

Legislative Counsel Bureau

Legislative Commission's Subcommittee to Study Water



Bulletin No. 17-7

Created by Nevada Revised Statutes 218E.200.

January 2017

**LEGISLATIVE COMMISSION'S SUBCOMMITTEE
TO STUDY WATER**

BULLETIN NO. 17-7

JANUARY 2017

TABLE OF CONTENTS

	<u>Page</u>
Summary of Recommendations	iii
Report to the Legislative Commission by the Legislative Commission's Subcommittee to Study Water	1
I. Introduction	1
II. Background	2
A. Overview of Nevada Water Law	2
B. Role of the State Engineer	3
C. Role of the Legislature	4
D. Water Resource Challenges.....	4
III. Major Issues Resulting in Recommendations for Legislation or Other Subcommittee Action	5
A. Cloud Seeding.....	5
B. Domestic Wells and Use	6
C. Groundwater Basin Management	7
IV. Concluding Remarks	9
V. Appendices	11

SUMMARY OF RECOMMENDATIONS

LEGISLATIVE COMMISSION'S SUBCOMMITTEE TO STUDY WATER

Nevada Revised Statutes (NRS) 218E.200

This summary presents the recommendations approved by the Legislative Commission's Subcommittee to Study Water during the 2015–2016 Legislative Interim at the Subcommittee's final meeting held on August 26, 2016, in Carson City, Nevada. The bill draft requests (BDRs) will be forwarded to the Legislative Commission for transmittal to the 79th Session of the Nevada Legislature in 2017.

RECOMMENDATIONS FOR LEGISLATION

1. Request the drafting of a bill to expand the allowable uses of the existing grant program for water projects (NRS 349.980, et seq.), otherwise known as the “AB 198 Grant Program” (Assembly Bill 198 [Chapter 559, *Statutes of Nevada 1991*]), to include a cloud seeding program as an allowable use of grant funds and to allow the Board for Financing Water Projects, Division of Environmental Protection, State Department of Conservation and Natural Resources (SDCNR), to receive gifts, grants, and donations. **(BDR 30–356)**
2. Request the drafting of a bill to provide that at times of curtailment by priority by the Office of the State Engineer, Division of Water Resources, SDCNR, only withdrawals from domestic wells for outdoor water use are curtailed, with an excepted allowance for outdoor watering of pets and livestock. **(BDR 48–357)**
3. Request the drafting of a bill to provide that in severely over-appropriated basins and designated critical management areas, the Office of the State Engineer limit withdrawals from new domestic wells to 0.5 acre-feet annually. The limitation is only applicable to new wells and is not applicable to currently existing domestic wells or to existing domestic wells that require rehabilitation, refurbishment, or replacement. **(BDR 48–358)**
4. Request the drafting of a bill to require the claimant of a pre-statutory water right to submit proof of the claim to the Office of the State Engineer on or before December 31, 2025, regardless of whether an adjudication has been ordered for a water source. If the claimant fails to submit such proof, the claim is deemed to be abandoned. **(BDR 48–359)**
5. Request the drafting of a bill that clarifies management tools that may be approved by the Office of the State Engineer in a Groundwater Management Plan (GMP) submitted for a basin designated as a critical management area. The bill also clarifies that an approved GMP applies to all water users in a basin. **(BDR 48–367)**

**RECOMMENDATIONS FOR POSITION STATEMENTS
IN FINAL SUBCOMMITTEE REPORT**

6. Include a position statement in the final report to acknowledge surface water and groundwater connectivity and the need for the Office of the State Engineer to utilize conjunctive management of surface water and groundwater resources where connected.
7. Include a position statement in the final report recommending a statewide Nevada water future discussion and encouraging the Executive Branch of State government, the Nevada Legislature, local governments, the business community, the environmental community, and the public to come together to discuss Nevada's water future and develop a Nevada water future strategy. Encourage utilization of the work of the Subcommittee, the Governor's Drought Summit, and the Nevada Drought Forum as a foundation for a meaningful statewide water future discussion and strategy.
8. Include a position statement in the final report calling for local government land use plans to be based on identified sustainable water resources.

**REPORT TO THE LEGISLATIVE COMMISSION
BY THE LEGISLATIVE COMMISSION'S
SUBCOMMITTEE TO STUDY WATER**

I. INTRODUCTION

As the most arid state in the nation, Nevada has always faced challenges managing its valuable water resources. Other western states share many similar issues; however, Nevada's tremendous population growth over the past decades, coupled with an unusually severe and ongoing drought, poses special challenges. In recognition of the importance of water resources in Nevada, the Legislative Commission's Subcommittee to Study Water was established by the Legislative Commission at its meeting on October 27, 2015, and charged with the task of studying water resource issues in Nevada during the 2015–2016 Interim. Senator Pete Goicoechea was appointed Chair of the Subcommittee. At its meeting on December 21, 2015, the Legislative Commission appointed four additional members (one member from each caucus) to the Subcommittee.

Members of the Subcommittee during the 2015–2016 Interim included the following legislators:

Senator Pete Goicoechea, Chair
Assemblyman James Oscarson, Vice Chair
Senator Aaron D. Ford
Senator Joseph (Joe) P. Hardy, M.D.
Assemblywoman Maggie Carlton

Legislative Counsel Bureau (LCB) staff services for the Subcommittee were provided by:

Alysa M. Keller, Senior Research Analyst, Research Division
Heidi A. Chlarson, Principal Deputy Legislative Counsel, Legal Division
Erin Roohan, Deputy Legislative Counsel, Legal Division
Natalie J. Pieretti, Senior Research Secretary, Research Division

The Subcommittee held six meetings during the 2015–2016 Interim. Three meetings were held in rural areas of the State (Dyer, Pahrump, and Winnemucca). Three meetings were held in urban areas of the State (Carson City and Las Vegas [2]).

In compliance with its broad directive, the Subcommittee considered a wide range of topics relating to water resources, including challenges concerning over-appropriated groundwater basins, water law, data, and studies. The Subcommittee received testimony from Nevada's State Engineer and the public at each of its meetings. The Subcommittee also spent a significant portion of each meeting receiving testimony from representatives of regional water authorities and private and citizen organizations. A summary of presenters and links to each

meeting is attached as **Appendix B** on page 17. More information on the Subcommittee’s activities, including minutes, recordings, and copies of the presentations and other exhibits, may be accessed on the Subcommittee’s website at: <https://www.leg.state.nv.us/App/InterimCommittee/REL/Interim2015/Committee/401>.

The Subcommittee received numerous recommendations from presenters and the public at its first five meetings, and on July 27, 2016, the Chair requested additional written recommendations be submitted to the Subcommittee prior to its final meeting. Written recommendations received and considered by the Subcommittee at its work session are included in the Work Session Document (WSD) available at: <https://www.leg.state.nv.us/App/InterimCommittee/REL/Interim2015/Meeting/4728>. Copies of written recommendations referenced in this report are included as **Appendix C** on page 21. At its work session in Carson City on August 26, 2016, the Subcommittee approved five recommendations to draft legislation and three recommendations to include position statements in the final report of the Subcommittee. The topics of recommendations approved by the Subcommittee include:

- Cloud seeding;
- Domestic wells and use; and
- Tools for groundwater basin management.

II. BACKGROUND

A. Overview of Nevada Water Law

Like 17 other western states, Nevada has adopted the prior appropriation doctrine. The prior appropriation doctrine was first developed in the nineteenth century in response to the water needs of mining and agricultural irrigation—uses that were often not located near surface waters. The Rule of Priority under the prior appropriation doctrine provides that “first in time is first in right” in Nevada. Another cornerstone of the prior appropriation doctrine is beneficial use as “the basis, the measure and the limit of the right to use water.” The beneficial use requirement means that water must actually be put to use for such recognized beneficial uses as: commercial, industrial, irrigation, mining, municipal, power generation, recreation, stockwatering, storage, or wildlife. If the water is not put to beneficial use, the right to such water is lost.

The basic statutory principles of Nevada water law in use today were adopted in 1913. Virtually all of the surface waters in Nevada are fully appropriated and administered in accordance with civil, federal, or State decrees. Nevada began regulating groundwater in 1939, much earlier than other western states, although groundwater development was very limited until the 1960s. New growth in the State—be it agricultural, commercial, industrial,

mining, or residential—generally looks to unappropriated groundwater or to changes in use of existing water rights.

Water rights may be acquired by: (1) adjudicating a right beneficially used prior to the enactment of water law (known as “vested” rights); or (2) applying to the State Engineer for a permit to appropriate unallocated water and perfecting the right by putting the water to beneficial use (known as “certificated” or “perfected” rights).

Nevada’s water law is set forth in Chapters 533 (“Adjudication of Vested Water Rights; Appropriation of Public Waters”) and 534 (“Underground Water and Wells”) of *Nevada Revised Statutes* (NRS). Over the years, the Legislature, numerous court decisions, and orders of the State Engineer have refined the law, and it is now considered one of the most comprehensive water laws in the West.

B. Role of the State Engineer

The Office of the State Engineer, created in 1903, is responsible for the administration of Nevada water law. The State Engineer is also the executive head of the Division of Water Resources in the State Department of Conservation and Natural Resources (SDCNR). The State Engineer is appointed by the Director of the SDCNR who is appointed by the Governor. The State Engineer determines the rights of claimants to water, the use to which water may be put, the quantity of water reasonably required for beneficial use, and where water may be used. Appeals from decisions of the State Engineer are heard by the State district courts. Federal courts also have jurisdiction over certain water resource decisions, such as federal decrees, interstate disputes, and other adjudications.

In addition to appropriation, distribution, and adjudication of water resources in the State, the State Engineer is responsible for:

- Quantifying existing water rights;
- Monitoring water use and maintaining related data and records;
- Processing reports of conveyances (transferring ownership of water rights);
- Reviewing recharge projects;
- Overseeing State and civil decrees and assisting in federal decrees;
- Reviewing water availability for new subdivisions;
- Overseeing dam safety;
- Appropriating geothermal water;

- Licensing and regulating well drillers and water rights surveyors;
- Reviewing flood control projects;
- Coordinating water planning and conservation plans; and
- Providing technical assistance to the public and governmental agencies.

C. Role of the Legislature

The Nevada Legislature enacted statutes related to water as early as 1866. In 1913, the water laws were rewritten, and the resulting principles continue to form the basis for Nevada's water law.

The Legislature has made several changes to Nevada water law over time and has conducted the following interim studies regarding the State's water resources:

- *The Beneficial Use of Water in Nevada*, LCB Bulletin No. 35 (1959);
- *Regional Water and Sewer in Washoe County*, LCB Bulletin No. 77-14 (1976);
- *Water Problems in the State*, LCB Bulletin No. 81-5 (1980);
- *Regional Water Authorities and Other Water Issues*, LCB Bulletin No. 85-10 (1984);
- *Study of the Laws, Regulations and Policies Relating to Water and Waste Water Resources in Nevada*, LCB Bulletin No. 91-8 (1990);
- *Study of the Use, Allocation and Management of Water*, LCB Bulletin No. 95-4 (1994); and
- *Use, Management, and Allocation of Water Resources*, LCB Bulletin No. 07-11 (2007).

D. Water Resource Challenges

Nevada's population growth, increasing urbanization, and ongoing drought is putting greater and greater demands on the limited water resources within the State. Communities throughout Nevada are working to find a balance between growth and limited water resources. Conversions of water rights from agricultural to municipal use present challenges for rural communities, and potential transfers of water from one basin or county to another have become matters of statewide interest. Since most surface waters in the State were put to use before the twentieth century and Nevada's allocation of Colorado River water is a mere 300,000 acre-feet per year, determining the sustainability of groundwater sources is a critical concern. Nevada's

groundwater is divided into 256 hydrographic basins. More than 20 percent of Nevada's groundwater basins are considered severely over-appropriated by the State Engineer.

As in other western states, the cumulative impact of domestic wells on groundwater supplies is an ongoing concern in some areas of the State. Domestic wells do not require a water right permit from the State Engineer but are deemed by Nevada law to be a "protectable interest" and are allowed to use up to 2 acre-feet of water annually. Drought and growth have combined to create increasingly contentious water resource issues related to domestic wells.

III. MAJOR ISSUES RESULTING IN RECOMMENDATIONS FOR LEGISLATION OR OTHER SUBCOMMITTEE ACTION

At its final meeting and work session on August 26, 2016, the Legislative Commission's Subcommittee to Study Water considered a total of 20 proposed actions for legislation, letters, or statements in the final report. For more information regarding all recommendations considered by the Subcommittee at its final meeting, please see the WSD at: <https://www.leg.state.nv.us/App/InterimCommittee/REL/Interim2015/Meeting/4728>. The sources of the proposed actions include suggestions received during testimony at the first five Subcommittee meetings and in writing prior to the work session.

A. Cloud Seeding

Recommendation No. 1

Testimony provided by the Humboldt River Basin Water Authority (HRBWA) at the March 9, 2016, meeting of the Subcommittee in Winnemucca, Nevada, indicated that although the State of Nevada provided significant funding for cloud seeding programs for more than 30 years (from the early 1980s through 2008), funding was suspended during the budget crisis and the programs have not been funded by the State since 2008. Testimony indicated cloud seeding can provide a variety of benefits to Nevada including drought resiliency and drought recovery; improved vegetation for the Bi-State and Greater Sage Grouse populations in Nevada; reductions in the risk of catastrophic wildfire; enhanced snowpack to support winter sports; enhanced runoff to support recreation on Nevada's rivers and streams; and the possibility of enhanced water supply to meet the demands of a growing population throughout Nevada. (See [HRBWA Estimated Costs of Proposed Cloud Seeding](#) and **Appendix C** on page 25 of this bulletin.)

Therefore, the Subcommittee voted to:

- **Request the drafting of a bill to expand the allowable uses of the existing grant program for water projects (NRS 349.980, et seq.), otherwise known as the "AB 198 Grant Program" (Assembly Bill 198 [Chapter 559, *Statutes of Nevada 1991*]), to include a cloud seeding program as an allowable use of grant funds and to allow the**

Board for Financing Water Projects, Division of Environmental Protection, State Department of Conservation and Natural Resources (SDCNR), to receive gifts, grants, and donations. (BDR 30–356)

B. Domestic Wells and Use

Recommendation No. 2

Issues regarding domestic wells and use were discussed at several meetings of the Subcommittee, including the March 9 meeting in Winnemucca, the June 7 meeting in Dyer, Nevada, and especially the July 11 meeting in Pahrump, Nevada. Testimony indicated that at times of curtailment by priority by the State Engineer, many domestic wells would be entirely curtailed. The priority date of a domestic well is the date of completion of the well. Therefore, in many areas, domestic wells have a junior priority and would be the first to be curtailed by priority. The State Engineer expressed concern regarding domestic well users being deprived of all water under such scenario and submitted a written recommendation for the Subcommittee to consider legislation allowing continued indoor use of water from domestic wells in times of curtailment by priority. (See [State Engineer Recommendation](#) and **Appendix C** on page 29 of this bulletin.) The Nye County Water District (NCWD) requested that there be an exception allowed for outdoor watering of pets and livestock. (See [NCWD Recommendation](#) and **Appendix C** on page 31 of this bulletin.)

Therefore, the Subcommittee voted to:

- **Request the drafting of a bill to provide that at times of curtailment by priority by the Office of the State Engineer, Division of Water Resources, SDCNR, only withdrawals from domestic wells for outdoor water use are curtailed, with an excepted allowance for outdoor watering of pets and livestock. (BDR 48–357)**

Recommendation No. 3

Additional testimony indicated that, as populations continue to grow, the proliferation of domestic wells is raising concerns about the cumulative effect of such water use in certain areas of the State. At the July 11 meeting in Pahrump and in writing, the NCWD asked the Subcommittee to consider legislation allowing withdrawals from new domestic wells to be limited. (See [NCWD Recommendation](#) and **Appendix C** on page 31 of this bulletin.)

Therefore, the Subcommittee voted to:

- **Request the drafting of a bill to provide that in severely over-appropriated basins and designated critical management areas, the Office of the State Engineer limit withdrawals from new domestic wells to 0.5 acre-feet annually. The limitation is only applicable to new wells and is not applicable to currently existing domestic wells or to**

existing domestic wells that require rehabilitation, refurbishment, or replacement. (BDR 48–358)

C. Groundwater Basin Management

Recommendation No. 4

Testimony received at several meetings of the Subcommittee emphasized that, in order to properly manage the State’s water resources, the State Engineer must have an accurate accounting of existing water rights in each basin. Recommendations received by the Central Nevada Regional Water Authority (CNRWA) at the April 22 meeting in Las Vegas, Nevada, and in writing discussed the importance of obtaining an accurate accounting of vested (pre-statutory) water rights throughout the State. (See [CNRWA Recommendation](#) and **Appendix C** on page 35 of this bulletin.)

Therefore, the Subcommittee voted to:

- **Request the drafting of a bill to require the claimant of a pre-statutory water right to submit proof of the claim to the Office of the State Engineer on or before December 31, 2025, regardless of whether an adjudication has been ordered for a water source. If the claimant fails to submit such proof, the claim is deemed to be abandoned. (BDR 48–359)**

Recommendation No. 5

At several meetings of the Subcommittee, testimony indicated that a statutory framework was required to provide local stakeholders the ability to use creative tools to bring a groundwater basin back in balance and adopt a Groundwater Management Plan (GMP), which could be approved by the Office of the State Engineer. The State Engineer indicated at each meeting that, although the development of a GMP is authorized in statute, it is unclear what tools may be utilized by the stakeholders, and approved by the State Engineer, to bring the groundwater basin back to a sustainable level. The State Engineer and others emphasized the need for maximum flexibility regarding tools which may be utilized in a GMP. (See [State Engineer Memorandum](#) and **Appendix C** on page 39 of this bulletin.) The Diamond Valley Groundwater Management Plan Advisory Board (DVGMPAB) submitted a written recommendation for proposed language to clarify the tools available for development and implementation of a GMP. (See [DVGMPAB Recommendation](#) and **Appendix C** on page 49 of this bulletin.)

Therefore, the Subcommittee voted to:

- **Request the drafting of a bill that clarifies management tools that may be approved by the Office of the State Engineer in a GMP submitted for a basin designated as a**

critical management area. The bill also clarifies that an approved GMP applies to all water users in a basin. (BDR 48–367)

Recommendation No. 6

Testimony indicated that, although NRS addresses surface water and groundwater under separate chapters—Chapters 533 and 534 of NRS—the two resources are often hydrologically connected. The State Engineer emphasized at several meetings of the Subcommittee that this connection must be acknowledged to allow his office to conjunctively manage surface and groundwater resources. (See [State Engineer Memo](#) and **Appendix C** on page 21 of this bulletin.)

Therefore, the Subcommittee voted to:

- **Include a position statement in the final report to acknowledge surface water and groundwater connectivity and the need for the Office of the State Engineer to utilize conjunctive management of surface water and groundwater resources where connected.**

Recommendation No. 7

According to testimony provided by the CNRWA, Nevada is facing both a short-term and long-term water supply crisis. A limited and possibly diminishing water supply is a critical issue for Nevada’s economic well-being, valued quality of life, and natural environment. Testimony indicated that Nevada is the most arid state in the country and that the Colorado River Basin and the Great Basin have experienced severe drought over the last decade. Further, the Subcommittee heard about concern for a number of Nevada communities that do not have an identified, sustainable water supply within their control to accommodate projected population growth over the next 30 years. A written recommendation was submitted by the CNRWA to encourage a statewide water future discussion and strategy. (See [CNRWA Recommendation](#) and **Appendix C** on page 21 of this bulletin.)

Therefore, the Subcommittee voted to:

- **Include a position statement in the final report recommending a statewide Nevada water future discussion and encouraging the Executive Branch of State government, the Nevada Legislature, local governments, the business community, the environmental community, and the public to come together to discuss Nevada’s water future and develop a Nevada water future strategy. Encourage utilization of the work of the Subcommittee, the Governor’s Drought Summit, and the Nevada Drought Forum as a foundation for a meaningful statewide water future discussion and strategy.**

Recommendation No. 8

The CNRWA also testified that an important issue facing the State is local government land use plans that require water resources in excess of the available water supply in the region and that have been developed without proper consideration of the amount and source of water necessary to implement the plans. (See [CNRWA Recommendation](#) and **Appendix C** on page 21 of this bulletin.)

Therefore, the Subcommittee voted to:

- **Include a position statement in the final report calling for local government land use plans to be based on identified sustainable water resources.**

IV. CONCLUDING REMARKS

The members of the Subcommittee would like to take this opportunity to thank the representatives from regional water authorities; State and local government; private organizations; citizens; and all other participants in this interim's hearings. The Subcommittee appreciates the important information regarding Nevada's water resources provided by the many talented and knowledgeable people who testified at its meetings.

V. APPENDICES

	<u>Page</u>
Appendix A	
<i>Nevada Revised Statutes</i> 218E.200	13
Appendix B	
Summary of Presenters and Links to Meetings	17
Appendix C	
Referenced Written Recommendations	21
Appendix D	
Suggested Legislation	51

APPENDIX A

Nevada Revised Statutes 218E.200

Nevada Revised Statutes 218E.200

NRS 218E.200 Power to conduct studies and investigations; establishment of subcommittees and interim or special committees; designation of members; compensation, allowances and expenses of members.

1. The Legislative Commission may conduct studies or investigations concerning governmental problems, important issues of public policy or questions of statewide interest.
2. The Legislative Commission may establish subcommittees and interim or special committees as official agencies of the Legislative Counsel Bureau to conduct such studies or investigations or otherwise to deal with such governmental problems, important issues of public policy or questions of statewide interest. The subcommittees and interim or special committees may exercise any of the investigative powers set forth in [NRS 218E.105](#) to [218E.140](#), inclusive.
3. The membership of the subcommittees and interim or special committees:
 - (a) Must be designated by the Legislative Commission; and
 - (b) May consist of members of the Legislative Commission and Legislators other than members of the Legislative Commission, employees of the State of Nevada or citizens of the State of Nevada.
4. For each day or portion of a day during which members of the subcommittees and interim or special committees who are not Legislators attend meetings or are otherwise engaged in the business of the subcommittees and interim or special committees, the members:
 - (a) Shall serve without salary.
 - (b) Are entitled to receive out of the Legislative Fund the per diem allowances and travel expenses provided for state officers and employees generally.
5. Except during a regular or special session, for each day or portion of a day during which members of the subcommittees and interim or special committees who are Legislators attend meetings of the subcommittees and interim or special committees or are otherwise engaged in the business of the subcommittees and interim or special committees, the members are entitled to receive out of the Legislative Fund:
 - (a) The compensation provided for a majority of the Legislators during the first 60 days of the preceding regular session;
 - (b) The per diem allowance provided for state officers and employees generally; and
 - (c) The travel expenses provided pursuant to [NRS 218A.655](#).

[10:134:1953]—(NRS A 1957, 386; 1961, 253; 1963, 1014; 1965, 1455; 1971, 2206; 1973, 119, 1118; 1975, 296; [1979, 612](#); [1985, 399](#); [1989, 1218](#), [1493](#); [1993, 2250](#); [2011, 3216](#); [2013, 3745](#))—(Substituted in revision for part of NRS 218.682)

APPENDIX B

Summary of Presenters and Links to Meetings

SUMMARY OF PRESENTERS AND LINKS TO MEETINGS

During the interim, the Legislative Commission's Subcommittee to Study Water received presentations regarding regional and statewide water resource issues from individuals, agencies, and organizations. In addition to public comments, the Subcommittee received presentations from the following individuals:

February 8, 2016—Las Vegas

- Jason King, P.E., State Engineer, Division of Water Resources (DWR), State Department of Conservation and Natural Resources (SDCNR);
- David Berger, Associate Director, Nevada Water Science Center, United States Geological Survey, U.S. Department of the Interior; and
- Gordon H. DePaoli, Shareholder, Woodburn and Wedge.

March 9, 2016—Winnemucca

- Mike L. Baughman, Ph.D., CECd, Executive Director, Humboldt River Basin Water Authority;
- Dana R. Bennett, Ph.D., President, Nevada Mining Association;
- Bennie Hodges, Manager, Pershing County Water Conservation District;
- Samuel J. Rouston, Vice President for Corporate and Legal Affairs, Winnemucca Farms;
- Joe Ratliff, Grass Valley Domestic Well Owner; and
- Jason King, P.E., State Engineer, DWR, SDCNR.

April 22, 2016—Las Vegas

- John J. Entsminger, General Manager, Southern Nevada Water Authority and Las Vegas Valley Water District;
- Jayne Harkins, P.E., Executive Director, Colorado River Commission of Nevada;
- Kevin Brown, General Manager, Virgin Valley Water District;
- Steve Bradhurst, Executive Director, Central Nevada Regional Water Authority;
- John A. Erwin, Director of Natural Resources Planning and Management, Truckee Meadows Water Authority;

- Susan Lynn, Senior Advisor, Great Basin Water Network; and
- Jason King, P.E., State Engineer, DWR, SDCNR.

June 7, 2016—Dyer

- Joy Morris, Program Director, Walker Basin Restoration Program, National Fish and Wildlife Foundation;
- Mike Young, Professor, The University of Adelaide, Australia;
- Jake Tibbitts, Natural Resources Manager, Department of Natural Resources, Eureka County;
- Edwin James, P.E., General Manager, Carson Water Subconservancy District;
- Brad M. Johnston, Attorney, Johnston Law Offices;
- John Maurer, President, Board of Directors, Valley Electric Association, Inc.; and
- Jason King, P.E., State Engineer, DWR, SDCNR.

July 11, 2016—Pahrump

- Frank Maurizio, President, Private Well Owners Cooperative of Nye County;
- Wendy Barnett, President, Utilities, Inc. of Central Nevada;
- Gregory T. Hafen, II General Manager, Pahrump Utility Company, Inc.;
- Nye County Water District;
- Robert F. Harrington, Ph.D., Director, Inyo County Water Department;
- Jason King, P.E., State Engineer, DWR, SDCNR.

August 26, 2016—Carson City

Work Session (No Presentations)

APPENDIX C

Referenced Written Recommendations

REFERENCED WRITTEN RECOMMENDATIONS

1. Humboldt River Basin Water Authority Estimated Costs of Proposed Cloud Seeding	25
2. State Engineer Recommendation.....	29
3. Nye County Water District Recommendation	31
4. Central Nevada Regional Water Authority Recommendation	35
5. State Engineer Memorandum.....	39
6. Diamond Valley Groundwater Management Plan Advisory Board Recommendation	49

Humboldt River Basin Water Authority
c/o Intertech Services Corporation
P.O. Box 2008
Carson City, Nevada 89702

Elko County
Eureka County
Humboldt County
Lander County
Pershing County

July 6, 2016

Senator Pete Goicoechea
Chairman
Nevada Legislative Commission's Subcommittee to Study Water
Legislative Building
401 S. Carson Street
Carson City, Nevada 89701-4747

Sent Via Email

RE: Submission of Estimated Costs of Proposed Cloud Seeding Operations for Various Locations in Nevada

Dear Senator Goicoechea:

On behalf of the five-county Humboldt River Basin Water Authority (HRBWA) and various other cloud-seeding stakeholders in Nevada and in response to a request to me by Senator Ford during the March 9, 2016 Legislative Commission's Subcommittee to Study, I am pleased to estimated costs of proposed cloud seeding operations for various locations in Nevada. As indicated during my testimony before the Subcommittee on March 9, 2016, HRBWA is being joined by the Southern Nevada Water Authority, Truckee Meadows Water Authority, Carson Water Subconservancy District, Walker River Irrigation District, Truckee-Carson Irrigation District, Pershing County Water Conservation District and the Central Nevada Water Authority in asking that the Subcommittee submit a bill draft request seeking a legislative n appropriation to fund a comprehensive program of cloud seeding during the 2017 and 2018 winters.

Since the Subcommittee's March 9, 2016 meeting, representatives of the aforementioned stakeholders have met via teleconference to discuss continuing support for cloud seeding and

areas in Nevada at which cloud seeding operations should be conducted. This information was provided to staff of the Desert Research Institute (DRI) which were asked to develop a summary proposal and estimate of costs for conducting such operations during the winters of 2017 and 2018. As a result, DRI has developed the document which is attached to this memorandum entitled, ***“Preliminary Proposal and Scope of Work for a Cloud Seeding Project for the State of Nevada for WY2017 – WY2018”***. The DRI proposal envisions installing, operating and maintaining 19 fully automated silver iodide ground-based generators and 7 fully automated liquid propane generators at sites within the following areas: Ruby Mountains, Upper Walker River watershed, Upper Truckee River/Lake Tahoe watershed; the Toiyabe Range; Mt. Charleston; the Tuscarorra area and the Lower Humboldt River Basin. In addition, DRI suggests cloud seeding by aircraft occur in the Ruby Mountains; Upper Walker River Basin; the Upper Carson River Basin; and the Upper Truckee River and Lake Tahoe basins. Collectively, **DRI estimates that cloud seeding using the techniques and in the areas outlined above will cost an estimated \$1,140,000.00 per year or \$2,280,000.00 over the FY 17-18 biennium. DRI estimates that the proposed program of cloud seeding would produce water augmentation yields ranging from an absolute minimum of 32,130 acre-feet to an absolute maximum of 189,027 acre-feet, with an estimated median water augmentation of 106,300 acre-feet. Based upon data in Table 1 of the aforementioned DRI document, the estimated median cost of the additional snow water resulting from the DRI proposed cloud seeding program ranges from a low of \$7.27 per acre foot to \$17.86 per acre foot.** DRI’s use of fully automated ground-based generators is unquestionably state of the art and is proven effective. Such fully automated systems are critical for use in areas such as the high Sierra Mountains where access to generator sites in the winter can be very difficult.

Where water is being used primarily for irrigation, the affordability of water, particularly given the variability in the amounts and distribution of snow water created, require that cloud seeding costs be minimized relative to potential benefits. The State of Utah has instituted a comprehensive program of cloud seeding comprising in excess of 140 manually operated ground-based generators located at many locations along the Wasatch Mountains. These generators are typically operated and maintained by volunteers or paid part-time staff recruited from among benefitting stakeholders such as irrigation districts, ski resorts, or small communities. Generators in Utah are typically located in areas easily accessible during the winter months.

If water users and other beneficiaries in the Humboldt River Basin are to secure the benefits of cloud seeding relative to the uncertainties of how much additional snow water is created and the distribution of same, it is imperative that the costs per acre foot be as low as possible. Accordingly, the HRBWA has obtained a feasibility study and costs for a program of cloud seeding modeled after that in Utah from North American Weather Consultants (NAWC) a primary cloud seeding contractor in Utah and several other western states. I have attached the NAWC document which is entitled ***“Updated Preliminary Feasibility Study and Cost Estimates for a Possible Winter Cloud Seeding Program in the Humboldt River Basin, Nevada”***. The NAWC cloud seeding program would involve 50 manually operated ground based generators located in the following areas of the Humboldt River Basin:

- Independence Range

- Ruby Mountains
- Toiyabe Range
- Santa Rosa Range
- Sonoma Range
- Humboldt Range
- Diamond Mountains (just outside of the Humboldt River Basin)

NAWC estimates the cost of installing and operating the 50 manually operated ground based generators located at sites in the areas listed above to be on the order of \$487,000.00 per year or \$974,000.00 over the FY 17-18 biennium. NAWC further estimates that the aforementioned 50 generators would produce 153,220 acre feet of additional snow water each year. As shown in Table 3 of the aforementioned NAWC feasibility study, the firm has estimated the cost of additional water generated to range from \$2.11 to \$3.33 per acre foot. Again, these costs are for a manually operated, ground based collection of generators.

As I described during my testimony before the Subcommittee on March 9, 2016, cloud seeding provides a variety of benefits to Nevada including drought resiliency and drought recovery; improved vegetation for the Bi-State and Greater Sage Grouse populations in Nevada; reductions in the risk of catastrophic wildfire; enhanced snowpack to support winter sports; enhanced runoff to support recreation on Nevada's rivers and streams; and the possibility of enhanced water supply to meet the demands of a growing population throughout Nevada.

Finally, please recall that the State of Nevada provided significant funding for cloud seeding in the state for over 30 years, ending such funding in 2008 during the height of the recession. The Humboldt River Basin Water Authority and other cloud seeding stakeholders would greatly encourage and appreciate the Legislative Commission's Subcommittee to Study Water requesting a bill draft seeking a legislative appropriation to fund a comprehensive program of cloud seeding during the 2017 and 2018 winters.

During our teleconference discussions, the aforementioned cloud seeding stakeholders discussed various approaches to funding cloud seeding in Nevada. One option would be to provide an appropriation for all or a portion (for example 75 percent) of two years' worth of cloud seeding costs to the Department of Conservation and Natural Resources, which pursuant to existing statutory authority under NRS 544, Weather Modification, could develop and operate a matching grant program (requiring at least a 25 percent match) to which local stakeholders could apply for funds to undertake cloud seeding programs in various areas of Nevada. Alternatively, legislation could be requested to expand the allowable uses of the existing grant program for water projects (NRS 349.980 et seq.) otherwise known as the AB 198 Grant Program to include a program of cloud seeding as an allowable use of said grant funds.

Unfortunately, due to a prior commitment, I will be unable to attend the Subcommittee's work session on August 26, 2016. I would however, be available by phone to answer questions the

RECOMMENDATION FOR POSSIBLE CONSIDERATION BY THE LEGISLATIVE COMMISSION'S SUBCOMMITTEE TO STUDY WATER DOMESTIC WELL USE IN TIMES OF CURTAILMENT

The recommendation is to change the current statutory requirement regarding the regulation of water from domestic wells in groundwater basins being regulated by priority. The intent of this recommendation is to protect the health, safety and welfare of homeowners by curtailing **ONLY** outdoor water use. It is proposed that in-house water use **NOT** be curtailed during times of regulation.

The priority of domestic wells is found in NRS 534.080(4):

“(a) The date of priority for the use of underground water from a well for domestic purposes where the draught does not exceed 2 acre-feet per year is the date of completion of the well as recorded by the well driller on the log the well driller files with the State Engineer pursuant to NRS 534.170; or
(b) Demonstrated through any other documentation or evidence specified by the State Engineer. “

As such, the vast majority of domestic wells drilled in the state are junior-in-time to senior rights in the respective basins. If regulation by priority is ordered, the domestic well use would be among the first to be curtailed.

Under current law, NRS 534.110(6) provides that:

“except as provided in subsection 7, the State Engineer shall conduct investigations in any basin or portion thereof where it appears that the average annual replenishment to the groundwater supply may not be adequate for the needs of all permittees and all vested-right claimants, and if the findings of the State Engineer so indicate, the State Engineer may order that withdrawals, **including, without limitation, withdrawals from domestic wells, be restricted to conform to priority rights.**”

Additionally, curtailment of domestic wells shows up in subsection 7 that provides for designating a groundwater basin as a critical management area:

“...any basin in which withdrawals of groundwater consistently exceed the perennial yield of the basin ... and that if a basin has been designated as a critical management area for at least 10 consecutive years, the State Engineer shall order that withdrawals, **including, without limitation, withdrawals from domestic**

wells, be restricted in that basin to conform to priority rights, unless a groundwater management plan has been approved for the basin pursuant to NRS 534.037.”

Does the recommendation revise one or more current *Nevada Revised Statutes* (NRS)? If “Yes,” please provide the reference to the NRS citation(s) affected by the recommendation, if known.

Yes, 534.110(6) and 534.110(7).

Potential draft language:

NRS 534.110 Rules and regulations of State Engineer; statements and pumping tests; conditions of appropriation; designation of critical management areas; restrictions.

6. Except as otherwise provided in subsection 7, the State Engineer shall conduct investigations in any basin or portion thereof where it appears that the average annual replenishment to the groundwater supply may not be adequate for the needs of all permittees and all vested-right claimants, and if the findings of the State Engineer so indicate, the State Engineer may order that withdrawals, including, without limitation, withdrawals from domestic wells, be restricted to conform to priority rights. [The curtailment of domestic wells only extends to outside water use.](#)

7. The State Engineer:

(a) May designate as a critical management area any basin in which withdrawals of groundwater consistently exceed the perennial yield of the basin.

(b) Shall designate as a critical management area any basin in which withdrawals of groundwater consistently exceed the perennial yield of the basin upon receipt of a petition for such a designation which is signed by a majority of the holders of certificates or permits to appropriate water in the basin that are on file in the Office of the State Engineer.

Ê The designation of a basin as a critical management area pursuant to this subsection may be appealed pursuant to [NRS 533.450](#). If a basin has been designated as a critical management area for at least 10 consecutive years, the State Engineer shall order that withdrawals, including, without limitation, withdrawals from domestic wells, be restricted in that basin to conform to priority rights, unless a groundwater management plan has been approved for the basin pursuant to [NRS 534.037](#). [If curtailment is ordered, the curtailment of domestic wells only extends to outside water use.](#)

What group or person is making the recommendation?

Nevada State Engineer Jason King

What is the name and contact information of the person who can provide additional information for the recommendation, if necessary?

Jason King, jking@water.nv.gov, 775-684-2861

To:
Legislative Subcommittee to Study Water
Senator Pete Goicoechea, Chair

Regarding proposed changes in statute(s) for regulation of domestic wells

The Nye County Water District is currently working on a Pahrump Basin 162 Groundwater Management Plan which, in part, includes a domestic well component. The Pahrump basin currently has more than 11,000 domestic wells and the basin has sufficient parcels to drill an additional 8,500. This discussion centers on priority doctrine, curtailment and limitations on future domestic wells in the Pahrump basin.

First: Based on the fact that a domestic well a.) Has a priority date and b.) Under priority doctrine is subject to curtailment (NRS 534.110.6); the overwhelming majority of domestic wells in the Pahrump basin are junior in priority. The Nye County Water District is confident that we can all agree that no person in their right mind would completely deny access to water from more than 11,000 existing domestic wells in the Pahrump basin. In context: This discussion centers on areas where a public water system does not exist, or by extension is disproportionately expensive for the individual to connect to a public water system.

Second: The Pahrump Groundwater Management Plan seeks to limit withdrawals from “new” domestic wells, as the local water resource is insufficient to support further drilling of domestic wells at 2 AF per in perpetuity. (The Pahrump Basin has a Perineal Yield of 20,000 AFA)

It is apparent that *existing* powers of the State Engineer [particularly with regard to regulation of domestic wells] remains the subject of confusion and debate. (A domestic well is defined in NRS 534.013)

We would respectfully request that the Subcommittee to Study Water receive clarification from the LCB regarding legislative intent on the appropriate statutes together with an AG’s opinion on the following:

- 1.) It is our understanding that the State Engineer currently has the power to completely curtail pumping of domestic wells under priority doctrine [emphasis on curtailment, priority doctrine and domestic well priority date]. (Reference to NRS 534.080.4(a)&(b), NRS 534.110.6, NRS 534.110.7(b) and NRS 534.037)
- 2.) Clarify if the State Engineer has the power to a.) Limit domestic well pumpage/duty to less than 2 AFA and b.) If so, does this constitute a “takings”? (Reference to NRS 534.120.1)
- 3.) Clarify if the State Engineer has the power to require meters on domestic wells. (NRS 534.180.4(a)(2) provides for limited powers to require meters)

Depending upon clarification of the existing powers of the State Engineer as outlined previously:

In reference to item 1.) Based on the fact that a domestic well a.) Has a priority date and b.) Under priority doctrine is subject to curtailment: It is of utmost importance to provide for an *exception to complete curtailment* of junior priority domestic wells if curtailment by priority was required in a groundwater basin. It is our understanding that the State Engineer would like to see the statutes amended to “*restrict outdoor use of domestic well water in times of curtailment*” [no curtailment of indoor use].

The Nye County Water District would respectfully request this exception be expanded to allow for the “*watering of pets and livestock*”. This is based on the fact that irrigation is the largest use of water; therefore curtailment of irrigation has the greatest impact to conservation efforts if curtailment by priority was required in a groundwater basin.

In reference to items 2 and 3.) Based on recommendations drafted in the Pahrump Basin 162 Groundwater Management Plan; we are requesting a provision in statute to “*limit withdrawals from “new” domestic wells to 0.5 AFA and meters be required on those domestic wells limited to 0.5 AFA*”.

In context: The Pahrump basin currently has more than 11,000 domestic wells and the basin has sufficient parcels to drill an additional 8,500. The Pahrump Groundwater Management Plan seeks to limit withdrawals from “new” domestic wells as the water resource is insufficient to support further drilling of domestic wells at 2 AF per in perpetuity. It is not our intent to request this amendment to statute for *all* domestic wells in Nevada. This amendment should only apply to severely over appropriated basins where steady water level decline is observed -and- where the data supports that the density/pumpage of domestic wells are a significant contributing factor to water level decline in a specific geographic area.

Further: How can the State Engineer manage groundwater withdrawals without the benefit of totalizer meter readings to determine pumpage? And by extension; how can local government participate in management of something we cannot quantify? At the moment DWR uses an actual pumpage *estimate* of 0.5 AF per domestic well for the Pahrump Basin. The State Engineer will be making decisions on management of the water resource without hard data, if we fail to face the metering issue.

The Nye County Water District would support an amendment to the statute(s) allowing for meters to be required on “new” domestic wells as outlined in the Pahrump Groundwater Management Plan. This amendment should only apply to severely over appropriated -and- over pumped basins where steady water level decline is observed -and- where the data supports that the density/pumpage of domestic wells are a significant contributing factor to water level decline in a specific geographic area.

List of attachments:

Backup showing references to statutes with regard to domestic wells

Note: The Pahrump Groundwater Management Plan with appendices can be accessed online at:
http://nyecountywaterdistrict.net/attachments/File/documents/GWMP_Draft_6__Stage_1__October_2015.pdf

Respectfully submitted by:

Nye County Water District
2101 E. Calvada Blvd., Ste. 100,
Pahrump, Nevada
89048

Contact Information

Oz Wichman, General Manager, Nye County Water District

Phone: 775-761-5307

Email: ohwichman@gmail.com

Dave Hall, Chair, Nye County Water District Governing Board

Phone: 775-764-0964

Email: davidt1147@gmail.com

August 4, 2016

Senator Pete Goicoechea, Chairman
Nevada Legislative Commission's Subcommittee to Study Water
Legislative Building
401 South Carson Street
Carson City, Nevada 89701-4747

Sent Via Email

RE: Response to Subcommittee to Study Water Solicitation of Recommendations for Possible Consideration at the Subcommittee's August 26, 2016 Meeting

Dear Senator Goicoechea:

The purpose of this letter is to respond to your July 27, 2016 request to interested parties for recommendations that might be considered at the August 26, 2016 Legislative Commission's Subcommittee to Study Water meeting in Carson City.

The Central Nevada Regional Water Authority would like to thank you and the Subcommittee for the opportunity to submit recommendations for consideration at the August 26th meeting.

The Authority's recommendations come from Authority positions taken over time, including the Authority's discussion and action on recommendations to the Subcommittee at the last two Authority meetings (March 18, 2016 and June 17, 2016). Each Authority recommendation will fall into one of three categories: 1) recommended legislation, 2) recommended position statement, and 3) recommended letter. The following are the Authority's recommendations to the Subcommittee:

A. Recommended Legislation:

1. Amend state water law to require the State Engineer to consider the possible connection between surface water and groundwater when making a decision on a water right application. Scientifically, there is no question that surface water and groundwater are a single source of water in many water basins. In addition, courts have linked surface water and groundwater in a number of cases. It is recommended state water law be amended to require the State Engineer make a finding when processing an application to appropriate water (groundwater or surface water) that the proposed use or change does not adversely affect the nearby surface water and groundwater source.
2. Senate Bill 485 in the 2015 Nevada Legislative Session should be passed in the 2017 Session. Senate Bill 485 in the 2015 Session pertains to the adjudication of vested water rights. SB 485 requires the claimant of a pre-statutory water right to submit proof of the claim to the State Engineer on or before December 31, 2025, regardless of whether an adjudication has been ordered for a water source. If the claimant fails to submit such

proof, the claim is deemed to be abandoned. SB 485 is needed since it will ensure in time that the State Engineer will have a correct accounting of groundwater and surface water rights in a basin, including vested water rights.

B. Recommended Position Statements:

1. Include a position statement in the final report that NRS 533.370 should not be amended to allow the State Engineer to approve a water right application that conflicts with an existing water right. Nevada water law has been guided by fundamental principles that have served the State well for more than 100 years. One of these principals involves the protection of a senior water right holder; that is, the first person to take a quantity of water from a water source for beneficial use – agricultural, industrial, quasi-municipal, etc. – has the right to continue to use that quantity of water for that purpose. And, subsequent users can take the remaining water for their own beneficial use provided they do not impinge on the rights of previous users. This principal – first in time, first in right – is the prior appropriation doctrine that serves as a critical component of western water law. NRS 533.370(2) says the State Engineer shall reject an application for water if any of the following occur: a) there is no unappropriated water in the proposed source of supply, b) the proposed use or change conflicts with an existing water right or with protectable interests in existing domestic wells, or c) the proposed use or change threatens to prove detrimental to the public interest. At the April 22, 2016 Subcommittee to Study Water meeting the State Engineer provided the Subcommittee a memorandum with recommended changes to Nevada water law. One change, under the heading *Mitigation of Conflicts*, pertains to NRS 533.370(2), and it reads as follows: *When considering the approval of a water right application, the right of mitigation is hereby granted to any appropriator whose appropriation may conflict with an existing water right, domestic well or vested claim. The mitigation measure negates the conflict. No mitigation may be made until application in writing has been made to and approved by the state engineer. In all cases replacement shall be at the sole cost and expense of the applicant and subject to such rules and regulations as the state engineer may prescribe.*

The Central Nevada Regional Water Authority is opposed to the State Engineer's proposed amendment to NRS 533.370(2) for a number of reasons, including the following: a) granting a "right of mitigation" to an applicant for a water right places a burden on an existing water right holder, who has developed a property right, to demonstrate he has a right to mitigation should a conflict occur, and therefore elevates the right of an applicant with no rights above the right of an existing water right holder; b) the "no conflict" requirement in NRS 533.370(2) protects a senior water right holder from potential destruction of an already existing water right and there is no guarantee a promised mitigation plan will keep a senior water rights holder whole; c) the definition of mitigation in the Merriam-Webster Dictionary is "to make (something) less severe, harmful, or painful," and therefore the presence of a mitigation plan means the senior water right holder may suffer adverse impacts, but the adverse impacts could have been a lot worse without the mitigation plan; d) the State Engineer has erroneously

characterized the “adaptive management” process, and he is depending on his understanding of “adaptive management” to make a mitigation plan protect a senior water right holder from a conflict; e) the State Engineer’s proposed amendment to NRS 533.370(2) presents serious legal challenges associated with the Takings and Due Process clauses of the United States and Nevada constitutions; and f) there is a place for a mitigation plan, and it is to be used to address unpredicted, unknown or uncertain impacts found by monitoring.

2. Include a position statement in the final report recommending a statewide Nevada water future discussion and strategy. Ensuring a secure water future for the State of Nevada has to be a top priority for State government, the Nevada Legislature, Nevada’s local governments, Nevada’s business community, the environmental community and the public. The Authority recommends there be a statement in the Subcommittee’s final report calling for these interests to come together in a partnership to discuss Nevada’s water future and develop a Nevada water future strategy. The work of the Legislative Commission’s Subcommittee to Study Water, the Nevada Drought Summit, the Nevada Drought Forum and the AB 198 Study could be a foundation for a meaningful statewide water future discussion and strategy. As would be expected, the States of Arizona, California and Utah are also facing a projected water supply shortfall in the near future. In the last few years these states have been actively addressing the problem by way of statewide programs focused on ensuring a secure water future.
 3. Include a position statement in the final report calling for local government land use plans to be based on identified sustainable water resources. Nevada, the driest state in the nation, has a finite sustainable water supply for its communities and ecosystems, and therefore local government land use plans (master plans) should be based on identified sustainable water resources. It is safe to say many local government land use plans have been developed without consideration of the amount and source of water needed to implement the plans; hence, one sees land use plans that require water resources far in excess of the known available water supply. Such plans create property owner expectations that cannot be supported by available water resources, and therefore lead to significant pressure on local governments to try to find water, at great cost to the water-gaining and water-losing areas.
- C. **Recommended Letters:**
1. Send a letter to the Nevada State Engineer recommending he consider a new perspective for groundwater management. At the February 8, 2016 Subcommittee to Study Water meeting the State Engineer provided the Subcommittee a presentation on Nevada water resource issues. One issue identified by the State Engineer is the over appropriation of groundwater resources in at least 84 water basins (out of 256 water basins). The imbalance between a water basin’s appropriated groundwater relative to its perennial yield will likely be exacerbated in a number of water basins by a determination of vested water right claims. In addition, the perennial yield concept provides an over estimate of a water basin’s sustainable groundwater resources. The U.S. Geological Survey does not support the use of the perennial yield concept for groundwater development. The USGS feels full implementation of the perennial yield concept will result in the following: a) all groundwater discharge will be intercepted, b)

no phreatophytic vegetation will remain in the water basin, c) all springs will dry up, d) no riparian areas around springs, and e) stream baseflows will disappear. The USGS feels a new perspective for groundwater management is needed, and it is sustainability of groundwater resources. The change from the perennial yield concept to sustainable groundwater use is to change from maximum capture of all groundwater discharge to what is an acceptable capture of groundwater discharge. For example, sustainability decisions include a) how much depletion should there be to surface water systems (streams, springs, etc.), b) how much reduction should there be in natural vegetation and wildlife habitat, and c) what is an acceptable water level change. The bottom line is the use of the perennial yield concept provides an over estimate of how much groundwater can be appropriated by the State Engineer, and the State Engineer should have sustainable use of groundwater as a goal.

2. Send a letter to the Nevada State Engineer recommending a water basin's groundwater resources should be determined by an independent, third party. The letter should recommend the State Engineer use the independent and peer-reviewed USGS estimates of a basin's groundwater resources (sustainable water resources or perennial yield) instead of using a water right applicant's estimate of a basin's groundwater resources. If there is a need for an updated estimate of a basin's groundwater resources as a result of an application or applications to transfer a substantial amount of groundwater from one basin to another basin, the applicant for the water right(s) should provide funds to the State Engineer to pay for the update, and the update should be performed by the USGS.

If you have any questions, or need additional information, please do not hesitate to contact me or the Authority's Chairperson, Joni Eastley.

Respectfully,

Steve Bradhurst
Executive Director
(775) 747-2038
sbradhurst@gmail.com

c: Central Nevada Regional Water Authority Board of Directors



MEMORANDUM



To: Alysa Keller, Legislative Counsel Bureau
From: Jason King, State Engineer
Date: April 19, 2016
Re: Legislative Commission Sub-Committee to Study Water

Below please find brief white papers that address four areas of concern the State Engineer believes would be useful for the Sub-Committee's consideration in managing Nevada's water resources.

TOOLS FOR MANAGING OVER-APPROPRIATED GROUNDWATER BASINS

Currently, the water law provides limited processes for addressing the issue of over-appropriated groundwater basins – namely curtailment by priority or designation as a Critical Management Area (CMA), which provides for the development of a groundwater management plan (GMP) by water users in the basin. See NRS 534.037. One problem with the CMA statute as currently written is that any petition for approval of a GMP must be signed by a majority of the holders of permits or certificates to appropriate water in the basin that are on file in the Office of the State Engineer. It is not clear what is meant by "majority." If one person holds 5 permits, does that person get five votes? If one person holds one permit, but that permit is for the majority of water in the basin, does that person get one vote? Another issue is that, as currently written, the law does not provide for input by domestic well owners and they have no vote for the approval of a GMP. However, in some basins there are more domestic wells than water right permits, so if given one vote each, they would be a majority. Additionally, if curtailment is to occur, the use of water by domestic well owners not in priority will be curtailed entirely leading to the argument that the domestic well owners should also have a "say" in the GMP. Another problem, and perhaps the biggest, is that it is not clear what tools are available for use under a GMP. For example, there has been statewide discussion regarding the "use it or lose it" provisions so central to the Prior Appropriation Doctrine and whether those provisions of the water law could be suspended under a GMP. It is not clear whether the provisions of that doctrine, such as forfeiture, can be waived for conservation of water under a GMP. It cannot be over stated, GMPs need clearly established tools that can be employed in bringing groundwater basins back into hydrologic balance that may be outside the current water law.

Another very important aspect of this issue is the ability of the Office of the State Engineer to recognize and approve GMPs in severely over-appropriated groundwater basins **OUTSIDE** of a CMA basin designation. Currently, there is no provision in the water law for the implementation of a GMP without the CMA designation. Even without a GMP, the State Engineer needs new tools to prevent waste and/or overuse of water in over-appropriated basins. This also applies to basins in hydrologic balance in times of drought.

Senate Bill 81 of the 2015 session was an attempt to achieve this goal. It was refined through the various workshops that were held with various stakeholders and is believed to have been a good start at accomplishing the goal of providing additional tools for use in a GMP. However, it failed to pass.

The State Engineer encourages this committee to consider legislation that continues to refine Nevada water law and provide flexibility in the development and acceptance of Groundwater Management Plans, whether in a Critical Management Area or not.

CONJUNCTIVE WATER MANAGEMENT

Surface Water and Groundwater Have Historically Been Managed as Separate Sources

Surface water and groundwater may have a natural hydrologic connection; however, in Nevada, with a few exceptions, surface water and groundwater have historically been managed as separate sources of water. This separate management appears to be a relic of the history of how water was developed in the state and the policy focus that the use of water was beneficial for the growth of the state; however, current science and events are challenging this management scheme.

Of course, the early history of water development in Nevada focused on the use of surface water. By the late 1800s, the mining industry had collapsed and our governors looked to cure Nevada's economic ills through reclamation of desert land to provide an economy partially based on agriculture. It was not until 1907 that issues regarding the use of groundwater begin to emerge. When the first flowing well was drilled to support the settlement of Las Vegas¹ and uncapped artesian wells were permitted to flow freely onto the desert floor, large quantities of water were wasted. This intensive groundwater use led to steady declines in spring flows and groundwater levels throughout Las Vegas Valley and by 1908 spring flows began to wane.² But history does not demonstrate concern with the loss of spring flow.

1 Michael Pavelko, David Wood and Randell Laczniaik, *Las Vegas, Nevada, Gambling with water in the Desert*, USGS, p. 52, 1964.

2 *Ibid.*

Up until 1909, little attention was paid to groundwater other than the use of water for Carey Act agricultural projects and artesian wells in areas such as Las Vegas and Pahrump. During this time, the general water law still only applied to surface water, but, after 1911, the State Engineer started to report on the availability of groundwater to support Carey Act projects.

By 1912, there were approximately 125 wells in the Las Vegas Valley discharging nearly 15,000 acre-feet per year and 60% percent of these wells were flowing-artesian wells.³ So, in 1913, legislation was enacted providing for conservation of underground waters by requiring casing and capping of artesian wells. This is the first formulation of Nevada Revised Statute Chapter 534. This was the year the legislature also enacted a new general water law that provided that all water, both surface water and groundwater, was subject to appropriation.

Even with the enactment that allowed for the appropriation of groundwater, little attention was paid to groundwater other than the areas with artesian water sources. Through 1918 only 109 applications had been filed to appropriate groundwater,⁴ so certainly there is no concern with the use of groundwater affecting surface-water supplies.

In the early 1930s, State Engineer Malone wrote about the groundwater/surface-water connection and stated that while the rain or snow that entered into the groundwater supply was not subject to evaporation or transpiration losses, this underground water has outlets, such as springs or wetlands. But he also stated that the rainfall that penetrates deeply enough became part of the underground supply and you could estimate the probable quantity of groundwater that can be used from the area by estimating the cover growth of indicator plants.⁵ This is a discharge analysis that can be used to estimate the perennial yield of a groundwater basin, which became the management concept to appropriate groundwater in Nevada. This is a demonstration of the thinking that these resources were to be managed as separate sources of water.

State Engineer Malone stated that valley floor springs and water mounds are good indicators that the groundwater reservoirs under these valleys are filled and some of that water is “escaping” through springs and that the pumping of water from an artesian supply will reduce “losses” of water through natural outlets and result in a greater available groundwater supply. If agriculture and the economy of the state were going to expand, it had to be through the use of groundwater. By the early 1930s, the State Engineer wrote that groundwater now formed practically the only potential future water supply for Nevada. He recognized the

3 *Ibid.*

4 Hugh A. Shamberger, *Evolution of Nevada's Water Laws, As Related to the Development and Evaluation of the State's Water Resources from 1866 to 1960*, State of Nevada, Dept. of Conservation and Natural Resources, Division of Water Resources, USGS, p. 33, 1991.

5 State of Nevada, *Biennial Report of the State Engineer, 1929-1930*.

connection between groundwater and surface-water discharge, but also indicated that the development of groundwater was Nevada's future.⁶

Around this same time, the State Engineer was instructed to designate administrative underground areas and subareas, and to only issue permits if there was a positive determination that there was unappropriated water in the area. So, by 1935, there were designated areas (a reflection of the hydrographic basin approach), the use of a perennial yield based on a discharge analysis (a determination that groundwater was a separate source of water), and the policy decision that the development of Nevada's groundwater resources was to be encouraged for the good of the entire state.

Today, after several years of drought, challenges have been raised that the use of groundwater is impacting senior surface-water rights, which presents an issue the State Engineer encourages the Committee to explore. Water in Nevada is managed using the Prior Appropriation Doctrine, which generally follows the principle of 'first in time, first in right.' Application of the doctrine to conjunctively manage surface and groundwater systems is more difficult than the application of the doctrine exclusively to surface-water systems for which it was initially adopted. The diversion of surface water upstream will impact downstream users in an amount nearly equal to the rate of diversion and often within a relatively short period of time. The effect of groundwater pumping propagates through an aquifer in all directions. Ultimately, the effects of groundwater pumping may reach a surface-water source and result in depletion of that source. The rate of depletion is often less than the rate at which groundwater is pumped and extends over a longer period of time. Because of this often slow-to-develop connection between groundwater and surface water, water use pursuant to existing groundwater rights may conflict with senior surface-water rights.

The State Engineer believes that legislation addressing conjunctive water management is imperative to Nevada's future. It is also important to recognize that the Legislature has declared that it is the policy of this State to encourage the State Engineer to consider the best available science in rendering decisions concerning the available surface-water and groundwater resources in Nevada. NRS 533.024. Therefore, before any conjunctive water management would be implemented, significant scientific work must precede it. While the State Engineer believes the Prior Appropriation Doctrine already provides the authority to consider whether the use of groundwater is impacting a senior water right on a surface-water source, what is lacking is a statutory acknowledgment that the two water sources can be hydrologically connected; and therefore, the State Engineer seeks guidance from the Legislature on tools that can be used to address this connectivity problem that are more balanced and equitable for all, rather than just completely prohibiting the use of water by the junior groundwater users.

⁶ State of Nevada, *Biennial Report of the State Engineer*, 1931-1934.

In order to facilitate the discussion, a distinction must first be made between conjunctive water use and conjunctive water management. The concepts of conjunctive water use and conjunctive water management are distinct, but intertwined. Conjunctive water use is a management approach that recognizes the hydrologic connection between the surface-water and groundwater source and tries to utilize the entire supply more efficiently. For example, use of groundwater by a farmer to supplement a limited surface-water supply in order to get a full growing season is conjunctive water use. A regional water management program that stores surface water below ground during wet years and then pumps groundwater during dry years is also conjunctive water use. The conjunctive water use concept is used to improve the overall availability and reliability of water.

Conjunctive water management is a concept that engages the principles of conjunctive water use, using surface water and groundwater in combination to improve water availability and reliability, and manages the two sources as one in the application of the Prior Appropriation Doctrine. Conjunctive water management requires the use of scientific studies to support water management. Determining what effect groundwater use may have on a surface-water source can be quite difficult and requires expertise in this type of analysis. Conjunctive water management requires monitoring and the evaluation of data to develop local management policies to understand the geology of the aquifer systems, to understand how and where surface water replenishes groundwater and how and where groundwater supports surface-water flows. A goal of conjunctive water management is to allow continued injurious groundwater pumping, so long as the negative impacts to the senior surface-water right holders are mitigated.

Nevada has no statutory provisions that provides for conjunctive management of surface water and groundwater. There is no single consensus on the appropriate implementation of a conjunctive water management program and no single document provides key parameters and standards for successful policies and programs. Nevada can look to other states programs or laws for guidance; however, Nevada must decide for itself what kind of program would work here. The ultimate goal would be to balance and optimize the use of surface-water and groundwater resources while recognizing that economic impacts will be felt. A conjunctive water management program will look at the physical water, economics, water laws, and social elements of such a program with the ultimate goal of improved water management in the particular region. The focus may need to be on local to regional scale programs rather than state-wide programs. For Nevada, the first area that has been drawn into focus is whether groundwater use along the Humboldt River may be affecting the base flow of the river.

A review of what has been done in a few other states is worthy of consideration. These states have found that where surface water and groundwater are connected they need to be managed together and have developed legislation and rules that allows them to manage the surface water and groundwater together while still respecting the Prior Appropriation Doctrine.

Colorado – In 1969, Colorado passed “The Water Rights Determination and Administration Act.” Colorado’s Revised Statute (C.R.S.) 37-92-102 provides that tributary groundwater be included with the surface water when determining priority under the Prior Appropriation Doctrine. “[I]t is the policy of the State of Colorado to integrate the appropriation, use, and administration of underground water tributary to a stream with the use of surface water in such a way to as maximize the beneficial use of all of the waters of this state.” Case law has created a presumption that all groundwater is tributary to the surface stream unless it proved or provided by statute otherwise. *Bd. Of County Comm’rs v. Park County Sportsmen’s Ranch, LLP*, 45 P.3d 693, 702 (Colo. 2002). The State Engineer is not suggesting that Nevada should go that far. However, Colorado has established a system of augmentation to allow junior groundwater users to continue to exercise their water rights by having a plan in place to replace the water used that negatively impacts a senior surface-water user, but the plan must be in place prior to a senior surface-water right holder’s call for the use of its water right. Nevada’s issues on the Humboldt River are past this point.

Idaho – Idaho accomplished conjunctive water management through the rulemaking process. See Idaho Administrative Code 37.03.11 “Rules for Conjunctive Management of Surface and Ground Water Resources.” These rules apply to groundwater sources from which the diversion and use of groundwater or changes in groundwater recharge affect the flow in a surface-water source or which the use of groundwater by a groundwater right holder affects the groundwater supply available to the holders of other groundwater rights. Idaho’s rules allow for mitigation not only to surface-water right holders, but other groundwater right holders. The rules clearly provide that the optimal development of the State’s water resources is in the public interest. They provide for delivery calls, but also apply the principle of the “futile call doctrine.” However, although a call may be futile, the rules may require mitigation or staged or phased curtailment of a junior-priority use if the diversion and use of the junior-priority water right causes material injury, even though not immediately measureable, to the senior-priority surface or groundwater right. This applies in instances where the hydrologic connection may be remote, the resource is large and no direct immediate relief would be achieved if the junior-priority water use was discontinued. The Idaho rules provide a very specific process of petition that requires information, measurements, data or study results to support the claim of material injury. The petition must also provide the specific names, addresses and description of water rights alleged to be causing material injury. The matter then becomes a contested case before the Department of Water Resources. The rules provide factors in determining material injury and for the submission of mitigation plans.

In 2014, due to drought, the Idaho Department of Water Resources informed the groundwater users within the Eastern Snake Plain Aquifer that their rights might be curtailed. As the data was gathered, they were subsequently notified to curtail groundwater pumping. Mitigation was not enough to address the call by the senior surface-water users. This was a strict application of the Prior Appropriation Doctrine.

Other states that can be looked to for examples are Utah, Washington and Oregon, but each state approaches the concept in a unique manner. The goal for Nevada would hopefully be one that would allow continued groundwater use while addressing ways to make the senior surface-water right holders whole. Any such program must be individually tailored to the stream system and groundwater resources involved. Tools that might be considered are aquifer storage and recovery programs, State-approved augmentation programs, forbearance agreements, direct financial compensation, and water banking programs.

The State Engineer encourages this committee to consider legislation to address conjunctive water management of Nevada's surface-water and groundwater resources.

ADAPTIVE WATER MANAGEMENT

Adaptive management is a concept used in resource development, which has been described as learning by doing. It has been used in business, agriculture, water resource management, fisheries and forestry settings. It is a structured process for decision making in the face of uncertainty with the focus being the reduction in that uncertainty as the understanding of the particular system improves. You learn from what you do and then change management practices accordingly. The aim of the process is to allow the approval of water right applications, with the idea that over time, as information is collected and analyzed, the diversion under the subject water rights can be moved and/or decreased such that conflicts are avoided. The process recognizes that predictions will never be perfect, nothing is absolutely certain, and many questions can only be answered by experiment and experience.

Adaptive management is a systematic approach for improving natural resource management with the emphasis being the collection of information that leads to improvements in resource management from the incorporation of what is learned into the ongoing management scheme. The aim of the process is reducing uncertainty over time from the monitoring of the system under consideration. Adaptive management is a scientific process and, as knowledge is gained, models can be updated and optimal management strategies derived. Key elements of adaptive management address the importance of design and experimentation, the crucial role of learning from policy experiments, the iterative link between knowledge and action, the integration and legitimacy of knowledge from various sources, and the need for responsive institutions. A growing body of professional literature,

reflecting a diverse body of interest and experience in application of adaptive management, has now developed.⁷

It is particularly useful when dealing with complex environmental/resource management problems. For example, no one can with absolute certainty know how a groundwater system will react in response to the pumping and whether there will be impacts to existing water rights or not. This is even more true in large basins where little pumping has occurred. Unless the water is pumped (and many times at large volumes), and data collected and the science improved, the uncertainty in the use of Nevada's resources remains. However, challenges have been raised to the use of the groundwater at all in the face of the uncertainty, which in effect means that the use of Nevada's groundwater is held hostage to the uncertainty. It is claimed that more and more data is needed before decisions can be made about the use of Nevada's water, but that data is unobtainable without actual pumping and use of the groundwater, which requires a water right and a beneficial use of the water. Without adaptive management, attempts to appropriate Nevada's resources could be stymied. It allows for the use of water while trying to find a balance between long-term knowledge gained to protect and utilize the resource and achieving the best short-term outcomes based on current knowledge. It allows for mitigation to avoid conflicts based on knowledge gained in the face of initial uncertainty.

NRS 533.3705 currently allows the State Engineer to limit the initial use of water to a quantity that is less than the total amount approved under the application and provides that the use of an additional amount of water may be authorized by the State Engineer at a later date if additional evidence demonstrates to the satisfaction of the State Engineer that the additional amount of water is available and may be appropriated in accordance with Nevada water law. Adaptive Resource Management should allow for augmentation or mitigation to avoid conflicts with existing rights to maximize the beneficial use of a shared and limited resource. Nevada water law needs to be clarified related to the State Engineer's inherent authority to provide for adaptive management through the implementation of monitoring, management and mitigation plans (3M Plans).

The State Engineer encourages this committee to consider legislation to clarify that adaptive water management is a tool that can be employed in the appropriation, development and use of Nevada's waters. Additionally, prior to issuing a water right permit, NRS 533.370(2) requires the State Engineer make a determination that the proposed water right will not conflict with existing rights. As part of the adaptive management process, the State Engineer encourages this committee to consider legislation that allows *mitigation* of a potential conflict

⁷ George H. Stankey, Roger N. Clark, Bernard T. Bomann, *Adaptive Management of Natural Resources: Theory, Concepts, and Management Institutions*, U.S. Dept. of Agriculture, Forest Service, General Technical Report PNW-GTR-654, p. 6 (2005).

to avoid the conflict, thereby allowing the full development of the available water resources in the state.

Since 1953, the State of Utah has had the following statute:

73-3-23. Replacement of water

In all cases of appropriations of underground water the right of replacement is hereby granted to any junior appropriator whose appropriation may diminish the quantity or injuriously affect the quality of appropriated underground water in which the right to the use thereof has been established as provided by law. No replacement may be made until application in writing has been made to and approved by the state engineer. In all cases replacement shall be at the sole cost and expense of the applicant and subject to such rules and regulations as the state engineer may prescribe. The right of eminent domain is hereby granted to any applicant for the purpose of replacement as provided herein.

A similar statute could be crafted in Nevada to read:

NRS 533.370(X). Mitigation of Conflicts

When considering the approval of a water right application, the right of mitigation is hereby granted to any appropriator whose appropriation may conflict with an existing water right, domestic well or vested claim. The mitigation measure negates the conflict. No mitigation may be made until application in writing has been made to and approved by the state engineer. In all cases replacement shall be at the sole cost and expense of the applicant and subject to such rules and regulations as the state engineer may prescribe.

DOMESTIC WELLS

The State Engineer encourages this committee to consider legislation to provide an exception to the current law that would require complete curtailment of junior priority domestic wells if curtailment by priority was required in a groundwater basin.

Nevada Revised Statute § 534.110(6) provides that except as otherwise provided in subsection 7 (Critical Management Areas), the State Engineer shall conduct investigations in any basin or portion thereof where it appears that the average annual replenishment to the groundwater supply may not be adequate for the needs of all permittees and all vested-right claimants, and if the findings of the State Engineer so indicate, the State Engineer may order that withdrawals, including, without limitation, withdrawals from domestic wells, be restricted to conform to priority rights. Subsection 7 also provides that if an area has been designated as a Critical Management Area for at least 10 consecutive years, the State Engineer shall order that withdrawals, including, without limitation, withdrawals from domestic wells, be restricted in that basin to conform to priority rights, unless a groundwater management plan has been approved for the basin pursuant to NRS 534.037.

This statute requires that, in times of curtailment, the State Engineer is required to regulate water use by priority including domestic well use. The State Engineer believes that it would be held unthinkable to restrict people from water use inside their homes and therefore would like to see this provision amended to restrict outdoor use only in times of curtailment.

Requested language from Diamond Valley Groundwater Management Plan Advisory Board for consideration under a bill draft request by the Subcommittee to Study Water to clarify the tools available for development and implementation of a Groundwater Management Plan:

In a basin designated as a Critical Management Area pursuant to NRS 534.110(7)(a), in consideration of a groundwater management plan submitted to the State Engineer pursuant to NRS 534.037, the State Engineer may, in addition to those powers conferred by law, approve:

- 1) Limits to the quantity of groundwater that may be withdrawn under any permit or certificate or other use outlined in the plan as long as senior permits or certificates receive more groundwater under the plan than junior permits or certificates;*
- 2) Conservation practices that might otherwise result in cancellation or forfeiture of the groundwater right pursuant to NRS 533.390, 533.395, 533.410 and 534.090 and exempt those rights from the requirements of NRS 533.390, 533.395, 533.410 and 534.090;*
- 3) Groundwater use requirements within the critical management area and under the plan not bound to any specific point of diversion, place of use, and manner of use;*
- 4) Groundwater banking for any unused volume of groundwater granted for use in any given year to be allowed for withdrawal in future years;*
- 5) Requirements for specific groundwater measuring and data reporting devices;*
- 6) Local governance, administration, or enforcement of the groundwater management plan while not abrogating any ultimate authority of the State Engineer over the plan;*
- 7) Assessment of fees on groundwater uses outlined in the plan or receive other funding to expend to administer the groundwater management plan, retire groundwater rights, or implement groundwater conservation practices;*
- 8) Penalties in accordance with NRS 534.190 through NRS 534.195 for violations with provisions of the plan by any entity under the plan with expenditure of any fines used to administer the groundwater management plan, retire groundwater rights, or implement groundwater conservation practices;*
- 9) Voluntary relinquishment to the groundwater source a portion of a groundwater right in exchange for exemption from provisions requiring the filing and approval of extensions of time to avoid cancellation and forfeiture during the period the groundwater management plan is in effect, but rights not relinquished would not be exempt from regulation by priority;*
- 10) Any other actions reasonably related to the implementation of a specific Groundwater Management Plan as outlined in that specific plan.*

A groundwater management plan approved pursuant to NRS 534.037 may continue beyond critical management area designation unless and until a petition is presented to the State Engineer, under the same procedures as NRS 534.037(1) and NRS 534.110(7)(b), to remove the plan.

Subcommittee may have regarding the benefits and costs of cloud seeding. Thank you for your consideration.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mike Baughman', followed by a horizontal line.

Mike Baughman, Ph.D

Executive Director

(775) 315-2544

mikebaughman@charter.net

APPENDIX D

Suggested Legislation

SUGGESTED LEGISLATION

The following Bill Draft Requests will be available during the 2017 Legislative Session, or can be accessed after “Introduction” at the following website: <http://www.leg.state.nv.us/Session/79th2017/BDRList/>.

- BDR -356 Revises provisions relating to grants for capital improvements to publicly owned water systems.
- BDR -357 Makes various changes relating to water.
- BDR -358 Makes various changes relating to water.
- BDR -359 Revises provisions relating to water.
- BDR -367 Makes various changes relating to water.