AGENDA ITEM or FINAL CONTRACT REVIEW SUBMITTAL FORM

AgendaTitle:
Fixed Price Agreement for Cloud Seeding Professional Services; North American Weather Consultants, Inc.; 11/15/14 thru 4/15/15; $10,000

Action Requested: County Manager Signature

Parties to the Agreement: North American Weather Consultants and Gunnison County

Term Begins: 11/15/2014 **Term Ends:** 4/15/2015 **Grant Contract #:** 14-357

Summary:
This is the service Agreement with NAWC to conduct cloud seeding in Gunnison County.

Fiscal Impact: County - $10,000

Submitted by: Jane Wyman **Submitter's Email Address:** jwyman@gunnisoncounty.com

Finance Review: (●) Required ( ) Not Required

Comments:

Total maximim cost of this agreement is included int he 2015 proposed budget.

Reviewed by: Discharge Date: 10/17/2014

County Attorney Review: (●) Required ( ) Not Required

Comments:

Reviewed by: GUNCOUNTY1\atrezise Discharge Date: 10/20/2014 Certificate of Insurance Required Yes (●) No ( )

County Manager Review:

Comments:

Reviewed by: GUNCOUNTY1\mbirnie Discharge Date: 10/22/2014

(●) Consent Agenda ( ) Regular Agenda ( ) Worksession Time Allotted:

Agenda Date: 11/4/2014 Follow Up Agenda Date:

Revised April 2013

North American Weather Consultants, Inc.

PROPOSAL TO CONDUCT A WINTER CLOUD SEEDING PROGRAM FOR THE UPPER GUNNISON RIVER AREA, 2014-2015

Prepared for

Gunnison County

by

North American Weather Consultants, Inc.
8180 South Highland Dr., Suite B-2
Sandy, Utah 84093

Proposal No. 14-357

September 2014

PROPOSAL TO CONDUCT A WINTER CLOUD SEEDING PROGRAM FOR THE UPPER GUNNISON RIVER AREA, 2014-2015

NORTH AMERICAN WEATHER CONSULTANTS

Proposal #P 14-357

1.0 INTRODUCTION

North American Weather Consultants (NAWC) was contacted by Gunnison County officials in the fall of 2002 regarding the design and conduct of a program within Gunnison County. A program was designed, including the preparation of a feasibility study, and a permit obtained (#2003-01) for the program from the Colorado Water Conservation Board. That initial program was operated from February 1 through April 15, 2003 (Griffith, et al, 2003). The program sponsors requested that the intended target area be expanded from only those drainages above 9000' in Gunnison County to include watersheds that had their headwaters in adjoining counties to the south. NAWC submitted an application for a new five-year permit to include these areas of interest in the program. The Colorado Water Conservation Board (CWCB) held a public hearing in Gunnison on this application on October 9, 2003. The CWCB granted a five-year permit (#2003-02) to NAWC for the new addition to the earlier target area on November 20, 2003. CWCB personnel gave NAWC verbal approval to begin seeding on November 15, 2003. The program for the 2004-2005 and following seasons was designed to seed the expanded target area as well as the original area. No new permits were necessary since each of the prior two permits were issued to be valid for a period of five years.

The first permit for the target areas within Gunnison County expired April 15, 2007. Through discussions with representatives of the sponsors of the program and with Mr. Joe Busto of the Colorado Water Conservation Board (CWCB), it was determined that NAWC should apply for a renewal of both permits merged into one new permit. NAWC sent in an application to the CWCB on July 3, 2007 to obtain a new five-year permit that would combine the two target

areas under a single permit. Notices of Intent, describing the new program, were published in the target and adjoining counties during the period of August 3 to August 16, 2007. A public hearing, as required by State Statute, was conducted on a telephone conference call on August 17, 2007. The State granted a new permit to NAWC on November 16, 2007, which was valid for a five-year period. NAWC applied for a renewal of its cloud seeding permit with the CWCB on July 12, 2012. A public hearing was held in Gunnison on August 30, 2012. The CWCB granted NAWC a five year permit on November 5, 2012. This permit allows cloud seeding operations during the November 15th through April 15th time frame.

NAWC conducted a five-month winter cloud seeding program for the upper Gunnison River watersheds above Blue Mesa Reservoir from November 15, 2003 through April 15, 2004, November 15, 2004 through April 15, 2005, November 15, 2005 through April 15, 2006, November 15, 2006 through April 15, 2007, November 15, 2007 through February 26, 2008 (operations were terminated in February due to near record snowpack accumulations in the target area), December 1, 2008 through April 15, 2009, November 15, 2009 through April 15, 2010, November 15, 2010 through April 15, 2011, November 15, 2011 through April 15, 2012, November 15, 2012 through April 15, 2013, and November 15, 2013 through April 15, 2014.

The following sections of this proposal describe a proposed program for a thirteenth winter season, similar to the one conducted during the 2013-2014 winter season. The format of this proposal is the same as our original proposal submitted in 2002, which followed a format specified by Gunnison County.

2.0 LIST OF WINTER SNOWPACK AUGMENTATION CLOUD SEEDING PROJECTS CONDUCTED IN THE INTER-MOUNTAIN WEST OVER THE PAST FIVE YEARS

NAWC has conducted a significant number of winter snowpack augmentation cloud seeding projects in the Inter-mountain West over the past five years. NAWC has also conducted a number of winter projects in other Inter-mountain areas dating back more than 39years. Table 1 provides a summary of some of these projects.

TABLE 1
NAWC INTER-MOUNTAIN CLOUD SEEDING PROJECTS

Sponsor(s)	Target Area	Seasons of Operations	Comments
Alta Ski Lifts and Snowbird Resorts	Alta and Snowbird Ski Areas, Utah	98- 99, 99-00, 00-01, 01- 02, 02-03, 03-04, 04-05, 05-06, 06-07, 07-08, 08-09, 09-10, 10-11, 11-12, 12-13, 13-14.	Project typically runs during November and December.
Utah, Division of Water Resources and Utah Water Resources Development Corporation	Most mountainous areas above 7000' msl in central and southern Utah. Total target area ~ 10,000 mi^2	98-99, 99-00, 00-01, 01-02, 02-03, 03-04, 04-05, 05-06, 06-07,07-08 08-09, 09-10, 10-11, 11-12, 12-13, 13-14.	Project began in 1974. Usually operates 4-5 months each season. ~ 14% increase in precipitation
Utah Division of Water Resources, Box Elder and Cache Counties, Utah	Grouse Creek, Raft River, Wellsville and Wasatch Mts. above 7000' msl, northern Utah	00- 01, 03-04, 04-05, 05-06, 06-07, 07-08, 08-09, 09-10, 10-11, 11-12, 12-13, 13-14.	Project began in 1989. Usually operates 4 months each season. ~ 14% increase in snow water content.
Utah Division of Water Resources and Cache County, Utah	Wellsville and Wasatch Mts. above 7000' msl, northern Utah	98-99, 99-00, 01-02, 02-03, 03-04, 04-05, 05-06, 06-07, 07-08, 08-09, 09-10, 10-11,11-12, 12-13, 13-14.	Project oftentimes conducted jointly with Box Elder Co. (see above). ~ 17% increase in precipitation.
Utah Division of Water Resources, Weber Basin Water Conservancy District and Provo River Water Users Assoc.	Western Uinta Mts. above 7000' msl, north-eastern Utah	00-01, 01-02, 02-03, 03-04, 04-05, 05-06, 06-07, 07-08, 08-09, 09-10, 10-11, 12-13, 13-14.	Project began in 1989. Usually operates 4 months each season. ~ 5% increase in precipitation

Sponsor(s)	Target Area	Seasons of Operations	Comments
Boise Project Board of Control	Boise River Drainage above Lucky Peak Dam, central Idaho	01-02, 02-03, 03-04, 04-05, 07-08, 08-09, 10-11, 13-14.	Earlier 4 season project, 92-96. Project usually operated 5 months each season. ~ 7% increase in precipitation
Central Utah Water Conservancy District, Duchesne County Water Conservation District, Uintah County Water Conservancy District	South Slopes of the Uinta Mountains in Duchesne and Uintah Counties	02-03, 03-04, 04-05, 05-06, 06-07, 07-08, 08-09, 09-10, 10-11, 11-12, 12-13,13-14.	Project began the fall of 2002 following the completion of a feasibility study. ~ 3-5% increase in precipitation.

3.0 COPY OF PREVIOUS REPORT

The County has several copies of previous seasons reports on this program.

4.0 PREVIOUS NAWC PUBLICATIONS AND CONFERENCE PRESENTATIONS CONCERNED WITH WINTER SNOWPACK AUGMENTATION

NAWC has a long tradition of preparing papers and giving presentations on our cloud seeding projects. Many of these papers and presentations have been concerned with winter snowpack augmentation projects. Some of the more recent publications and presentations are summarized in the following. Of special note, NAWC published a technical, peer reviewed paper on the Upper Gunnison River cloud seeding program in Volume 43 of the Weather Modification Associations' *Journal of weather Modification* in April 2011. Other NAWC papers and conference presentations are as follows:

TECHNICAL PAPERS

Griffith, D.A. and D.P. Yorty, 2014: A brief History of Evaluations Performed on the Operational Kings River Winter Orographic Seeding Program. Will appear in Weather

Modification Association *Journal of Weather Modification*, Vol. 46.

Griffith, D.A., D.P. Yorty, W. Weston and M.E. Solak, 2013: Winter "Cloud Seeding Windows" and Potential Influences of Targeted Mountain Barriers. Weather Modification Association *Journal of Weather Modification*, Vol. **45**, pp. 44-58.

Griffith, D.A., D.P. Yorty and M.E. Solak, 2011: A Winter Operational Cloud Seeding Program: Upper Gunnison River Basin. Weather Modification Association *Journal of Weather Modification*, Vol. **43**, pp. 29-43.

Griffith, D.A., M.E. Solak, and D.P. Yorty, 2009: 30+ Winter seasons of Operational Cloud seeding in Utah. *WMA Journal of Weather Modification,* Vol. **41**, pp. 23-37.

Griffith, D.A., M.E. Solak and D.P. Yorty, 2007: A Level II Weather Modification Feasibility Study for Winter Snowpack Augmentation in the Salt River and Wyoming Ranges in Utah. *WMA Journal of Weather Modification,* Vol. **39**, pp. 76-83.

Griffith, D. A. and M .E. Solak, 2007: Cloud Seeding in the Upper Colorado Basin; Technical Feasibility. Southwest Hydrology, March/April. pp. 19, 32.

Griffith, D.A. and M.E. Solak, 2006: The Potential Use of Winter Cloud Seeding Programs to Augment the Flow of the Colorado River. North American Weather Consultants White Paper to the Upper Colorado River Commission, 49 p.

Griffith, D.A., M.E. Solak and D.P. Yorty, 2005: Is Air Pollution Impacting Winter Orographic Precipitation in Utah? *WMA Journal of Weather Modification,* Vol. **37**, pp. 14-20.

Griffith, D.A., M.E. Solak R.B. Almy and D. Gibbs, 2005: The Santa Barbara Cloud Seeding Project in Coastal Southern California, Summary of Results and Their Implications. *WMA Journal of Weather Modification,* Vol. **37**, pp. 21-27.

Solak, M.E., D.P. Yorty and D.A. Griffith, 2005: Observations of Rime Ice in the Wasatch Mountains of Utah: Implications for Winter Cloud Seeding. *WMA Journal of Weather Modification,* Vol. **37**, pp. 28-34.

Griffith, *et al*, 2006: Second Edition; Guidelines for Cloud Seeding to Augment Precipitation. ASCE Manuals and Reports on Engineering Practice No. 81.

Griffith, *et al,* 2004: Standard Practice for the Design and Operation of Precipitation Enhancement Projects. ASCE/EWRI Standard 42-04, 63p.

Griffith, D.A. and M.E. Solak, 2004: Reply to a Paper Entitled "Reexamination of Historical Regression Anaysis Applied to a Recent Idaho Cloud Seeding Project". *WMA Journal of Weather Modification*, Vol. **36**, pp. 15-22.

Solak, M.E., D.P. Yorty and D.A. Griffith, 2003: Estimations of Downwind Cloud Seeding Effects in Utah. *WMA Journal of Weather Modification,* Vol. **35**, pp. 52-58.

Griffith, D.A., M.E. Solak, R.B. Almy and D. Gibbs, 2003: The Santa Barbara Cloud Seeding Project in Coastal Southern California, USA, Operations and Research Spanning more than 50 Years. *Eight WMO Scientific Conference on Weather Modification,* Casablanca, Morocco, April 7-12, 2003.

Griffith, D.A. and M.E. Solak, 2002: Economic Feasibility Assessment of Winter Cloud Seeding in the Boise River Drainage, Idaho. *WMA Journal of Weather Modification,* Vol. **34**, pp. 39-46.

Griffith, D.A., 2002: Alternative: Increase Precipitation, Runoff and Infiltration through Cloud Seeding. A White Paper prepared for inclusion in a Jemez y Sangre Water Plan, New Mexico, prepared for Daniel B. Stephens and Associates, Albuquerque, New Mexico.

Griffith, D. A., J. R. Thompson, D. A. Risch, and M. E. Solak, 1997: An Update on a Winter Cloud Seeding Program in Utah. *WMA Journal of Weather Modification*, Vol. **29**, No. 1, pp. 95-99.

Keyes, C. G, R. D. Elliott, R. F. Reinking, R. J. Davis, L. O. Grant, and D. A. Griffith, 1995: *Guidelines for Cloud Seeding to Augment Precipitation.* American Society of Civil Engineers Manual of Professional Practice No. 81.

CONFERENCES

Griffith, D.A., 2013: Winter "Cloud Seeding Windows" and Potential Influences of the Targeted Mountain Barriers. Weather Modification Association Annual Meeting, San Antonio, Texas, April 10-12, 2013.

Griffith, D.A., 2013: Winter "Cloud Seeding Windows" and Potential Influences of the Targeted Mountain Barriers. AMS 19th Conference on Planned & Inadvertent Weather Modification, Austin, Texas, January 8, 2013.

Griffith, D.A., 2013: Extra Area Cloud Seeding Effects: Santa Barbara II Research Program and Southern/Central Utah Operational Program. Weather Modification Association Annual Meeting, Extra Area Effects Workshop, Las Vegas, Nevada, April 27, 2012.

Griffith, D.A., 2012: Cloud Seeding Operations in Utah. Utah Water Users Workshop, St. George, Utah, March 12-14, 2012.

Griffith, D.A., 2011: A Winter Operational Cloud Seeding Program in the Upper Gunnison River Basin, Colorado. Weather Modification Association Annual Meeting, Park City, Utah, April 13-15, 2011.

Griffith, D.A., 2011: 30+ Winter Seasons of Operational Cloud Seeding in Utah. AMS 18th Conference on Planned & Inadvertent Weather Modification, Seattle, Washington, January 24-27, 2011.

Griffith, D.A., 2010: Cloud Seeding Technology, A Feasible Alternative Water Source for the Caribbean? American Water Resources Association, International Specialty Conference and 8th Caribbean Islands Water Resources Congress and Tropical Hydrology and Sustainable Water Resources in a Changing Climate, Rio Grande, Puerto Rico, August 30 – September 1, 2010.

Griffith, D.A., 2009: The Potential Use of Cloud Seeding to Augment the Flow of the Colorado River. American Water Resources Association, Adaptive Management of Water Resources II, Snowbird, Utah, June 29-July 1, 2009.

Griffith, D.A., 2009: Possible Air Pollution Impacts on Winter Orographic Precipitation in the Western U.S. American Water Resources Association, Adaptive Management of Water Resources II, Snowbird, Utah, June 29-July 1, 2009.

Griffith, D.A., 2009: A Feasibility/Design Study for a Winter Weather Modification Program in the Upper Snake Basin in Idaho. Weather Modification Association Annual Meeting, Anaheim, California, April 22-24, 2009.

Griffith, D.A., M.E. Solak and D.P. Yorty, 2008: 30+ Seasons of Operational Cloud Seeding in Utah. AMS 17th Conference on Planned & Inadvertent Weather Modification Joint with the Weather Modification Association, Westminster, Colorado, April 21-25, 2008.

Griffith, D.A., 2007: A Level II Weather Modification Feasibility Study for Winter Snowpack Augmentation in the Salt River and Wyoming Ranges in Utah. Weather Modification Association Conference, San Francisco, California, April 18-20, 2007.

Griffith, D.A., 2007: A Level II Weather Modification Feasibility Study for Winter Snowpack Augmentation in the Salt River and Wyoming Ranges in Wyoming. Weather Modification Association Annual Meeting, San Francisco, California, April 18-20, 2007.

Griffith, D.A., 2006: Summary of Cloud Seeding Programs in Utah Including Impacts of Air Pollution. Utah Water Users Workshop, St. George, Utah, March 7-8, 2006.

Griffith, D.A., 2005: Workshop on Fundamentals of Precipitation Enhancement and Weather Damage Mitigation Technologies; Design of Operational Precipitation Enhancement Programs. Workshop conducted at a Special Meeting of the Weather Modification Association, Athens, Greece, September 21-23, 2005.

Griffith, D.A., 2005: Workshop on Fundamentals of Operational Weather Modification Programs; Design of an Operational Program. Workshop conducted at the Annual Meeting of the Weather Modification Association, Washington, D.C., April 27-28, 2005.

Griffith, D.A., 2005: Possible Impacts of Air Pollution on Wintertime Precipitation in Utah. Weather Modification Association Annual Meeting, Washington, D.C., April 27-28, 2005.

Griffith, D.A., 2005: Update on the Santa Barbara Winter Seeding Program. Weather Modification Association Annual Meeting, Washington, D.C., April 27-28, 2005.

Griffith, D.A., 2005: The Santa Barbara Cloud Seeding Project in Coastal Southern California, Operations and Research Spanning More Than 50 Years. American Meteorological Society Annual Conference, San Diego, California, January 9-12, 2005.

Griffith, D.A., 2004: An Update on the Boise River Winter Cloud Seeding Program. Weather Modification Annual Meeting, Fresno, California, April 29-30, 2004.

Griffith, D.A., 2003: A New Winter Cloud Seeding Program in the High Uinta Mountains of Utah. Weather Modification Association, Annual Meeting, Rapid City, South Dakota, April 24-24, 2003.

Solak, M.E., 2003: Estimations of Downwind Cloud Seeding Effects in Utah. Weather Modification Annual Meeting, Rapid City, South Dakota. April 24-26, 2003.

Solak, M.E., 2002: Economic Feasibility Assessment of Winter Cloud Seeding in the Boise River Drainage, Idaho. Weather Modification Association, Annual Meeting, Reno, Nevada, April 24-26, 2002.

Griffith, D.A., 2002: Guidelines for Cloud Seeding to Augment Precipitation. ASCE Trans-boundary Water Management Conference, Traverse City, Michigan, July 23-26, 2002.

Griffith, D.A., 2002: Alternative: Increase Precipitation, Runoff and Infiltration through Cloud Seeding. Jemez y Sangre Water Planning Council Charrette, Santa Fe, New Mexico, February 27, 2002.

Griffith, D.A., 2002: Workshop on Atmospheric Water Management Using Precipitation Enhancement Technologies; Seeding Modes and Instrumentation. Workshop conducted at the Annual Meeting of the Weather Modification Association, Reno, Nevada, April 24-26.

Griffith, D.A., 2000: Cloud Seeding in Utah. The 2000 Utah Water Users' Workshop, St. George, Utah, Mar. 7-8, 2000.

Griffith, D.A., 1998: Current Evaluations of the Utah Winter Seeding Program. Weather Modification Association, Annual Meeting, Park City, Utah, May 13-15, 1998.

5.0 NAWC FULL-TIME METEOROLOGISTS

NAWC currently has five full-time meteorologists on staff. The five full-time meteorologists are: Mr. Don Griffith, Mr. Mark Solak, Mr. David Yorty, Ms. Stephanie Beall and Ms. Shauna Ward. The first two men are highly experienced meteorologists and are also co-

owners of NAWC. Both men have extensive experience in the research and operational aspects of weather modification. The Weather Modification Association has certified them both as Weather Modification Managers and Operators. Mr. Griffith is also a Certified Consulting Meteorologist by the American Meteorological Society. Mr. Yorty has worked for NAWC for twelve years following his graduation from the University of Utah where he obtained a Master's Degree in Meteorology. He obtained certification from the Weather Modification Association as a Certified Operator seven years ago. Ms. Stephanie Beall, who recently joined NAWC as a full time employee, has a B.S. degree in Meteorology from the University of Oklahoma and nine years work experience. She is a WMA Certified Operator. Ms. Shauna Ward joined NAWC in the fall of 2013. She has an M.S. degree in Meteorology from the University of Wyoming. NAWC will again employ a local, part-time employee to install, service, maintain and remove the cloud seeding generators (Dale Gilden).

6.0 NAWC DESIGN/FEASIBILITY STUDIES

NAWC has performed a number of feasibility and/or design studies for winter snowpack augmentation projects. One study was completed for the Gunnison County program. This study was entitled "Meteorological Feasibility Assessment of Cloud Seeding Potential for Snowpack Augmentation in the Higher Elevations of Gunnison County, Colorado" (Griffith and Yorty, 2002). This study provides the basis for the design of the Gunnison River program. NAWC was awarded a contract by the Wyoming Water Development Commission to conduct a feasibility study for a possible winter cloud seeding program in the Salt and Wyoming Ranges of Western Wyoming. A final comprehensive report was completed in 2005. A peer-reviewed summary of this work was published in the Weather Modification Association's Journal of Weather Modification (Griffith, et al, 2007). NAWC was awarded another design/feasibility contract by the Idaho Water Resource Board IWRB) in 2007 for the Eastern Snake River Basin in Idaho. This work was completed in 2008 (Griffith, 2008, 2010). The IDWR awarded two more follow on contracts to NAWC to prepare feasibility/design studies for the Big and Little Wood Rivers and the Upper Boise River Basin. A technical paper was recently published in the Weather

Modification Association's Journal of Weather Modification (Griffith, et al, 2012) on the Boise feasibility study.

7.0 SUMMARY OF UPPER GUNNISON COUNTY PROJECT DESIGN

The primary target area is defined as those mountainous areas above 9000 feet MSL located in Gunnison County, northern Hinsdale and northern Saguache Counties. The proposed primary target area constitutes much of the upper Gunnison River Drainage that contributes streamfow to Blue Mesa Reservoir. Figure 1 provides a map of the proposed primary target area along with the generator locations used in the conduct of the 2013-2014 winter program.

Operational seeding decisions of when and which ground based generators should be utilized during specific storm occurrences will be made from North American Weather Consultants, Inc.(NAWC) headquarters located at 8180 South Highland Dr., Ste. B-2, Sandy, Utah. This headquarters is equipped with four personal computers with high speed internet access. A variety of weather products, available through the internet, will be monitored to assist in making these seeding decisions. These products, most of which are provided by the National Weather Service (NWS) will include: weather satellite (infra-red and visual) photos, surface charts, constant pressure charts (i.e. 700, 500 mb), upper-air rawinsonde observations (weather balloons), NEXRAD weather radar information, surface weather reports (typically available at hourly intervals), NWS weather forecasts and prognostic (forecast) charts of a variety of weather parameters. The NOAA HYSPLIT model will also be used to predict the transport and diffusion of seeding materials released from ground generators.

NAWC meteorologists will monitor the above information to determine if NAWC's generalized cloud seeding criteria are met and, if so, which generators should be operated. NAWC's generalized seeding criteria are provided in Table 1. These criteria have been developed based upon practical considerations plus the results from previous winter orographic (mountainous) weather modification research programs.

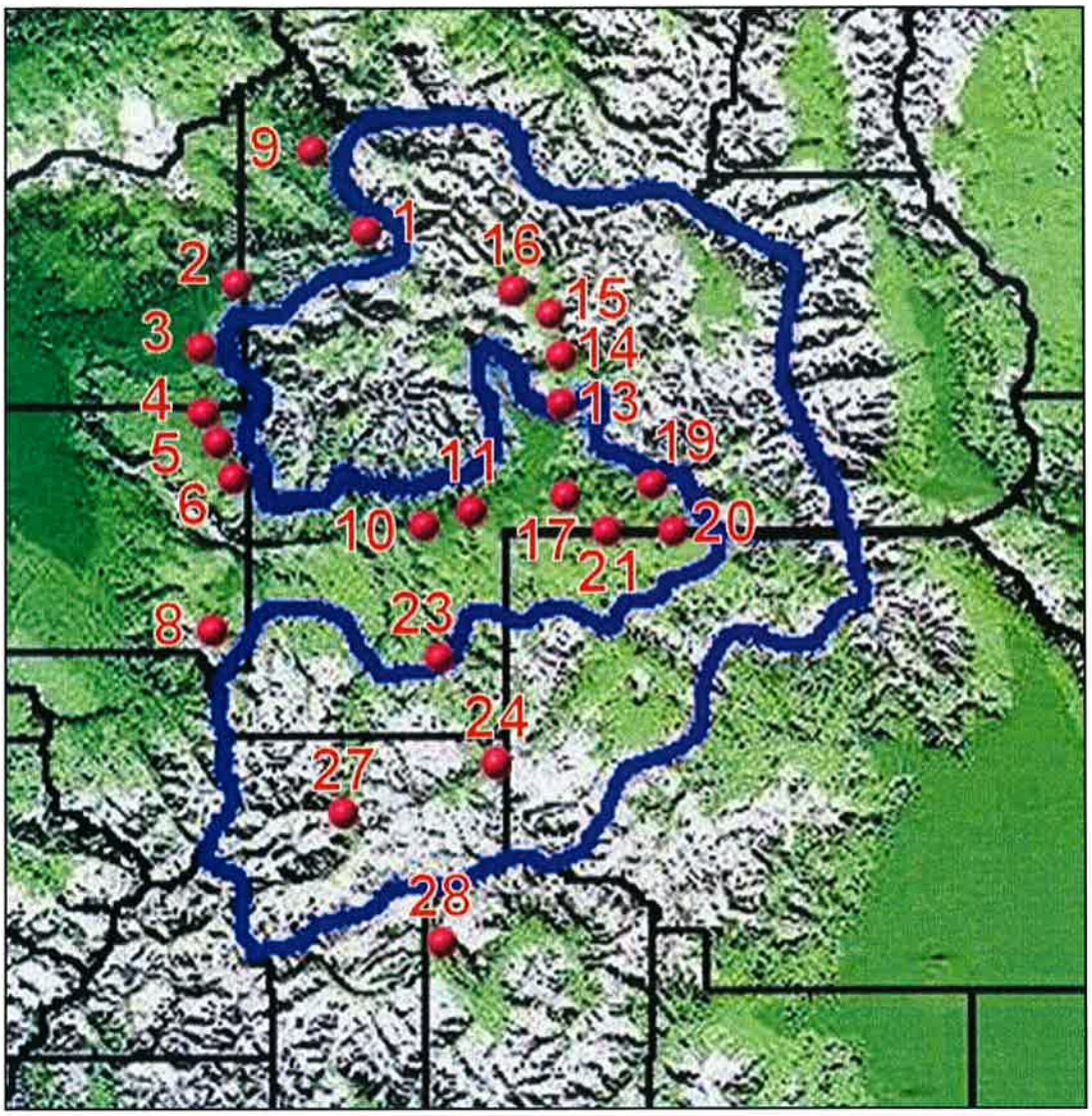

Figure 1 Target Area and Generator Locations, 2013-2014 Program

Table 1

NAWC Winter Cloud Seeding Criteria

- CLOUD BASES ARE BELOW THE MOUNTAIN BARRIER CREST.
- LOW-LEVEL WIND DIRECTIONS AND SPEEDS THAT WOULD FAVOR THE MOVEMENT OF THE SILVER IODIDE PARTICLES FROM THEIR RELEASE POINTS INTO THE INTENDED TARGET AREA.
- NO LOW LEVEL ATMOSPHERIC INVERSIONS OR STABLE LAYERS THAT WOULD RESTRICT THE VERTICAL MOVEMENT OF THE SILVER IODIDE PARTICLES FROM THE SURFACE TO AT LEAST THE -5°C (23°F) LEVEL OR COLDER.
- TEMPERATURE AT MOUNTAIN BARRIER CREST HEIGHT EXPECTED TO BE -5°C (23°F) OR COLDER.
- TEMPERATURE AT THE 700 MB LEVEL (APPROXIMATELY 10,000 FEET) EXPECTED TO BE WARMER THAN -15°C (5°F).
- CLOUD TOP TEMPERATURES WARMER THAN -26^0 C.

A network of 20-25 ground based silver iodide generators will be used in the conduct of this project. These generators will be sited at private residences, public places of business, and possibly remote locations. The residents or business operators will be trained in the operational procedures to be used in turning the manually operated generators on or off. Remote generators, as the name implies, would be operated using radio, telephone, or satellite communications systems. NAWC meteorologists will contact the manual generator operators when conditions have been determined to be favorable for operations and request that the generators be activated. When conditions are no longer favorable, the operators will be called to turn the generators off.

Figure 2 provides a photograph of one of NAWC's ground based, manually operated units. Each generator site is equipped with a propane tank. The propane is lit within the generators burn chamber and then the silver iodide (dissolved in acetone) is injected into the propane flame. As the effluent from the generator cools, literally trillions of microscopic sized particles of silver iodide are produced. These particles have the ability to cause water droplets within clouds that are colder than approximately -5°C to freeze. The tiny ice crystal that is produced, if it remains in a favorable environment, will grow into a snowflake. NAWC will use a seeding solution composed of acetone, silver iodide, sodium iodide and paradichlorobenzene. This solution has been shown to produce more effective seeding particles at warmer temperatures (i.e. about -10° to -5°C) and to produce these crystals more quickly than pure silver iodide. Each generator will release approximately 8 grams of silver iodide per hour of operation.

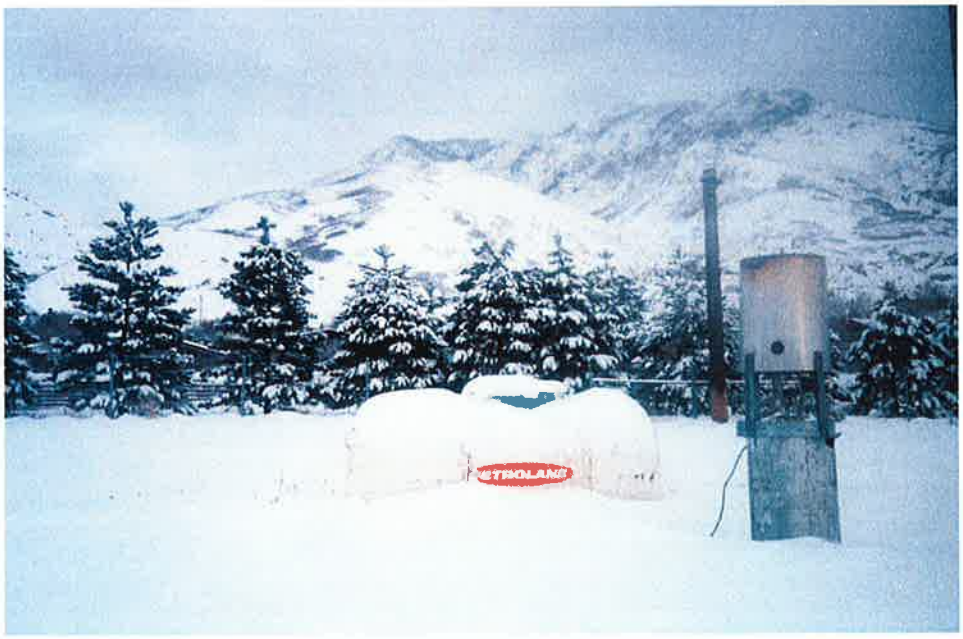

Figure 2 NAWC Ground-Based Silver Iodide Seeding Generator

Special consideration will be given to the targeting of the seeding material to affect the intended target areas. This requires the project meteorologist to decide which generators should be operated and the times of operation once it has been determined that a seedable situation is developing according to the criteria provided in Table 1. NAWC began using a special National Oceanic and Atmospheric Administration (NOAA) computer model three seasons ago to assist the project meteorologist in making these decisions. The HYSPLIT (HYbrid Single-Particle Lagrangian Integrated Trajectory) model is the newest version of a complete system for computing simple air parcel trajectories to complex dispersion and deposition simulations. In the HYSPLIT particle model, a fixed number of initial particles are advected about the model domain by the mean wind field and a turbulence component. The model's default configuration assumes a puff distribution in the horizontal and particle dispersion in the vertical direction. The HYSPLIT model can be used to simulate the transport and diffusion of seeding plumes of silver iodide particles from different generator locations using input meteorological data and the underlying topography of the area of interest. Figure 3 provides an example from a seeded storm situation last winter for the Upper Gunnison River program. The seeding plumes in this case are depicted for several generator locations used to seed this storm, which impacted the target area on December 3, 2013.

The Colorado Water Conservation Board and the three Lower Colorado River Basin States have previously provided funds for the acquisition and installation of an icing rate meter and other supporting equipment which will be installed at an exposed location at the Crested Butte Ski area for the 2014-2015 winter season. The icing meter detects the presence of supercooled liquid droplets which are the targets of opportunity to increase precipitation through cloud seeding. An anemometer, temperature sensor and precipitation sensor will be installed along with the icing rate meter on an existing tower near the summit of the ski area. NAWC meteorologists can get real-time information through the internet from this site through using a program (VISTA) that collects data from the site and creates several useful displays of the data. Such information is useful in determining if seeding potential exists during the passage of storms. NAWC has installed three sites similar to this one in the State of Utah with Lower

Colorado River Basin States funding. Figure 4 provides a photo of one of these sites located at the Brian Head Ski area located in southern Utah.

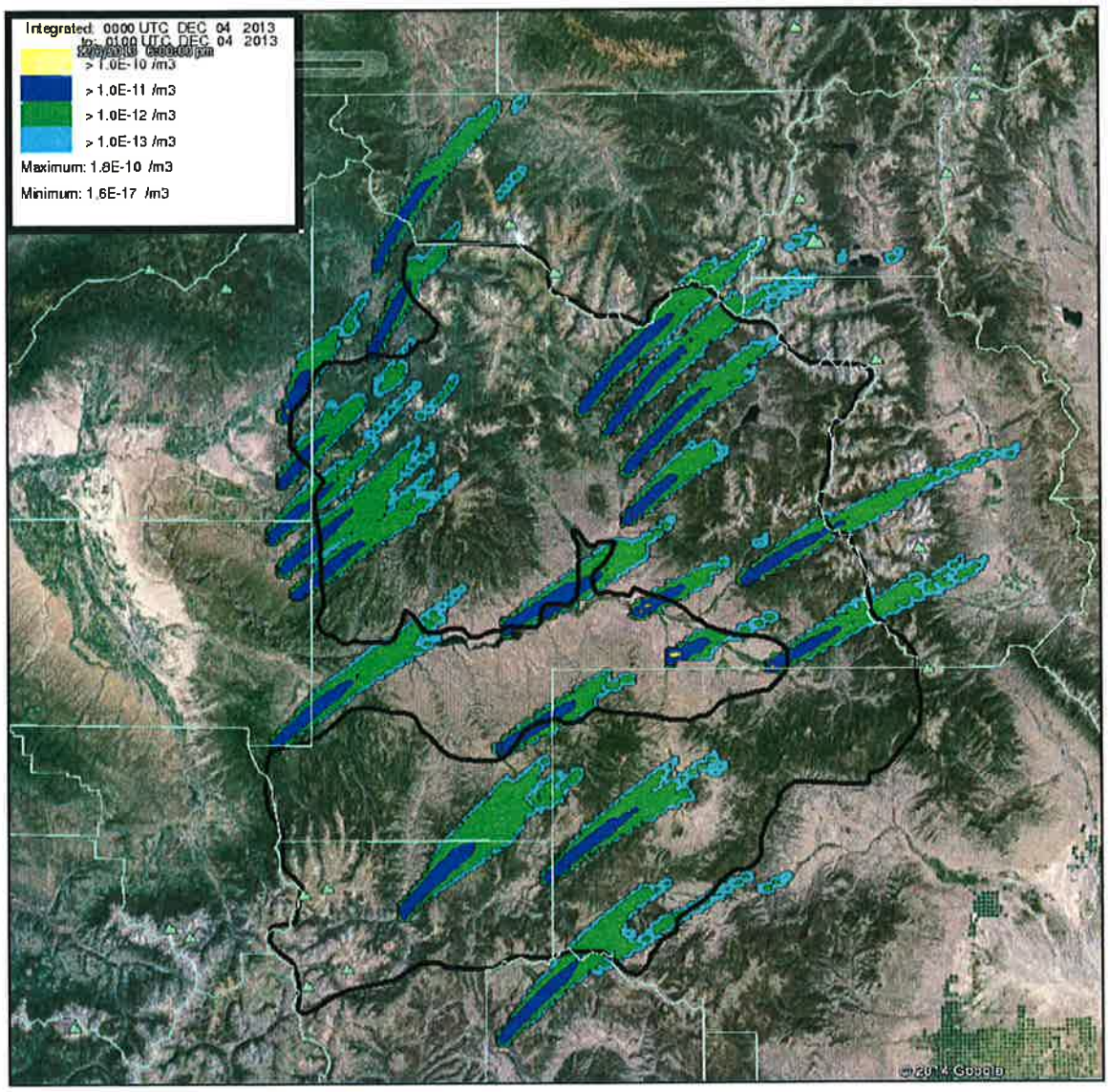

Figure 3 **HYSPLIT plot of forecast plume dispersion for a one-hour period ending at 1900 MST on December 3, 2013 from all potential seeding sites. Winds were from the southwest. Most sites (only excluding 2 sites on the northwest side) were active at the time.**

Figure 4 **Icing Rate Meter Installation at the Brian Head Ski Area, Utah**

8.0 NAWC CORPORATE HISTORY

North American Weather Consultants (NAWC) was founded in Altadena, California, in 1950. The headquarters office was moved to Santa Barbara, California, in 1951, where it remained until 1980. The company became involved in weather modification starting in 1951. This involvement in weather modification has continued in an uninterrupted fashion to the present. The headquarters were relocated to Salt Lake City, Utah, in 1980. NAWC became a Utah corporation at that time. NAWC, which had been privately owned by individual stockholders since its inception, was acquired by a national environmental firm, TRC Environmental Corporation, in 1992. Two employees of TRC/NAWC bought the company back in 1999. NAWC is a corporation in good standing in the State of Utah and licensed to do business in the State of Colorado.

Some relevant facts about NAWC are listed below:

- Incorporated in 1950, NAWC has more than 60 years of continuous involvement in weather modification. We are, indeed, the longest-standing private weather modification company in the world.
- NAWC was founded as a weather modification company. Weather modification has always been NAWC's primary specialty.
- NAWC is recognized internationally as a leader in the weather modification field, in research and operations.
- NAWC received the American Meteorological Society's prestigious "Award for Outstanding Services to Meteorology by a Corporation" in 1970 for it's pioneering the practice of private meteorology in the United States.
- NAWC has conducted weather modification projects and provided consulting services in many countries outside the United States, including Europe, South America, Central America, Asia and the Middle East.
- Our weather modification activities and contributions are well known, through our hundreds of publications and reports.

- Our extensive client list includes hydroelectric utilities, government agencies, water districts, universities and private entities.

- NAWC's client satisfaction rating is consistently very high, due to NAWC's ongoing commitment to carefully determining and then fully addressing each client's specific needs. We always tailor our services/project to our clients' interests and circumstances.

- NAWC offers the full spectrum of weather modification services, ranging from basic research to feasibility studies and reviews of existing projects, and from start-up services to full service operational projects.

- We offer the full spectrum of cloud seeding capabilities, including ground based and airborne seeding systems, appropriate support systems, as well as ground based and airborne seeding plume tracking using tracer technology.

9.0 CORPORATE REFERENCES

The RFP requests references of previous or current cloud seeding clients. Five contacts are listed in the following:

- Mr. Todd Adams, Assistant Director, Utah Division of Water Resources, Salt Lake City, Utah, 801-538-7272.

- Mr. Bryce Jackson, President, Utah Water Resources Development Corporation (a non-profit corporation that administers the central and southern Utah cloud seeding program) Fairview, Utah, 435-427-3749.

- Mr. Dennis Gibbs, Hydrologist, Santa Barbara County Water Agency, Santa Barbara, California, 805-568-3543.

- Mr. Barry Lawrence, Wyoming Water Development, Cheyenne, Wyoming, 307-777-7626.

- Mr. Lynn Lemon, Cache County Executive, Logan, Utah, 435-716-7171

10.0 PROPOSED SERVICES

NAWC will provide a variety of services that will result in the continued development of a scientifically sound and successful winter cloud seeding program for Gunnison County. The primary steps would include the following items:

- Filing of an initial report on the project with the National Oceanic and Atmospheric Administration (NOAA).
- Installation of the propane tanks and cloud seeding generator network. NAWC would propose to lease the generators to this project (Figure 1 provides the locations of the generators used in the conduct of the 2013-2014 program).
- Monitoring of weather and operations of cloud seeding generators during storm periods that pass over the target area during the operational period of the contract.
- Filing of an interim report on the project status with NOAA.
- Removal of equipment from the field following completion of the operational seeding. Propane tanks are frequently left in the field if it appears that the project will become active in the following winter season.
- Filing of a final report on the project with NOAA
- Preparation of a Final Operations and Evaluation Report.

11.0 PROPOSED COSTS TO OPERATE AND REPORT ON A FIVE MONTH 2014-2015 WINTER CLOUD SEEDING PROGRAM

Assumptions: North American Weather Consultants (NAWC) will conduct a five month winter cloud seeding program to affect the higher elevations (>9,000 feet MSL) in Gunnison, northern Hinsdale and northern Saguache Counties. The intended target area is outlined in Figure 1. NAWC obtained a five year permit in 2012 from the CWCB to operate this program. A local

technician will be hired to install, maintain and remove NAWC's cloud seeding generators. NAWC estimates that approximately 20-25 silver iodide ground generators will be used to seed this area. It is proposed that the program begin on November 15, 2014 and continue through April 15, 2015.

NAWC personnel in Salt Lake City, Utah will monitor weather conditions over the target area on a daily basis. Each storm system that impacts the target area during the operational period will be evaluated to determine whether the storm or portions thereof, appear to present some seeding opportunity. If so, NAWC personnel will contact the appropriate generator operators to initiate operations. When conditions are deemed to no longer be seedable from a given site (i.e., winds shift, storm moves out of the area, storm becomes too cold) the operators will be called to turn off the generators. NAWC generators would be removed from their field locations in the spring but the propane tanks left in place for possible operations in the next winter season. NAWC would prepare all necessary reports (i.e., initial, interim and final NOAA reports) and monthly operations reports and a final report to Gunnison County. The final report will include discussions of operations and the use of a target/control evaluation technique to estimate the effectiveness of the cloud seeding program during this third season of operations. The results from previous winter seasons suggest increases of +8-13% in April 1st snow water content in the intended target areas. The estimated cost of the average additional runoff produced from this seeding program is approximately $0.75 per acre-foot. The anticipated results from the 2014-2015 seeding program would be a 10-15% increase in target area precipitation.

NAWC normally contracts to conduct operational weather modification programs on a fixed price plus cost reimbursable basis. The fixed costs cover our non-variable expenses such as salaries, equipment rental, etc. Reimbursable charges are billed based on actual experience regarding such items as ground generator usage. We feel this is a mutually advantageous approach to both the client and NAWC. Since the prediction of the seasonal number of seeding opportunities and their duration is impossible, the establishment of set rates (unit costs) for these variables removes any guesswork from the process. In this approach there is neither an

advantage nor disadvantage to NAWC to seed more or less, etc. This allows us to use our best professional judgment of when seeding should be conducted. The sponsors of this program would only be charged for the actual generator hours used in the conduct of the program.

This approach has been used to prepare a budget for the proposed program. We have split out our fixed costs into two categories:

1) Set-up, take-down and reporting costs and
2) Monthly costs.

NAWC proposes to conduct a five program, as outlined herein, for a total cost not to exceed $100,000.

Fixed costs and estimated reimbursable charges are as follows:

1. PROJECT SET-UP (includes cloud seeding generator and propane tank leases)	$14,500
2. MONTHLY FIXED OPERATIONAL COSTS (Weather monitoring, seeding decision-making, maintenance of generator network, etc.) 5 months @ $9,000/month	$45,000
3. <u>ESTIMATED</u> MONTHLY REIMBURSABLE COSTS (These charges would be invoiced following each month of operation based upon the actual number of generator hours used , estimated usage is 600 hours per month @ $9.00 per hour times 5 months)	$27,000
4. PROJECT TAKE-DOWN	$5,000
5. REPORTING (NOAA reports, monthly progress reports and	

final operations/evaluation report)	$ 8,500
ESTIMATED TOTAL COSTS FOR A FIVE MONTH OPERATIONAL PROJECT	$100,000

There is also a 2% (of the total program cost) fee levied by the Colorado Water Conservation Board, which the sponsors of the program pay. There are some probable cost sharing funds available from the Colorado Water Conservation Board and the Lower Colorado River Basin States to support this program, as was the case for last winter's program.

A shorter operational period could be adopted due to budget constraints, etc. NAWC would not recommend conducting a program of less than three months duration. Obviously the likely benefits from a three-month program would be less than those from a five-month program.

Submitted by:

Don A. Griffith
President
North American Weather Consultants, Inc.

This proposal is valid until December 15, 2014 unless withdrawn earlier in writing.

REFERENCES

Griffith, D.A., T. Warren Weston, and D.P. Yorty, 2013: The Conduct and Evaluation of a Cloud Seeding Program for the Gunnison River Basin, Colorado during the 2012-2013 Winter Season. North American Weather Consultants Report No. WM 13-6.

Griffith, D.A., D. P. Yorty and M.E. Solak, 2012: Summary of a Weather Modification Feasibility Study for Winter Snowpack Augmentation in the Upper Boise River Basin, Idaho. WMA Journal of Weather Modification, Vol. 44, pp. 115-123.

Griffith, D.A., T. Warren Weston, and D.P. Yorty, 2012: The Conduct and Evaluation of a Cloud

Seeding Program for the Gunnison River Basin, Colorado during the 2011-2012 Winter Season. North American Weather Consultants Report No. WM 12-3.

Griffith, D.A., M.E. Solak, and D. P. Yorty, 2011: A Winter Operational Cloud Seeding Program: Upper Gunnison River Basin, Colorado. WMA Journal of Weather Modification, Vol. 43, pp. 29-43.

Griffith, D.A., M.E. Solak, and D. P. Yorty, 2010: Summary of a Weather Modification Feasibility Study for Winter Snowpack Augmentation in the Eastern Snake River Basin, Idaho. WMA Journal of Weather Modification, Vol. 42, pp. 115-123.

Griffith, D.A., D.P. Yorty and M.E. Solak, 2010: The Conduct and Evaluation of a Cloud Seeding Program for the Gunnison River Basin, Colorado during the 2009-2010 Winter Season. North American Weather Consultants Report No. WM 10-4.

Griffith, D.A., M.E. Solak, and D.P. Yorty, 2009: 30+ Winter Seasons of Operational Cloud Seeding in Utah. *WMA Journal of Weather Modification*, **41**, p. 23-37.

Griffith, D.A., Weather Modification Feasibility Study for the Upper Snake River Basin in Idaho. NAWC report No. WM 08-11 to the Idaho Water Resource Board, October 2008.

Griffith, D.A., D.P. Yorty and M.E. Solak, 2005: The Development, Conduct and Evaluation of a Cloud Seeding Program for the Gunnison River Basin, Colorado during the 2004-2005 Winter Season. North American Weather Consultants Report No. WM 05-2.

Griffith, D.A., D.P. Yorty and M.E. Solak, 2003: The Development, Conduct and Evaluation of a Cloud Seeding Program for Gunnison County, Colorado during the 2002-2003 Winter Season. North American Weather Consultants Report No. WM 03-04.

Griffith, D.A. and D.P. Yorty, 2002: Meteorological Feasibility Assessment for Snowpack Augmentation in the Higher Elevations of Gunnison County, Colorado. North American Weather Consultants Report No. WM 02-5.

North American
Weather Consultants, Inc.

8180 South Highland Dr., Suite B-2
Sandy, Utah 84093

FIXED PRICE AGREEMENT
FOR CLOUD SEEDING PROFESSIONAL SERVICES

This AGREEMENT is by and between North American Weather Consultants, Inc. (NAWC) a Utah corporation, and Gunnison County of Colorado (CLIENT). CLIENT retains NAWC to perform cloud seeding professional services at or relative to certain premises in portions of Gunnison, Hinsdale and Saguache Counties (SITE) in return for cash consideration to be paid by CLIENT under terms and conditions set forth below.

1. SERVICES

NAWC will perform as follows:

1.1 Provide the Services that are described in this Agreement and on the attached scope of services (Attachment 1) and NAWC Proposal No. 14-357, which, by reference, are made a part of this Agreement. In the case of inconsistency among the documents, the more specific document shall control.

2. CLIENT RESPONSIBILITIES

CLIENT will perform the following in a timely manner so as not to delay the Services of NAWC:

2.1 Designate in writing the person or persons with authority to act in CLIENT'S behalf on all matters concerning the Services;

2.2 Arrange for NAWC access to CLIENT owned sites as may be required for NAWC to perform its Services;

2.3 Inform NAWC of any project information that CLIENT intends to have NAWC treat in confidence and mark such information "Confidential", if the information is committed to writing; and

2.4 Bear all costs incident to the requirements of this Section 2.

3. PERIOD OF PERFORMANCE

3.1 NAWC's Services will be considered complete on the date when the Final Report specified in the scope of services is received by CLIENT.

4. STANDARD OF SERVICES

4.1 NAWC will perform its Services with that degree of skill and care that is in accordance with generally accepted professional practices and procedures in the state of Colorado. The standard of care will be judged according to standards in place at the time the services are performed and not according to later standards. This standard is in lieu of all other standards or warranties, either expressed or implied. Wherever reasonably possible, NAWC will correct any services not meeting this standard provided CLIENT notifies NAWC of the deficiencies with reasonable specificity within 30 days of discovery and no later than 120 days after completion of the Services. The total amount of NAWC's liability to CLIENT and its agents arising out of this Agreement for any and all causes will not exceed the total compensation or consideration received by NAWC under this Agreement.

4.2 Neither NAWC, nor any of its directors, officers, agents, subcontractors, consultants, or employees, will be liable to the CLIENT for consequential, incidental, indirect, special or punitive damages, including loss of use of property or lost profits, whether such liability arises out of contract, including breach of warranty, or tort.

5. PAYMENTS TO NAWC

5.1 For the Services rendered hereunder, CLIENT agrees to pay NAWC the fixed and reimbursable amounts specified in the attached scope of services and/or any attachment thereto.

5.2 NAWC will submit monthly invoices for Services rendered, and CLIENT will make payment within 30 days of receipt of NAWC's invoices. If CLIENT objects to all or any portion of an invoice, it will notify NAWC of the same within fifteen days from the date of receipt of the invoice and will pay that portion of the invoice not in dispute, and the parties shall immediately make every effort to settle the disputed portion of the invoice.

5.3 If CLIENT fails to make any payment due NAWC within 30 days after receipt of an invoice, then the amount due NAWC will increase at the rate of 1.0 percent per month after the 30th day. In addition, NAWC may, after giving 7 days' written notice to CLIENT, suspend its Services and any deliverables until NAWC has been paid in full for all amounts outstanding more than 30 days.

6. GENERAL CONSIDERATIONS

6.1 All documents prepared by or for NAWC and delivered to CLIENT in performance of this Agreement are considered property of the CLIENT. NAWC may make and retain copies of all such documents delivered to CLIENT.

6.2 NAWC will procure and maintain insurance as required by law or regulation. At a minimum, NAWC will procure and maintain the following types of insurance during the entire term of this Agreement, and name CLIENT as an additional insured on such insurance:

(1) Workers' compensation and occupational disease insurance in amounts to satisfy Colorado state law;

(2) Employer's liability insurance in the amount of $1,000,000;

(3) Automobile liability in the amount of $1,000,000 per occurrence; and

(4) General comprehensive liability insurance for bodily injury, death or loss of or damage to property of third persons in the minimum amount of $1,000,000 per occurrence and in the aggregate.

(5) NAWC shall provide CLIENT with proof of such insurance within ten(10) days of the execution of this Agreement. Each policy shall require thirty days written notice to CLIENT before such policy can be cancelled.

6.3 NAWC will be and will operate as an independent contractor in the performance of this Agreement and will have complete charge of its employees, subcontractors and consultants engaged in performing the required Services.

6.4 The Parties will comply with all applicable federal, state and local laws, rules and regulations, including amendments and changes as they may occur.

6.5 Each Party assumes full responsibility for any claims, suits, accidents, injuries (including death) or damages to the person or property of any third party resulting from its own negligent, reckless or willful acts or those of any of its employees in connection with the Services or activities covered by this Agreement, and, to the extent of its proportionate responsibility therefore, will indemnify, defend and save harmless the other Party, from any costs, liabilities or expenses arising out of such negligent, reckless or willful acts. However, nothing in this Agreement, or required by this Agreement, is or shall be construed to be a wavier by CLIENT of any right, privilege or immunity provided by the Colorado Governmental Immunity Act.

6.6 If a delay in the performance of Services is caused by an act of God, fire, hurricane, flood, explosions, strike, boycott or other labor dispute, or by acts of Government, which, in the opinion of NAWC, could not have been reasonably foreseen and provided for, such delay will entitle NAWC to an extension of time in performing its Services.

6.7 CLIENT will have the right to terminate this Agreement at any time without cause by giving NAWC fifteen (15) days written notice to such effect. NAWC will immediately discontinue all Services in progress, which can be discontinued without creating a hazardous condition, and cancel all outstanding commitments, which may be canceled without undue cost. NAWC will notify CLIENT of any commitment, which cannot be canceled without undue cost or without jeopardizing the Services completed to date. Subject to compliance with the foregoing and any other applicable provision of the Agreement, CLIENT will pay to NAWC all amounts owing to NAWC under this Agreement plus reasonable costs and fees for termination of work. NAWC will submit to CLIENT, within 30 days of termination, its invoice for the aforesaid amounts in such reasonable detail as the CLIENT may request. Subject to verification thereof, CLIENT will remit such amount within thirty (30) days after receipt of the invoice from NAWC. NAWC will have the right to terminate this Agreement only for non-payment pursuant to section 5.

6.8 The terms and conditions of this Agreement will be governed by and construed and interpreted in accordance with the laws of the state of Colorado.

6.9 This Agreement, together with its Exhibits, will constitute the entire Agreement between the Parties and will supersede all prior written or oral understandings and any purchase order terms that may be issued by CLIENT. This Agreement and its Exhibits may only be amended, supplemented, modified or canceled by a duly executed written instrument signed by the Parties.

7. SPECIAL PROVISIONS

Special Provisions are X__ are not __ attached to and made a part of this Agreement and identified as: Attch.1_____.

This Agreement is effective on the last day signed.

North American Weather Consultants, Inc.	**GUNNISON COUNTY**
By _____	By _____
Name Don A. Griffith	Name _____
Title President	Title _____
Telephone (801) 942-9005	Telephone _____
Address 8180 S. Highland Dr., Ste. B-2 Sandy, Utah 84093	Address _____ _____
Date Sep. 24, 2014	Date _____

ATTACHMENT 1

SCOPE OF SERVICES

CLIENT and NAWC do hereby agree as follows:

1. CLIENT shall undertake a weather modification project; to wit, the seeding of clouds to enhance snowfall at elevations above 9000 feet in Gunnison, northern Hinsdale and northern Saguache Counties, Colorado utilizing Contractor to perform this work. A five-month program is anticipated operating from November 15, 2014 through April 15, 2015.

2. CLIENT hereby agrees to:

   (a) To assist NAWC in making local arrangements to efficiently conduct the program, and

   (b) to serve as liaison for publicity, public affairs and public relations.

3. NAWC hereby agrees:

   To provide the personnel, equipment, and services as contained in its proposal P 14-357, which by reference hereto, is incorporated into this agreement. A summary of these items is as follows:

   - Select approximately 20-25 ground generator sites.
   - Provide a part-time technician who will install, maintain, and remove the generators from the field.
   - Provide all necessary propane and seeding materials.
   - File all required notices and paperwork required at the State and Federal level.
   - Provide decision-making on which generators should be operated during suitable storm systems. NAWC meteorologists will perform this monitoring from NAWC's offices in Sandy. NAWC meteorologists will call the local operators for each operation.
   - Notify Client's program coordinator of project operations via a monthly operations report.
   - Prepare an annual report of the activity on the program plus a limited evaluation of the apparent effectiveness of the program.

- Maintain necessary insurance coverages including: workers compensation insurance, comprehensive general liability insurance and automobile liability insurance. Client will be provided a certificate of this insurance.

4. CLIENT hereby agrees:

CLIENT agrees to pay to NAWC the following amounts and at the following terms:

Project Set-up, within 30 days of contract approval	$14,500
Monthly fixed cost, due the 30th day of each operational month	9,000
Reimbursable Costs (estimated 600 hours/mo. @ $9.00/hr x 5 months), due within 15 days of submission of an invoice for the previous month's generator usage.	27,000
Project Take-down, due within 30 days of receipt of invoice following completion of take-down operations	5,000
Project Final Report, due within 30 days of receipt of invoice following submission of report.	8,500

The total cost to perform this work (five month program) will not exceed $100,000 without written authorization from Client. Client will also pay a 2% fee to the Colorado Water Conservation Board based upon the actual final cost of the program.

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 9/2/2014

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
The Buckner Company
6550 S Millrock, Suite #300
Salt Lake City UT 84121

CONTACT NAME: Jennifer Eckersley
PHONE (A/C, No, Ext): 801-937-6719 FAX (A/C, No): 801-930-6359
E-MAIL ADDRESS: jeckersley@buckner.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Crum and Forster Insurance Company	42471
INSURER B :	
INSURER C :	
INSURER D :	
INSURER E :	
INSURER F :	

INSURED
North American Weather Cons
8180 South Highland Drive Suite B2
Sandy UT 84093

NORTAME-02

COVERAGES **CERTIFICATE NUMBER:** 1183268223 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	**GENERAL LIABILITY**			EPK105232	8/31/2014	8/31/2015	EACH OCCURRENCE	$1,000,000
	X COMMERCIAL GENERAL LIABILITY						DAMAGE TO RENTED PREMISES (Ea occurrence)	$50,000
	CLAIMS-MADE X OCCUR						MED EXP (Any one person)	$5,000
							PERSONAL & ADV INJURY	$1,000,000
							GENERAL AGGREGATE	$2,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						PRODUCTS - COMP/OP AGG	$2,000,000
	X POLICY PRO-JECT LOC							$
	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident)	$
	ANY AUTO						BODILY INJURY (Per person)	$
	ALL OWNED AUTOS / SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	HIRED AUTOS / NON-OWNED AUTOS						PROPERTY DAMAGE (Per accident)	$
								$
	UMBRELLA LIAB OCCUR						EACH OCCURRENCE	$
	EXCESS LIAB CLAIMS-MADE						AGGREGATE	$
	DED RETENTION $							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N						WC STATU-TORY LIMITS / OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? **(Mandatory in NH)**	N / A					E.L. EACH ACCIDENT	$
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$
							E.L. DISEASE - POLICY LIMIT	$
A	Contractors Pollution Liability Professional Liab/E&O			EPK105232	8/31/2014	8/31/2015	General Aggregate General Aggregate Deductible	$1,000,000 $1,000,000 $5,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

The insurance coverage afforded by the referenced insurance policy is subject to the terms, exclusions, and conditions of the insurance policy itself.

CERTIFICATE HOLDER

Gunnison County
Jane Wyman, Weather Modification Coordinater
200 East Virginia Avenue
Gunnison CO 81230

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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