Water Supply Reserve Account – Grant and Loan Program Water Activity Summary Sheet March 16-17, 2016 Agenda Item 14(k)

Applicant & Fiscal Agent: Upper Gunnison River Water Conservancy District

Water Activity Name: Remote Cloud Seeder for Upper Gunnison Basin

Water Activity Purpose: Multipurpose

County: Gunnison/Saguache/Hinsdale

Drainage Basin: Gunnison

Water Source: Gunnison River and tributaries

Amount Requested/Source of Funds: \$25,000 Gunnison Basin Account

Matching Funds: Basin Account Match (\$25,000) = 100% of total grant

request (meets 5% min);

Applicant/ 3^{rd} Party Match (\$38,774) = 63.63% of total

project costs (\$68.774)

(refer to Funding Summary/Matching Funds section)

Staff Recommendation:

Staff recommends approval of up to \$25,000 from the Gunnison Basin Account to help fund the project titled: Remote Cloud Seeder for Upper Gunnison Basin.

Water Activity Summary: WSRA funds, if approved, will be expended to fund the project titled: Remote Cloud Seeder for Upper Gunnison Basin. The proposed activity involves purchasing a remotely operated cloud seeder that utilizes silver iodide as the seeding nuclei. Following procurement, the seeder will be delivered to and installed at the proposed site, which is about 1/2 mile northeast of Lake Irwin, around 10,600 feet near Kebler Pass between Paonia and Crested Butte, Colorado on private land. This seeder will join 2 other cloud seeders operated by North American Weather Consultants (NAWC) for the purpose of increasing snowpack levels in the Upper Gunnison Basin and other surrounding higher terrain. This particular location allows the cloud seeder to be close to the cloud bases it will target as well as be upwind of a good portion of our target area during storm events with north-northwest winds accompanying it and fills in one of the remaining "coverage gaps" in the Upper East River Basin.

NAWC has a meteorologist who monitors winter storms and will advise those running the cloud seeders in our network when to turn their seeder on and off. Criteria that must be met in order for effective cloud seeding include wind direction towards the target area, humidity greater than 90%, temperatures at cloud bases in the optimal range, and it must be snowing. Cloud seeders do not cause a snowstorm to develop, they do provide condensation nuclei for liquid water droplets present in the cloud to adhere to form more snowflakes with the right conditions. A typical winter has between 20-25 winter storms that are seedable. The cloud seeder works simply by igniting a propane-fed flame and spraying a solution of acetone containing silver iodide into the flame. The heat generated by the large burner combined with prevailing upslope winds will lift the atomized silver iodide up into the cloud.

Discussion: This project would aid in increasing precipitation and snowpack water content to benefit the natural habitat, agriculture, municipalities, recreation, tourism, and the area economy. The project would also aid in increasing the water supply in the upper Colorado River basin.

This project is consistent with goals and actions identified in the Gunnison Basin Implementation Plan as well as Colorado's Water Plan.

Issues/Additional Needs: No issues or additional needs have been identified.

Threshold and Evaluation Criteria:

The application meets all four Threshold Criteria.

Tier 1-3 Evaluation Criteria: n/a

Funding Summary/Matching Funds:

Funding Source		Cash	In-kind	Total
Lower Basin States		\$35,000	\$0	\$35,000
Upper Gunnison Stakeholders		\$5,000	\$3,774	\$8,774
Subtotal Matching Funds		\$40,000	\$3,774	\$43,774
WSRA Gunnison Account		\$25,000	n/a	\$25,000
	Total	\$65,000	\$3,774	\$68,774

CWCB Project Manager: Joe Busto

All products, data and information developed as a result of this grant must be provided to the CWCB in hard copy and electronic format as part of the project documentation. This information will in turn be made widely available to Basin Roundtables and the general public and will help promote the development of a common technical platform. In accordance with the revised WSRA Criteria and Guidelines, staff would like to highlight additional reporting and final deliverable requirements. The specific requirements are provided below.

Reporting: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of the executed contract. The progress report shall describe the completion or partial completion of the tasks identified in the scope of work including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Deliverable: At completion of the project, the applicant shall provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

Engineering: All engineering work (as defined in the Engineers Practice Act (§12-25-102(10) C.R.S.)) performed under this grant shall be performed by or under the responsible charge of professional engineer licensed by the State of Colorado to practice Engineering.

The Gunnison Basin Roundtable 501 Palmer Street Delta, CO 81416

February 9, 2016

Mr. Craig Godbout Water Supply Management Section COLORADO WATER CONSERVATION BOARD 1313 Sherman St., Room 718 Denver, CO 80203

Re: WSRA Grant Request: UGRWCD – Remote Cloud Seeder for Upper Gunnison Basin

Dear Mr. Godbout:

This letter is presented to advise you that the grant application submitted by the Upper Gunnison River Water Conservancy District for \$25,000 from Basin Account funds from the Water Supply Reserve Account for the Remote Cloud Seeder for Upper Gunnison Basin project was reviewed by the Gunnison Basin Roundtable and its Project Screening Committee. The proposal was approved by a unanimous vote of the Gunnison Basin Roundtable during our meeting on February 1, 2016.

This water activity meets the provisions of Section 37-75-104(2), Colorado Revised Statutes. The requirements/language from the statute is provided in Part 3 of the Criteria and Guidelines.

This activity would aid in increasing precipitation and snowpack water content to benefit the natural habitat, agriculture, municipalities, recreation, tourism, and the area economy. The project would also aid in increasing the water supply in the upper Colorado River basin.

Sincerely,

Frank J. Kugel Vice Chair

cc: Hugh Sanburg (e-mail) Tom Alvey (e-mail)



COLORADO WATER CONSERVATION BOARD

WATER SUPPLY RESERVE ACCOUNT APPLICATION FORM





25,000

Remote Cloud Seeder for Opper Gunn	ISON BASIN						
Name of Water Activity/Project							
Upper Gunnison River Wate	r Conservancy District						
Name of Applicant	Amount from Statewide Account:	0					
Gunnison Basin							
	Amount from Basin Account(s):	25,000					

Total WSRA Funds Requested:

Approving Basin Roundtable(s)

(If multiple basins specify amounts in parentheses.)

FEIN: 841180992

Application Content

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Required Exhibits

- A. Statement of Work, Budget, and Schedule
- B. Project Map
- C. As Needed (i.e. letters of support, photos, maps, etc.)

Appendices – Reference Material

- 1. Program Information
- 2. Insurance Requirements
- 3. WSRA Standard Contract Information (Required for Projects Over \$100,000)
- 4. W-9 Form (Required for All Projects Prior to Contracting)

Instructions

To receive funding from the Water Supply Reserve Account (WSRA), a proposed water activity must be approved by the local Basin Roundtable **AND** the Colorado Water Conservation Board (CWCB). The process for Basin Roundtable consideration and approval is outlined in materials in Appendix 1.

Once approved by the local Basin Roundtable, the applicant should submit this application with a detailed statement of work including budget and schedule as Exhibit A to CWCB staff by the application deadline.

WSRA applications are due with the roundtable letter of support 60 calendar days prior to the bimonthly Board meeting at which it will be considered. Board meetings are held in January, March, May, July, September, and November. Meeting details, including scheduled dates, agendas, etc. are posted on the CWCB website at: http://cwcb.state.co.us Applications to the WSRA Basin Account are considered at every board meeting, while applications to the WSRA Statewide Account are only considered at the March and September board meetings.

When completing this application, the applicant should refer to the WSRA Criteria and Guidelines available at: http://cwcb.state.co.us/LoansGrants/water-supply-reserve-account-grants/Documents/WSRACriteriaGuidelines.pdf. In addition, the applicant should also refer to the <a href="https://www.supplemental.gov/supplemental.g

The application, statement of work, budget, and schedule **must be submitted in electronic format** (Microsoft Word or text-enabled PDF are preferred) and can be emailed or mailed on a disk to:

Craig Godbout - WSRA Application Colorado Water Conservation Board 1313 Sherman St., Room 721 Denver, CO 80203 Craig.godbout@state.co.us

If you have questions or need additional assistance, please contact Craig Godbout at: 303-866-3441 x3210 or craig.godbout@state.co.us.

Part I. - Description of the Applicant (Project Sponsor or Owner);

1.	Applicant Name(s): Upper Gunnison River Water Conservancy District								
	Mailing address:		210 W. Spencer Ave., Ste B Gunnison, CO 81230						
	FEIN#:	84-09	25208						
	Primary Contact:	Frank Kugel Position/Title: General Manager							
	Email:	fkugel	@ugrwcd.org						
	Phone Numbers:	Cell:	(970) 209-6141	Office:	(970) 641-6065				
	Alternate Contact:	Jill Ste	eele	Position/Title:	Office Manager				
	Email:	jill@u	grwcd.org						
	Phone Numbers:	Cell:	(970) 209-6574	(970) 209-6574 Office:					
2. El	Public (Government) - Federal agencies are e recipient. Federal age	- municij ncourage ncies are	nclude the following. What palities, enterprises, countied to work with local entities eligible, but only if they can	es, and State of Co	lorado agencies. tity should be the grant				
x	local partner cannot be the grant recipient. Public (Districts) – authorities, Title 32/special districts, (conservancy, conservation, and irrigation districts), and water activity enterprises.								
	Private Incorporated –	mutual (ditch companies, homeowne	ers associations, co	orporations.				
			os, and sole proprietors are eom the Statewide Account.		g from the Basin				
	Non-governmental org government.	anizatio	ns – broadly defined as any	organization that	is not part of the				

3. Provide a brief description of your organization

Upper Gunnison River Basin Weather Modification Program Highlights

Program Summary:

- <u>Manager:</u> Upper Gunnison River Water Conservancy District (UGRWCD) (Key contact: Frank Kugel)
- <u>Contractor:</u> North American Weather Consultants, Inc. (NAWC), with headquarters in Sandy, Utah, is the contractor for the operational seeding activities of the Program, and holds the permit for the Program. (Key contact: Don Griffith)
- Target Area: The mountainous areas above 9,000 feet mean sea level located within Gunnison, northwestern Saguache, and northern Hinsdale Counties that contribute streamflow to Blue Mesa Reservoir as shown on the Program map attached. Drainages that originate from these areas include, but are not limited to, the upper Gunnison River, East River, Taylor River, Slate River, Ohio Creek, Tomichi Creek, Cochetopa Creek, Cebolla Creek, and Lake Fork of the Gunnison River.
- <u>Seeding Equipment and Instrumentation</u>: Up to 30 cloud seeding generators, one icing rate meter
- Season: Up to 5 months (Nov 15 through Apr 15)
- <u>History:</u> Program began in 2002 which initially included only those drainages above 9,000 feet mean sea level in Gunnison County during the first season (2002-2003). Later, at the request of the sponsors, the Target Area was expanded to include additional watershed areas in two adjoining counties to the south (Hinsdale and Saguache).
- <u>Permit:</u> State of Colorado Weather Modification Permit No. 2012-01 through April 15, 2013, with conditional approval given for the next five winters through operational season 2016-2017
- <u>Scientific Evaluations:</u> Pursuant to the 2012 State of Colorado Weather Modification Rules and Regulations, NAWC has completed a target/control evaluation of the Program since 2013. For WY 2015, NAWC reports that the estimated results of the target/control evaluation indicate an average of 8% to 12% increases in April 1st snow water content at target area SNOTEL sites.

Program Objectives:

- Increase precipitation and snowpack water content to benefit the natural habitat, agriculture, municipalities, recreation, tourism, and the area economy in a cost efficient manner
- Increase water supply within the upper Colorado River basin
- Improve the science and techniques in operation in Colorado

Program Sponsors:

- Upper Gunnison River Water Conservancy District (UGRWCD)
- Gunnison County
- Dos Rios Water & Sewer
- Gunnison County Stock Growers Association
- Town of Crested Butte

- Antelope Hills Water
- Colorado Water Conservation Board (CWCB) and the Lower Basin States (Metropolitan Water District of Southern California, Southern Nevada Water Authority, Central Arizona Water Conservation District, and California Six Agency Committee)

Program Funding:

- Program funding varies year by year
- Used to seed storms or portions of storms that meet NAWC generalized seeding criteria in the Target Area from November 15 through April 15
- Existing funding not adequate to take advantage of all seeding potentials and/or scientific evaluation opportunities

Future Program Enhancements:

- <u>Instrumentation:</u> Essential to include new meteorological instrumentation in the Program where necessary to assist with seed/no-seed decisions
 - NAWC recommended installation of one ground-based icing meter at Crested Butte Ski Area in order to make observations of supercooled liquid water to assist with these decisions.
 The icing meter was installed in the fall of 2014.
 - o NAWC recommends including a new icing meter on Monarch Pass
 - Continued funding support needed for new instrumentation operations, maintenance and data analyses in future years
- ***Remote Generators: Desirable to include remote generators in the Program where necessary. NAWC recommends the addition of 1-2 remotes to target high yield areas in the Target Area (e.g. Upper East River drainage)***
- Manual Generators: NAWC recommends the addition of 2-3 manual generators in the area south of Aspen to target highly seedable storms that have a northerly wind component
- <u>Scientific Evaluations</u>: On-going scientific evaluations of the seeding effectiveness of the entire seeding program:
 - Evaluate current generator locations and relocate if necessary to maximize seeding potential
 - NAWC provides annual target/control evaluations pursuant to the 2012 Weather Modification Rules & Regulations
 - NAWC has identified a potential opportunity in the 2015-16 season to use the CWCBleased radiometer in the Target Area to make observations of supercooled liquid water to allow for comparisons of observed data from the existing ground based icing meter
 - This summer 2015, NAWC will prepare a scientific analysis and report of the icing events observed at the Crested Butte ski area site last winter
- Collaboration: Seek opportunities for shared generator installations with neighboring basins

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4.	If the Contracting Entity is different than the Applicant (Project Sponsor or Owner) please describe the Contracting Entity here. The Contracting Entity and the Applicant are the same.
5.	Successful applicants will have to execute a contract with the CWCB prior to beginning work on the portion of the project funded by the WSRA grant. In order to expedite the contracting process the CWCB has established a standard contract with provisions the applicant must adhere to. A link to this standard contract is included in Appendix 3. Please review this contract and check the appropriate box.
	The Applicant will be able to contract with the CWCB using the Standard Contract
	The Applicant has reviewed the standard contract and has some questions/issues/concerns. Please be aware that any deviation from the standard contract could result in a significant delay between grant approval and the funds being available.
6.	The Tax Payer Bill of Rights (TABOR) may limit the amount of grant money an entity can receive. Please describe any relevant TABOR issues that may affect the applicant.
Th	ne UGRWCD has been 'de-Bruced'.

Water Supply Reserve Account – Application Form Revised October 2013

Part II Des	scription of the Water Activity/Project
1. What is th	e primary purpose of this grant application? (Please check only one)
	Nonconsumptive (Environmental or Recreational)
	Agricultural
	Municipal/Industrial
	Needs Assessment
	TVCCUS ASSESSMENT
	Education
X	Other Explain: Increasing Water Supply
2 If you feel	this project addresses multiple purposes please explain.
	f this project is to increase snowpack which would provide extra water for nonconsumptive,
	ultural, or M&I use.
3. Is this proj	ect primarily a study or implementation of a water activity/project? (Please check only one)
	Study X Implementation
4. To catalog	g measurable results achieved with WSRA funds can you provide any of the following numbers?
0	New Storage Created (acre-feet)
3,000	New Annual Water Supplies Developed, Consumptive or Nonconsumptive (acre-feet)
0	Existing Storage Preserved or Enhanced (acre-feet)
0	Length of Stream Restored or Protected (linear feet)
0	Length of Pipe/Canal Built or Improved (linear feet)
0	Efficiency Savings (acre-feet/year OR dollars/year – circle one)
0	Area of Restored or Preserved Habitat (acres)
	Other Explain:

Water Supply Reserve Account – Application Form

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4. To help us map WSRA projects please include a map (Exhibit B) and provide the general coordinates below:

Latitude: 38.887 Longitude: -107.102

5. Please provide an overview/summary of the proposed water activity (no more than one page). Include a description of the overall water activity and specifically what the WSRA funding will be used for. A full **Statement of Work** with a detailed budget and schedule is required as **Exhibit A** of this application.

The proposed activity involves purchasing a remotely operated cloud seeder that utilizes silver iodide as the seeding nuclei. Following procurement, the seeder will be delivered to and installed at the proposed site, which is about 1/2 mile northeast of Lake Irwin, around 10,600 feet near Kebler Pass between Paonia and Crested Butte, Colorado on private land. This seeder will join 2 other cloud seeders operated by North American Weather Consultants for the purpose of increasing snowpack levels in the Upper Gunnison Basin and other surrounding higher terrain. This particular location allows the cloud seeder to be close to the cloud bases it will target as well as be upwind of a good portion of our target area during storm events with north-northwest winds accompanying it and fills in one of the remaining "coverage gaps" we have for the Upper East River Basin.

Our Cloud Seeding process:

NAWC has a meteorologist who monitors winter storms and will advise those running the cloud seeders in our network when to turn their seeder on and off. Criteria that must be met in order for effective cloud seeding include wind direction towards the target area, humidity greater than 90%, temperatures at cloud bases in the optimal range, and it must be snowing. Cloud seeders do not cause a snowstorm to develop, they do provide condensation nuclei for liquid water droplets present in the cloud to adhere to form more snowflakes with the right conditions. A typical winter has between 20-25 winter storms that are seedable. The cloud seeder works simply by igniting a propane-fed flame and spraying a solution of acetone containing silver iodide into the flame. The heat generated by the large burner combined with prevailing upslope winds will lift the atomized silver iodide up into the cloud.

Water Supply Reserve Account – Application Form

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Part III. - Threshold and Evaluation Criteria

- 1. <u>Describe how</u> the water activity meets these **Threshold Criteria.** (Detailed in Part 3 of the Water Supply Reserve Account Criteria and Guidelines.)
 - a) The water activity is consistent with Section 37-75-102 Colorado Revised Statutes.¹

b) The water activity underwent an evaluation and approval process and was approved by the Basin Roundtable (BRT) and the application includes a description of the results of the BRTs evaluation and approval of the activity. At a minimum, the description must include the level of agreement reached by the roundtable, including any minority opinion(s) if there was not general agreement for the activity. The description must also include reasons why general agreement was not reached (if it was not), including who opposed the activity and why they opposed it. Note- If this information is included in the letter from the roundtable chair simply reference that letter.

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¹ 37-75-102. Water rights - protections. (1) It is the policy of the General Assembly that the current system of allocating water within Colorado shall not be superseded, abrogated, or otherwise impaired by this article. Nothing in this article shall be interpreted to repeal or in any manner amend the existing water rights adjudication system. The General Assembly affirms the state constitution's recognition of water rights as a private usufructuary property right, and this article is not intended to restrict the ability of the holder of a water right to use or to dispose of that water right in any manner permitted under Colorado law. (2) The General Assembly affirms the protections for contractual and property rights recognized by the contract and takings protections under the state constitution and related statutes. This article shall not be implemented in any way that would diminish, impair, or cause injury to any property or contractual right created by intergovernmental agreements, contracts, stipulations among parties to water cases, terms and conditions in water decrees, or any other similar document related to the allocation or use of water. This article shall not be construed to supersede, abrogate, or cause injury to vested water rights or decreed conditional water rights. The General Assembly affirms that this article does not impair, limit, or otherwise affect the rights of persons or entities to enter into agreements, contracts, or memoranda of understanding with other persons or entities relating to the appropriation, movement, or use of water under other provisions of law.

Revised October 2013

- c) The water activity meets the provisions of Section 37-75-104(2), Colorado Revised Statutes.² The Basin Roundtable Chairs shall include in their approval letters for particular WSRA grant applications a description of how the water activity will assist in meeting the water supply needs identified in the basin roundtable's consumptive and/or non-consumptive needs assessments.
- d) Matching Requirement: For requests from the **Statewide Fund**, the applicants will be required to demonstrate a **25 percent** (or greater) match of the total grant request from the other sources, including by not limited to Basin Funds. A minimum match of 5% of the total grant amount shall be from Basin funds. A minimum match of 5% of the total grant amount must come from the applicant or 3rd party sources. Sources of matching funds include but are not limited to Basin Funds, in-kind services, funding from other sources, and/or direct cash match. Past expenditures directly related to the project may be considered as matching funds if the expenditures occurred within 9 months of the date the contract or purchase order between the applicant and the State of Colorado is executed. Please describe the source(s) of matching funds. (NOTE: These matching funds should also be reflected in your Detailed Budget in **Exhibit A** of this application)

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² 37-75-104 (2)(c). Using data and information from the Statewide Water Supply Initiative and other appropriate sources and in cooperation with the on-going Statewide Water Supply Initiative, develop a basin-wide consumptive and nonconsumptive water supply needs assessment, conduct an analysis of available unappropriated waters within the basin, and propose projects or methods, both structural and nonstructural, for meeting those needs and utilizing those unappropriated waters where appropriate. Basin Roundtables shall actively seek the input and advice of affected local governments, water providers, and other interested stakeholders and persons in establishing its needs assessment, and shall propose projects or methods for meeting those needs. Recommendations from this assessment shall be forwarded to the Interbasin Compact Committee and other basin roundtables for analysis and consideration after the General Assembly has approved the Interbasin Compact Charter.

Water Supply Reserve Account – Application Form

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2. For Applications that include a request for funds from the **Statewide Account**, <u>describe how</u> the water activity/project meets all applicable **Evaluation Criteria**. (Detailed in Part 3 of the Water Supply Reserve Account Criteria and Guidelines and repeated below.) Projects will be assessed on how well they meet the Evaluation Criteria. **Please attach additional pages as necessary.**

<u>Evaluation Criteria</u> – the following criteria will be utilized to further evaluate the merits of the water activity proposed for funding from the Statewide Account. In evaluation of proposed water activities, preference will be given to projects that meet one or more criteria from each of the three "tiers" or categories. Each "tier" is grouped in level of importance. For instance, projects that meet Tier 1 criteria will outweigh projects that only meet Tier 3 criteria. The applicant should also refer to the Supplemental Scoring Matrix applied to Evaluation Criteria Tiers 1-3 for Statewide Account requests. WSRA grant requests for projects that may qualify for loans through the CWCB loan program will receive preference in the Statewide Evaluation Criteria if the grant request is part of a CWCB loan/WSRA grant package. For these CWCB loan/WSRA grant packages, the applicant must have a CWCB loan/WSRA grant ratio of 1:1 or higher. Preference will be given to those with a higher loan/grant ratio.

<u>Tier 1: Promoting Collaboration/Cooperation and Meeting Water Management Goals and Identified Water Needs</u>

- a. The water activity addresses multiple needs or issues, including consumptive and/or non-consumptive needs, or the needs and issues of multiple interests or multiple basins. This can be demonstrated by obtaining letters of support from other basin roundtables (in addition to an approval letter from the sponsoring basin).
- b. The number and types of entities represented in the application and the degree to which the activity will promote cooperation and collaboration among traditional consumptive water interests and/or non-consumptive interests, and if applicable, the degree to which the water activity is effective in addressing intrabasin or interbasin needs or issues.
- c. The water activity helps implement projects and processes identified as helping meet Colorado's future water needs, and/or addresses the gap areas between available water supply and future need as identified in SWSI or a roundtable's basin-wide water needs assessment.

Tier 2: Facilitating Water Activity Implementation

- d. Funding from this Account will reduce the uncertainty that the water activity will be implemented. For this criterion the applicant should discuss how receiving funding from the Account will make a significant difference in the implementation of the water activity (i.e., how will receiving funding enable the water activity to move forward or the inability obtaining funding elsewhere).
- e. The amount of matching funds provided by the applicant via direct contributions, demonstrable in-kind contributions, and/or other sources demonstrates a significant & appropriate commitment to the project.

Tier 3: The Water Activity Addresses Other Issues of Statewide Value and Maximizes Benefits

- f. The water activity helps sustain agriculture & open space, or meets environmental or recreational needs.
- g. The water activity assists in the administration of compact-entitled waters or addresses problems related to compact entitled waters and compact compliance and the degree to which the activity promotes maximum utilization of state waters.
- h. The water activity assists in the recovery of threatened and endangered wildlife species or Colorado State species of concern.
- i. The water activity provides a high level of benefit to Colorado in relationship to the amount of funds requested.

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j. The water activity is complimentary to or assists in the implementation of other CWCB programs. Continued: Explanation of how the water activity/project meets all applicable **Evaluation Criteria**. **Please attach additional pages as necessary.**

Part IV. - Required Supporting Material

1. **Water Rights, Availability, and Sustainability** – This information is needed to assess the viability of the water project or activity. Please provide a description of the water supply source to be utilized, or the water body to be affected by, the water activity. This should include a description of applicable water rights, and water rights issues, and the name/location of water bodies affected by the water activity.

Cloud seeding tries to get more water to fall to the target area from the atmospheric ocean of water vapor present above us during winter storms. Cloud seeding does not "rob" downwind areas of their precipitation due to the phenomenon of vertical movement of water and water vapor during cloud formation and storm events – think of a thunderhead and/or hail stones developing during thundershower, both rely on vertical currents. The extra supercooled liquid water (SLW) that cloud seeding causes to fall out of the cloud base as a snowflake is replenished via currents and mixing as the cloud continues its path downwind.

Water bodies affected include the Aspinall Unit Reservoirs – Blue Mesa, Morrow Point and Crystal. NAWC considers the range of a cloud seeder to be 15-20 miles maximum, higher wind speeds in the storm would increase this range but also increases the uncertainty of where our silver iodide plume is so seeding is suspended for extremely high winds. Major streams and rivers that benefit from our program include: East River, Taylor River and the Gunnison River; all of which end up in the Colorado River.

2. Please provide a brief narrative of any related studies or permitting issues.

The proposed remote generator would be sited on private property associated with Irwin Lodge.

3. Statement of Work, Detailed Budget, and Project Schedule

The statement of work will form the basis for the contract between the Applicant and the State of Colorado. In short, the Applicant is agreeing to undertake the work for the compensation outlined in the statement of work and budget, and in return, the State of Colorado is receiving the deliverables/products specified. **Please note that costs incurred prior to execution of a contract or purchase order are not subject to reimbursement**. All WSRA funds are disbursed on a reimbursement basis after review invoices and appropriate backup material.

Please provide a detailed statement of work using the template in Exhibit A. Additional sections or modifications may be included as necessary. Please define all acronyms and include page numbers.

REPORTING AND FINAL DELIVERABLE

Reporting: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of the executed contract. The progress report shall describe the completion or partial completion of the tasks identified in the statement of work including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Deliverable: At completion of the project, the applicant shall provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

PAYMENT

Payment will be made based on actual expenditures and invoicing by the applicant. Invoices from any other entity (i.e. subcontractors) cannot be processed by the State. The request for payment must include a description of the work accomplished by major task, and estimate of the percent completion for individual tasks and the entire water activity in relation to the percentage of budget spent, identification of any major issues and proposed or implemented corrective actions. The last 10 percent of the entire water activity budget will be withheld until final project/water activity documentation is completed. All products, data and information developed as a result of this grant must be provided to the CWCB in hard copy and electronic format as part of the project documentation. This information will in turn be made widely available to Basin Roundtables and the general public and help promote the development of a common technical platform.

Water Supply Reserve Account – Application Form

Revised October 2013

The above statements are true to the best of my knowledge:

Signature of Applicant:

Print Applicant's Name: Frank Kugel

Project Title: Remote Cloud Seeder for Upper Gunnison River Basin

Date: January 8, 2016

Return an electronic version (hardcopy may also be submitted) of this application to:

Craig Godbout – WSRA Application Colorado Water Conservation Board 1313 Sherman St., Room 721 Denver, CO 80203 303-866-3441, ext. 3210 (office) 303-547-8061 (cell)

Exhibit 10 Water Year 2016 Annual Supplement

This Annual Supplement is made and entered into on this 4th day of December 2015 by and among: the Six Agency Committee, Central Arizona Water Conservation District, the Southern Nevada Water Authority (Lower Basin Parties) and the Colorado Water Conservation Board (CWCB) all of which at times are referred to collectively as "Parties" or individually as "Party." This Annual Supplement is attached to the base Agreement among the Parties that was fully executed on March 21, 2007 for the provision of funds for weather modification activities in the State of Colorado.

Objectives

Activities for Water Year 2016 (WY16) include extensions of existing programs, modernization of old equipment and programs to improve effectiveness, and steps to build cooperation and local support for future activities. Only appropriate storms with the potential to increase precipitation will be seeded. Similarly, established State thresholds and precautionary measures for cloud seeding will be followed in the interest of public safety and flood prevention. The \$243,000 in Lower Basin Parties Funds will be spent extending, modernizing, and evaluating Operations.

The CWCB will spend approximately \$242,500 of State funds in WY16 for grants, new equipment, and completion of current generator configuration evaluations. There are two funding sources used for the State match this year. The CWCB weather modification program will provide \$175,000 and the CWCB Water Supply Reserve Account (WSRA) Program will provide \$67,500. If the WSRA funds do not become available, the Lower Basin has the option of requesting return of the Funds it provided for those Activities, and the CWCB agrees to return those Funds. Consistent with Section 6.2 of the Base Agreement, should there be any unspent funds due to lack of feasibility or unavailability of equipment, CWCB will facilitate additional Activities in a manner agreed to by the Lower Basin Parties project managers to effectively exhaust any unused Funds for WY16. Similarly, the CWCB and Lower Basin funds in this Annual Supplement are needed to expend the total \$485,500 minimum budget for the year. During the year the CWCB receives additional funds from multiple sources: fees from Program Sponsors, contributions from ski areas, severance taxes, unspent items from other budget categories, and others. The CWCB intends to spend all additional available funds to implement the proposed Activities, outlined below which total \$509,000.

Funds/Contributions

The following Parties will provide Funds for WY16 as follows:

Central Arizona Water Conservation District Six Agency Committee		81,000
Six Agency Committee		81,000
Southern Nevada Water Authority		81,000
Committee and the Committee of the Commi	Total	\$243,000

Activities and Budget

The \$243,000 of Lower Basin contributions will be spend on the following Activities:

Extend Manual Operations: \$118,500

A. Extend by 30 days Operations in the following six programs: Western San Juan Mountains (\$15,000), Eastern San Juan Mountains (\$15,000), Upper San Miguel Drainage Basin (\$16,000), Central Colorado Mountains (\$25,000), Upper Gunnison River Basin (\$25,000), and Grand Mesa Program (\$22,500). The Lower Basin is funding \$118,500 of this \$203,000 Activity.

Modernize Operations: \$116,500

- A. Fund a portion of a proposal from DRI to operate two remotely controlled generators at the Winter Park ski area. The Lower Basin is funding \$15,000 of this \$60,000 Activity.
- B. Fund a portion of a proposal from DRI to: supply consumables, maintain, repair if necessary, and prepare a report which evaluates the operation of a remotely controlled generator at Mancos Mountain (San Juans program) that will be operated by the local permit holder Western Weather consultants (WWC). The proposal is \$30,000 plus \$6,000 will be paid to WWC to operate it and prepare a final report. The Lower Basin is funding \$18,000 of this \$36,000 Activity.
- C. Fund a portion of a proposal from DRI to: supply consumables, maintain, repair if necessary, and prepare a report which evaluates the operation of a remote generator at Telluride ski area that will be operated by WWC. The proposal is \$34,000 and \$6,000 will be paid to WWC to operate and report on its use. The Lower Basin is funding \$15,000 of this \$40,000 Activity.
- D. Fund a portion of a proposal from Idaho Power Company to fabricate and purchase a remotely controlled generator for the Gunnison Basin program. It will be located in the vicinity of existing manually operated generators and is intended to replace those operations. This is equipment purchase price only and site selection and deployment are a planned Water Year 2017 Activity. The Lower Basin is funding \$17,500 of this \$35,000 Activity.
- E. Fund a portion of a proposal from North American Weather Consultants to operate and maintain a weather station at Crested Butte ski area and prepare a report on the icing sensor data. The Lower Basin is funding \$8,000 of this \$15,000 Activity.
- F. Fund a portion of the second year contract with Radiometrics Corporation to lease-to-own a Radiometer. The Lower Basin is paying \$25,000 of this \$50,000 Activity.
- G. Fund a portion of a proposal from DRI to transfer ownership of DRI built equipment to local ownership by the Grand Mesa Water Enhancement Authority (WEA). Four pieces of equipment (two DRI silver remotely controlled generators, one propane dispenser, and a weather station) previously leased from DRI will now be locally owned and operated on the Grand Mesa by WEA. The Lower Basin is funding \$18,000 of this \$35,000 Activity.

Evaluate Manual Operations: \$8,000

A. Fund a portion of a proposal from DRI to evaluate the operation of the existing manually operated generators of the Central Mountains program, with the intention of identifying new potential sites for high elevation remotely controlled generators. The Lower Basin is paying \$8,000 of this \$35,000 activity.

Responsibilities

In return for the Funds outlined above the CWCB shall:

- 1. Distribute the Funds as described above.
- 2. Ensure these Funds extend Operations. It is the intent of the Parties that Funds identified in this Annual Supplement not replace CWCB or local Program Sponsor funds, but rather that funding from CWCB and Program Sponsors remain constant and the Funds provided by this Annual Supplement be used to extend or enhance cloud seeding Activities. CWCB shall ensure that Program Sponsors utilize local and CWCB funding prior to spending Funds made available under this Annual Supplement.
- Expenditure of Funds from Lower Basin Parties shall only be used for those Objectives and Activities described in this Annual Supplement. No Funds from Lower Basin Parties shall be used for public outreach or administration.
- Provide to each of the Lower Basin Parties maps of the seeding programs' operational areas showing locations of generators and target areas, a copy of any new or renewed permits, and general operational plans for WY16.
- Provide to the Lower Basin Parties a copy of the operators' final operational seeding summary report and all other data described in the operators' permit with CWCB within 30 days of receipt from the operator.
- 6. Provide reasonable staff time for regulatory, logistical, administrative and technical assistance.
- Perform basic public relations and outreach. If public concerns are documented, the CWCB will present the specific comments to the Lower Basin Parties.
- 8. Attend meetings between the Lower Basin Parties and Program Sponsors as necessary to carry out the duties in this Annual Supplement.
- 9. Provide to the Lower Basin Parties a final accounting of Funds spent, and prepare a summary report of WY16 Activities under this Annual Supplement.
- 10. Agree to abide by the provisions of this Paragraph regarding the purchase and disposition of equipment. In all future Exhibits the following provisions will be in full force and effect unless specifically noted. With regard to any equipment purchased by CWCB, or the San Juan Resources and Development Council (RCDC) on behalf of CWCB, with Funds provided by the Lower Basin Parties the following provisions apply:
 - A. The CWCB, upon receipt of the equipment or instrumentation, shall be the owner of such equipment. The CWCB will track and report to the Lower Basin Parties on leases and ownership of all equipment through annual operational reports. Attachment 1 to this Exhibit is the list of all equipment purchased or leased with Lower Basin Funds and, its location as of the beginning of WY16.

- B. While the ownership of all equipment remains as described in Attachment 1, the CWCB shall be the sole decision-maker about how, where, and whether to use said equipment in a given snowmaking season. The CWCB agrees to notify the Lower Basin Parties if the CWCB does not intend to use said equipment in a given season and the Lower Basin Parties are entitled to, at their sole cost of moving and operating said equipment, use said equipment in a different location for that season. If the Lower Basin Parties utilize the equipment under this clause, the Lower Basin Parties agree to pay the costs associated with transporting the equipment to a location determined by the CWCB following the seasons(s) the equipment is used by the Lower Basin Parties. This notification requirement of the CWCB shall expire when the equipment has depreciated to 20% (or less) of its original valuation, or after five years following equipment purchased (20% depreciation per year).
- C. The CWCB agrees that it will notify the Lower Basin Parties prior to the sale, donation, or other transfer of equipment that was purchased with Funds provided by the Lower Basin Parties and the Lower Basin Parties will have the right of first refusal to take ownership of the equipment under the same terms on which CWCB proposed to dispose of the equipment.
- D. The CWCB and the Lower Basin Parties agree that it is not in their best interests to sell or donate equipment to an entity that then leases the equipment back to the CWCB or Lower Basin Parties, and all Parties agree that disposition of said equipment will occur with appropriate conditions and in such a manner to assure that this does not occur.
- E. Finally, the CWCB and the Lower Basin Parties agree that it is not in their best interests to donate equipment (or transfer at a value less than the present value of said equipment), purchased with public funds to private entities, and all Parties agree that disposition of said equipment will occur with appropriate conditions and in such a manner to assure that this does not occur.
- 11. Ensure that the Lower Basin Parties are included as additional insureds to RCDC's commercial General Liability Insurance policies.
- 12. Ensure that RCDC requires subcontractors and weather modification vendors performing Operations to maintain a valid general liability insurance policy for at least \$1,000,000 and include the Lower Basin Parties as additional insureds.
- 13. Provide to the Lower Basin Parties by November 15 of each year the Agreement is in effect, ACORD forms from the weather modification vendors performing Operations indicating the Lower Basin Parties as additional insureds.
- 14. Provide as an annual deliverable to the Lower Basin project manager an updated table (Attachment 1 to this Exhibit) of the disposition of all purchased or leased equipment.
- 15. This Exhibit and all future Annual Supplements to the base Agreement among the Parties that was executed on March 21, 2007 may be executed in counterparts, each of which shall be deemed an original, but all of which, when taken together, shall constitute one and the same document with the same force and effect as though all signatures appeared on a single document.

Schedule

- 1. November 2015: Annual Supplement executed. As soon as is practical thereafter, CWCB will invoice the Lower Basin Parties and Funds will be transferred to the CWCB.
- 2. April 2016: Extensions of Operations are completed and equipment proposals funded by CWCB.
- 3. August 2016: Evaluations completed.
- 4. September 2016: A complete and Final Summary Report of WY16 Funding for WY16 Objectives and Activities and itemized statement of accounting provided to Lower Basin Parties.

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Mr. Dana B. Fisher Chairman	Date
Mr. Theodore Cooke Interim General Manager Central Arizona Water Conservation District	11-9-15 Date
Mr. John Entsminger General Manager Southern Nevada Water Authority	Date
James Eklund	Date

Mr. Dana B. Fisher Chairman Six Agency Committee	11-11-13 Date
Mr. Theodore Cooke Interim General Manager Central Arizona Water Conservation District	Date
Mr. John Entsminger General Manager	Date
Southern Nevada Water Authority	

Mr. Dana B. Fisher Chairman Six Agency Committee	Date
Mr. Theodore Cooke Interim General Manager Central Arizona Water Conservation District	Date
Mr. John Entsminger General Manager Southern Nevada Water Authority	//. 18.15 Date
James Eklund Director Colorado Water Conservation Board	Date

Southern Nevada Water Authority

Date 11/17/15

Approved as to form:

Mr. Dana B. Fisher Chairman Six Agency Committee	Date
Mr. Theodore Cooke Interim General Manager Central Arizona Water Conservation District	Date
Mr. John Entsminger General Manager Southern Nevada Water Authority	Date
Mr. James Eklund	12/4/15 Date

Colorado Water Conservation Board

Attachment 1

Colorado Water Conservation Board and Lower Basin States Weather Modification Agreement Tracking of Agreement Funded Equipment (October 2015)

WY	No.	Serial No.	item	Water Year Funded / Deployed	Own or Lease	Lower Basin Deliverable	Contract No.	Owner	Responsible Party	Permit No.	Location	Notes
WY08	1	DRI 28 (formerly 29) WX 1	Agl generator WX station Icing rate sensor	WY08/08	Own Own Own	WY08-G	P.O. 08-61	WEA WEA	WEA WEA	2000-3	DRI 29 on Kannah Creek - West Grand Mesa WX 1 at Whitewater on Grand Mesa	Moved to Winter Park ski area in WY10. Was originally DRI 29. In 9/11 DRI removed problem generator and replaced it with DRI 28
WY08	2	DRI 34	Agl generator	WY08/09	Own	WY08-H	P.O. 08-138	WEA	WEA	2000-3	Deployed on Milk Creek above Cedaredge near Grand Mesa in WY09	Fabricated in WY08 deployed in WY09
WY09	3	DRI 35	Agl generator	WY09/11	Long-Term Loan	WY09-C	P.O. 09-79	DRI	CWCB, WWC	2000-2	Deployed in WY11 at Mancos Mountain (Durango Mtn Resort) for Western San Juans project. WWC will operate	In WY09 this generator was in Nevada being fabricated. In WY10 it sat idle in Durango
WY09	4	LP 1	LP generator	WY09/09	Own	WY09-B	P.O. 08-79, 09-28	WEA	WEA	2000-3	On Milk Creek	Co-located with Item No. 2 in WY12. To be moved to near Skinned Horse reservoir in WY15
WY10	5	Wx 2	WX station Icing rate sensor	WY10/11	Own Own	WY08-1	09 PDA 00106	SJRCDC CWCB	DRI, Durango Mtn.	2000-2	Durango Mountain Resort	This was WY08 (I) deliverable "Purchase 3 icing sensors" was changed to one weather station and icing rate sensor
WY10	6	WX3	WX station lcing rate sensor	WY10/11	Own Own	WY10-Expand A	P.O. 11-21	CWCB	DRI, Winter Park	2007-1	Deployed at Winter Park ski area	Recalibrated at Storm Pk, Lab In WY13
WY10	7	DRI 36	Agl generator	WY10/10	Short-Term Loan	WY10-Expand B	P.O. 10-32	DRI	DRI, Winter Park	2007-1	North and west of Winter Park ski area	Generator DRI 28 moved from Grand Mesa and added to this program
WY12	8	DRI 14	Agl generator	WY12/13	Long-Term Loan	WY 12 – Modernize A	P.O. 12-55	DRI	WEA – City of Grand Junction	2011-1	Southwest side of Grand Mesa on BLM land. Site identified as Rocky Road	Deployed November 2012
WY13	9	WX 4	WX station loing rate sensor	WY13/14	Own	WY 13 – Expand B	P.O. 13-84	Gunnison County	NAWC	2012-1	TBD – Crested Butte ski area	Deployed October 2014
WY16	10	IPC1	IPC Agl generator	WY15	Own	WY 15	P.O.GGI 2015-357	WEA	WEA	2011-1	North side of Grand Mesa above Collabran (Colo River)	Deployed September 2015

WY16 11	I IPC 2	IPC Agi Vi generator	WY 15 Own	WY 15 POGG 1 2015-35	WEA 5	WEA	2011-1	South Side of Grand Mesa above Cedaredge (Gunnison River)	Deployed September 2015
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Notes:

Table is updated each autumn after summer deployment and as new Exhibit is being prepared

WWC – Western Weather Consultants CWCB – Colorado Water Conservation Board DRI – Desert Research Institute LP – liquid propane NAWC – North American Weather Consultants rev. 9/29/15

WX – weather station
WEA – Grand Mesa Water Enhancement Authority
SJRCDC – San Juan Resource Conservation and Development Council
IPC – Idaho Power Company

Exhibit A

Statement of Work Date: December 30, 2015

WATER ACTIVITY NAME – Remote Cloud Seeder for Upper Gunnison

GRANT RECIPIENT – Upper Gunnison Cloudseeding Program

FUNDING SOURCE - \$35,000 Lower Basin States, \$5,000 UG Stakeholders & \$25,000 GBRT (requested)

INTRODUCTION AND BACKGROUND

The goal of this project is to purchase, locate, and have in operation by November of 2016, a remotely-controlled cloud seeder constructed by Idaho Power Company (IPC). The model available to purchase is called the RCNG14 (Remote Cloud Nuclei Generator – design revised in 2014). The RCNG14 will join the fleet of 23 other cloud seeders already in use by the Gunnison conduct wintertime cloud seeding operations targeting the Upper Gunnison basin and other surrounding high terrain in Western Colorado. Background: Cloud seeding has been conducted in the Upper Gunnison basin since 2004.

OBJECTIVES

- 1) Locate the RCNG14 in a place that will allow it to effectively seed winter storms and increase snowpack levels in the Upper Gunnison basin.
- 2) Get more water in our reservoirs and rivers.
- 3) Utilize a new vendor for remote cloud seeders who can make an equally reliable product at roughly half the cost.
- 4) Set a precedent where Colorado programs are responsible for maintaining their own generators and eliminate the costly maintenance contracts with out-of-state agencies.

TASKS

Provide a detailed description of each task using the following format

TASK 1 – Procurement of the RCNG14

<u>Description of Task-</u>Once IPC has finished building the RCNG14, they will schedule a delivery date with UGRWCD.

TASK 2 – Delivery, Training, and Setup of the RCNG14

<u>Description of Task</u>: The IPC will_deliver the generator and all supporting hardware and documentation. The IPC will conduct a two-day seminar including setup and operation for the

UGRWCD; other entities conducting cloud seeding programs in Colorado will also be invited to this training as the RCNG14 will be the second of its kind in the state.

TASK 3 – Commencement of Operation of the RCNG14

<u>Description of Task UGRWCD</u> will be responsible for setting up a contract with RigNet communication services for the satellite service which is required to communicate and monitor the generator. A maintenance kit must also be purchased from IPC. Once the RCNG14 is set up, the UGRWCD is trained on how to run it, and we can communicate with it, it should be ready to seed storms. Our permit allows us to seed storms that meet the seeding criteria after November 1.

<u>Deliverable:</u> The CWCB will get a final report detailing the process and showing pictures of RCNG14 in its location. Although it is not anticipated, should this project run longer than 6 months, the CWCB will get a progress report detailing where we're at in the process and what is causing any delays.

REPORTING AND FINAL DELIVERABLE

Reporting: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of the executed contract. The progress report shall describe the completion or partial completion of the tasks identified in the statement of work including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Deliverable: At completion of the project, the applicant shall provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

BUDGET

Provide a detailed budget by task including number of hours and rates for labor and unit costs for other direct costs (i.e. mileage, \$/unit of material for construction, etc.). A detailed and perfectly balanced budget that shows all costs is required for the State's contracting and purchase order processes. Sample budget tables are provided below. Please note that these budget tables are examples and will need to be adapted to fit each individual application. Tasks should correspond to the tasks described above.

Total Costs					
			Matching Funds		
	Labor	Other Direct Costs	(If Applicable)	Total Project Costs	
Task 1 - Procurement		35,000	10,000	35,000	
Task 2 – Delivery, Training, &		15,000	15,000	15,000	
Set-Up					
Task 3- Maintenance Kit		10,000	10,000	10,000	
In-Kind Contributions	3209.60	565.00		3,774.60	
Total Costs:				63,774.60	

Other Direct Costs					
Item:	Cloud Seeder	Maintenance Kit	Delivery & Training (covered by State Cloud Seeding		Total
			Program)		
Task 1 - Procurement	35,000				35,000
Task 2 –Delivery & Trng			15,000		15,000
Task 3- Maintenance Kit		10,000			10,000
Total Cost:	35,000	10,000	15,000		60,000

SCHEDULE:

Task	Start Date	Finish Date	
1-Procurement	Upon NTP	NTP + 60 days	
2 Delivery, Training, &	September 1, 2016	October 10, 2016	
Set-Up	_		
3Commencement of	November 1, 2016		
Operation			

NTP = Notice to Proceed

PAYMENT

Payment will be made based on actual expenditures and invoicing by the applicant. Invoices from any other entity (i.e. subcontractors) cannot be processed by the State. The request for payment must include a description of the work accomplished by major task, and estimate of the percent completion for individual tasks and the entire water activity in relation to the percentage of budget spent, identification of any major issues and proposed or implemented corrective actions. The last 5 percent of the entire water activity budget will be withheld until final project/water activity documentation is completed. All products, data and information developed as a result of this grant must be provided to the CWCB in hard copy and electronic format as part of the project documentation. This information will in turn be made widely available to Basin Roundtables and the general public and help promote the development of a common technical platform.

