supply provided pursuant to Paragraph III.F.3).

4) The Subdistrict will release the Grand County Water Apportionment from Granby Reservoir at the request of Grand County or its designee for diversion for irrigation, domestic, municipal or industrial uses on the West Slope that do not require a change of the Windy Gap Water Rights. The Parties will use their best efforts to effectuate the purposes of the Grand County Water Apportionment in a manner that does not require a change of the Windy Gap Water Rights. The Parties acknowledge that Grand County intends to time such releases for beneficial use in a manner that results in optimizing the benefits to aquatic and recreation resources within the County and furthering the goals of the Learning by Doing Cooperative Effort (Exhibit 1). The Parties intend that the Grand County Water Apportionment not be diverted for irrigation, domestic, municipal or industrial uses upstream of the confluence of the Colorado River and Blue River by any person or any entity.

(a) The Parties intend for the reservoir releases of the Grand County Water Apportionment to increase the flow of water through the County above flows that would otherwise exist. To accomplish these objectives, the River District will make good faith efforts to arrange for the delivery of the Grand County Water Apportionment for diversion and beneficial use for irrigation, domestic, municipal or industrial uses on the Colorado River or its tributaries, below the confluence of the Blue and Colorado Rivers. Unless otherwise directed by Grand County, the River District's efforts will be focused on diversion and beneficial use downstream of the confluence of the Colorado and Roaring Fork Rivers but upstream of the Utah State Line.

(b) Grand County and the Subdistrict may request annual reports of the beneficial use made of the Grand County Water Apportionment. Any dispute regarding such use will be resolved in accordance with the Conflict Resolution provisions of this WGFP IGA (Paragraph VI.O.). Regardless of the outcome of any dispute regarding this paragraph, the Parties agree that the River District shall not bear any liability regarding the beneficial use of, or the failure to arrange for the beneficial use any of, the Grand County Water Apportionment.

(i) Following is a list of representative, but not exclusive, beneficial uses that the Parties agree satisfy the intent of this paragraph III.F.4):

Diversion for irrigation (including agriculture, lawn watering, parks, and stock-water), domestic, municipal, or industrial uses by: the Grand Valley Irrigation Company (irrigation, including uses incident of irrigation); Grand Valley Water Users Association (including irrigation, power generation, and uses incident to those uses); Orchard Mesa Irrigation District (irrigation, irrigation lift/pumping, power generation, and exchanges incident to such uses); Palisade Irrigation District (irrigation); Mesa County Irrigation District (irrigation); Ute Water Conservancy District (including municipal); Town of Clifton (municipal); Silt Water Conservancy District (irrigation and domestic); Town of Silt (municipal); Town of New Castle (municipal); City of Rifle (municipal); Battlement Mesa (municipal); diversions at the Bluestone or Town of Debeque intakes (municipal, irrigation, and industrial); substitutions in lieu of releases from Wolford Mountain Reservoir or Ruedi Reservoir for municipal, irrigation or industrial uses under the River District's water marketing program; substitutions in lieu of releases from, or exchanges into, Williams Fork Reservoir to increase the amount of, or flexibility of use, of water in Grand County's account in Williams Fork Reservoir; transit losses attributable to such uses as may be assessed by the State Engineer.

5) The Parties agree that, if Grand County determines then-current stream flow conditions in the County are sufficient to satisfy the purposes of the releases of water as described in Paragraph III.F.4), including downstream of the confluence of the Colorado and Blue Rivers, then the Grand County Water Apportionment may be exchanged or substituted for water that otherwise would be released from Wolford Mountain Reservoir, Green Mountain Reservoir or Williams Fork Reservoir in order to assist Front Range and West Slope water users in managing limited water supplies for use in the upper Colorado River basin.

G. Priority of Pumping. The right of Middle Park and Grand County to pump additional water pursuant to Paragraphs III.E.4)(c), III.E.4)(d)(i) and III.F.3)(b)(ii) shall be shared on an equal basis between Middle Park and Grand County.

H. Middle Park and Grand County Water Apportionments, Carryover Balances, and Carryover Balance Limitations.

1) Subject to the provisions of this Paragraph III.H., Middle Park and Grand County may each have a Carryover Balance derived from Water Apportionments made available pursuant to Paragraphs III.E.4), III.F.2) and III.F.3). The maximum Carryover Balance available to Middle Park

and Grand County shall not exceed their respective Carryover Balance Limitation.

2) Middle Park shall have the right to a Carryover Balance Limitation of 3,000 acre feet for its Variable Water Supply for use in the then current or subsequent water years.

3) Grand County Carryover Balance Limitations.

   (a) Upon execution of this WGFP IGA and until WGFP Completion, Grand County shall have the right to accrue a maximum of 7,500 acre feet of Carryover Balance for use in the then current or subsequent water years.

   (b) Upon WGFP Completion Grand County's Carryover Balance Limitation shall be reduced to 6,000 acre feet until at such time as the Windy Gap Project Water stored in Chimney Hollow Reservoir has reached, at any point in time, 85% of the constructed active storage capacity of Chimney Hollow Reservoir .

   (c) At such time as the Windy Gap Project Water stored in Chimney Hollow Reservoir has reached, at any point in time, 85% of the constructed active storage capacity of Chimney Hollow Reservoir, Grand County's Carryover Balance Limitation shall be reduced to 4,500 acre feet

   (d) The permanent Grand County Carryover Balance Limitation shall be 4,500 acre feet. If Chimney Hollow Reservoir construction begins but is not completed as a result of actions by the West Slope Parties, any water stored in this account will revert to the Subdistrict.

4) Except during the first fill of Chimney Hollow, during which Paragraphs III.H.3) controls, Middle Park and Grand County can share a combined Carryover Balance Limitation of 7,500 acre feet. Middle Park and Grand County shall notify the Subdistrict before or during pumping of their intent to share the Carryover Balances and the respective amounts of water to be stored for each.

5) Any Carryover Balance of Middle Park or Grand County shall be reduced by any losses, if any, charged pursuant to the Amendatory Contract. Middle Park and Grand County shall be provided with documentation of such charges before any such reductions.

6) Any Variable Water Apportionment and any Carryover Balance made available to Middle Park or Grand County pursuant to this WGFP IGA shall be subject to a pro rata share of monetary charges, payable by Middle

Park or Grand County as applicable, for storage of Windy Gap Project Water in Granby Reservoir, if any, assessed pursuant to the Amendatory Contract. The Parties will advocate to Reclamation that no monetary charges be assessed for storage of Windy Gap Project Water in Granby Reservoir.

7) The Parties will advocate that Reclamation adopt specific and different shrink charges for introduction and storage of Windy Gap Project Water on the West Slope and conveyance and delivery of Windy Gap Project Water to the east slope.

8) All Carryover Balances referred to in this paragraph III.H. shall be Net Credited Storage.

I. Spill Criteria:

1) 1st to spill - Grand County Carryover Balance over 1,500 acre feet.

2) 2nd to spill - Any remaining Grand County Carryover Balance, any Middle Park Carryover Balance, and any Windy Gap Project Water stored on behalf of the WGFP Participants proportionally, based on Carryover Balances and Windy Gap Project Water in storage on behalf of the WGFP Participants as of the date(s) of spill.

3) 3rd to spill – Windy Gap Project Water stored on behalf of Windy Gap Project Participants that are not WGFP Participants.

J. No Paper Spills. In the event that Middle Park or Grand County have a Carryover Balance and the total amount of Colorado-Big Thompson Project water in active storage in Granby Reservoir and Chimney Hollow Reservoir, combined, reaches 465,568 acre feet, Middle Park's and Grand County's Water Apportionments will only spill in the event of a physical spill from Granby Reservoir. Any physical spill of Windy Gap Project Water will be allocated between WGFP Participants, Middle Park, and Grand County in accordance with Paragraph III.I.

K. Minimum Pumping. If Windy Gap Project Water is not already being pumped, the Subdistrict shall not be required to pump Variable Water Supply for any party unless the Subdistrict's water supply forecasts predict that there will be a minimum of 1,000 acre feet of water available for diversion and storage under the Windy Gap Water Rights at the time of the proposed pumping during the current pumping season.

L. Pumping Costs. Pumping Costs shall be payable 30 days after the submission of an invoice by the Subdistrict at the end of the then current pumping season to the appropriate entity. The invoice shall include the actual bills from the

power provider. In the event of a delinquency or failure to pay Pumping Costs by Middle Park or Grand County, the Subdistrict shall suspend release of any Variable Water Supply held by the Subdistrict for that entity and all future pumping for the delinquent Party pursuant to this WGFP IGA until any delinquent payments have been made in full.

## IV) Additional Provisions

A. Wolford Protection. The Subdistrict, and the WGFP Enterprise agree that the Windy Gap Project and the WGFP will be operated in a manner that does not diminish the ability of the Colorado River Water Conservation District to capture the natural flow of Muddy Creek up to a maximum of 65,998 acre feet pursuant to the water rights, applicable permits, and operating criteria for Wolford Mountain Reservoir.

B. Future Uses. The Subdistrict and WGFP Enterprise agree to not place a call under the Windy Gap Decrees on any present or future water rights on the Colorado and Fraser Rivers and their tributaries above Windy Gap Reservoir; Provided, however, the Windy Gap Project and WGFP may divert any water which can be diverted in priority at the decreed point of diversion without placing a call as described above except for water provided as described in paragraph IV. M. of this WGFP IGA.

C. Open Space. Upon execution of this WGFP IGA, the Subdistrict agrees to impose a deed restriction on the sale of any parcel that requires subsequent development of the parcel to be approved subject to the existing Grand County Rural Land Use Process in conformance with C.R.S. § 30-28-403, as it exists now or may be amended in the future; provided, however, that nothing in this WGFP IGA or in the deed restriction shall affect or preclude the sale or development of such parcel(s) pursuant to provisions of existing or future law that allow the sale or development of lands in a manner that is not within the definition of a "subdivision" or "subdivided land".

D. Public Access. Upon execution of this WGFP IGA, the Subdistrict will make arrangements with Northern Water to provide public access to that portion of Willow Creek located on Northern Water's lands for as long as Northern Water owns the lands adjacent to Willow Creek, if and to the extent that the public access will be managed by the Colorado Division of Parks and Wildlife or other entity acceptable to Northern Water.

E. Jasper Reservoir Conditional Water right. The Subdistrict will abandon the conditional water right for Jasper Reservoir upon WGFP Completion.

F. Recording and Telemetry Devices. Recording and telemetry devices for flow measuring devices approved by the Colorado State Engineer will be acquired, installed, operated, maintained and replaced by and at the expense of the

WGFP Enterprise if it is able to obtain permanent access agreements allowing the WGFP Enterprise to install, operate, maintain, and replace such devices.

G. Water Accounting. The Subdistrict agrees to submit detailed daily water accounting to the State of Colorado Division Engineer as required by the Division Engineer and provide copies to the West Slope Parties.

H. Future Water Development.

1) Compact Curtailment Plan. The Signatories agree to cooperate in good faith toward the development of a plan to avoid and address a potential curtailment of existing Colorado water rights under the provisions of the 1922 Colorado River Compact and the 1948 Upper Colorado River Compact. The Signatories agree to meet and confer before the Municipal Subdistrict or WGFP Enterprise take any action pursuant to Paragraph IV.H.3. of this WGFP IGA.

2) The Subdistrict and WGFP Enterprise agree that, without the prior express written consent of Grand County and the Colorado River Water Conservation District, they will not (a) acquire any existing water rights in Grand County; (b) construct additional water supply facilities in Grand County, (c) appropriate new water rights in Grand County; or (d) appropriate any new water rights in Water Division No. 5 that will result in depletions of water from Grand County.

3) Compact Curtailment Actions.

(a) To the extent, and during such time that the operation of the Windy Gap Project or WGFP, or the exercise of the Windy Gap Project Water Rights, is or may in the future be curtailed, limited, or otherwise restricted as the result of, or for the purpose of, compliance with the 1922 Colorado River Compact or 1948 Upper Colorado River Compact ("Compact Curtailment"), the Municipal Subdistrict or WGFP Enterprise may take any actions or use any existing or future facilities as may be required to provide a water supply to the Municipal Subdistrict or WGFP Enterprise, as limited by and subject to the WG Volumetric Limits ("Compact Curtailment Actions") and the express obligations of the Subdistrict and WGFP Enterprise under this WGFP IGA. The Municipal Subdistrict or WGFP Enterprise may undertake such Compact Curtailment Actions as may be necessary to prudently plan and prepare in advance of any potential Compact Curtailment; Provided however, that any such advance Compact Curtailment Actions will be implemented only during such time that the quantity of water that would otherwise be diverted under the Windy Gap Water Rights is reduced as the result of a Compact

Curtailment. The West Slope Parties may oppose any Compact Curtailment Actions in any forum.

(b) Nothing in this WGFP IGA, including without limitation Paragraphs IV.H.1) and IV.H.2) above, shall affect, limit, or otherwise restrict the right of the Municipal Subdistrict or WGFP Enterprise to take any actions or to use any existing or future facilities as required to provide a water supply to the Municipal Subdistrict or WGFP Enterprise, as limited by and subject to the WG Volumetric Limits, in the event, to the extent, and during such time that the operation of the Windy Gap Project or WGFP, or the exercise of the Windy Gap Project Water Rights, is or may in the future be curtailed, limited, or otherwise restricted as the result of or for the purpose of compliance with the 1922 Colorado River Compact or 1948 Upper Colorado River Compact. Nothing in this WGFP IGA shall limit or restrict the right of West Slope Parties to oppose any such actions or use of any such existing or future facilities.

(c) Nothing in this Paragraph IV.H.3 shall be construed to 1) allow the Subdistrict or WGFP Enterprise to increase the yield of the WG Project or WGFP at times other than when the quantity of water that would otherwise be diverted under the Windy Gap Water Rights is reduced as the result of the enforcement of the 1922 Colorado River Compact or 1948 Upper Colorado River Compact, or 2) use any banked or stored water in a manner that causes an increase in the yield of the Windy Gap Project or WGFP at times other than when the quantity of water that would otherwise be diverted under the Windy Gap Water Rights is reduced as the result of the enforcement of the 1922 Colorado River Compact or 1948 Upper Colorado River Compact.

(d) Nothing in this Paragraph IV.H.3) shall affect the obligations of the Subdistrict and WGFP Enterprise under Paragraph III. of this WGFP IGA.

4) Nothing in this WGFP IGA shall affect, limit, or otherwise restrict the right of the Municipal Subdistrict to fully utilize the Windy Gap Water Rights and associated existing facilities in Grand County or any existing or future facilities on the East Slope, or existing or future water rights in Water Division No. 1 in a manner that will not exceed the WG Volumetric Limits. The West Slope Parties reserve the right to oppose any actions taken by the Subdistrict intended to achieve the WG Volumetric Limits using existing or future facilities or water rights that are not expressly authorized by the 1980 Agreement, the 1985 Supplemental Agreement, and this WGFP IGA.

5) Any consent of Grand County under Paragraph IV.H.2) shall not be construed as a limitation on or waiver of any review, approval, or permit authority, or a predetermination of any action to be taken thereunder by Grand County.

6) Nothing in this WGFP IGA shall affect, limit, or otherwise restrict the maintenance, repair, replacement or rehabilitation of the existing Windy Gap Project facilities, replacement facilities, or rehabilitated facilities located in Grand County.

I. CWCB Instream Flow. The Subdistrict and WGFP Enterprise will support the entry of a decree in accordance with applicable law for a CWCB instream flow on the Colorado River mainstem from the confluence of the Blue and Colorado Rivers to a point immediately upstream of the confluence of the Eagle and Colorado Rivers if a) the CWCB instream flow is not used as a basis for imposing restrictions or limitations on the WGFP, b) the West Slope Parties agree that they will never assert in any forum that the CWCB Instream flow be used as a basis for restrictions or limitations on the WGP or WGFP, and c) the right is subject to substantively the same terms and conditions as are set forth in the Findings of the CWCB in declaring its intent to appropriate dated _____, 2011.

J. Grand County RICD. Subdistrict and WGFP Enterprise will not oppose the entry of a decree in Case No. 10CW298 consistent with the draft decree dated September 20, 2012 and stipulation attached as Exhibit 2 to this WGFP IGA.

K. Shoshone Outage Protocol.

1) For purposes of this WGFP IGA, the Shoshone Outage Protocol means that the Windy Gap Project and WGFP will operate as described in this paragraph IV.K.1), IV.K.2), and IV.K.3) during periods when the Shoshone Power Plant is shutdown or otherwise not able to divert the full amount of its 1,250 cfs senior water right due to repair, maintenance, or other reasons ("Shoshone Outage"). When the Windy Gap Project's participation in the Shoshone Outage Protocol is in effect pursuant to this WGFP IGA, the Windy Gap Project and WGFP will bypass the amount of water that the Windy Gap Project and WGFP would have been required to bypass if the Senior Shoshone Call had been in effect in order to result in a flow of not more than 1,250 cfs at the Dotsero gage on the Colorado River (not including any water released for endangered fish species purposes). For purposes of this WGFP IGA, a Shoshone Outage does not include a shutdown of the Shoshone Power Plant for regularly scheduled maintenance for a cumulative period of 17-days during the period of November 1 through March 15.

2) The Windy Gap Project and WGFP will operate in accordance with the Shoshone Outage Protocol from July 16-April 14 of each year. Prior to WGFP Completion, the Windy Gap Project and WGFP may operate in accordance with the Shoshone Outage Protocol during the period of April 15-July 15 on a voluntary cooperative basis. Following WGFP Completion, the Windy Gap Project and WGFP will operate in accordance with the Shoshone Outage Protocol during the period April 15 – July 15 at any time during this period when the combined amount of Windy Gap Project Water stored in Chimney Hollow Reservoir and Windy Gap Project Water stored on behalf of WGFP Participants in Granby Reservoir is greater than 50% of the Active Capacity of Chimney Hollow Reservoir.

3) Participation in the Shoshone Outage Protocol by the Windy Gap Project and WGFP during the period of April 15-July 15 will be limited to a total maximum volume of foregone pumping equal to 10,000 acre feet (30 days with one pump running) in one year, a total of 20,000 acre feet (60 days with one pump running) in any 3 consecutive year period, and a total of 30,000 acre feet (90 days with one pump running) in any 5 consecutive year period.

4) The Subdistrict agrees that it will participate in good faith in negotiations to achieve permanent management of the flow of the Colorado River to address certain flow changes that result during a Shoshone Outage.

L. Cooperative Effort for Aquatic Environment. The Subdistrict and the WGFP Enterprise, Grand County, Middle Park, and the River District agree to participate in the Learning by Doing Cooperative Agreement ("Cooperative Agreement") as defined in the Intergovernmental Agreement for The Learning by, Doing Cooperative Effort which is attached as Exhibit 1 but which is not a part of or incorporated within this WGFP IGA. Any amendments to the Cooperative Agreement shall not require amendment or modification of this WGFP IGA.

M. Colorado River Cooperative Agreement. The Subdistrict and the WGFP Enterprise agree not to oppose or otherwise interfere with the efforts to obtain such court decrees and approvals as are necessary for the Colorado River Cooperative Agreement to the extent that the court decrees and approvals do not adversely affect the WGFP or Windy Gap Project. The Subdistrict further agrees that it will not divert water that would not have been available but for the actions of the Management Committee or Grand County pursuant to the Learning by Doing process.

N. Wild and Scenic. Within one year of issuance of an acceptable permit for the WGFP, the Subdistrict shall pay $50,000 and the River District shall pay $25,000 to the Endowment Fund of the Upper Colorado River Wild and Scenic Stakeholder Group for use to protect Wild and Scenic resources

identified in the Colorado River from Kremmling downstream to No Name. The Subdistrict's contribution provided herein shall satisfy the obligation of the Subdistrict and WGFP Enterprise to contribute endowment funds for Wild and Scenic purposes under this WGFP IGA. The Subdistrict agrees that the River District's contribution provided herein shall satisfy the obligation of the River District to contribute endowment funds for Wild and Scenic purposes under the WGFP IGA. The Subdistrict will contribute 20% of the amount contributed by the River District, not to exceed $5,000 annually adjusted annually by the Denver-Boulder-Greely CPI-U, for annual operating costs of the Upper Colorado River Wild and Scenic Stakeholder Group.

O. Windy Gap Water Right Diversion at Granby Reservoir. Absent the express written consent of Grand County and the River District, the Subdistrict and WGFP Enterprise agree that neither will divert water at Granby Reservoir under the priority of the Windy Gap Decrees or during free-river conditions.

P. Bypass of Windy Gap Reservoir. The Subdistrict will enter into an agreement with Colorado Division of Parks and Wildlife to provide up to $250,000 to study methods for bypass of flows, sediment, and/or fish around or through Windy Gap Reservoir and identify potential modifications that would provide tangible benefits to aquatic resources below Windy Gap Reservoir. The implementation of recommendations resulting from the study will not constitute a violation of or require amendment of this WGFP IGA or the 1980 and 1985 Agreements.

## V) West Slope Parties' Commitments

A. No Opposition to WGFP. The West Slope Parties will not oppose final state and federal approvals of the WGFP, subject to performance of this WGFP IGA by the Subdistrict and WGFP Enterprise and the performance of such mitigation, requirements, and conditions as are required in those approvals, including but not limited to the Records of Decision by Reclamation and USACE, the Amendatory Contract, 401 Certification, or the 404 Permit. Nothing herein shall affect any 1041 authority of Grand County.

B. Reopen Approvals or Authorizations. The West Slope Parties will not request that any governmental approval or authorization of the Windy Gap Project or the WGFP be subject to provisions that have the effect of reopening the governmental approval or authorization. For a period of five years from the date of the first diversions into the constructed Chimney Hollow Reservoir, no party will unilaterally request, or cause others to request, that the United States Army Corps of Engineers or other regulatory agency with jurisdiction and authority over the WGFP, reopen a permit or license for the Windy Gap Project or WGFP for any reason except as may be necessary to preserve any right to undertake such action prior to expiration of any applicable legal deadline or statute of limitation. Each party reserves the right to oppose any

such efforts to reopen the permits or licenses for the Windy Gap Project or WGFP. This Paragraph V.B. is not intended to prevent the West Slope Parties from commencing any legal action to enforce this WGFP IGA or to request enforcement of specific terms of federal permits.

C. Windy Gap Reservoir Conditional Storage Right. The West Slope Parties will not oppose future applications to make the remaining conditional portion (1,101.14 acre feet) of the existing Windy Gap Reservoir storage right absolute.

D. Modification of Windy Gap Decree. The West Slope Parties will consent to the entry of a decree modifying the existing Windy Gap Decrees to incorporate this WGFP IGA and will not assert that a change of the Windy Gap Water Rights is required for the operations of the Windy Gap Project or WGFP in a manner consistent with this WGFP IGA.

## VI) Further Agreements of the Parties

A. Reform of Invalid Provisions. Wherever possible each provision of this Agreement shall be interpreted and implemented to be effective and valid under applicable law. If any provision or portion of this WGFP IGA is determined to be invalid or unenforceable by a final, non-appealable order or decision of any judicial or administrative body with jurisdiction, the Parties agree to reform this WGFP IGA to replace any such invalid or unenforceable provision with a valid and enforceable provision that comes as close as possible to the intention of the invalid or unenforceable provision. The provisions of this WGFP IGA shall be reasonably and liberally construed to achieve the intent of the Parties.

B. No Party will oppose final state, local and federal approvals of the WGFP, subject to performance of this WGFP IGA by the Subdistrict and WGFP Enterprise and the performance of such mitigation, requirements, and conditions as are required in those approvals, including but not limited to the Records of Decision by Reclamation and USACE, the WGFP Amendatory Contract, 401 Certification, or the 404 Permit. Nothing herein shall affect any 1041 authority of Grand County.

C. The Subdistrict agrees that conditions of the federal authorization for the WGFP will include provisions that substantially conform to the following:

1) the total volume of Colorado-Big Thompson Project water stored in the combination of Granby and Chimney Hollow Reservoirs will not exceed 465,568 acre feet. For the purposes of this Paragraph of the WGFP IGA, the amount of Colorado-Big Thompson Project water in storage in Granby Reservoir shall be the amount of Colorado-Big Thompson Project water

stored above the invert of the Farr Pumping Plant Intake and below the normal high water line; and

2) in any year in which the April 1st or subsequent projection by Northern Water anticipates a spill at Granby Reservoir, Colorado-Big Thompson Project water then in storage in Chimney Hollow Reservoir shall not be released to satisfy delivery requirements to Colorado-Big Thompson Project Allottees if such release would allow the capture and storage of additional Colorado-Big Thompson Project water in Granby Reservoir.

D. Nothing in this WGFP IGA shall be construed to limit the discretion of the Northern Colorado Water Conservancy District or Reclamation regarding the operation of the Colorado-Big Thompson Project, including, without limitation the pre-emptive release of Windy Gap Project water from Granby Reservoir that may increase the risk of or result in a spill of water provided to Middle Park or Grand County (any such spill in accordance with Paragraph III.I of this WGFP IGA).

E. Except as necessary to comply with the express terms of this WGFP IGA, nothing in this WGFP IGA shall be construed to limit the discretion of the Subdistrict or WGFP Enterprise regarding the operation of the Windy Gap Project or Windy Gap Firming Project, including, without limitation, the pre-emptive release of Windy Gap Project Water from Granby Reservoir that may increase the risk of or result in a spill of water provided to Middle Park or Grand County in accordance with Paragraph III.I of this WGFP IGA (any such spill in accordance with Paragraph III.I of this WGFP IGA).

F. The Parties agree that performance of this WGFP IGA, compliance with any mitigation requirements for the WGFP imposed by a federal or state agency, and compliance with the requirements of a Grand County 2012 Windy Gap Firming Project ("1041") Permit for the WGFP shall constitute full and complete satisfaction of the obligations of the Subdistrict and WGFP Enterprise to set forth and complete a plan with respect to the WGFP which satisfies the requirements of C.R.S. § 37-45-118(1)(b)(II) of the Water Conservancy Act.

G. This WGFP IGA does not limit, change or expand the role of or protections afforded to all Parties with interests in the Colorado-Big Thompson Project as described in the Manner of Operation provisions of Senate Document No. 80, the 1961 Principles to Govern the Release of Water at Granby Dam To Provide Fishery Flows Immediately Downstream In The Colorado River ("1961 Principles"), and the Blue River Decrees. Water released from Granby Reservoir pursuant to this WGFP IGA shall be in addition to the then current bypass of water under the 1961 Principles.

H. The obligations of the Parties to this WGFP IGA shall exist upon execution of this WGFP IGA unless otherwise specified in this WGFP IGA.

I. Except to the extent and unless it is terminated, this WGFP IGA shall be incorporated within and be a non-severable part of the Windy Gap Decrees. The Subdistrict will not divert water into Chimney Hollow Reservoir unless this WGFP IGA is incorporated within the Windy Gap Water Rights.

J. The West Slope Parties agree to not assert that the WGFP and Moffat Collection System Project are interdependent or interrelated.

K. This WGFP IGA is an agreement between the Parties and does not bind or limit the authority or jurisdiction of agencies of the United States of America.

L. Performance of the portions of this WGFP IGA that require the expenditure of funds are subject to future budgeting and appropriation of funds by the governing bodies of the Subdistrict, WGFP Enterprise, Middle Park, Grand County, and the River District. The Parties agree to make good faith efforts to appropriate such funds.

M. The Parties agree that this WGFP IGA is an intergovernmental agreement pursuant to Article XIV, Sec. 18 of the Colorado Constitution and C.R.S. §§ 29-1-201 et. seq. inclusive, among all governmental entities hereto. In addition to any other remedy provided by law, the Parties further agree that the terms and conditions of this WGFP IGA are enforceable by specific performance and agree not to bring any defense to specific performance based on the doctrine of governmental immunity. The Parties also agree that a breach of this WGFP IGA will cause irreparable harm sufficient for injunctive relief.

N. The Parties agree to work cooperatively to implement a stipulated resolution of the Green Mountain Reservoir Administrative Fill dispute.

O. The Parties agree that if a dispute arises on any matter covered by this WGFP IGA, the Parties will confer in good faith and endeavor to resolve the concern. If the Parties reach an impasse, they will select a neutral third party mediator who would seek an acceptable voluntary solution to the conflict. For conflicts that involve a technical or scientific matter, the neutral third party mediator may select an independent technical or scientific expert, acceptable to the Parties involved in the mediation, to review and make a recommendation on the matter. If the conflict cannot be resolved through the efforts of the mediator, then the affected Parties may pursue any available legal or administrative recourse. Nothing herein shall preclude the commencement of any action that would otherwise be barred by a statute of limitations or the timely participation in any judicial or administrative process.

P. This WGFP IGA is the result of negotiations between the Parties and their respective counsel. These negotiations produced numerous drafts that were prepared by one or more of the Parties. The Parties agree that these drafts, including omissions, do not provide or represent evidence of intent of any Party and may not be relied upon for purposes of construction and enforcement of this WGFP IGA or for any other purpose.

Q. Suspension and Termination of 1041 Permits. The Subdistrict and WGFP Enterprise shall not be obligated to perform or comply with Paragraphs III. E. through L. or IV.K. (SHOP) of this WGFP IGA during any period of suspension of the WGFP 1041 Permit issued by Grand County. This WGFP IGA shall be terminated and of no further force or effect if the WGFP 1041 Permit issued by Grand County is terminated or revoked. During such time of suspension, or in the event of termination or revocation of the WGFP Permit (1041), the 1980 Agreement, as amended and supplemented by the 1985 Agreement, and the 1985 Agreement, shall be in full force and effect according to their terms.

1) Suspension of 1041 Permit. The Subdistrict and WGFP Enterprise shall not be obligated to perform or comply with Paragraphs III.E through L, or IV.K. (SHOP) of this WGFP IGA during any period of suspension of the WGFP 1041 Permit issued by Grand County.

   (a) During such time of suspension, the 1980 Agreement, as amended and supplemented by the 1985 Agreement, and the 1985 Agreement, shall be in full force and effect according to their terms.
   (b) Any water stored on behalf of Grand County or Middle Park pursuant to Paragraph III.H. at the time the WGFP Permit (1041) suspension is imposed shall not be available for use by Grand County or Middle Park during the time of the suspension, but will be available for use pursuant to Paragraph III.H. at such time as the suspension is not in effect. Any such water shall be subject to all reductions, charges, restrictions and requirements applicable to the storage of water under this WGFP IGA, the Amendatory Contract, and any other contracts or laws applicable to the storage of water on behalf of Middle Park and Grand County. Any such payments shall be made by Grand County or Middle Park, as appropriate, at such time as the suspension is not in effect and prior to the use of such water.

2) Termination or Revocation. In the event the WGFP Permit (1041) is revoked or terminated, any water stored on behalf of Grand County or Middle Park pursuant to Paragraph III.H. shall revert to the ownership and control of the Subdistrict. The Subdistrict will reimburse Grand County and Middle Park respectively for 91% of any pumping costs incurred by

the respective entity associated with the water stored on behalf of Grand County or Middle Park pursuant to Paragraph III.H.

**VII) No Waiver**

A. The Parties do not agree:

1) Whether amendment of the Blue River Decree or Senate Document No. 80 is required to authorize the storage of Colorado-Big Thompson Project water in Chimney Hollow Reservoir;

2) Whether a change of water right is required to allow the storage of Windy Gap Project Water in Chimney Hollow Reservoir; or

3) Whether the Section 390b(d) of the Water Supply Act of 1958 requires Congressional approval for the Windy Gap Firming Project.

4) Notwithstanding these disagreements, the West Slope Parties will not object to, litigate or otherwise dispute in any forum the storage of Colorado-Big Thompson Project water in Chimney Hollow Reservoir or the storage of Windy Gap Project Water in Chimney Hollow Reservoir in accordance with, and subject to the following provisions:

(a) The total volume of Colorado-Big Thompson Project water stored in the combination of Granby and Chimney Hollow Reservoirs will not exceed 465,568 acre feet. For the purposes of this Paragraph of the WGFP IGA, the amount of Colorado-Big Thompson Project water in storage in Granby Reservoir shall be the amount of Colorado-Big Thompson Project water stored above the invert of the Farr Pumping Plant Intake and below the normal high water line.

(b) In any year in which the April 1st or subsequent projection by Northern Water anticipates a spill at Granby Reservoir, Colorado-Big Thompson Project water then in storage in Chimney Hollow Reservoir shall not be released to satisfy delivery requirements to Colorado-Big Thompson Project beneficiaries if such release would allow the capture and storage of additional Colorado-Big Thompson Project water in Granby Reservoir.

(c) The implementation of this WGFP IGA.

(d) The Parties do not waive any rights regarding any other changes to the historical operations of the Colorado-Big Thompson Project or Windy Gap Project.

B. No Waiver – Colorado-Big Thompson. The Parties agree that the dispute concerning storage of Colorado-Big Thompson Project water in Chimney Hollow Reservoir has not been litigated. The Parties agree that, except as provided for in this WGFP IGA, in entering into the agreement and not litigating or otherwise objecting in any forum to the legal issues specified in Paragraph VII.A., above, that this WGFP IGA shall never give rise to any claim, defense, or theory of acquiescence, bar, merger, issue or claim preclusion, promissory estoppel, equitable estoppel, waiver, laches, unclean hands or any other similar position or defense concerning any factual or legal position regarding the Parties' respective positions regarding the storage of Colorado-Big Thompson Project water and the Parties' respective interpretations of Senate Document No. 80, the 1961 Principles, the 1938 Repayment Contract, Reclamation Law, the Blue River Decrees, or Colorado law. The Parties further agree that they do not intend this WGFP IGA to have the effect of precedent or preclusion on any factual or legal issue in any other matter. The Parties expressly reserve their rights to assert any legal or factual position or challenge the legal or factual position taken by any other party or entity on any other matter.

C. No Waiver – WGFP. The Parties agree that the dispute concerning storage of Windy Gap Project Water in Chimney Hollow Reservoir has not been litigated. The Parties agree that, except as provided for in this WGFP IGA, in entering into this WGFP IGA and not litigating or otherwise objecting in any forum to the legal issues specified in Paragraph VII.A, above, that this WGFP IGA shall never give rise to any claim, defense, or theory of acquiescence, bar, merger, issue or claim preclusion, promissory estoppel, equitable estoppel, waiver, laches, unclean hands or any other similar position or defense concerning any factual or legal position regarding the Parties' respective positions regarding the storage of Windy Gap Project Water in Chimney Hollow Reservoir and the Parties' respective interpretations of federal or Colorado law. The Parties further agree that they do not intend this WGFP IGA to have the effect of precedent or preclusion on any factual or legal issue in any other matter. The Parties expressly reserve their rights to assert any legal or factual position or challenge the legal or factual position taken by any other party on any other matter.

D. The Parties do not agree whether Grand County has the authority to regulate the WGFP pursuant to C.R.S. §§ 24-65.1-101, *et seq.*

1) Notwithstanding these disagreements, the Subdistrict will not object to, litigate, or otherwise dispute in any forum the authority of Grand County to require a permit for the WGFP issued by Grand County pursuant to C.R.S. §§ 24-65.1-101, *et seq.* (1041 Permit), including any terms and conditions thereof once said Permit has been accepted by the Subdistrict.

2) With the exception of a challenge to Grand County's authority to require a permit for the WGFP, the Subdistrict does not waive or relinquish its rights to raise any defense or assert in any forum that it has fully complied with and is not in violation of the WGFP 1041 Permit.

3) The Subdistrict does not waive or relinquish its rights to object to, litigate, or otherwise dispute in any forum the authority of Grand County to modify, amend or terminate the WGFP 1041 Permit or to require a 1041 Permit or other Grand County permit or authorization for any other existing or future project, action, or other activity of the Subdistrict.

E. Preservation of Governmental Powers. Except as specifically provided herein, nothing in this WGFP IGA shall be construed as a limitation on or waiver of any review, approval, or permit authority, or a predetermination of any action taken thereunder, by any governmental or quasi-municipal entity including, without limitation, the regulatory or quasi-judicial power or authority of Grand County.

F. No Third-Party Beneficiaries. This WGFP IGA does not and is not intended to confer any rights or remedies upon any person or entity other than the Parties.

MUNICIPAL SUBDISTRICT, NORTHERN COLORADO WATER CONSERVANCY DISTRICT

ATTEST:

Secretary

Date: 1/3/13

By: _____
President

WINDY GAP FIRMING PROJECT WATER ACTIVITY ENTERPRISE

ATTEST:

Secretary

Date: 1/3/13

By: _____
President

ATTEST:

R. Eric Kuhn
Secretary/General Manager

Date: 07/12/16

COLORADO RIVER WATER CONSERVATION DISTRICT

By: Jon Stavney
President

ATTEST:

Clerk and Recorder

Date: 12/4/2012

BOARD OF COUNTY COMMISSIONERS OF THE COUNTY OF GRAND, COLORADO

By: Nancy Stuart
Chairman

ATTEST:

Secretary

Date: 1/24/2013

NORTHWEST COLORADO COUNCIL OF GOVERNMENTS

By:
Chairman

ATTEST:

Secretary

Date: 2/1/13

MIDDLE PARK WATER CONSERVANCY DISTRICT

By: _____

President

Exhibit 3

List of Related Agreements

1. Intergovernmental Agreement between the Northern Colorado Water Conservancy District, Grand County, Middle Park Water Conservancy District and Colorado River Water Conservation District
2. Memorandum of Understanding, Grand Lake Clarity Project (Umbrella Agreement)
3. Clarity Supplement to the 1938 Repayment Contract
4. Windy Gap Bypass Funding Agreement
5. Processed Material Supply Agreement (Gravel Pit Agreement)
6. Windy Gap Decree
7. Grand County RICD Stipulation
8. Learning by Doing Cooperative Effort
9. Green Mountain Reservoir Administration
10. Contracts for Delivery of Water to Grand Valley
11. Amendatory Contract
12. Letter from Subdistrict to River District re: no opposition to use of WG water for uses incidental to irrigation such as fish screen, fish ladder, etc
13. Letter from NW to GC stating how the 5,412.5 will be made permanent

**General Manager**
sroman@erwsd.org
C: 970.471.0314
Vail, CO

### Education
BS, Environmental Engineering, University of Colorado – Boulder

### Licenses & Certifications
- Professional Engineer, Colorado
- License No. PE-42750
- Wastewater Operator D License
- Water Operator D License
- Distribution Operator I License

### Key Areas of Expertise
- Advocacy & Partnerships
- Leadership & Team Building
- Communication & Collaboration
- Strategic Planning & Problem-Solving
- Resiliency & Risk Management
- Project Management & Engineering Design

# Siri Roman, P.E.

## Professional Profile

I am a purpose-driven, values-based leader and engineer whose passion is all things water. With a strategic and visionary mindset, I have consistently demonstrated that I can build successful, collaborative, unified partnerships and teams to meet complex and evolving fiscal, water resource, regulatory, operational, organizational and community needs. While grounded in data-driven decisions, risk assessment, and fiduciary responsibility, I believe in the power of relationships, collaboration, accountability, and gratitude to influence positive change.

## Experience

**General Manager,** Eagle River Water & Sanitation District, Vail, CO (2022-current)

- Developed and implementing a strategic organizational vision that is focused on excellence, resiliency, purpose-driven teams, accountability, expertise in all things water, and protecting water for future generations
- Oversee all operations and business functions for the Eagle River Water & Sanitation District, and by contract the Upper Eagle Regional Water Authority and the Eagle Park Reservoir Company
- Oversee operations of the Eagle Park Reservoir (Fremont Pass) and Black Lakes (Vail Pass) and the District and Authority water rights portfolios; develop water supply/water use strategies
- Oversee complex drinking water distribution and treatment system (3 DWF, 18 wells, 48 tanks) and all associated regulatory programs
- Oversee complex wastewater collection and treatment system (3 WWTFs, 7 lift stations) and all associated regulatory programs
- Oversee annual $33M operating budget and $44M capital budget; and the development of a long-term financial plan that considers aging infrastructure, regulatory drivers, resiliency, and the workforce
- Regularly presents and engages with the four land use authorities within the District and Authority service area; aligning on infrastructure, development, water supply, water rights, and rates
- Pursuing development of 1200AF Bolts Lake Reservoir is a key component in the our long-term water supply strategy, ensuring a secure water future for communities served by the District and Authority
- Set a strategic priority to reduce water use by 400 AF by 2026 through rate redesigns and aligning water conservation efforts with industry standards.

EAGLE RIVER
WATER & SANITATION
DISTRICT

## Legislative Participation & Advocacy

**Federal Legislation**
In-person testimony before U.S. House Committee, January 2024, written testimony for Senate Committee, May 2024, H.R. 4297 - Bolts Ditch Act

**State Legislation**
Senate Bill 24-005, Prohibit Landscaping Practices for Water Conservation

Senate Bill 24-197, Water Conservation Measures

House Bill 24-1463, Special District Tap Fees Regulation (Opposed)

Senate Bill 23-150 Require Labeling Disposable Wipes

Senate Bill 23- 213 Land Use (Opposed)

Senate Bill 23- 295 Colorado River Task Force

House Bill 22-1151, Turf Replacement Program

**Water Quality Control Commission Rulemaking**
Regulations 31, 33, and 93

## Awards

- 2023 Special District Association - Safest District of the Year
- 2023 Rocky Mountain Water Environment Association - Excellence in Plant Operations
- 2022 Rocky Mountain Water Environment Association - Sustainability Award
- Colorado Green Business Network - Gold Level Status

**Director of Operations,** Eagle River Water & Sanitation District, Vail, CO (2019-2022)

- Responsible for the storage, treatment, and delivery of safe drinking water
- Responsible for the conveyance, treatment, and return of clean water to Gore Creek and the Eagle River
- Oversaw annual $18M operating budget and $70M capital budget
- Provided vision, strategy, and direction for the water, wastewater, field operations, utility services, laboratory, operational technology, and fleet and facilities management departments
- Ensured regulatory compliance for both the clean and safe drinking water programs
- Led outreach efforts for numerous topics including financing strategies, regulations, water quality, and operations

**Wastewater Manager,** Eagle River Water & Sanitation District, Vail, CO (2012-2019)

- Managed the Vail, Avon, and Edwards wastewater treatment facilities, employees, and the water quality laboratory
- Ensured compliance with all requirements of the Colorado Department of Public Health and Environment (CDPHE) Colorado Discharge, including effluent discharge limits, compliance schedule requirements, specialized sampling, communications, and reporting
- Managed master planning efforts for regulatory compliance and preparation for future growth
- Represented the District in state regulatory matters, local urban runoff, and community water quality efforts and presented wastewater information to local stakeholders

**Special Projects and Bridge Enterprise Manager,** Colorado Department of Transportation, Eagle, CO (2011-2012)

- Managed multiple bridge replacement and rehabilitation projects
- Employed innovative contracting method Construction Manager/General Contractor (CM/GC) on CDOT's first transportation project

**Project Engineer,** Peak Land Consultants, Inc., Vail, CO (2007-2011)

- Designed water and wastewater infrastructure projects including budgeting, scheduling, and invoicing
- Prepared all bid documents, construction quantities, cost estimates, addendums, bid tabs, field changes, and drafted as-built drawings

## Siri Roman, P.E.

**Relevant Media & Public Speaking Events**
Colorado Water Congress Summer Conference, August 2024
*Innovations of Water & Energy*

Eagle River Valley State of the River, June 2024
*Water Affordability Panel with Senator Dylan Roberts*
Vail Daily: Will water bills in Eagle County turn into a second mortgage?

Rocky Mountain Water Environment Association, September 2023
*Nutrient Management*

Special District Association, September 2023
*Facilitated Session on Water*

Eagle River Valley State of the River, June 2023
*Value of Water*
Vail Daily: The cost of water is only going one direction in Eagle County
Big Pivots: Enough water for lawns at the headwaters of the Colorado River?

Water Education Colorado, Connecting the Drops, June 2020
*Water and the Pandemic: Colorado Water and COVID-19*

WEFTEC, September 2018
*Integrated Planning between Water Resource Recovery Facilities*

Colorado Water Congress Summer Conference, August 2018
*Nutrient Management Memorandum of Understanding*

**Recent Legislative-Related Media**
Vail Daily: More than 40 years after a mapping blunder, will Congress finally remedy Bolts Ditch situation?

Vail Daily: ERWSD helped initiate 'Do Not Flush' wet-wipe labeling which will become law in 2024

Vail Daily: Vail, Avon leaders testify in opposition to sweeping Colorado land-use bill during marathon Senate hearing