STATE OF COLORADO

Colorado Water Conservation Board Department of Natural Resources

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TO: Colorado Water Conservation Board Members

FROM: Linda J. Bassi, Chief

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Stream and Lake Protection Section

DATE: September 1, 2011

SUBJECT: Agenda Item 9, September 13-14, 2011 Board Meeting

Stream and Lake Protection Section - ISF Water Acquisitions for Colorado River

Cooperative Agreement



John W. Hickenlooper

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Introduction

At the July 2011 Board meeting, the Board heard a presentation on the Colorado River Cooperative Agreement ("CRCA") between Denver Water and a number of West Slope entities (35 parties). The CRCA was formulated to resolve long-standing disputes over water and Denver Water's proposed Moffat Collection System Project ("Moffat Project"). Although the CRCA has not yet been finalized, CWCB has been asked to help effectuate certain terms of the agreement via an acquisition of a contractual interest in water for instream flow use. Under the proposed acquisition, Denver Water will enter into a contract with Grand County and CWCB under which it will deliver water to Grand County for instream flow ("ISF") use by CWCB in the Fraser, Williams Fork, and Upper Colorado River Basins in Grand County and in the 15 Mile Reach of the Colorado River ("Acquisition"). The contract ("Water Delivery Agreement") will specify the terms of use of the delivered water. Under this Agreement, CWCB would cooperate with Grand County and Denver Water in the administration and monitoring of the water deliveries for the intended beneficial uses. Denver Water and Grand County intend to file a water court application in September 2011, and to add CWCB as a co-applicant after the Board takes final action on this proposal. A general map of the area is attached as **Appendix A**; a summary of the CRCA is attached as **Appendix B**; and a draft of the Water Delivery Agreement will be provided as Appendix C at the September Board meeting.

Staff Recommendation

Pursuant to ISF Rule 6b, the Board's consideration of this proposal at this meeting will initiate the 120-day period for Board review. **No formal action is required at this time.** Staff believes that the proposed Acquisition will benefit the ISF Program. The initial presentation of this proposal provides an opportunity to the Board and the public to identify questions or concerns that Staff, Grand County or Denver Water will address at this or a subsequent meeting.

Background

Denver Water's Moffat Collection System Project ("Moffat Project") is a proposed a new water supply project using the Moffat facilities that is designed to provide 18,000 af per year of new water supply to Denver Water's customers. Denver Water proposes to divert additional water to be stored in the enlarged existing 42,000 af Gross Reservoir, located in Boulder County. Gross Dam would be raised 125 feet to provide an additional 72,000 af of storage capacity for a total of 114,000 af of storage to insure the additional firm yield of 18,000 af. Denver Water diverts water from the Fraser, Williams Fork, Blue, and South Platte Rivers and South Boulder Creek. Under the Moffat Project, additional diversions from the Fraser and Williams Fork Rivers are expected to be approximately 10,000 af on an average annual basis.

In conjunction with the Moffat Project, Denver Water is considering several environmental options under both voluntary and non-voluntary frameworks that could benefit the aquatic environment. This proposed Acquisition is under a voluntary framework. Non-voluntary frameworks include both Federal and State required environmental review and permits. State review includes review by the Colorado Wildlife Commission pursuant to section 37-60-122.2, C.R.S. (2010), under which Denver Water prepared a fish and wildlife mitigation plan ("FWMP"). The FWMP was presented to and adopted by the CWCB in July 2011. In the FWMP, mitigation in the Fraser and Colorado Rivers is focused mainly on temperature standards, with the mitigation activity in the form of flushing flows, or simply not diverting when certain high stream temperatures are triggered at specified locations.

Under voluntary measures, the Moffat Collection System Project Fish and Wildlife Enhancement Plan describes proposed voluntary actions and was prepared by Denver Water for the Moffat Project in partnership with the Municipal Subdistrict of the Northern Colorado Water Conservancy District ("Northern") for the Windy Gap Firming Project. See Appendix D. This document was created for the Colorado Wildlife Commission pursuant to regulations implementing CRS 37-60-122.2(2). The CRCA provides for other voluntary measures, including the measures provided for under the Water Delivery Agreement. Implementation will be guided by a cooperative effort under an intergovernmental agreement entitled "Learning by Doing Cooperative Intergovernmental Agreement" ("LBDIGA"). See Appendix E for the most recent draft. Participants in this cooperative effort will develop a process to monitor stream conditions to enable response to potential changes in or desired improvements to the stream environment. The LBDIGA provides a flexible iterative tool for implementation of environmental actions, and provides for those actions to be modified and adjusted in response to specific results on the ground. The proposed LBDIGA will be entered into by Grand County, Denver Water, the Middle Park Water Conservancy District and the Colorado River Water Conservation District to maintain, restore and enhance the stream environments in the Fraser, Williams Fork and Upper Colorado River Basins.

Grand County, with support from Denver Water and Northern, has undertaken a study to develop a Stream Management Plan ("SMP"). The August 2010 draft SMP can be found at http://co.grand.co.us/WRM.html. The purpose of the SMP is "to provide a framework for maintaining a healthy stream system in Grand County, Colorado through the protection and enhancement of aquatic habitat while at the same time protecting local water users, and retaining flexibility for future water operations." The SMP includes scientifically-based recommendations of environmental target stream flows for 19 stream reaches, including periodic habitat improvement flows for some reaches. The SMP will provide a basis for the Learning by Doing process and help guide the implementation of the Water Delivery Agreement. It is anticipated that the SMP will evolve over time as real time information and data is added.

CWCB's Role

This proposed Acquisition will help effectuate the terms of the CRCA, which can be viewed at http://www.crwcd.org/media/uploads/20110428 CRAC mediation agreement.pdf. As part of the CRCA, Denver Water has agreed to provide to Grand County 1,000 af of water each year for environmental purposes and any incidental recreational benefit, pursuant to Article III (E) of the CRCA. Denver Water intends to fulfill its obligation to Grand County using new water rights that it will apply for in 2011. The water will be protected under the CWCB's Instream Flow Program. The new water rights will include storage in Gross Reservoir on the East Slope to be used by substitution for environmental flows in Grand County. When Grand County requests a release of water, Denver Water will bypass water it could otherwise divert to the East Slope under its existing water rights at the identified diversion points inside Grand County. CWCB will protect the water under ISF water rights to the county line and potentially in the 15 Mile Reach of the Colorado River. Under certain conditions, Denver Water will then be able to transfer water among its storage pools in Gross Reservoir and release a like amount of water from its storage in Gross Reservoir for delivery to its customers.

CWCB's involvement will be guided by the Water Delivery Agreement, which contains several components. In the first component, Denver Water has agreed to make available 1,000 acre-feet annually to Grand County through Denver Water's Fraser River Collection System ("Fraser 1,000 af"), to be released and used in Grand County at times and in the amounts that Grand County requests. In the second component, Denver Water has agreed to make available another 1,000 acre-feet of water from the Williams Fork Reservoir ("Williams Fork 1,000 af"), to be released under certain conditions and at times and in the amounts that Grand County requests. The Agreement further provides that Denver Water will deliver up to 375 af to Grand County Water Users, to be managed in accordance with the 2011 Grand County Operating Plan, subject to the terms and conditions of Article III.E.20 of the CRCA ("Grand County 375 af"). In years when this 375 af is not needed for use by the Grand County Water Users, it may be made available for environmental purposes in the same manner as the Fraser 1,000 af. Discussions are also under way regarding the successive use of this water for West Slope purposes after its beneficial uses in Grand County. The primary proposed successive uses are West Slope uses decreed to Green Mountain Reservoir under the Blue River Decree (including use by substitution from Wolford Mountain Reservoir), power generation, use by CWCB in the 15 Mile Reach, or delivery to Grand Valley Water Users. Such successive uses could help maximize the beneficial use of the water.

Use of the delivered water in Grand County, and any successive uses, will be authorized by a water court decree. Denver Water and Grand County intend to file a water court application in September 2011 and to add CWCB as a co-applicant after the Board takes final action on this proposal.

The Water Rights

As currently proposed, Denver Water will apply for a new junior water storage right of 1,375 af in Gross Reservoir for the beneficial use of instream flows (and other uses as described in the application) in Grand County and the 15 Mile Reach, as well as a new junior water storage right of 1,000 af in Williams Fork Reservoir. Denver Water will divert under the new junior priorities mainly during spring snowmelt runoff. Later in the year, when flows are low and Grand County has requested that Denver Water make part of the 1,375 af available, Denver Water would "release" or bypass diversions it could otherwise make under its senior water rights in the

amount requested at the diversion structure specified by Grand County. Simultaneously, water stored in Gross Reservoir under the new junior right will be transferred to Denver's senior rights in Gross Reservoir under a right of substitution also to be adjudicated by Denver Water. The State and Division Engineers and the Attorney General's office believe the substitution concept allows Denver and Grand County a method to lawfully effectuate their agreement without requiring Denver Water to subject its water rights to a change of type of use proceeding. The timing of the diversions and "releases" provides Denver Water with storage water it needs during high flows and cool temperatures when the natural environment does not necessarily need higher flows, and provides Grand County with water during low flows and high temperatures when the environment needs it the most. Denver Water will also be able to release water from Williams Fork Reservoir as requested by Grand County for use downstream of the reservoir.

Water "released" or bypassed at a structure into a stream will need to be protected through the intended reaches from diversion from other water users. The proposed Acquisition allows CWCB to accept the water and put it to beneficial use to preserve and/or improve the natural environment to a reasonable degree from the structure through the reaches down to the county line and potentially in the 15 Mile Reach of the Colorado River, thus protecting it from diversion by other water users. The above-mentioned water court decree will instruct the administration of the water right, and will define specific reaches by upper and lower terminus locations with specific rates of flow to be protected for specific uses (i.e. to preserve or to improve).

The Board's Water Acquisition Procedures

Rule 6 of the Rules Concerning the Colorado Instream Flow and Natural Lake Level Program ("ISF Rules") sets forth the Board's procedures for acquiring water for ISF use. Section 37-92-102(3), C.R.S. provides 120 days for the Board to determine what terms and conditions it will accept in an acquisition agreement for water, water rights, or interests in water to preserve or improve the natural environment. ISF Rule 6 requires a minimum of two Board meetings to allow for public input prior to taking final action on a proposed acquisition. The Board's initial consideration of this proposal at this Board meeting initiates the 120-day time period for the Board to consider the terms and conditions of the proposed acquisition. Final action on the proposal could occur at the November 2011 Board meeting. ISF Rule 6m (4) provides that any person may request the Board to hold a hearing on the proposed acquisition, and that such a request must be filed within twenty days of this Board meeting.

ISF Rules 6e and 6f require the Board to evaluate the appropriateness of the acquisition and determine how best to utilize the acquired water rights to preserve or improve the natural environment. The Rules list several factors the Board may consider in its evaluation of the acquisitions. Several of the factors address water rights that need to be changed from irrigation or other uses to instream flow uses. Because this Acquisition involves a new appropriation, several of the factors do not apply. This memo addresses the applicable factors.

Pursuant to statute, Staff has requested recommendations from the Division of Wildlife and the Division of Parks and Outdoor Recreation, the U.S. Department of Agriculture and the U.S. Department of Interior. Pursuant to ISF Rule 6m(1), Staff has provided notice of the proposed Acquisition to all persons included on the appropriate ISF Subscription Mailing Lists and provided notice to the State Engineer's Substitute Supply Plan Notification List. Staff has requested a biological analysis from Colorado Parks and Wildlife ("CPW") pursuant to Rule 6f(2). CPW will address the Board regarding this Acquisition at the Board meeting.

Summary of Proposed Acquisition

Under the Water Delivery Agreement, Denver Water will provide annually up to 1,375 af of water to Grand County for ISF use by CWCB. The ISF use will consist of preserving the natural environment to a reasonable degree by maintaining flows in stream reaches where the CWCB has decreed ISF rights when those ISF rights are not satisfied, and also may include: (1) improving the natural environment to a reasonable degree by increasing flows in ISF reaches above the CWCB's decreed amounts up to the flow amounts recommended in the SMP or in amounts to be recommended by Grand County, CPW and CWCB staff; and (2) preserving and in some cases improving the natural environment to a reasonable degree on streams where CWCB does not currently hold decreed ISF rights. Grand County, CWCB staff and CPW staff are discussing the potential for the latter two types of ISF use. A summary of some key provisions of the proposed Agreement are set forth below. The draft Water Delivery Agreement will be provided to the Board prior to or at the Board meeting.

- a. The Agreement is conditioned upon complete execution of the CRCA.
- b. Denver Water will file an application with the Water Court to confirm Denver Water's right(s) to physically and legally provide water to Grand County for ISF use by the CWCB as contemplated by the Water Delivery Agreement. Grand County and CWCB shall be coapplicants for the purposes of advancing and protecting their contractual rights under the Agreement, including CWCB's obtaining a decreed right to use the water delivered by Denver Water under this Agreement to preserve and improve the natural environment to a reasonable degree on the specified stream reaches.
- c. The water court application will request that the water court to confirm that the State and Division Engineers will protect and shepherd the delivered water through the intended stream reaches without diversion or exchange by intervening water users.
- d. Denver Water will make available to Grand County 1,000 af annually from its Fraser River Collection System ("Fraser 1,000 af"). Denver Water will make an additional 375 af of water available annually to certain Grand County Water Users, to be managed in accordance with the Grand County Operating Plan. In years when the Grand County Water Users do not need this 375 af, it may be made available for environmental purposes in the same manner as the Fraser 1,000 af.
- e. In years when 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, Denver Water will make available a like amount of water, up to 1,000 af, from the Williams Fork Reservoir ("Williams Fork 1,000 af").
- f. The CWCB, Denver Water and Ground County will cooperate in the administration and monitoring of Denver Water's deliveries of water and the intended beneficial uses under the Agreement.
- g. Denver Water will not be responsible for the costs of any new infrastructure required to deliver or make the water available.
- h. Denver Water will be the sole owner of any new water rights adjudicated to accomplish the purposes of the Agreement.
- i. The water court application will request that the water court order that the delivered water will be protected and shepherded by the State and Division Engineers through the intended stream reaches.

- j. Grand County and the CWCB, in consultation with the Division Engineer, may install any measuring device(s) necessary to administer the delivered water.
- k. Use of the water provided to Grand County by Denver Water shall be coordinated through the Cooperative Effort of the LBDIGA.
- 1. The Agreement is perpetual unless terminated by the written agreement of all of the parties.

Because Grand County will determine the desired amounts and locations of the water to be provided by Denver Water under the Cooperative Effort of the LBDIGA, those amounts and locations will vary according to where the water is deemed to be needed most. Thus, this Acquisition differs from most acquisitions the Board has seen in that it covers many streams and does not provide water to each stream on a regular basis.

Existing Instream Flow Water Rights

The Board currently holds ISF water rights on 44 reaches in the Upper Colorado, Fraser and Williams Fork River Basins that could benefit from the Acquisition. There are also 48 segments in these three basins where the CWCB does not currently hold any ISF water rights. The streams are shown on the map attached as **Appendix A**. The Board also holds ISF water rights on the 15 Mile Reach of the Colorado River.

Existing Natural Environment

The Fraser River, Williams Fork River and Upper Colorado River basins support cold water fisheries. The Board has appropriated approximately 44 ISF water rights in these basins, and has already determined there is a natural environment to preserve on those streams. Additionally, the 15 Mile Reach supports a warm water fishery, including the four endangered fish species of the Colorado River.

Proposed Use of the Delivered Water

The Board could use the delivered water to preserve and improve the natural environment to a reasonable degree in the Upper Colorado, Fraser and Williams Fork watersheds in Grand County, and in the 15 Mile Reach. The additional water could be used to bring flows up to decreed ISF amounts at times when the existing ISF rights are not being met, or could be added to the existing ISF water rights to improve the natural environment to a reasonable degree, up to the amounts recommended by the SMP. Additionally, the water could be used to preserve and improve the natural environment to a reasonable degree on streams where the CWCB currently does not hold decreed ISF water rights, up to amounts recommended by the SMP. For reaches not included in the Stream Management Plan, CWCB and CPW staff will coordinate with Grand County on developing recommended amounts to protect. As stated above, Grand County, CWCB staff and CPW staff are discussing whether Grand County wants CWCB to (1) use the delivered water to improve the natural environment to a reasonable degree on decreed ISF reaches and (2) provide ISF protection on streams with no decreed ISF water rights. Given the relatively small volume of water involved, it is likely the water will be used in the most critical reaches, as determined under the Learning by Doing process and by Grand County.

Potential Stream Reaches that Could be Protected in the Fraser River Basin

Fraser River – A 27.6 mile reach of the natural environment on the Fraser River could be preserved and improved from the headgate of the Denver Water diversion point (West Canal Line intake at Fraser River) to the confluence with the Colorado River, encompassing ISF water

rights decreed in Case Nos. 90CW302, 90CW307, 90CW315, 90CW308 and 90CW308B. The additional water could be used to bring flows up to the decreed ISF amounts (3.5 to 8 cfs; 5 to 11 cfs; 11 to 17 cfs; 11 to 17 cfs; 19 to 30 cfs respectively) at times when the ISF water rights are not being met, or could be added to the existing ISF water rights to improve the natural environment to a reasonable degree in amounts to be recommended by Grand County, CPW and CWCB staff.

The SMP divides the Fraser into reaches, with recommendations for six of them (F3, F4, F6, F8, F9 and F10), both for year-round target flows as well as for periodic habitat improvement flows. The target environmental flows range from 4 to 100 cfs. The recommended habitat improvement flows, which are for a period of three days once every two years, range from 80 to 400 cfs. Again, given the small volume of water, it is unlikely the maximum flows will be achieved. However, identifying the potential to protect such maximum flows ensures that the water is being put to beneficial use and can be protected by the Division Engineer.

Vasquez Creek – A 4.7 mile reach of the natural environment on Vasquez Creek could be preserved and improved from the headgate of Denver Water diversion point (West Canal Line intake from Vasquez Creek) to the confluence with the Fraser River, encompassing the ISF water right decreed in Case No. 90CW318). The additional water could be used to bring flows up to the decreed ISF amounts (3 to 6 cfs) at times when the ISF water right is not being met, or could be added to the existing ISF water rights to improve the natural environment to a reasonable degree up to the amounts recommended by the SMP (5 to 8 cfs year round, and a 50 cfs flow for 3 days once in two years during late May to late June: F-VC) or in amounts to be recommended by Grand County, CPW and CWCB staff.

St. Louis Creek – A 9.2 mile reach of the natural environment on St. Louis Creek could be preserved and improved from the headgate of the Denver Water diversion point (West Canal Line intake from St. Louis Creek) to the confluence with the Fraser River, encompassing ISF water rights decreed in Case Nos. 90CW304, 90CW317, 90CW317A and 90CW316. The additional water could be used to bring flows up to the decreed ISF amounts (2 to 10 cfs; 3 to 11 cfs; 4.5 to 11 cfs; 3.5 to 6 cfs) at times when the ISF water rights are not being met, or could be added to the existing ISF water rights to improve the natural environment to a reasonable degree up to the amounts recommended by the SMP (5 to 10 cfs year round, and a 70 cfs flow for 3 days once in two years during late May to late June: F-StL) or in amounts to be recommended by Grand County, CPW and CWCB staff.

Ranch Creek – A 4.0 mile reach of the natural environment on Ranch Creek could be preserved and improved from the Denver Water diversion point (West Canal Line intake from Ranch Creek) to the confluence with Cabin Creek near Devil's Thumb, encompassing ISF water rights decreed in Case Nos. 90CW314 and 90CW306. The additional water could be used to bring flows up to the decreed ISF amounts (2 to 3 cfs; 1.5 to 7 cfs) at times when the ISF water rights are not being met, or could be added to the existing ISF water rights to improve the natural environment to a reasonable degree up to the amounts recommended by the SMP (6 to 10 cfs year round, and a 40 cfs flow for 3 days once in two years during late May to late June: F-RC1) or in amounts to be recommended by Grand County, CPW and CWCB staff.

A 5.3 mile reach of the natural environment on Ranch Creek could be preserved and improved from the confluence with Cabin Creek near Devil's Thumb to the confluence with the Fraser River, encompassing ISF water rights decreed in Case Nos. 90CW306A and 90CW305. The additional water could be used to bring flows up to the decreed ISF amounts (1.5 to 7 cfs; 5 to 8 cfs) at times when the ISF water rights are not being met, or could be added to the existing ISF water rights to improve the natural environment to a reasonable degree up to the amounts

recommended by the SMP (30 to 50 cfs April through September, 20 to 30 cfs October through March, and a 150 cfs flow for 3 days once in two years during late May to late June: F-RC2) or in amounts to be recommended by Grand County, CPW and CWCB staff.

Other Streams – Additionally, there are various stream segments within the Fraser River basin that have no existing ISF water rights (with a few exceptions) and currently no SMP recommended flows. However, these reaches all contain Denver Water diversion points, and could all potentially be protected in the future by using the additional water to preserve and improve the natural environment to a reasonable degree. These streams are as follows:

Jim Creek; Buck Creek; Cub Creek; Cooper Creek; Little Vasquez Creek; Main Elk Creek; East Elk Creek; West Main Elk Creek; West Elk Creek; East St. Louis Creek; Fool Creek; King Creek; Iron Creek; Byers Creek; Short Creek; West St. Louis Creek; South Fork Ranch Creek; Middle Fork Ranch Creek; Dribble Creek; North Ranch Creek; Little Cabin Creek; Cabin Creek (encompassing 90CW312); Hamilton Creek (encompassing 90CW311); Hurd Creek; South Trail Creek; North Trail Creek; and Meadow Creek (encompassing 90CW310 and 90CW309).

Potential Stream Reaches that Could be Protected in the Williams Fork River Basin

Williams Fork River – A 2 mile reach of the natural environment on the Williams Fork River, where there is currently no ISF right, could be preserved and improved from the Williams Fork Reservoir to the confluence with the Colorado River. The additional water could be used to preserve and improve the natural environment to a reasonable degree up to the amounts recommended by the SMP (40 to 140 cfs April through September, 40 to 100 cfs October through March, and a 200 cfs flow for 3 days once in two years during early June to early July: WR) or in amounts to be recommended by Grand County, CPW and CWCB staff.

Other Streams – Additionally, there are various stream segments within the Williams Fork River basin that currently have no SMP recommended flows. However, these reaches all contain Denver Water diversion points, and could all potentially be protected in the future by using the additional water to preserve and improve the environment to a reasonable degree. These streams are as follows:

The Williams Fork River from its headwaters (at the confluence with McQueary and Bobtail Creeks) to the Williams Fork Reservoir (which encompasses 11 ISF decrees); Bobtail Creek (encompassing 79CW163 and 79CW164); Steelman Creek (encompassing 79CW166 and 79CW167); McQueary Creek; Jones Creek; Middle Fork Williams Fork River (encompassing 79CW171); South Fork Williams Fork River (encompassing 79CW176, 79CW177, 79CW178 and 79CW179); and Short Creek.

Potential Stream Reaches that Could be Protected in the Upper Colorado River Basin

Colorado River – A 46 mile reach of the natural environment on the Colorado River could be preserved and improved from the confluence with the Fraser River to the Grand County line, encompassing ISF water rights decreed in Case Nos. 80CW447, 80CW446, 80CW448 and a pending 2011 ISF decree. The additional water could be used to bring flows up to the decreed ISF amounts (90 cfs; 135 cfs; 150 cfs; 250 to 500 cfs) at times when the ISF water rights are not being met, or could be added to the existing ISF water rights to improve the natural environment to a reasonable degree up to the amounts recommended by the SMP or in amounts to be recommended by Grand County, CPW and CWCB staff.

The SMP divides the Colorado River into reaches, with recommendations for four of them (CR4, CR5, CR6 and CR7), both for year-round target flows and periodic habitat improvement flows.

The target environmental flows range from 135 to 1,000 cfs. The recommended habitat improvement flows, which are for a period of three days once every two years, range from 600 to 2,500 cfs.

15 Mile Reach of Colorado River

A 14.7 mile reach of the natural environment on the Colorado River could be preserved and improved from the headgate of the Grand Valley Irrigation Company diversion to the confluence with the Gunnison River, encompassing ISF water rights decreed in Case Nos. 92CW286 and 94CW330. The additional water could be used to bring flows up to the decreed ISF amounts (581 cfs with a 300 cfs increase in the reach from the 27.5 Road Gage to the confluence with the Gunnison River at times when the ISF water rights are not being met, or could be added to the existing ISF water rights to improve the natural environment to a reasonable degree in amounts to be recommended by Grand County, CPW and CWCB staff.

9. Potential Benefits of Donation

Fraser River Basin – The Board currently holds ISF water rights on the Fraser River (downstream of the first Denver Water diversion point) for a total of 24.7 miles, ranging from 3.5 to 30 cfs. The Board currently holds ISF water rights on six tributary streams in the Fraser River Basin (downstream of the Denver Water diversion points), for a total of 33.8 miles, ranging from 0.5 to 11 cfs. This proposed Acquisition could help preserve the natural environment to a reasonable decree by bringing flows up to the decreed ISF amounts at times when the ISF water right is not being met, and could increase the water rights up to the amounts recommended by the Grand County SMP, ranging from 8 to 50 cfs on the tributaries and up to 120 cfs on the Fraser, since the delivered water would be left undiverted. The additional flows are expected to benefit the water-dependent natural environment of the Fraser River Basin. The Board's ability, in cooperation with Grand County, to request the Division Engineer to protect flows from diversion by other water rights will benefit the fish habitat existing in the ISF reaches.

Accepting the delivery of this water will potentially increase the frequency that the existing ISF water rights on the Fraser River and on creeks in the Fraser River Basin will be fully satisfied, which in turn should increase the quality of the water-dependent natural environment within these streams. Furthermore, the additional flows in the river and creeks are expected to improve the natural environment to a reasonable degree within the ISF reaches, as well as within segments where there currently are no decreed ISF water rights.

Upper Colorado River Basin – The Board currently holds ISF water rights on the Colorado River (downstream of the confluence with the Fraser River) for a total of 46 miles inside Grand County, and a total of 90 miles extending to the state line (including pending decrees). These rights range from 20 to 800 cfs. This proposed Acquisition could help preserve the natural environment to a reasonable decree by bringing flows up to the decreed ISF amounts at times when the ISF water rights are not being met, and could increase the flows up to the amounts recommended by the Grand County SMP, ranging from 250 to 1000 cfs. CPW studies have indicated that the river environment of the Upper Colorado River is experiencing a decline in the populations of *Pteronarcys californica* (giant stonefly), which historically has been a major source of food for trout in the Colorado River, as well as other species of stoneflies and mayflies. Populations of the mottle sculpin (*Cottus bairdi*), a native fish that is also an important source of food for trout, have also declined. Populations of trout species have declined in the Colorado River between Windy Gap Reservoir and the Town of Kremmling, due to alterations in flow

regime, river depletions, sedimentation and armoring of the channel bed in riffle areas below Windy Gap. The additional flows are expected to benefit the water-dependent natural environment of the Colorado River Basin. The Board's ability, in cooperation with Grand County, to request the Division Engineer to protect flows from diversion by other water rights will benefit the fish habitat existing in the ISF reaches. Lower on the Colorado River, this Acquisition could benefit the habitat of Colorado's four endangered fish species in the 15 Mile Reach.

Williams Fork River Basin – The Board currently holds ISF water rights on the Williams Fork River (downstream of the first Denver Water diversion point) for a total of 23.3 miles, ranging from 1 to 38 cfs. The Board currently holds ISF water rights on four tributary streams in the Williams Fork River Basin (downstream of the Denver Water diversion points), for a total of 11.8 miles, ranging from 1 to 10 cfs. This proposed Acquisition could help preserve the natural environment to a reasonable decree by bringing flows up to the decreed ISF amounts at times when the ISF water rights are not being met, and could increase the water rights up to the amounts recommended by the Grand County SMP (up to 140 cfs on the Williams Fork River), since the delivered water would be left undiverted. The additional flows are expected to benefit the water-dependent natural environment of the Williams Fork River Basin and the Colorado River Basin. The Board's ability, in cooperation with Grand County, to request the Division Engineer to protect flows from diversion by other water rights will benefit the fish habitat existing in the ISF reaches.

There are many segments on the main stem rivers and on their tributaries in the above basins where the Board currently holds no ISF water rights. This proposed Acquisition could help preserve and improve the natural environment to a reasonable degree on these streams below Denver diversion points where there is currently no ISF protection.

10. Other Water Rights in Proposed Reach and Potential Injury to Existing Rights

Because the additional ISF protection under this proposal will be achieved with new junior water rights, other water rights in the subject reaches will not be injured by the proposed ISF uses. Also, the water court decree implementing the Water Delivery Agreement will contain terms and conditions to assure that no vested water rights on any of the reaches will be injured as a result of the ISF use.

11. Administrability

Staff will confirm with the Division Engineer that the CWCB's proposed uses of the delivered water will be administrable.

12. Effect of Proposed Acquisition on Maximum Utilization of the Waters of the State

The Denver Water rights stem from new junior storage rights in Gross Reservoir that will be substituted for these headgate releases as the releases are made. The substituted water will be used by Denver on the Front Range. The released 1,375 af will be beneficially used for ISF purposes within Grand County and potentially in the 15 Mile Reach of the Colorado River. Once the 1,375 af has fulfilled its intended beneficial use in Grand County, it may be exchanged into storage for successive use consistent with the West Slope purposes of Green Mountain Reservoir under the Blue River Decree (including use by substitution from Wolford Mountain Reservoir), power generation, use by CWCB in the 15 Mile Reach, or delivery to use by Grand Valley Water Users, as directed by the final terms of the agreement and water court application (details to be determined).

13. Effect of Proposed Acquisition on Any Relevant Interstate Compact Issue

It is anticipated that this water will be diverted and used directly or by exchange by other water users downstream once it has satisfied its intended beneficial use in Grand County or in the 15 Mile Reach of the Colorado River. Consequently, it does not appear that this Acquisition will raise any compact issues.

14. Availability of the Delivered Water for Subsequent Use Downstream

This proposed Acquisition will provide up to 1,375 (or more) acre-feet of new water instream in the Fraser River basin, and up to 2,500 af downstream of Williams Fork Reservoir, during a time that the Grand County streams are running low. The water that is provided to Grand County during low flows could then be made available for subsequent use downstream of the intended location of use in Grand County as described above.

15. Costs to complete the transaction, or other associated costs

Denver Water and Grand County are not requesting the Board to pay for the delivered water. Since the Board already holds and protects existing ISF water rights on many of the targeted rivers and streams and Grand County has performed biological studies on many segments of the targeted streams, Staff does not expect to incur significant additional costs to protect the delivered water. The CWCB will participate as a co-applicant in the water court case. However, CWCB's role in the court process should be minimal while Denver Water takes the lead role.

Attachments

Appendix A: General Map

Appendix B: Summary of the CRCA

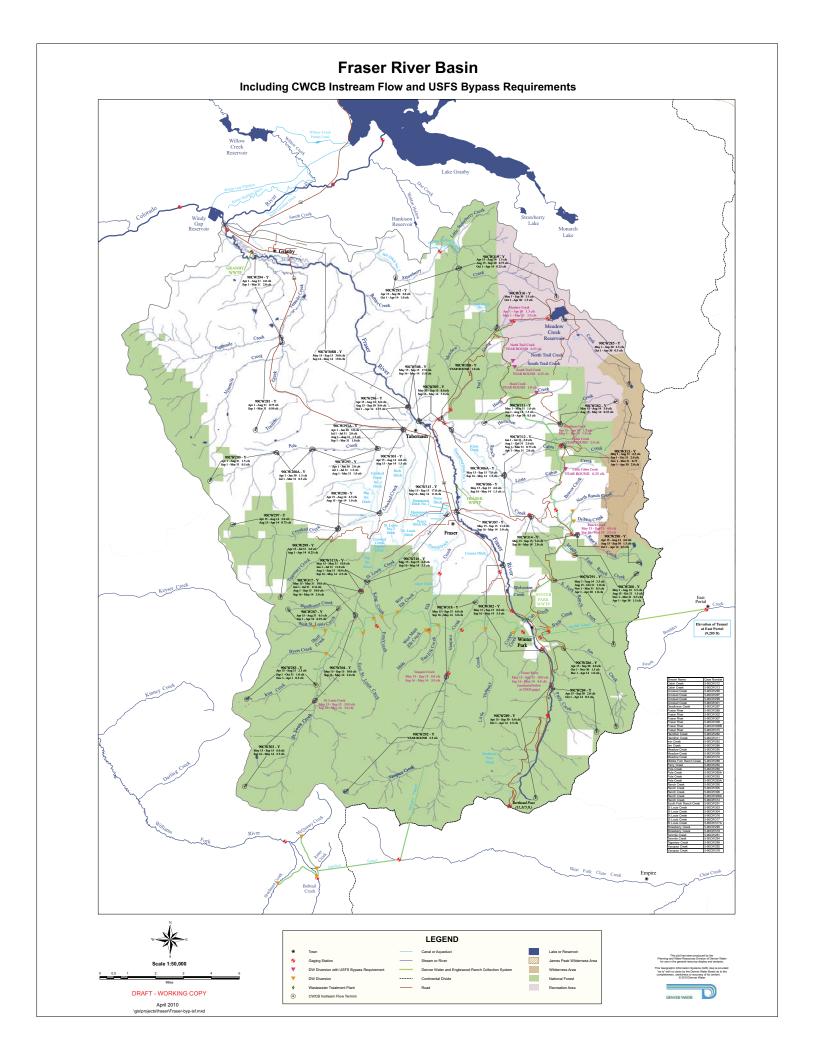
Appendix C: Water Delivery Agreement (to be provided)

Appendix D: Moffat Collection System Project Fish and Wildlife Enhancement Plan

Appendix E: Intergovernmental Agreement for the Learning by Doing Cooperative Effort

("LBDIGA")

APPENDIX A



APPENDIX B

Proposed

Colorado River Cooperative Agreement:

Path to a Secure Water Future

April 28, 2011

A secure and sustainable water future for Colorado is essential. It is vital for those who live in our cities and towns, for a healthy economy, for farmers and ranchers across the state, for wildlife and the aquatic life in our rivers and streams, and for those who enjoy the wonderful recreational opportunities our state offers. In short, it is essential to all that makes Colorado special.

Yet, competition for our water resources continues to increase. Nowhere is this more evident than in the Colorado River Basin, where conflicts between these competing interests have existed for generations.

A different approach is possible. It is an approach that provides proper balance among competing interests, a shared vision for better river health, reliable supply for all water users, and a future of cooperation, not conflict. It is precisely that approach that this agreement — among 35 water providers, local governments and the ski industry — embodies.

The visionary agreement provides for:

- 1. Resolution of historic conflicts and a holistic approach to resolving Colorado water disputes
- 2. Cooperative, long-term efforts to improve the health of the Colorado River mainstem and its tributaries
- 3. Additional water supply for those who live, work and play on the west slope and for customers of Denver Water

An Historic Collaboration

Never in the history of Colorado have so many varied interests agreed on a shared vision for a secure and sustainable water future. The partners to this proposed agreement include:

- Denver Water
- Colorado River District
- Grand County
- Summit County
- Eagle County
- Snake River Water District
- Dillon Valley Metro District
- Grand County Water and Sanitation District No. 1
- Winter Park Water and Sanitation 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
- Town of Breckenridge
- Town of Dillon
- Town of Silverthorne
- Town of Frisco
- Town of Fraser
- Town of Granby
- Vail Resorts
- Vail Summit Resort's Breckenridge Ski Resort
- Vail Summit Resort's Keystone Ski Resort
- Powdr-Copper Mountain
- Winter Park Recreational Association
- Arapahoe Basin Ski Area
- Copper Mountain Consolidated Metropolitan
 District

Benefit Highlights

For Colorado

- Ushers in a new era of cooperation by providing that any new water project by Denver Water in the Colorado River Basin will be developed only in cooperation with those entities impacted by the development
- Solidifies this era of cooperation by establishing a "Learning by Doing" process where Denver Water, Grand County, the Colorado River District, the Middle Park Conservancy District, and others have made a permanent commitment to identify and address future environmental issues in the headwaters of the Colorado River
- Provides protections for river flows and water quality along the entire reach of the main stem of the Colorado River
- Solidifies Denver Water's commitment to conservation and reuse
- Makes possible an agreement between Denver Water and water utilities in Douglas and Arapahoe counties that will lessen their reliance on non-renewable groundwater and condition their ability to go to the Colorado River Basin for additional water supplies
- Improves the health of Colorado's rivers and streams by dedicating funds to pay for watershed, water treatment and aquatic habitat improvements in the Colorado River Basin

For Cities, Counties and Other Entities in the Colorado River basin

- Additional water for towns, districts and ski areas in Grand and Summit counties to serve the needs of their residents and to improve the health of our rivers and streams
- An agreement to operate key Denver Water facilities, such as Dillon Reservoir in Summit County, and Williams Fork Reservoir and the Moffat Collection System in Grand County, in a way that better addresses the needs and concerns of neighboring communities and enhances the river environment
- Enhanced recreational opportunities by providing additional water to certain ski areas
- Greater certainty in the continued availability of water in the middle and lower Colorado River by
 ensuring that when the Shoshone Power Plant in Glenwood Canyon is not operating, the parties will
 operate their facilities as if the plant was operational to help maintain the historic flows in the Colorado
 River.

For Denver Water

- Greater certainty in developing a secure water future for its customers by resolving long-standing disputes over its service territory, its ability to use West Slope water, its ability to develop future water supplies in the Colorado River Basin, and other legal issues
- Additional water and enhanced system reliability for customers of Denver Water, representing nearly 25 percent of the state's population, by moving forward the Moffat Collection System Project
- Agreement by all partners to not oppose Denver's storage of its Blue River and Moffat Project water on the Front Range
- Clarification of the conditions under which Denver Water will be able to provide water outside its service territory — thus paving the way for the cooperative WISE Project

APPENDIX C

APPENDIX C TO BE PROVIDED

APPENDIX D

Moffat Collection System Project

Fish and Wildlife Enhancement Plan

Prepared for:

The Colorado Wildlife Commission In accordance with CRS 37-60-122.2

Prepared by: **Denver Water**

In Partnership With:

Municipal Subdistrict,

Northern Colorado Water Conservancy District

Table of Contents

1.0 INTRODUCTION

- 1.1. Enhancement Project Overview
- 1.2. Fish and Wildlife Enhancement Plan Stakeholders
- 1.3. Concurrent and Related Activities

2.0 ENHANCEMENTS

- 2.1. Upper Colorado River Habitat Project
- 2.2. Implementing the Learning by Doing Cooperative Effort
- 3.0 RELATIONSHIP TO PROJECT MITIGATION

List of Figures

- 1 Upper Colorado River Habitat Project
- 2 Implementing the Learning By Doing Cooperative Effort

Appendix

A Summary of Denver Water's Enhancement Agreement under the Mediation Effort with Grand County and other West Slope Parties

Proposed Learning by Doing IGA

1.0 INTRODUCTION

1.1 Enhancement Project Overview

The City and County of Denver, acting by and through its Board of Water Commissioners (Denver Water) is proposing to construct the Moffat Collection System Project (Moffat Project), a project designed to provide 18,000 acre-feet (AF) per year of new water supply to Denver Water's customers. Denver Water proposes to enlarge its existing 42,000-AF Gross Reservoir, which is located in Boulder County, Colorado approximately 35 miles northwest of Denver and 6 miles southwest of the city of Boulder. Gross Dam would be raised 125 feet to provide an additional 72,000 AF of reservoir storage.

Pursuant to CRS 37-60-122.2(1), Denver Water and the Municipal Subdistrict, Northern Colorado Water Conservancy District, acting by and through the Windy Gap Firming Project (WGFP) Water Activity Enterprise (Subdistrict) have agreed to participate with the Colorado Department of Natural Resources (DNR) and Colorado Division of Wildlife (CDOW) in concurrent development of Fish and Wildlife Mitigation Plans (FWMPs) for the Subdistrict's WGFP and Denver Water's Moffat Project. In addition to the concurrent FWMPs, Denver Water and the Subdistrict have decided to submit to the CDOW enhancement plans to improve existing fish and wildlife resources. These Enhancement Plans are submitted pursuant to regulations implementing CRS 37-60-122.2(2) and are intended to enhance fish and wildlife resources over and above the levels existing without the Moffat Project and WGFP. Denver Water and the Subdistrict are submitting their Enhancement Plans simultaneously with their FWMPs.

Denver Water is also providing the Wildlife Commission with a copy of the proposed "Learning by Doing" (LBD) Cooperative Effort Intergovernmental Agreement (IGA), which was developed as part of the proposed mediation agreement between the West Slope entities and Denver Water. In the mediation agreement, Denver Water has committed to provide money for habitat improvements, water for environmental flows, and considerable system flexibility to provide flushing flows, all directed towards enhancing the current stream conditions and aquatic habitat in Grand County. The LBD effort, along with these mediation commitments, can provide considerable additional benefits to fish and wildlife resources.

1.2 Fish and Wildlife Enhancement Plan Stakeholders

Denver Water has been consulting and conferring with a broad range of federal and state agencies, as well as local governments and environmental groups, to solicit input on desired enhancements to existing fish and wildlife resources. These entities include:

- Governmental organizations: CDOW, Northern Water Conservancy District, Grand County, and Town of Hot Sulphur Springs
- Non-governmental organizations: Trout Unlimited and landowners along the upper Colorado River and in the Fraser River Basin

Although the CRS 37-60-122.2 procedures do not specify public involvement requirements, Denver Water and the Subdistrict acknowledge the Colorado Wildlife

Commission's desire to provide ample opportunity for public participation. To date, the Wildlife Commission has provided the following opportunities for the public to provide mitigation and enhancement suggestions:

- Stakeholder Workshops, January 24-25, 2011, Winter Park CDOW solicited input on options for fixing the upper Colorado River between Windy Gap and the Kemp-Breeze State Wildlife Area to ensure a functioning river that supports fish and wildlife resources given anticipated future flows.
- Public Comment Period on Draft Enhancement and Mitigation Plans, Feb. 10-24, 2011 – CDOW invited public review and comment on the draft plans. The input was reviewed by CDOW, Denver Water and the Subdistrict while preparing the April 7th plans.
- Wildlife Commission Meeting, March 10, 2011 Members of the public provided comments on the draft plans and review process.

1.3 Concurrent and Related Activities

Windy Gap Firming Project

The Windy Gap Firming Project (WGFP) is a proposed water supply project that would provide more reliable water deliveries to Front Range and West Slope communities and industries. The Subdistrict is seeking to construct the project on behalf of the 13 WGFP Participants. Project Participants include the City and County of Broomfield, the towns of Erie and Superior, the cities of Evans, Fort Lupton, Greeley, Lafayette, Longmont, Louisville, Loveland, Little Thompson Water District, Central Weld County Water District, and the Platte River Power Authority.

The proposed WGFP is to add water storage and related facilities to the existing Windy Gap operations capable of delivering a firm annual yield of about 30,000 AF to Project Participants. The Subdistrict's Proposed Action is the construction of Chimney Hollow Reservoir to store Windy Gap Project water. The WGFP Draft EIS was issued by the U.S. Bureau of Reclamation (Bureau) in 2008.

The Moffat Project would increase diversions from the Fraser River Basin upstream of the Windy Gap Project diversion site on the Colorado River and would affect the availability of water for the WGFP. Diversions for the WGFP and Moffat Project would result in changes to flows in the Colorado River below the Windy Gap dam. Denver Water and the Subdistrict have agreed to cooperate with each other and with the DNR and CDOW in concurrent development of the mitigation plans required under CRS 37-60-122.2 for the two projects. They have jointly developed stream temperature monitoring stations as mitigation (refer to the Moffat Project FWMP). Additionally, Denver Water and the Subdistrict have proposed enhancements with significant resources and funding to improve current conditions in the river.

2.0 ENHANCEMENTS

2.1 Upper Colorado River Habitat Project

The Upper Colorado River Habitat Project (Habitat Project) was designed in coordination with the Subdistrict to address concerns raised by CDOW and other stakeholders regarding the current conditions of the aquatic ecosystem in the Colorado River downstream of Windy Gap. CDOW studies have identified a decline in populations of *Pteronarcys californica* (giant stonefly), which, historically, has been a major source of food for trout in the Colorado River as well as other species of stoneflies and mayflies. Populations of the mottled sculpin (*Cottus bairdi*), a native fish that is also an important food source for trout and shares habitat with the *Pteronarcys*, have also declined. CDOW believes that riffle areas below the Windy Gap Reservoir have been altered by changes in flow regime, water depletions, sedimentation, and armoring of the channel bed. Trout populations between Windy Gap and Kremmling have declined. CDOW has expressed a desire to return the river to a more functional system considering current and future hydrology.

The goal of the Habitat Project is to design and implement a stream restoration program to improve the existing aquatic environment from the Windy Gap Diversion to the lower terminus of the Kemp-Breeze State Wildlife Area (Segment). Refer to Figure 1. The intent is for Denver Water and the Subdistrict to join with the CDOW, along with other stakeholders, in a cooperative effort to identify and address desired improvements to the stream environment.

Resources for the Project

- A. <u>Funds Provided by Denver Water</u>. To implement the Habitat Project, Denver Water will provide \$1 million.
- B. <u>Funds Provided by Subdistrict</u>. To implement the Habitat Project, the Subdistrict will provide \$2.5 million.
- C. Possible Funds Provided by Learning by Doing. Denver Water and the Subdistrict will participate in the LBD Cooperative Effort, which is described in Section 2.2. In the LBD Cooperative Effort, Denver Water has committed money for habitat improvements, water for environmental flows, and considerable system flexibility to provide flushing flows, all directed towards enhancing the aquatic environment in Grand County (refer to Appendix A for details). Denver Water and the Subdistrict, as two members of the sixmember Management Committee, will work with the other members of the committee to dedicate an additional \$1 million (from the funds committed to LBD by Denver Water) to the Habitat Project, in addition to the amounts committed by Denver Water and the Subdistrict in paragraphs A and B above.
- D. Other Resources. If the Habitat Project participants desire additional resources beyond the \$3.5 million described in A and B above, the project participants will work with other stakeholders and granting agencies to seek other sources of funding. In addition, Denver Water and the Subdistrict will

contribute in-kind resources such as labor, equipment, and materials as practicable, and where it will not affect operation or maintenance of either entity's existing projects, to help maximize the value of funds provided in paragraphs A, B, and C above. In addition, CDOW has indicated a willingness to provide in-house expertise and resources for stream restoration design.

E. <u>Future Funding</u>. The Subdistrict and Denver Water will contribute \$500,000 each for a total of \$1 million to a fund to be used for adaptive management in the Habitat Project segment. Adaptive Management in this case means that the \$1 million will be available to adjust elements of the stream restoration efforts that are not functioning as designed.

<u>Use of Funds</u>. The public funds described above will be used for the Habitat Project to restore the Segment on public land. However, the public stream reaches are interrupted by reaches of private land. The effectiveness of habitat restoration work and overall stream health will be compromised if there is not some degree of stream enhancement continuity for the entire Segment. While, preference will be given to work on public lands, public funds may be used for stream restoration on private land to provide continuity and prevent harm to the Habitat Project as a whole, or where a conservation easement is in place that allows public access, and/or through a program of matching private funds with public funds. Proposed work on private land within the Segment will be developed in cooperation with the project participants and the land owner to ensure maximum benefit to the health of the river.

Any funds remaining after implementation of the Habitat Project will be used for additional projects to improve the aquatic environment on the Colorado River. Additional projects could include maintenance activities, a bypass around Windy Gap Reservoir or continuing stream improvements downstream to the confluence with Troublesome Creek (the lower terminus of the Gold Medal fishery designation). Other projects would be identified and agreed upon by the project participants.

Effective Date. The Habitat Project will commence when the Subdistrict and Denver Water have received acceptable Records of Decision and permits for their respective projects and have begun final design and construction activities. If a permit is appealed, the Habitat Project will commence after final resolution of the appeal and acceptance of the resolution by the Subdistrict and Denver Water.

<u>Project Implementation</u>. The Habitat Project will be implemented in collaboration with and as a subset of the LBD Cooperative Effort to ensure consistency and coordination with the overall stream enhancement efforts in Grand County. Section 2.2 describes the coordinated implementation and management structure of LBD.

2.2 Implementing the Learning by Doing Cooperative Effort

Denver Water and Grand County have spent over three years working cooperatively to resolve issues related to Denver Water's existing operations in Grand County. Denver Water and Grand County reached a proposed agreement on September 24, 2010 regarding Denver Water's commitments to enhance existing conditions in Grand County. Denver Water and Grand County are currently working with the State to assure that the benefits of Denver Water's commitments can be delivered and protected under Colorado's water rights system. Grand County Commissioners will also conduct a public process to gather input from county residents and other interested parties on the proposed agreement prior to a formal vote by the Commissioners on the agreement. A major component of the proposed agreement is the LBD Cooperative Effort. This is a cooperative, iterative and ongoing process to maintain, and when reasonably possible, restore or enhance the stream environment in the Fraser and Williams Fork river basins, and in the mainstem of the Colorado River from the outflow of Granby Reservoir to its confluence with the Blue River.

The Subdistrict has also been working cooperatively with Grand County and other West Slope stakeholders to develop an IGA regarding additional enhancements to existing conditions in Grand County. The IGA has not been completed, but the Subdistrict has committed to participate in the proposed LBD Cooperative Effort.

The Grand County Stream Management Plan (SMP) is the framework for the overall LBD Cooperative Effort. The SMP will be used as a "living" document that will be revised as additional monitoring data are gathered and as management goals for each stream reach are agreed upon. Types of restoration opportunities include channel bank revegetation, enhancing fish passage, applying enhancement flows to existing low and/or high flow conditions, and in-stream habitat restoration.

The LBD Effort will be implemented with the following management structure, as shown in Figure 2.

<u>Management Committee</u> – The LBD Cooperative Effort will be managed by representatives of the public entities contributing resources to the various activities and projects undertaken by the group. Resources are defined as funding, water, project design, and/or equipment and manpower to implement a project. The Management Committee will operate by consensus under the LBD Cooperative Effort IGA. A copy of the proposed IGA is included in Appendix A of this Enhancement Plan. The Management Committee will include one representative from:

- Denver Water
- Northern Colorado Water Conservancy District, Subdistrict
- Grand County
- Colorado River Water Conservation District
- Middle Park Water Conservancy District
- CDOW

The Management Committee may elect to invite others to participate as members of the Management Committee based on commitments to long-term contributions of funding or other tangible resources that will further the goals of the LBD Cooperative Effort.

<u>Advisory Committee</u> – The Management Committee may request participation by other parties, such as representatives from environmental, recreational, governmental and agricultural interests, to provide expertise and technical advice. It is anticipated that Trout Unlimited and the U.S. Forest Service, among others, would be invited to be advisors.

Responsibilities – The responsibilities of the Management Committee, with input and assistance from the Advisory Committee, include:

- Monitoring Plan A long-term monitoring plan will be developed and implemented to identify critical stream reaches and assign priorities for actions; identify changes in the aquatic environment; evaluate effectiveness of actions taken, and modify and refine strategies for achieving the goals of the LBD Cooperative Effort.
- Operations Plan As stream reaches are prioritized and projects identified, the
 Management Committee will develop an annual Operations Plan to maximize the
 stream environmental benefits with the available resources such as water
 commitments, system flexibility and funding. The Management Committee will
 meet as frequently as necessary to explore opportunities to coordinate
 operations of all diversion structures and reservoir releases among all water
 users in Grand County.
- Enhancements Denver Water committed in the proposed mediation agreement to provide substantial resources of money, water and system flexibility for the purpose of maintaining, restoring or enhancing the Upper Colorado, Fraser and Upper Williams Fork watersheds. Additional resources can be contributed by other parties to implement the LBD Cooperative Effort.
- Annual Review The entire LBD Cooperative Effort, inclusive of coordinated operations, stream reach prioritization, stream improvement projects and monitoring programs, will be reviewed annually by the Management Committee in refining and updating the plans and projects.

STREAM PROJECTS

The Management Committee, with input from the Advisory Committee, will prioritize stream reaches for implementing stream improvement projects.

<u>Stream Team</u> – A specific stream project, as prioritized by the Management Committee, will be managed by a "Stream Team" comprised of organizations or individuals that have committed resources to that specific project. Resources are defined as funding, water, project design, and/or equipment and manpower to implement a specific project. Each Stream Team will consist of representatives of the Management Committee, who will be contributing resources, to ensure consistency and

continuity with the LBD Cooperative Effort, plus any other contributing members. Each Stream Team will only develop and implement enhancement projects that support the goals and priorities of the LBD Effort. Private landowners who contribute resources, or have a conservation easement allowing public access, would be invited to participate on the Stream Team for their respective segment of the river. These landowners would approve any projects proposed by the Stream Team on property they own. Contributing Members of each Stream Team will enter into a binding agreement to implement the project, and will operate by consensus. The binding agreement will reference the LBD Effort IGA.

<u>Advisory Team</u> – The Stream Team will invite other interested parties such as representatives from environmental, recreational, governmental and agricultural interests, to serve as technical advisors on a particular project.

Upper Colorado River Habitat Project

The first identified project is the Upper Colorado River Habitat Project described in Section 2.1.

<u>Stream Team</u>: The contributing members of the Habitat Project Steam Team include:

- Denver Water
- Subdistrict
- CDOW
- Grand County
- Landowners (who contribute funding and/or resources, or have a conservation easement allowing public access, for their respective segment of the river)

The Habitat Project Stream Team will operate by consensus (i.e., unanimous vote) and make good faith efforts to resolve any conflicts. If the good faith effort does not result in consensus, the Habitat Project Stream Team will refer the issue to the LBD Management Committee for resolution. If the Management Committee cannot resolve the issues, it will be submitted to the Director of the DNR for resolution. Prior to referral, the unresolved issue will be summarized in writing with an explanation of any "competing views" and efforts to date to resolve the matter.

<u>Advisory Team</u>: Interested parties not contributing resources, including Trout Unlimited and landowners.

<u>Implementation of Habitat Project</u>: The Habitat Project will be managed by the Habitat Project Stream Team with advice from the Advisory Team and will likely consist of several phases.

 Project Goals – The Team will begin by setting specific goals for the Habitat Project to promote functionality of the river system. Goals may include specific biological goals related to health of the aquatic ecosystem, including fish and macroinvertebrates (e.g. trout, *Pteronarcys* and sculpin). The Habitat Project goals will be consistent with the LBD Effort and the SMP.

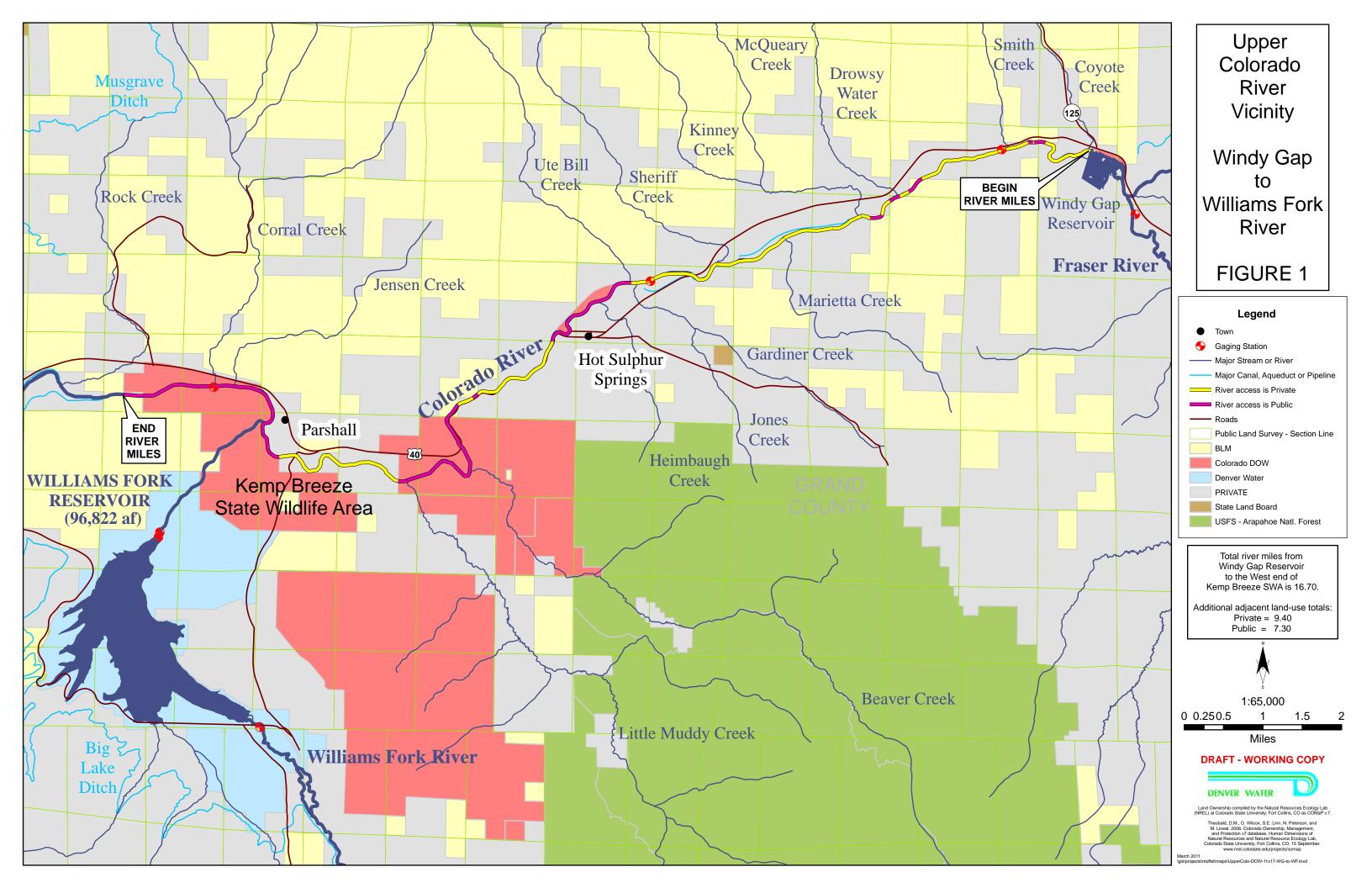
- Project Design The Team will evaluate the most effective and sustainable restoration opportunities for the Segment. Different designs or solutions may be appropriate and implemented for different parts of the Segment. The Team will evaluate restoration opportunities based on site-specific field evaluations, data from the SMP, and the specific objectives for a given reach.
- Implementation The Team will prioritize proposed habitat improvements, as well as allocation of funding for public and privately-owned stream segments. The Habitat Project will be implemented over time as stream reaches are prioritized and designs are completed. The CDOW will be responsible for the final design, permitting and implementation of the stream restoration activities.
- Monitoring The Team will determine the appropriate monitoring activities to measure outcomes from implementing the Habitat Project taking into consideration monitoring already in place or proposed as part of the LBD Effort. The CDOW will be responsible for the long-term monitoring and maintenance of the stream restoration activities.

3.0 RELATIONSHIP TO PROJECT MITIGATION

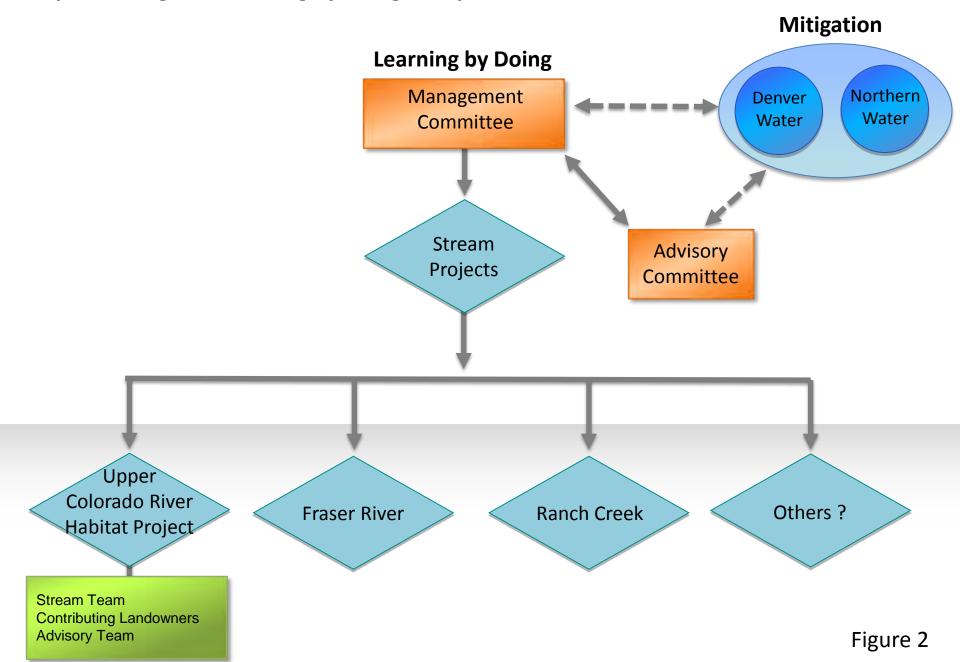
Both Denver Water and the Subdistrict will comply with all mitigation measures required in the permits for their respective projects, Moffat Project and WGFP. Compliance with the mitigation measures in permits will be the sole responsibility of the permittee (i.e., Denver Water and the Subdistrict). However, Denver Water and the Subdistrict are members of the Management Committee, and will collaborate, to the extent practicable, to implement the mitigation measures in a manner consistent with the objectives of the LBD Cooperative Effort and specific Stream Team efforts.

The stream enhancement cooperative efforts, such as the Upper Colorado River Habitat Project and the LBD, are efforts to enhance the existing environment and are not intended to substitute for any mitigation required by the federal agencies for the projects. The goal is to coordinate the application of any required mitigation efforts with the voluntary and collaborative efforts of the stream enhancement projects to assure the maximum benefit for the stream environment.

If the Corps and the Bureau do not require any mitigation in the Segment to offset impacts identified in the Moffat Project or the WGFP, Denver Water and the Subdistrict will enter into a binding agreement with CDOW and the Stream Team for the Habitat Project, as described above. If the Corps or the Bureau requires aquatic mitigation in the Segment, some or all of the committed resources listed above may be enforceable through conditions in the permits. The Habitat Project will be implemented in a manner that complements any mitigation measures required by the Corps for the Moffat Project or by the Bureau for the WGFP.



Implementing the "Learning by Doing" Cooperative Effort



Appendix A

Summary of Denver Water's Enhancement Agreement under the Mediation Effort with Grand County and Other West Slope Parties

and

Proposed Intergovernmental Agreement for the Learning By Doing Cooperative Effort

Summary of Denver Water's Enhancement Agreement under the Mediation Effort with Grand County and Other West Slope Parties

As part of negotiations between West Slope parties and Denver Water, Grand County and Denver Water have reached a proposed agreement that addresses some of the issues related to Denver Water's existing operations in Grand County. In this proposed agreement, Denver Water has committed to the LBD Cooperative Effort and the following resources to provide environmental enhancements to benefit the aquatic environment in the Fraser, Williams Fork and upper Colorado rivers. A copy of the proposed LBD IGA is included in this Appendix. Denver Water and Grand County are currently working with the State to assure that the benefits of the commitments can be delivered and protected under Colorado's water rights system. Also, the Grand County Commissioners will conduct a public process about the proposed mediation agreement, including LBD, to allow the citizens of Grand County and other interested parties to comment on the agreement prior to the Commissioners considering approval of the agreement. Under the proposed agreement, the following assets will be provided by Denver Water.

- \$2,000,000 to address nutrient loading. If the Mitigation Plan required in the permitting process for the Moffat Project mandates funds for this purpose, then this \$2,000,000 would be proportionately reduced.
- \$1,000,000 for aquatic habitat improvements
- A second \$1,000,000 for aquatic habitat improvements. If the Mitigation Plan required in the permitting process for the Moffat Project mandates funds for this purpose, then this \$1,000,000 would be proportionately reduced.
- Operation of and \$50,000 contribution to construction of the Berthoud Pass sediment basin
- \$2,000,000 for future environmental enhancements
- \$1,000,000 to contribute to the costs of pumping Windy Gap water for environmental purposes
- 1,000 acre-feet annually of bypass water from the Fraser Collection System for environmental purposes
- Up to 1,000 acre-feet annually of releases from Williams Fork Reservoir and 2,500 acre-feet of carry over storage in Williams Fork Reservoir for environmental purposes
- Agree to not reduce USFS bypass flows during a drought unless Denver Water has banned all residential lawn watering in its service area (Denver Water has never banned residential lawn watering).
- Agree to a joint study to determine how best Denver Water's rights in Rich, Hammond no.1 and Big Lake ditches can be used to enhance stream flows and maximize environmental benefits
- Agree to a joint study of Denver Water lands in Grand County to identify those lands that could be set aside for wildlife habitat and public fishing access

With regard to impacts caused by the future operation of the Moffat Project, Denver Water agreed to abide by the mitigation requirements that would be required by the U.S. Army Corps of Engineers in the Section 404 permit for the project.

APPENDIX E

INTERGOVERNMENTAL AGREEMENT FOR THE LEARNING BY DOING COOPERATIVE EFFORT

This Intergovernmental Agreement (Agreement) is entered into between the CITY AND COUNTY OF DENVER, acting by and through its BOARD OF WATER COMMISSIONERS (Board); GRAND COUNTY BOARD OF COUNTY COMMISSIONERS (Grand County) MIDDLE PARK WATER CONSERVANCY DISTRICT (Middle Park) and COLORADO RIVER WATER CONSERVATION DISTRICT (River District), collectively, the "parties."

WHEREAS, the Board, Grand County, Middle Park, and the River District desire to engage in a cooperative, iterative and on-going process (Cooperative Effort) to maintain, and when reasonably possible, restore or enhance the stream environment in the Fraser and Williams Fork River Basins and in the mainstem of the Colorado River from the outflow of Windy Gap Reservoir to its confluence with the Blue River (the Cooperative Effort Area); and

WHEREAS, in addition to other data and information, this Cooperative Effort will rely on the information contained in the draft Grand County Stream Management Plan (SMP). The current draft SMP is dated August 2010, but the parties anticipate that the SMP will evolve over time with the addition of real time information and data; and

WHEREAS, this Cooperative Effort is intended to address impacts that may be associated with existing operations by the Board, Grand County and other water users in the Cooperative Effort Area. Any new impacts to the stream environment projected to be caused by the Board's proposed Moffat Project will be addressed by mitigation plans to be developed by regulatory agencies as part of the permitting process for the Moffat Project; and

WHEREAS, the parties to this Cooperative Effort will develop a process to monitor the stream conditions to identify and respond to potential changes in or desired improvements to the stream environment, based upon the concepts embodied in this Agreement; and

WHEREAS, the Cooperative Effort will allow the participants to identify and react to changes in the stream environment in a manner that maximizes the benefits to be realized from the defined resources available to the entities, and that minimizes adverse changes to the stream environment whenever possible; and

WHEREAS, the parties are authorized to enter into this Agreement by, *inter alia*, Section 29-1-201, *et seq.*, C.R.S.; Section 29-10-101, *et seq.*, C.R.S.; and Article XIV, Section 18(2) of the Colorado Constitution.

NOW THEREFORE, the parties agree to implement thise Cooperative Effort in accordance with the following provisions:

I. Guiding Principles

The overarching goal for the Cooperative Effort is to maintain and, where reasonably possible, restore or enhance the condition of the stream environment in Grand County. The Upper

Colorado River system and the Fraser and Williams Fork rivers serve as a critical municipal, agricultural, recreational and industrial water supply source for the state as a whole and provide important aquatic habitat. The participants in the Cooperative Effort have a mutual interest in protecting the stream environment and commit to work together in a cooperative and comprehensive manner to address issues related to maintaining and, when reasonably possible, enhancing the condition of the stream environment in Grand County. To that end, the parties agree to the following principles to build and promote a stable, permanent, relationship that respects the interests and legal responsibilities of the parties, while achieving the goals of the Cooperative Effort.

- A. The Cooperative Effort will not seek a culprit for changes in the condition of the stream, but will provide a mechanism to identify issues of concern and focus available resources to address those issues.
- B. The parties to this Agreement have been involved since 2007, along with numerous other West Slope entities, in negotiating an agreement (Mediation Agreement) to resolve longstanding issues. The Board has committed to Grand County a substantial, but defined amount of resources described in Article III.E of the Mediation Agreement for the purpose of maintaining, restoring or enhancing the Upper Colorado, Fraser and Williams Fork watersheds. Grand County commits to using the resources provided under Article III.E of the Mediation Agreement in a manner consistent with the purposes of the Cooperative Effort. In addition, Grand County, Middle Park and the River District agree to contribute resources to the Cooperative Effort on an ongoing basis, as available and appropriate. Because resources available to the Parties are limited, the use of those resources will be prioritized as part of the Cooperative Effort. Grand County agrees, consistent with the provisions of Article III.E.9 of the Mediation Agreement, that amounts in excess of \$2 million in the WG Pumping Fund will be dedicated to the Cooperative Effort.
- C. The Cooperative Effort does not constitute mitigation for the Moffat Project. The Board agrees to undertake all mitigation measures related to Grand County (Mitigation Measures) required in the permit for the Moffat Project to be issued by the Corps of Engineers (COE). The parties to the Cooperative Effort agree not to pursue a challenge to the Mitigation Measures described in the COE permit for the Moffat Project. All the parties to the Cooperative Effort will work in good faith to implement the Cooperative Effort in a way that complements the Mitigation Measures.
- D. If the Management Committee desires additional resources beyond the Grand County Article III.E resources, and resources contributed by Middle Park, Grand County and the River District, to implement the Cooperative Effort, the parties will work with other stakeholders, granting agencies, and identify other sources of funding to provide additional resources. If mutually defined additional resources are still desired, the parties may agree to consider contributing more of their own resources on a case-by-case basis and within the context of the other principles listed herein. Each party retains its sole discretion whether to provide any additional resources without future judgment or prejudice by the other parties.

- E. The parties to this Agreement agree that active participation in the Cooperative Effort by the Board will commence after Issuance and Acceptance by the Board of Permits Necessary for the Moffat Project, as defined in the Mediation Agreement. Prior to the issuance and acceptance of permits, the parties agree that they will continue to work together on completing and improving the draft SMP.
- F. The parties acknowledge that actions not the subject of other contractual obligations that would impair a party's ability to meet its water supply commitments will not be undertaken as part of the Cooperative Effort, unless agreed to voluntarily by the owner of the water supply.
- G. For a period of five years from the date of the first diversions into the constructed Moffat Project, no party will unilaterally request, or cause others to request, that the COE or other applicable regulatory agencies reopen a permit or license for the Moffat Project for any reason. Each party reserves the right to oppose any such efforts to reopen the permits or licenses for the Moffat Project.

II. The Cooperative Effort

A. Organization.

- 1. **Management Committee**. The parties will form a Management Committee within six months after this Agreement becomes effective.
- 2. **Representation.** The initial Management Committee will comprise five members, one representative each from Grand County, the Board, the River District, Middle Park, and Trout Unlimited. If Grand County and Northern Colorado Water Conservancy District (Northern Water), and the Municipal Subdistrict of the Northern Colorado Water Conservancy District (Subdistrict) enter into an agreement similar to this agreement, the Management Committee will be expanded by one to accommodate a representative from Northern Water or the Subdistrict. The Management Committee may decide to invite others to be members, such as representatives from agricultural, environmental, recreational, industrial, and governmental interests. It is anticipated that the Colorado Division of Wildlife and the United State Forest Service will be invited to play an advisory role in the Management Committee. Any decision to add other members to the Management Committee will be by consensus, with consideration being given to the resources and contributions other potential members may provide to the Cooperative Effort.
- 3. **Decision-making.** The Management Committee will operate by consensus; i.e. unanimous vote. The Management Committee will make a good faith effort to resolve any issues. If the good faith effort does not result in

- consensus, the Management Committee will implement the Conflict Resolution process.
- 4. **Organizational Structure**. The Management Committee may establish a not-for-profit organization to implement the Cooperative Effort if it determines that such a vehicle is the most effective means for accomplishing its objectives.
- B. **Tasks and Responsibilities**. The following are expected under the Cooperative Effort:
 - 1. Continue to Improve the Grand County Stream Management Plan. Phase 1, 2, and 3 of the draft SMP have been completed. The parties will continue to adapt and improve the draft SMP cooperatively as additional information is developed, the understanding of desired stream conditions is better defined, and the management goals for each stream reach are agreed upon.
 - 2. Management Goals and Priorities. The Management Committee will define the management goals for each stream reach of interest. By way of example, one reach may be managed to increase the fishing experience for rainbow trout, while another reach may be managed for a specific stream characteristic such as macro-invertebrate diversity. Which management goals are practicable for a specific reach could be influenced by the resources available for use in that reach. It is expected that the Management Committee might also define secondary management goals for specific reaches. Once the management goals for the stream reaches are agreed upon, the Management Committee will prioritize the reaches based upon the agreed upon management goals, the desired stream conditions for each reach, and the available resources.
 - 3. Coordinate with the COE. If applicable, the Management Committee may work with the COE to coordinate, to the extent practicable, Mitigation Measures for the Moffat Project with the management goals, priorities and projects undertaken as part of the Cooperative Effort. The Management Committee will work to ensure that the Board is not required to engage in duplicative or conflicting actions, nor implement measures that do not accomplish their stated benefits.
 - 4. **Water Quality Standards.** CDPHE has listed several stream reaches in the Cooperative Effort Area on the 2010 303d list of impaired waters. The Cooperative Effort will participate in developing the appropriate management actions for these segments.
 - 5. **Monitoring Plan.** The ability to fully identify cause and effect relationships in a complex aquatic environment is difficult. Therefore, the parties agree to implement a monitoring plan to identify undesirable changes in, and agree

upon desired modifications to, the stream environment, and to measure the effectiveness of actions taken to protect or improve the stream environment. This approach will allow the available resources to be focused on avoiding problems, responding to changing conditions, and achieving stream goals. The Cooperative Effort will rely on existing data and new data gathering under existing programs to provide the primary source of information for designing the management goals and for prioritizing those goals and reaches where the goals will be applied. The Management Committee can initiate additional monitoring, data gathering and analysis, and may choose to focus on specific measurable indicators, as circumstances warrant, to guide in applying the resources and to monitor the effectiveness of the resources in meeting a management goal. The principles of the potential monitoring plan are described in Attachment A.

- 6. **Implementation.** The Management Committee will review the results of monitoring to evaluate the effectiveness of the Cooperative Effort and of the allocation of available resources in meeting the management goals and priorities. The results of the monitoring program also may be used to identify measures that might be desirable to maintain or improve the stream environment.
- 7. **Independent Experts.** The Management Committee may retain independent experts and consultants if deemed necessary to perform the Committee's work. The cost of such independent experts and consultants shall be allocated among the parties as agreed to by the Management Committee.
- 8. **Operations Plan**. The Management Committee will develop an annual operations plan to maximize the stream environmental benefits of the available resources (including water commitments, system flexibility and funding. The plan will explore opportunities for coordinated operations of diversion structures and reservoir releases among all water users in Grand County, including Northern Water; the Subdistrict; the Bureau of Reclamation, the Board; Middle Park; River District; and in-county diversions for agricultural, municipal, industrial, and others uses. The purpose of coordinated operations is to allow the water users to meet the supply requirements of their systems, while maximizing the effectiveness of the Cooperative Effort. Subject to any contractual commitments regarding system operations, all water users retain sole discretion over their water supply system demands and opportunities and available system flexibility. The decisions and actions by the Management Committee in developing and implementing the operations plan shall take into account water rights priorities, draft SMP flow ranges as they change over time, naturally occurring hydrologic conditions, recreational flow needs, CWCB instream flows, and the results of monitoring.

- 9. **Incorporate New Knowledge into Management Actions.** As the results of testing various operational changes, monitoring the effectiveness of measures, and collecting and analyzing additional data, the Management Committee will have new information to inform its decision-making. The Management Committee will address data management and access issues in a timely fashion.
- 10. **Obtain and Manage Funding.** The Management Committee will explore whether the most effective use of funds made available for the benefit of the stream environment is to set up an endowment fund dedicated to the goals of the Cooperative Effort. For example, the interest from such a fund could be used as matching funds for grants. The Management Committee also will research available sources of funding for planning, monitoring and implementing measures identified during the Cooperative Effort, including, but not limited to grants, contributions, assessments, or fees on water or sewer services.
- 11. Weekly Coordination. The Management Committee will conduct weekly coordination meetings or calls from May through September or at such other times as mutually agreed by the Management Committee. The purpose of these meetings/calls is to highlight upcoming operational issues, discuss potential options to reduce possible negative impacts to the stream environment, and to coordinate implementation of actions under the Cooperative Effort. The Management Committee can agree to include other entities in the meetings or calls, as a general practice or as warranted. However, the other entities participating in these calls would act as advisors only unless they were providing water, usable resources, or system flexibility to a particular solution or action of the Management Committee.
- 12. Annual Review and Stream Management Plan Adaptations. The Management Committee will conduct an annual review in January or February before the next spring and summer field season to assess whether management goals are being met, evaluate the monitoring data gathered, assess the use of available resources, identify additional data and analysis needs, determine if refinements are needed to the Grand County draft SMP or the operations plan, and provide an annual summary to each of the parties.

III. Conflict Resolution

The parties agree that, if the Management Committee cannot adequately address an issue to the satisfaction of one of the parties, the parties will confer in good faith and endeavor to resolve the concern.

Where the Management Committee cannot make a decision by consensus and any single entity believes that issue warrants mediation, the Management Committee 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 all parties, to review and make a recommendation on the matter. If the conflict cannot be resolved through the efforts of the mediator, then the Management Committee would agree to disagree, and move forward with the other elements of the Cooperative Effort where they had reached agreement.

In the specific case of water resources included in Article III.E of the Mediation Agreement, those water resources will continue to be released annually in the pattern and location previously agreed to by the Management Committee to protect the environment until another pattern or location is identified by the Management Committee.

If the conflict cannot be resolved by the efforts of the mediator and the Management Committee is prevented from moving forward with the other aspects of the Cooperative Effort, then the parties can pursue any available legal or administrative recourse.

IV. Effective Date

This Agreement shall become effective upon the Issuance and Acceptance by the Board of Permits Necessary for the Moffat Project, as defined in the Mediation Agreement.

V. Miscellaneous Provisions

A. Regulatory Action or Litigation

In the event any person or entity files a petition to the COE, FERC or other regulatory agency for regulatory action, or commences litigation, which would materially adversely affect the Moffat Project (Adverse Action), the parties to the Cooperative Effort agree to 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 parties could avoid the Adverse Action or mitigate its impact on the affected party. 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 parties. If the Moffat Project is denied an acceptable permit, or if the Board decides not to proceed with its project, then the Board shall provide notice to the parties to this Agreement within ten days of the decision and shall be released from its obligation to participate in the Cooperative Effort. Nothing in this paragraph modifies the Board's independent obligations under Article III.E of the Mediation Agreement.

B. No Property Rights or Servitude

Nothing in this Agreement shall be deemed or construed as granting or creating any property right or servitude whatsoever on any party's water rights or facilities. The foregoing sentence shall not impair the rights of any party to specific performance of this Agreement.

C. No Operating Obligation

Except for those Article III E resources which will require operational changes, nothing in this Agreement shall be deemed or construed as creating any obligation on any party to

operate its raw or treated waterworks system in any particular manner, so long as the party complies with the terms of this Agreement. Each party retains sole and exclusive discretion concerning the operation of its system.

D. Right of Specific Performance

If any party shall fail to cure any default or breach of this Agreement within 120 days after receipt of notice from the non-defaulting or non-breaching party, then the non-defaulting or non-breaching party may elect to file suit, without further notice, for specific performance of this Agreement. The parties agree that the terms and conditions of this Agreement are enforceable by specific performance, and the parties hereby waive any defenses to specific performance based on the doctrine of sovereign immunity

E. Force Majeure

A party shall be excused from performing its obligations under this Agreement during the time and to the extent that it is prevented from performing by a cause beyond its control, provided that such nonperformance is beyond the reasonable control of, and is not due to the fault or negligence of the party not performing.

F. Severability

If any provision of this Agreement shall prove to be illegal, invalid, unenforceable or impossible of performance, the remainder of this Agreement shall remain in full force and effect.

G. Assignment

Neither this Agreement nor any of a party's rights, obligations, duties or authority hereunder may be assigned in whole or in part without the prior written consent of the other parties.

H. Colorado Law

This Agreement shall be construed in accordance with the laws of the state of Colorado.

I. Termination

This Agreement will remain in effect unless terminated in writing by all the parties.

I. Admission of New Parties

The original parties to this Agreement may, upon unanimous consent, admit new parties upon such terms and conditions as they determine appropriate.

acting by and through its ATTEST: **BOARD OF WATER COMMISSIONERS** By:______ Secretary By: _____ President Date: _____ APPROVED: By:_____ Director of Planning APPROVED AS TO FORM: By:_____ Legal Division COLORADO RIVER WATER MIDDLE PARK WATER CONSERVANCY DISTRICT CONSERVATION DISTRICT By:_____ By:_____ Date:_____ Date: _____ GRAND COUNTY BOARD OF **COUNTY COMMISSIONERS** By: _____ ATTEST: _____

CITY AND COUNTY OF DENVER,

Date:

ATTACHMENT A Monitoring Plan

Some level of effective monitoring of the stream environment is essential to understanding and measuring success of applied prescriptions. The Management Committee will design an Aquatic Resource Monitoring Plan, which will cover the Cooperative Effort Area. The Monitoring Plan will focus on understanding the resource and preparing to measure the success of the applied prescriptions.

The Monitoring Plan will be developed and implemented as part of the Cooperative Effort, and will incorporate the elements of the monitoring plan prepared during Phase 3B of the draft SMP that the Management Committee determines are appropriate. The monitoring data will be used by the Management Committee for its decision-making. For example, monitoring will be used to identify changes in the aquatic environment, identify critical stream reaches, assign priorities for action steps, evaluate the effectiveness of actions taken, and to modify and refine strategies for achieving goals of the Cooperative Effort.

The elements of the plan will be determined as part of the Cooperative Effort. The Plan could include some or all of the following elements:

- Identification of key stream segments and groundwater to monitor.
- Existing hydrologic conditions.
- Specific existing ecological conditions at key locations.
- Permanent stream transects to monitor and evaluate any future changes in ecological conditions (e.g., shifts in riffle/pool ratios, increases in sedimentation, reduction in stream habitat diversity) associated with changes in channel maintenance and applied flushing flows proscribed in the Cooperative Effort.
- Establish key indicators of aquatic life and stream health (e.g., fish biomass) and threshold levels at specific locations that reflect increases or declines in aquatic life and stream health from application of measures defined in the Cooperative Effort.