



COLORADO

**Colorado Water
Conservation Board**

Department of Natural Resources

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TO: Colorado Water Conservation Board Members

FROM: Kaylea White, Senior Water Resource Specialist
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Stream and Lake Protection Section

DATE: November 17-18, 2021

AGENDA ITEM: #21. Proposed Lease of Ruedi Reservoir Water for Instream Flow
Use on the Fryingpan River and 15-Mile Reach of the Colorado
River (Water Division 5)

Staff Recommendation

No formal action is required at this time.

Pursuant to Rule 6b. of the Rules Concerning the Colorado Instream Flow and Natural Lake Level Program (“ISF Rules”), the Board’s consideration of this proposal at this meeting will initiate the 120-day period for Board review. The initial presentation of this proposal provides an opportunity for the Board and the public to identify questions or concerns that Staff will address at this or a subsequent meeting.

Introduction

The Colorado River Water Conservation District, acting through its Colorado River Water Projects Enterprise (“District”), has offered the Colorado Water Conservation Board (“CWCB”) another opportunity to enter into a one-year short-term lease of a portion of water that the District holds in Ruedi Reservoir for instream flow (“ISF”) use. This would be the third of such leases with the District.

The objective of the proposed lease is to help maintain Fryingpan River flows up to a rate of 70 cfs to prevent the formation of anchor ice at times when temperatures and low flows could otherwise combine to create anchor ice during between January and March. The CWCB would use the leased water to supplement its existing decreed ISF water right to preserve and improve the natural environment to a reasonable degree on the Fryingpan River. Beginning April 1, the balance of the leased water, if any, would be delivered to the 15-Mile Reach as needed to help meet or reduce shortfalls to the U.S. Fish and Wildlife Service (“USFWS”) flow recommendations for the endangered fish critical habitat in that reach. See the Location Map attached as **Exhibit A** and River District Offer Letter as **Exhibit B**.



Background

In 2018, the District worked with the Roaring Fork Conservancy (“RFC”) to evaluate needs and potential available supply to enhance instream flows in the Fryingpan River below Ruedi Reservoir during the winter months under certain conditions. Studies have shown that winter flows of 70 cfs, 31 cfs above the decreed ISF rate of 39 cfs (November 1 -April 30), would benefit the natural environment by preventing and/or mitigating the effects anchor ice. Anchor ice formation has been shown to adversely impact aquatic macroinvertebrates and trout fry in the Fryingpan River.

Based upon those studies and a recommendation from Colorado Parks and Wildlife (“CPW”), the District and CWCB entered into a one-year lease agreement in 2018. Operation of that lease in 2019 provided up to 26 cfs of additional flows from January 1, 2019 - March 7, 2019 by releasing 3,201 acre-feet, and proved to be very beneficial toward maintaining Fryingpan River flows at a minimum of 70 cfs. These releases helped mitigate the effects of anchor ice formation. The balance of the leased water remaining after March 31, 2019 in the amount of 299 acre-feet was released in late September of 2019 for use in the 15-Mile Reach.

In 2020, the District and CWCB entered into a second lease for 3,500 acre-feet of water for ISF use on the Fryingpan River and 15-mile reach. Operation of that lease again provided additional flows to meet the 70 cfs target rate from January 1, 2021 - February 28, 2021.

This year, the District has offered to lease 1,750 acre-feet of water available to it under two different Ruedi Reservoir Round II Water Sales Contracts with the Bureau of Reclamation (“USBR”). The terms for a District lease for in-channel water uses are set forth in the District’s Water Marketing Policy dated January 20, 2021.

Discussion

ISF Rule 6e. requires the Board to evaluate the appropriateness of the acquisition and to determine how best to utilize the acquired water to preserve or improve the natural environment. ISF Rules 6e. and 6f. describe the Board’s evaluation process, including specific factors that the Board must consider in determining the appropriateness of an acquisition. Information that the Board may use to evaluate the proposed lease is included below:

1. Amount and Source of Water Proposed for Lease

The water rights proposed to be leased to the CWCB would be up to 1,750 acre-feet of water available to the District in Ruedi Reservoir pursuant to its Ruedi Reservoir Round II Water Sales Contract No. 079D6C0106 that could be delivered to the Fryingpan River in Pitkin and Eagle Counties (“Leased Water”). The contract includes an explicit term that the water may be used “...to supplement winter instream flows in the Fryingpan River.” After March 31, 2022, any remaining Leased Water could be delivered pursuant to the River District’s Ruedi Reservoir Round II Water Sales Contract No. 139D6C0101 (“Remaining Leased Water”). That contract authorizes municipal uses in the Colorado River Basin; the contract’s definition of “municipal uses” includes “use of water by . . . piscatorial users, including delivery of water



to supplement streamflow . . .” Ruedi Reservoir is decreed for several types of use: irrigation, domestic, municipal, generation of electrical energy, stockwatering, industrial, piscatorial, recreation, and other beneficial uses.

2. Location of Use

The reach of stream proposed for use of the Leased Water is the Fryingpan River from its confluence with Rocky Fork Creek, adjacent to the outlet of Ruedi Reservoir, down to its confluence with the Roaring Fork River in Pitkin and Eagle Counties. The Remaining Leased Water would be used on the 15-Mile Reach of the Colorado River. The reaches are described below and shown on the attached Location Map.

3. Existing ISF Water Rights

The CWCB currently holds ISF water rights on the following reaches of the Fryingpan and Colorado Rivers on which it would use the Leased Water and Remaining Leased Water, respectively:

Case No.	Stream	Segment	Length (miles)	Amount CFS Rates (Dates)	Appropriation Date
W-1945 (1973)	Fryingpan River	confl Rocky Fork Creek to confl Roaring Fork River	Approx. 14 miles	39 cfs (11/1 - 4/30) 110 cfs (5/1 - 10/31)	07/12/1973
5-92CW286	Colorado River (15 mile reach)	Tailrace of Grand Valley Pumping Plant to confl Gunnison River	Approx. 15 miles	581cfs (7/1-9/30)	3/5/1992
5-94CW330	Colorado River (15 mile reach)	27.5 Road Gage to confl Gunnison River	Approx. 2 miles	300 cfs (7/1-9/30)	11/4/1994

4. Natural Flow Regimes

The Fryingpan River originates in the central Rocky Mountains of Colorado northeast of Aspen in Pitkin County. The headwaters of the Fryingpan River are at the Continental Divide in the Hunter Fryingpan Wilderness at an elevation of about 12,000 feet. Streamflow in the Fryingpan River is primarily from snowmelt and local precipitation and influenced by reservoir operations and transmountain diversions. The largest storage facility in the basin is the Bureau of Reclamation’s Ruedi Reservoir, located in the lower portion of the watershed approximately 11 miles above the point at which the Fryingpan River flows in to the Roaring Fork River near the town of Basalt. Peak flows typically occur in May, June, and early July and diminish down to base flows in July through September; streamflow is characteristically low and steady from November through March of most years. The watershed above Ruedi Reservoir is approximately 230 square miles with an extensive tributary network; several of these tributaries are diverted to the eastern slope via facilities associated with the Fryingpan-Arkansas project. The Fryingpan River below Ruedi Reservoir flows in a westerly direction



through a confined canyon fed by only a few small tributary streams. The streamflow of the Fryingpan River in this canyon is almost entirely made up of Ruedi Reservoir releases, especially during the winter months. The thermal effects of the reservoir releases create open water conditions virtually year round, making the river a very popular fishery for both local residents and visitors to the area.

The Colorado River originates in the southern Rocky Mountains of Colorado over 2 miles above sea level, flows past Glenwood Springs and Grand Junction, running parallel to I-70, and flows west out of Colorado into Utah. The 15-Mile Reach includes the portion of the river from the Grand Valley Diversion (River Mile 185.1) to the confluence with the Gunnison River in Grand Junction. Streamflow is primarily from snowmelt and local precipitation. Peak flows typically occur in May and June, and drop off quickly in July-September most years. Significant tributaries include the Blue, Eagle, and Roaring Fork Rivers.

5. Existing Natural Environments

The Fryingpan River is a Gold Medal trout fishery renowned for its abundant quality-sized trout, specifically a robust brown trout population and a burgeoning rainbow trout population recovering from the impacts of whirling disease. Mottled sculpin and aquatic invertebrates are the foundation of the diet that supports the Gold Medal fishery. The daily aquatic invertebrate hatches are well known for the consistency and timing such that anglers can “set their watches” to virtually guaranteed fish feeding frenzies and predictable conditions for dry fly fishing. The anglers drawn to this fishing opportunity provide a significant economic driver for local communities and the quality fishery is pivotal to the high quality of life for residents and visitors. Winter flow conditions below the reservoir and the thermal effects of the reservoir have, over time, created fairly predictable conditions for anchor ice formation when streamflow is below 70 cfs and when air temperatures are in the single digits. Extensive anchor ice deposits can have dramatic impacts on aquatic macroinvertebrate numbers and can disrupt their life cycles. Impacts on trout fry in the interstitial spaces in the substrate can also occur with the formation and accumulation of anchor ice deposits.

The 15-Mile Reach of the Colorado River provides critical habitat for two species of endangered fish: the Colorado pikeminnow and razorback sucker. This reach is sensitive to water depletions because of its location downstream of several large diversions. It provides spawning habitat for these endangered fish species as well as high-quality habitat for adult fish.

Due to development on the Colorado River, this reach has experienced declining flows and significant dewatering during the late summer months, and at times there are shortages in the springtime. As a result, the USFWS has issued flow recommendations for the 15-Mile Reach since 1989 to protect instream habitat for the endangered fish.

6. Proposed Method of Acquisition

Under this proposal, the CWCB would lease 1,750 acre-feet of Ruedi Reservoir water from the District. The District and the CWCB will need to negotiate the terms of the short term lease



and work through each agency's respective contracting processes. Any final lease agreement will become effective after approval by both the CWCB and District's boards of directors. Issues that the lease would address include: (1) the lease term; (2) amount of water to be leased; (3) timing of and coordination on releases; (4) payments to District for the leased water; (5) the potential for the USBR to suspend releases when necessary to meet its legal and regulatory obligations; and (6) any other provisions deemed necessary by the parties. The use of the water under the lease is authorized by the Ruedi Reservoir decrees, the District contract with USBR, and CWCB Board findings and acceptance of the acquired water.

7. Proposed Use of the Leased Water

Upon finalizing the agreement, from that date until March 31, 2022, the Leased Water would be used to supplement the existing 39 cfs ISF water right in the Fryingpan River to preserve the natural environment, to bring the stream flow up to 70 cfs to meet the RFC and CPW flow recommendations to improve the natural environment to a reasonable degree. The objective of the lease would be to maintain Fryingpan River flows at a rate of 70 cfs to prevent the formation of anchor ice at times when temperatures and low flows could otherwise combine to create anchor ice. See RFC letter and memo attached as **Exhibit C**.

Based upon its river monitoring system and analysis of weather conditions, the RFC will inform the CWCB of when conditions are conducive to the formation of anchor ice. The CWCB, CRWCD, RFC, and USBR will coordinate on the timing and amount of releases of Ruedi water, requesting such releases, and recording and accounting for the releases.

From April 1 - June 30, any Remaining Leased Water would be used on the 15-Mile Reach of the Colorado River to provide an incremental amount of water to preserve the natural environment by helping meet or reduce shortfalls to the USFWS flow recommendations.

From July 1 - September 30, any Remaining Leased Water would be used to supplement existing ISF water rights in the 15-Mile Reach to preserve the natural environment, and to provide water to help meet or reduce shortfalls to the USFWS flow recommendations for the endangered fish critical habitat. The CWCB's use of the Remaining Leased Water above the decreed ISF rates to meet the USFWS flow recommendations will improve the natural environment to a reasonable degree.

CPW has confirmed that the USFWS flow recommendations and related biological studies, developed in 1989, refined in 1995, and incorporated into the 1999 Programmatic Biological Opinion ("PBO") for the Upper Colorado River above its confluence with the Gunnison River, formed the basis for the ISF water rights held by the Board on the 15-Mile Reach of the Colorado River. Based upon the numerous actions of the State over the years supporting the Upper Colorado River Recovery Program and the PBO, and the ongoing need for water in the 15-Mile Reach, CPW recommends moving forward with this proposal and its letter of recommendation is attached as **Exhibit D**.



8. Historical Use and Historical Return Flows

Because this is a release of stored water and does not involve a change of water right, or other mechanism through which return flows would be owed, the Board does not need to consider this factor.

9. Location of Other Water Rights

There are many other water rights located on the Fryingpan River and Colorado River; however, they will not be affected by this release of stored water for ISF use on the Fryingpan River and delivery to and use on the 15-Mile Reach.

10. Material Injury to Existing Rights

There will be no injury to existing rights. Under this lease, water previously stored in priority under the Ruedi Reservoir water rights would be released during times when temperature and flow conditions are conducive to the formation of anchor ice in the winter months, and when needed to supplement flows in the 15-Mile Reach.

11. Stacking Evaluation

When the Leased Water is available under this lease for ISF use on the Fryingpan River or Remaining Leased Water is available for ISF use on the 15-Mile Reach, it can be used to supplement the Board's decreed ISF water rights and may be combined, or "stacked," with the existing ISF water right to achieve a greater level of protection for the natural environment and to help meet the USFWS flow targets for the endangered fish.

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

The proposed lease does not negatively affect any interstate compact.

13. Effect on Maximum Utilization of Waters of the State

This proposed lease will promote maximum utilization of waters of the State by generating hydropower at the Ruedi power plant, supporting the recovery of endangered fish within the Upper Colorado River Basin, and making water available to downstream users.

14. Availability for Downstream Use

The Leased Water would be available for use below the confluence with the Roaring Fork River and the Remaining Leased Water would be available for use downstream of the 15-Mile Reach of the Colorado River.

15. Administration

Discussions with the Division 5 Division Engineer indicates that the release and delivery of the Leased Water and Remaining Leased Water from Ruedi Reservoir to and through the Fryingpan River and the 15-Mile Reach pursuant to a lease agreement between the District and the CWCB will be administrable.



16. Cost to Complete Transaction

The District's Water Marketing Policy indicates costs for project year 2021 at \$69.75/AF, which, for 1,750 AF, would total \$122,062.50. The CWCB would pay for the lease with funds authorized by section 37-60-123.7, C.R.S. (2021) for acquisitions of water for ISF use to preserve or improve the natural environment.

17. Policy 19 Funding Request

Because staff is requesting the Board to approve an expenditure of funds authorized by section 37-60-123.7, information required by CWCB's Financial Policy 19, which governs such expenditures, is set forth below:

Financial Aspects of the Proposal

The price for this lease is based upon the CRWCD's Water Marketing Policy, which sets a price of \$69.75/AF for Ruedi water used in-channel in the Fryingpan and Roaring Fork Rivers to the confluence with the Colorado River. Costs related to negotiating and finalizing the lease agreement can be absorbed as part of the ordinary course of business of the CWCB staff. Consequently, staff will recommend that the Board authorize an expenditure of up to \$122,062.50 for this lease.

Required Information from Colorado Parks and Wildlife

Because the acquired water will be used to improve the natural environment to a reasonable degree on the Fryingpan River and on the 15-Mile Reach of the Colorado River, Policy 19 requires CPW to provide the following information regarding the subject ISF reaches:

a. The degree to which the acquired water will add useable habitat to riffles, pools and runs within the subject ISF reach; and b. the amount of additional useable area for fish and macroinvertebrates that the acquired water will provide:

Fryingpan River: Flows up to 70 cfs resulting from the Leased Water will benefit brown trout adults and egg incubation over the winter. IFIM/PHABSIM studies show that flows up to 100 cfs provide benefits for brown trout adults and egg incubation and flows up to 250 cfs provide benefits for multiple life stages of rainbow trout. Additional site-specific studies have found that flows higher than 40 cfs are beneficial for invertebrates below Ruedi Reservoir, supporting a diverse food base for resident fish.

15-Mile Reach: Any Remaining Leased Water above the decreed ISF flow rates will improve the natural environment by helping meet USFWS flow recommendations during low flow or baseflow conditions both before and after peak spring runoff. USFWS flow recommendations are based on IFIM/PHABSIM which models the relationship between flow and preferred habitat for the Colorado pikeminnow and razorback sucker. This modeling indicates that increases in preferred habitat are anticipated for any Remaining Leased Water added to the 15-mile reach.



c. Where applicable, the amount of protection from high temperatures and low oxygen levels in hot summer months that the acquired water will provide:

Fryingpan River: Because Leased Water will be used in the Fryingpan River only in the winter, CPW concluded that this information is not relevant to this acquisition.

15-mile Reach: Because Leased Water will be used for warm-water fish species, CPW concluded that this information is not relevant to this acquisition.

d. An analysis of the degree to which the additional water resulting from the acquisition: (1) benefits the natural environment, and (2) does not result in hydraulic conditions that are detrimental to the aspects of the natural environment intended to be benefited by the acquired water, such as habitat requirements for a particular life stage of a fish species:

Fryingpan River: Flows up to 70 cfs resulting from the Leased Water will benefit brown trout adults and egg incubation over the winter. IFIM/PHABSIM studies show that flows up to 100 cfs provide benefits for brown trout adults and egg incubation and flows up to 250 cfs provide benefits for multiple life stages of rainbow trout.

15-mile Reach: Any Remaining Leased Water above the decreed ISF flow rates will improve the natural environment by helping meet the USFWS flow recommendations. USFWS flow recommendations are based on PHABSIM/IFIM studies, which model the relationship between flow and preferred habitat, specifically showing where habitat is increasing and/or declining for adult Colorado pikeminnow and razorback sucker. USFWS flow recommendations vary by hydrologic year type, but seek to maximize preferred habitat without detrimental hydraulic conditions for the endangered fish.

e. Where applicable, an estimate of the degree to which the acquired water will increase moisture levels in the alluvial aquifer to support the riparian vegetation in the subject stream reach:

Fryingpan River: Because Leased Water will be used in the Fryingpan River only in the winter, CPW concluded that this information is not relevant to this acquisition.

15-mile Reach: Because Leased Water will be used for warm-water fish species, CPW concluded that this information is not relevant to this acquisition.

Additional information provided by CPW relevant to Policy 19 can be found in Exhibit D.

Potential Benefits of This Proposed Lease

During the duration of this short-term lease when Leased Water is available for ISF use, such water will be protected through the subject reach of the Fryingpan River down to the confluence with the Roaring Fork River. The proposed acquisition would increase stream flows in the Fryingpan River and provide benefits to the fish species that live in this reach. In addition to mitigating the effects of anchor ice formation, CPW has observed that increased flows on the Fryingpan River during the winter months improve fish habitat, increase



spawning success and fry emergence for brown trout, promote a more robust macroinvertebrate food base for fish. These observations confirm the results of previous studies that are also described in CPW's letter of recommendation in Exhibit D. Additionally, releases will also increase the efficiency of hydropower production at the City of Aspen's hydropower plant located at the base of Ruedi Reservoir. A letter of support from the Ruedi Water and Power Authority is attached as **Exhibit E**.

Any Remaining Leased Water will be used in the Colorado River and be protected through the 15-Mile Reach, down to the confluence with the Gunnison River. The proposed acquisition would increase stream flows in the Colorado River and provide benefits to the two species of endangered fish that live in this reach.

Procedure and Timeline for Temporary Loan Acquisition

ISF Rule 6. governs 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 its November 2021 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 January 2022 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 request must be filed within twenty days of this Board meeting.

As required by statute, CWCB staff requested recommendations CPW, the U.S. Department of Agriculture, and the U.S. Department of Interior. Pursuant to ISF Rule 6m.(1), CWCB staff provided notice of the proposed acquisition to all persons on the appropriate ISF Subscription Mailing Lists, and provided notice to the State Engineer's Substitute Supply Plan Notification List for Water Division 5.

ATTACHMENTS

Exhibit A: Location Map
Exhibit B: District's Offer Letter
Exhibit C: Roaring Fork Conservancy Memo
Exhibit D: CPW Letter of Recommendation
Exhibit E: Ruedi Water and Power Authority Letter of Support

