

# RECLAMATION

*Managing Water in the West*

**Supplement to  
January 2013 Scoping Report  
Paradox Valley Unit EIS  
December 2016**



**Paradox Valley**

Bureau of Reclamation  
Western Colorado Area Office  
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# Contents

1. Introduction and Background .....	5
2. Project Need and Purpose .....	5
3. Objectives .....	6
4. Cooperating Agencies .....	6
5. Public Scoping Activities.....	7
6. Scoping Results.....	7
7. Consideration of Proposed Alternatives .....	10
8. Summary .....	12
9. References Cited .....	12
ATTACHMENT A – EIS Scoping Comments.....	13
ATTACHMENT B – Pilot Pond Scoping Comments .....	61
ATTACHMENT C – Combined Comment Summary .....	115

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## **1. Introduction and Background**

The Bureau of Reclamation (Reclamation) is preparing an environmental impact statement (EIS) to describe potential effects related to the construction and operation of facilities to continue to dispose of brine at the Paradox Valley Unit (PVU) of the Colorado River Basin Salinity Control Program. The PVU is designed to reduce salinity levels in the Colorado River.

In January 2013, the Bureau of Reclamation (Reclamation) prepared a Scoping Report for the Paradox Valley Unit Alternatives Study and Environmental Impact Statement (EIS). Previously, in April 2012, Reclamation prepared a Scoping Report for the Paradox Evaporation Pond Pilot Study. Since issuance of these scoping reports, Reclamation has further refined the issues and proposed alternatives identified during the scoping process for the EIS and 2012 pilot pond study, and prepared this supplement in order to assist in the evaluation of significant issues and alternatives that merit further consideration through the NEPA process. This supplement also clarifies the project need and purpose. In addition, comments regarding potential project alternatives are evaluated as to whether they are within the scope of the proposed action, and will therefore be further evaluated in the EIS.

A draft EIS and a final EIS will be prepared to provide decision makers appropriate information and to inform the public of the proposed action, reasonable alternatives, and the impacts of the alternatives. In addition to scoping of significant issues and alternatives, key activities will include development of alternatives that support the purpose and need, analysis of issues in the EIS, and selection of a recommended plan. The final decision will be documented in a Record of Decision (ROD) following the final EIS. The ROD will officially present the Department of the Interior's position on brine disposal at the Paradox Valley Unit (PVU).

Periodic meetings, website updates, and mailings are being used to keep the public updated on the process.

## **2. Project Need and Purpose**

The purpose of the proposed action is to comply with Title II, Section 202(1) of the Colorado River Basin Salinity Control Act. The need for the proposed action is salinity control in the Colorado River Basin, including the Dolores River that flows through the Paradox Valley. The Paradox Valley Unit has injected naturally-occurring brine from the Paradox Valley since 1996, but the unit may be nearing the end of its useful life. As the injection pressure increases and brine disposal rates are further reduced, continued brine control and disposal would still be needed for continued enhancement and protection of the quality of water available in the Colorado River for use in the United States and the Republic of Mexico, and to enable the United States to comply with its obligations under the agreement with Mexico of August 30, 1973.

### **3. Objectives**

In addition to meeting the purpose and need for action while fulfilling its mission, Reclamation will select a preferred alternative for the continuation of salinity control in the Paradox Valley based on a determination of which alternative best meets the following goals and objectives:

- Remove approximately 100,000 or more tons of salt per year that would otherwise enter the Dolores River and downstream in the Colorado River.
- Optimize the cost per ton of salt removed.
- Avoid and minimize adverse impacts to physical, biological, social, economic, cultural, and tribal resources in the affected environment.
- Be consistent with existing BLM resource management plans, where applicable.
- Minimize use of non-renewable resources, including land and energy.
- Be in the best interest of the public, including considerations of health and safety and the local community's desired future conditions.

### **4. Cooperating Agencies**

There are currently 18 Cooperating Agencies for this EIS:

- Arizona Department of Water Resources
- Bureau of Land Management
- Colorado Department of Natural Resources
- Colorado Department of Public Health and Environment
- Colorado River Board of California
- Colorado River Commission of Nevada
- Colorado River Water Conservation District
- Environmental Protection Agency
- Fish and Wildlife Service
- Army Corps of Engineers
- Montrose County
- New Mexico Interstate Stream Commission
- Southern Nevada Water Authority
- Southwestern Water Conservation District
- U.S. Geological Survey
- Utah Department of Environmental Quality
- Wyoming Department of Environmental Quality
- Wyoming State Engineer's Office

Reclamation will discuss cooperating agency status with other agencies as determined appropriate during the NEPA review process.

## 5. Public Scoping Activities

Reclamation began formal scoping for an environmental assessment of a proposed pilot surface evaporation pond in late 2011 to early 2012, and completed a scoping report in 2012. Based on the scoping for that proposed action, Reclamation decided to stop working on the environmental assessment and to begin an environmental impact statement (EIS). Public scoping activities for this EIS are described in the 2013 Scoping Report. The formal scoping period for the EIS extended from September through November 2012. Both scoping reports are incorporated by reference.

Further information on the EIS process and related documents can be found on the Paradox website at: <http://www.usbr.gov/uc/wcao/progact/paradox/index.html>. An email address has also been established to obtain information or offer comments on the EIS: ([paradoxeis@usbr.gov](mailto:paradoxeis@usbr.gov)).

## 6. Scoping Results

General scoping results are summarized in the 2013 Scoping Report. Reclamation received 52 comment documents (combined EIS and Pilot Pond Study comment documents), including transcripts from scoping meetings, emails, and letters. The comment documents were from four federal agencies, five state or quasi-state organizations, one local government agency, thirty individuals, and five coalitions of one or more environmental groups. Attachment B contains the comment documents.

The 52 comment documents contained 235 individual comments. While NEPA is not a voting process, the majority of the individual comments (83 total) were about the NEPA process. Of those 83 comments, 42 concerned alternatives. A total of 152 comments were made about physical, biological, social, economic, and cultural resources that the commenters felt should be analyzed during the NEPA process. Table 1 lists these resource topics in decreasing order based on the frequency of the comments per topic.

**Table 1. Issues Raised during Scoping**

<b>Issue / Topic</b>	<b>Count</b>
NEPA Process, Alternatives, Permits, Cumulative Actions	83
Solid and Hazardous Wastes, Including RCRA, Clean Water Act, Safe Drinking Water Act Compliance	19
Seismicity	15
Community Impacts, Including Property Values, Environmental Justice	13
Wildlife, Animal Species	12
Land Use, Including Agriculture & Farmlands, Grazing, Recreation, Wilderness	10
Air Quality, Including Odors, Climate Change, Greenhouse Gases	8
Birds, MBTA Compliance	8
Noise	8
Visual Resources, Landscape, Scenery	8
Water Quality	8
Economics, Cost:Benefit	5
Groundwater	4
Water Resources, Including the Dolores River, Floodplains	4
Endangered Species, Critical Habitat, ESA Compliance	3
Geology, Soils, Cyanobacteria, Topography or Siting Characteristics	3
Light Pollution	3
Plants	3
Traffic	3
Consistency with Federal, State & Local Plans & Desired Conditions	2
Cultural Resources, Historic Properties	2
Energy	2
Public Health and Safety, Emergency Preparedness	2
Wetlands	2
Wild & Scenic Rivers	2
Ecosystem Services	1
Special Status Species	1
Water Rights	1

Chapter 3 of the forthcoming EIS will describe these resources or environmental components of the Paradox Valley that would be affected by the alternatives and/or would affect the alternatives if they were implemented. The topics may be lumped or split to aid in presentation and analysis.

For example, one comment concerned cyanobacteria or soil crusts that help stabilize soils in the area. There will be no specific analysis of effects on soil crusts; however, soil disturbance will be analyzed.

One topic raised during scoping that will not be analyzed in the EIS is ecosystem services. The CEQ's "Principles and Requirements for Federal Investments in Federal Water Resources" calls for calculating ecosystem services in weighing the costs and benefits of certain Federal water projects. While Reclamation is committed to considering both monetary and non-monetary benefits and costs of the alternatives in the EIS, it does not have to monetize ecosystem services for the Paradox Valley Unit because the project has already been authorized by Congress; in other words, the Principles and Requirements for monetizing ecosystem services does not apply to this federal water project because it was previously approved by Congress.

Another topic is special status species. The EIS will analyze plant and animal species that might be affected by the alternatives, and this will encompass any state-listed special status species.

Indian trust assets were not raised as an issue during scoping; however, Department of the Interior policy requires their consideration in all NEPA analyses. For this proposed federal action, there are no legal interests in property held in trust by the United States government for Indian tribes and individuals in the Paradox Valley.

Based on external and internal scoping, the tentative list of issues that will be evaluated in the EIS are as follows:

**Table 2. Resources to be Analyzed**

Physical Resources

Air Quality, Greenhouse Gases, Climate Change  
Energy, Energy Conservation  
Floodplains  
Geology and Soils  
Seismicity  
Solid and Hazardous Wastes  
Water Resources - Surface Water, Ground Water, Water Quality  
Wetlands and Jurisdictional Waters

Biological Resources

Birds  
Invasive Species  
Plants  
Threatened & Endangered Species  
Wildlife

Cultural Resources

Historic Properties  
American Indian Sacred Sites

Socioeconomic Resources

Community Impacts - Property Values, Jobs  
Economics

Socioeconomic Resources (continued)

Environmental Justice  
Land Use - Agricultural, Farmlands, Grazing, Recreation, Wilderness, Wild & Scenic Rivers, Areas of Critical Environmental Concern  
Land Acquisition and Relocation  
Light Pollution  
Odors (Hydrogen Sulfide)  
Noise  
Public Health and Safety, Emergency Preparedness, Safety of Dams  
Transportation and Traffic  
Visual Resources - Landscape, Scenery

Construction Impacts

Jobs (temporary)

Cumulative Impacts

Relationship Between Local Short-Term Uses of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity

Irreversible and Irrecoverable

Commitment of Resources that Would be Involved in the Proposed Project

**7. Consideration of Proposed Alternatives**

Comments received by Reclamation on both the proposed action and the pilot evaporation pond study are included in Attachments A and B, and summarized in Attachment C.

**Issues Regarding Alternatives That Will be Analyzed Further**

We have synthesized these comments into four categories that will be incorporated into the alternatives analyzed in the EIS. The first category is proposals regarding injection wells. One comment was to close the existing well. Nine comments were about new wells or siting new wells in or outside of the Paradox Valley. Five comments were about considering different operational scenarios for injection wells, including monitoring the wells.

The second category is proposals for surface evaporation ponds or land disposal of the brine. Ten comments called for considering surface evaporation ponds and managing them to prevent leakage or discharge to surface waters, or to consider particular locations. Three comments raised concerns about netting or noise cannons to prevent birds from landing on the ponds. One comment said do not consider ponds or a new landfill in the Paradox Valley, but consider moving the brine elsewhere.

The third category is to consider combinations of surface evaporation ponds and injection wells. There were two comments in this category.

A fourth category said to consider private/public partnerships or commercial opportunities for brine disposal, and there were four comments in this category.

### **Issues Regarding Alternatives That Will Not be Analyzed Further**

Eleven comments regarding potential alternatives are considered out of scope for this EIS. While these potential alternatives may be evaluated separately, they will not be analyzed further in this EIS because they do not meet the purpose and need and/or the objectives for the action.

Three comments called for changes in farming or irrigation practices instead of building a Paradox Valley Unit. Two comments called for basinwide environmental impact statements. One comment specified avoiding the Dolores River streambed. Two comments said to consider planting phreatophytes to reduce salinity. Three comments were related to the operation or decommissioning of McPhee Dam and the Dolores Project.

### **Summary and Conclusion Regarding Alternatives**

Based on internal and external scoping, the interdisciplinary team has identified the following alternatives that will be analyzed in the EIS, along with the alternative of No Action.

- No Action (future without well and salinity control)
- Additional Injection Well
- Evaporation Ponds
- Commercial Operations

Comments were received to consider combinations of surface evaporation ponds and injection wells. Rather than analyze this scenario as a separate alternative, the EIS will analyze both alternatives such that a combination could be selected for the final EIS or the Record of Decision.

## **8. Summary**

The 2012 and 2013 Scoping Reports discuss public scoping conducted regarding a replacement brine control and disposal mechanism at the Paradox Valley Unit. This supplemental scoping report updates the 2012 and 2013 Scoping Reports in order to further assist Reclamation's development of alternatives and identification of potentially significant issues to be evaluated during the NEPA process.

## **9. References Cited**

Bureau of Reclamation, 2012. Final Scoping Report-Paradox Evaporation Pond Pilot Study. Bureau of Reclamation, Western Colorado Area Office, Grand Junction, Colorado.

Bureau of Reclamation, 2013. Scoping Report-Paradox Valley Unit EIS. Bureau of Reclamation, Western Colorado Area Office, Grand Junction, Colorado.

# ATTACHMENT A – EIS Scoping Comments

101



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 8  
1595 Wyrkoop Street  
DENVER, CO 80202-1129  
Phone 800-227-8917  
<http://www.epa.gov/region08>

NOV 26 2012

Ref: 8EPR-N

Ed Warner  
Area Manager  
Bureau of Reclamation  
2764 Compass Drive, Suite 106  
Grand Junction, Colorado 81506

Re: Scoping Comments for the Paradox Valley Salinity Control Unit DEIS

Dear Mr. Warner:

This letter outlines the U.S. Environmental Protection Agency's (EPA) recommended scoping issues to be addressed in a future Environmental Impact Statement (EIS) for the Paradox Valley Salinity Control Unit: Evaluation of Brine Disposal Alternatives. The Bureau of Reclamation's (BOR) operation of the current salinity control unit has been identified as one of the most successful salinity control projects on the Colorado River, removing approximately 110,000 tons of salt annually. Highly saline water is collected and disposed of through an injection well. This injection well was built and has been in operation since 1995, operating during approximately 85% of the days over the past decade. As the BOR's existing well is estimated to have only three to five years remaining of successful operation, the BOR's proposed action is intended to maintain salinity control measures into the future. To ensure continuity of salinity control operations, the BOR's environmental review and any subsequent permitting activities may need to be completed in an expedited manner. We recommend that the data collection and analysis for the EIS be combined with the information needs for future permits, operational scenarios and facility siting.

## Range of Alternatives

1. We recommend that the action alternatives include various injection well locations and operational scenarios. Operational scenarios for the injection wells might include operating both the existing and new well at 50% capacity or alternating well operations (e.g., using one injection well for six months followed by six months of rest while the second well is operating). We suggest that the operational procedures options be developed to allow flexibility and adaptive management. For example, operations may need to be adjusted based on groundwater monitoring results.
2. The BOR completed a full environmental analysis for the initial Project in a Draft EIS, Definite Plan Report (1978) and a Final EIS (1979). The decision based on those documents was to construct and

.103 cont. operate two deep injection wells to remove salinity from the Dolores and Colorado Rivers. The BOR may want to consider tiering from the previous EIS for construction of the second injection well. If the BOR adopts this approach, we recommend updating the previous EIS, perhaps through an Environmental Assessment.

.104 3. We understand the BOR initiated an Environmental Assessment (EA) for a proposed pilot project to evaluate the potential for using evaporation ponds to replace or augment the existing injection well, but it appears that the BOR may have put the EA process on hold. Depending on the capability of evaporation ponds to remove salt in the long term, it may be advantageous to include evaporation ponds as a sub-alternative to the injection well alternatives to improve the efficiency of the injection wells and provide emergency storage. We recognize, however, that the use of evaporation ponds could raise bird and wildlife concerns as well as reclamation and closure issues, and these should be analyzed if evaporation ponds are considered in the EIS.

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**Future Underground Injection Control Permit (UIC)**

.107 4. If the preferred alternative includes construction of a new injection well, a Class 5 UIC permit would need to be obtained from the EPA. To expedite the permitting process, we recommend that BOR ensure the information prepared for the EIS also meets the information needs of the proposed UIC permit application. For example, data obtained from geological investigations and modeling for groundwater impacts will be needed for both the NEPA and UIC permitting processes. With respect to groundwater modeling, the EPA offers the following recommendations:

.109 • **Well Operations.** In conducting groundwater modeling, it would be useful to include sensitivity analyses on the optimal methods for well operations. The various factors that could be evaluated include: 1) alternating well usage; 2) running both wells at the same time with lower volumes and potential pressures; and 3) examining rest period durations. By determining the best practices for the injection zone's ability to receive fluids, there is an opportunity to optimize operations and maximize well life.

.111 • **Second Well Location.** We also recommend that the groundwater modeling be used to evaluate potential well locations, identifying the minimum and optimal spacing between the wells. The groundwater modeling could be used in conjunction with other siting criteria such as land ownership, costs of pipeline and surface facilities and construction impacts to identify the preferred well location alternative.

5. Staff from the EPA's UIC program and NEPA program are available to provide feedback as the BOR evaluates injection well alternatives and to assist the BOR with the UIC permitting process.

The EPA appreciates the opportunity to provide scoping comments at this stage of the EIS process. If we may provide further explanation of our comments during this phase of your planning process, please contact Dana Allen at 303-312-6870 ([allen.dana@epa.gov](mailto:allen.dana@epa.gov)) or me at 303-312-6925. Craig Boomgaard is the EPA staff contact for the UIC program and can be reached at 303-312-6794 or at [boomgaard.craig@epa.gov](mailto:boomgaard.craig@epa.gov).

Sincerely,



Suzanne J. Bohan  
Director, NEPA Compliance and Review Program  
Office of Ecosystems Protection and Remediation

cc: [1Stroh@usbr.gov](mailto:1Stroh@usbr.gov)



**MONTROSE COUNTY**  
COLORADO

**BOARD OF COUNTY COMMISSIONERS**

November 5, 2012

Ed Warner  
Area Manager  
Bureau of Reclamation  
2764 Compass Drive, Suite 106  
Grand Junction, CO 81506

Submitted VIA US Certified Mail

Re: Paradox Valley Salinity Control Unit: Evaluation of Brine Disposal Alternatives

Mr. Warner:

As the elected County Commissioners for Montrose County, Colorado we are hereby submitting comments in regard to the above referenced action.

It is our understanding that the current deep well injection facility may only be viable for another three to five years under current operations. To date, the alternative brine disposal methods discussed have included evaporation ponds and new well sites. Given the tremendous expense of new well facilities and the myriad issues associated with the evaporation ponds, it is our request that an additional alternative be evaluated as part of the EIS process.

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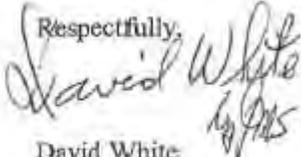
Based on information presented at the scoping meeting held in Montrose on September 26, it appears that raising the maximum allowable pressure within the existing well is an option. In the event that the maximum pressure authorized by the EPA can be increased without jeopardizing public health or safety, we feel that this is an option worth evaluating as part of the environmental process.

102

103

It is our intent to participate in the Cooperating Agency process for this action. We are hereby designating Jon Waschbusch, Public Affairs Manager as the Montrose County designee for the Cooperating Agency process and all correspondence related to this action.

Thank you for your consideration in this matter. We look forward to our continued involvement.

Respectfully,  
  
David White  
Chairman

  
Gary Ellis  
Vice-Chairman

  
Ron Henderson  
Commissioner

**COLORADO RIVER BOARD OF CALIFORNIA**

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103

November 26, 2012

Mr. Ed Warner  
Area Manager  
Western Colorado Area Office  
U.S. Bureau of Reclamation  
2764 Compass Drive, Suite 106  
Grand Junction, Colorado 81506

Re: Scoping Comments associated with the Bureau of Reclamation's Evaluation of Brine Disposal Alternatives at the Paradox Valley Salinity Control Unit, Montrose County, Colorado

Dear Mr. Warner:

The purpose of this letter is to provide the Bureau of Reclamation (Reclamation) with the scoping comments of the Colorado River Board of California (Board) regarding the National Environmental Policy Act (NEPA) project analysis process being conducted with respect to proposed brine disposal alternatives associated with the Paradox Valley Salinity Control Unit (Paradox Valley Unit) in Montrose County, Colorado. The Board is the state agency charged with protecting California's interests and rights in the water and power resources of the Colorado River system. California participates along with the other six Colorado River Basin states through the Colorado River Basin Salinity Control Forum (Forum) and Advisory Council (Council) in coordinating salinity control efforts within the Colorado River Basin (Basin).

In its September 13, 2012 request for scoping comments, Reclamation indicates its intent to prepare an Environmental Impact Statement (EIS), or Environmental Assessment (EA), to evaluate potential brine disposal alternatives to replace or supplement the existing deep injection well, which was built in 1988 and has a projected remaining useful life of three to five years under normal operations. Due to operating issues resulting from high wellhead injection pressures and reoccurring seismic activities in the region, evidence seems to indicate that the injection well could fail at any time.

Based upon information provided to the Forum and Advisory Council, the current Paradox Injection Well provides approximately ten percent of the total salinity control in the Basin, and is considered one of the most cost-effective salinity control projects in the Basin. The Colorado River Basin Salinity Control Program, including a fully-functional Paradox Valley Unit, is vital to the long-term protection, enhancement and management of the water quality of the Colorado River. As you may be aware, Lower Basin Colorado River water users currently suffer millions of dollars of economic damages per year due to the salinity of mainstream Colorado River water. Consequently, in light of the Paradox Valley Unit's potential failure and its role in providing salinity control benefits to downstream water users, the Board strongly recommends that Reclamation expedite its

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November 26, 2012

Page 2 of 2

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identification and analysis of the alternatives associated with brine disposal at the Paradox Salinity Control Unit through completion of the proposed NEPA process.

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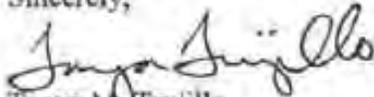
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While there may be additional brine disposal alternatives under consideration, the Board urges Reclamation to carefully evaluate the economic feasibility and potential environmental impacts associated with brine disposal via (1) the drilling and use of a replacement deep-injection well, and/or (2) the use of evaporation ponds.

The Board also reiterates the concerns expressed in the July 13, 2012, letter from Salinity Control Forum Council Chairman Larry Dozier to the U.S. Department of the Interior Secretary Ken Salazar. That letter emphasized the importance of the Paradox Valley Unit on the continued success of the Salinity Control Program and expressed concerns about the lack of progress toward identifying a replacement alternative.

In closing, the Board appreciates the opportunity to provide these scoping comments, and requests that it continue to be notified of any activities related to the preparation of the EIS/EA. Please feel free to contact me at (818) 500-1625, if you have any questions regarding these comments, or if you require any additional information.

Sincerely,



Tanya M. Trujillo  
Executive Director

Cc: Don Barnett, Colorado River Salinity Control Forum



## Colorado River Basin SALINITY CONTROL FORUM

### GOVERNORS

Janice K. Brewer, AZ  
 Jerry Brown, CA  
 John Hickenlooper, CO  
 Brian Sandoval, NV  
 Susana Martinez, NM  
 Gary R. Herbert, UT  
 Matthew H. Mead, WY

November 19, 2012

Terence L. Stroh  
 Western Colorado Area Office  
 Upper Colorado Region  
 Bureau of Reclamation  
 2764 Compass Dr., Suite 106  
 Grand Junction, CO 81506

### FORUM MEMBERS

Arizona  
 Thomas Buschatzke  
 Larry R. Dozier  
 Linda Jaunt

Re: Input Concerning the Paradox Valley Unit's Brine Disposal  
 Alternatives Study

California  
 Pete Silva  
 Gerald R. Zimmerman

Dear Terry:

Colorado  
 Jennifer L. Gianbel  
 Steven H. Gunderson  
 David W. Robbins

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This letter is written to convey the Colorado River Basin Salinity Control Forum's strong support for Reclamation's efforts to proceed as expeditiously as possible on an evaluation of brine disposal alternatives for the Paradox Valley Unit. This project has been successful in controlling about 110,000 tons of salt discharge annually, which represents almost 10 percent of the total Colorado River Basin Salinity Control Program's efforts and 25 percent of Reclamation's efforts to reduce the salt load of the Colorado River. Loss of the ability to dispose of collected brines at the project would lead to \$20-25 million of annual quantified damages to downstream users. Hence, the Forum applauds Reclamation's efforts to move forward quickly on studying brine disposal alternatives. The Forum urges Reclamation to fully and fairly review all potential viable alternatives including a replacement injection well, as well as evaporation pond(s). The Forum looks forward to participating with Reclamation in this review process and again states its support for the efforts.

Nevada  
 Leo M. Drozdloff  
 John J. Entsminger  
 McClain Peterson

.102

New Mexico  
 Estevan López  
 Scott A. Verhues

Utah  
 Gawain Snow  
 Dennis J. Strong  
 John Whitehead

Wyoming  
 Dan S. Buchi  
 Patrick T. Tyrrell  
 John P. Wagner

Sincerely,

Larry R. Dozier  
 Chairman

EXECUTIVE DIRECTOR  
 Don A. Barnett

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November 26, 2012

Mr. Ed Warner  
 Area Manager  
 Bureau of Reclamation  
 2764 Compass Drive, Suite 106  
 Grand Junction, Colorado, 81506

Delivered via email to Terry Stroh, TStroh@usbr.gov

Re: Paradox Valley Salinity Control Unit Evaluation of Brine Disposal Alternatives - Scoping Comments

Dear Mr. Warner and Mr. Stroh:

We appreciate the opportunity to comment on the Bureau of Reclamation's Paradox Valley Salinity Control Project. These scoping comments are submitted on behalf of the Dolores River Coalition, a partnership of eighteen local, regional, state, and national groups with a vested interest in comprehensive management and protections in the Dolores River Corridor and watershed. Included in this letter are the coalition's general areas of concern based on our ongoing work for the Dolores River. Individual organizations within our coalition will also be submitting comments that focus on their specific concerns.

Uniting our coalition is our shared-principle that the Dolores River Basin is a unique national resource that provides significant ecological values that benefit the natural environment and support human habitation throughout the Dolores River basin and beyond. The BOR's Salinity Control project is a significant piece of the puzzle of watershed management. Water quality and water quantity relate to critical and ongoing discussions for local and regional communities. We also are aware of concerns regarding localized seismic activity in relation to deep injection wells. With the various associated concerns, we support the BOR's decision to make a thorough and comprehensive assessment of the salinity control situation and address the implications locally, regionally, and beyond. A visionary approach to addressing the issue of salinity is warranted as climatic changes, drought, and other challenges further impact our region.

We recognize the benefits of the Paradox Valley Salinity Control Unit, including improvement of habitat for threatened fish species in the Dolores and Colorado River basins. We also understand the social and cultural needs for clean water for drinking water, farm operations, and other necessities. These needs and benefits should be thoroughly addressed in relation to the challenges and impacts of the project, and an ecosystem services analyses should be included in the assessment.

The Dolores River is a signature landscape, and is currently the nexus of many collaborative stakeholder and agency processes. Dolores River Coalition members and affiliates have been actively involved with these processes including the Dolores River Dialogue and the Lower Dolores Working Group, the San Juan Public Lands SEIS and Land

.108 cont.

Use Plan, the Gothic Shale Master Leasing Plan, the Department of Energy's Uranium Leasing Program, the BLM's Grand Junction, Tres Rios, and Uncompahgre Field Offices' Resource Management Plan Revisions, the Department of the Interior's Lands with Wilderness Character Inventory, and the Wild and Scenic Rivers Analysis. These plans and processes will provide the overall direction for land and river management in the Dolores River basin for the next 20 years and beyond. The BOR's Paradox Salinity Control Unit interplays directly with these and other processes in geographic scope, and in related management decisions. As such, consultation with these agencies is essential, and management conflicts must be proactively mitigated.

Since 2004, the Dolores River Dialogue has worked to create a river management plan that incorporates community and conservation concerns, and the best available science, into a comprehensive flow regime focused on releases from McPhee Reservoir. After years of work and the related analyses, the Implementation Plan was recently released and is being vetted with local communities. The BOR's Salinity Control Project must not reverse progress on flows and flow management. We would like to receive more information regarding the Colorado River Basin Water Salinity Control Forum so we can understand how that may interplay with the work of the Dolores River Dialogue and associated efforts.

Based on our current understanding of the project and options, we prefer injection wells over evaporation ponds that cause unnecessary impacts to the landscape and to plant and animal species though the NEPA analysis will help us better understand the range of alternatives. In the case of evaporation ponds, transport and disposal of materials from evaporation pond development needs to be properly addressed and vetted with the implicated counties, communities, cooperating agencies, and interested parties. Additionally, since the Dolores River is popular for boating, the reduced aesthetics of evaporation ponds must also be considered. Evaporation ponds would change the character of the area and potentially preclude other types of sustainable development opportunities like recreation and tourism. Thus, cumulative impacts of current and projected resource development in the area must also be analyzed.

The Dolores River and its tributaries are remarkable for their ecological values and recreational opportunities. Careful protection and management of the Dolores River is imperative for the future of this spectacular region. We thank you for your time and consideration of our comments and concerns, and look forward to the analyses that a thorough NEPA process will provide.

Sincerely,

Lee-Ann Hill  
Dolores River Coordinator  
San Juan Citizens Alliance  
P.O. Box 1513, 10 West Main Street  
Cortez, CO 81321  
(970) 565-7191

**Dolores River Coalition**

American Whitewater  
Colorado Environmental Coalition  
Colorado Mountain Club  
Colorado Riverkeeper  
Colorado River Outfitters Association  
Environmental Defense  
Grand Canyon Trust  
Living Rivers  
Lower Dolores Boating Advocates  
Rocky Mountain Wild  
San Juan Citizens Alliance  
San Miguel Watershed Coalition  
Sheep Mountain Alliance  
Southern Utah Wilderness Alliance  
The Wilderness Society and The Wilderness Support Center  
Uncompahgre Valley Association  
Utah Rivers Council  
Western Colorado Congress



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November 26, 2012

Mr. Terry Stroh  
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Re: Request for input concerning Paradox Valley Salinity Control Unit: Evaluation of brine disposal alternatives in Montrose County, Colorado.

Dear Mr. Stroh,

In light of the extended scoping comment period for the Paradox Valley Salinity Control Unit's proposed brine disposal alternatives, Living Rivers, Colorado Riverkeeper, Sheep Mountain Alliance, Canyonlands Watershed Council, Center for Biological Diversity, and Grand Canyon Trust offer the following supplemental comments to our support for the Sheep Mountain Alliance comments of January 30, 2012.

#### INTRODUCTION

The Colorado River salinity control program is the result of flawed river and water management policies longtime led by Reclamation and its partnerships with select stakeholders in the basin. Nature has been discharging brine into the Colorado River for millennia, and will continue to do so well beyond any efforts Reclamation engineers may pursue to contain it. The Dolores and Colorado River ecosystems evolved quite well under these conditions, helping to spawn a vibrant desert ecosystem below Paradox Valley. Only in the past 40 years, due to Reclamation's direct and indirect interventions into Colorado River management have issues of salinity required attention, principally to meet water quality treaty obligations with Mexico.

In the past 25-years salinity management programs have continuously trended upward, removing nearly 1.2 million tons of salt in 2010. Despite this ongoing increase and major unaddressed drivers that will further elevate salinity levels, Reclamation offers no long-

term plan for how the proposed action will contribute to sustainability with regard to resolving the mounting salinity challenges in the basin. Moreover, the proposed action merely represents a piecemeal response aimed at the replacement of infrastructure that became fully operational just 16-years ago.

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Most tragic, the proposed action represents a continuation of engineering approaches to manage natural sources of salinity that have historically never been a problem for the ecosystem. More than 50 percent of the salts now flowing into the Colorado River are the result of anthropogenic drivers, principally irrigated agriculture with Reclamation-delivered water. It's these sources which have tipped the balance, representing 37% of the 8.2 million tons of salt entering the Colorado River system annually. That's roughly 3.2 million tons of salt, nearly 30 times the amount slated for removal by Reclamation via this proposed action.

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It's far more appropriate that Reclamation look at opportunities to reduce this human-generated salinity, to begin addressing the problem at its source (farming and irrigation practices), as opposed to the continuous intervention into natural processes that cannot be entirely controlled.

Prior to pursuing this proposed action, Reclamation must first develop a more holistic, long-term management plan for Colorado River water resources that extends well beyond the Paradox Valley project and the salinity control program as a whole. It must also include new approaches to water storage and delivery management strategies that minimize evaporation and maximize in-stream flows to help reduce salt concentrations. Absent this, projects like the proposed action and the others identified in Interim Report No. 1 (Reclamation's supply and demand study release of June 2011), will continue to be put forward that offer only incremental, short-term technological salves that consume vast amounts of capital, all the while never addressing the source of the problem. It's premature to even consider scoping for this proposed action until a more comprehensive evaluation is undertaken that tackles the human-induced causes of increased salinity and abandons attempts at placing technical shackles on natural processes that will continuously succeed in breaking them.

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#### **IDENTIFYING THE PROBLEM**

The Reclamation Act of 1902 and Colorado River Compact of 1922 have transformed the Colorado River basin: securing energy, agriculture, metropolises, and industry upon a landscape that early explorers described as valueless due to its debilitating aridity during the growing season and for poor soils requiring amendments to be productive.

What this Congressional act and interstate compact have not succeeded in accomplishing is establishing a system of water delivery that is as resilient as the deserts these policies attempt to hydrate. Beyond the corrosive processes eating away at the Paradox Valley's nascent salinity control infrastructure, and the ever expanding salinity problem it fails to address, lies a whole host of challenges impeding any hope of sustainable fresh water management in the basin, not the least of which is sediment.

The continued propping up of a massive reservoir system that all the while is filling with material from the natural erosion of the Colorado Plateau's marine and terrestrial rock

layers will also degrade water quality, not to mention interrupt water delivery. Since the 1960s, the US Geological Survey and Reclamation both have acknowledged the unsustainable nature of Reclamation's approach due to this accumulating storage of sediment in reservoirs, referring to it as "the day of reckoning." Similar warnings have longtime been advanced with regard to water allocation exceeding natural supplies, now all the more worrisome due to flow reductions resulting from climate change, and inappropriate irrigation practices eating away at the soil quality, public coffers and yes, the water quality that precipitated the proposed action.

The salinity problem in the basin lies with faulty management decisions prior to, and following the Reclamation Act of 1902. For example, trans-basin diversions from the Colorado River basin to the Mississippi River basin was the first mistake, because taking abundant flows of nearly pristine water near the headwaters meant the Colorado River would be less capable of diluting the natural salinity downstream that emanates from the marine-based rocks of the Colorado Plateau. The second mistake was to permit farming on the saline soils of the Colorado Plateau, such as the Mancos Shale. The third mistake was to allow farming in the Basin and Range, where poor soil drainage creates a situation of salinization on agricultural fields, exemplified by the insidious Wellton-Mohawk Project near Yuma, AZ—with its hugely expensive brine extraction project, the MODE Canal, and the Yuma Desalting Plant.

In Paradox Valley specifically, the first mistake was to build McPhee Reservoir. The annual average yield of the Dolores River (817,000 acre-feet) was significant to abate the impacts of natural salt inflows through dilution. Making matters worse for the Dolores basin is that water diverted from McPhee Reservoir is applied to soils high in salinity in the San Juan River basin.

So far, this Reclamation-created salinity and sediment challenge is being addressed in a piecemeal fashion through the Salinity Control Act, and by various dredging operations below Davis Dam. Under Reclamation's artificial metrics, the program is labeled as successful as it complies with Reclamations established threshold numbers at Hoover Dam, Parker Dam and Imperial Dam (see Table 1, 2 and 3 below). However, success in meeting these benchmarks may have as much to do with nature's whims as those of Reclamation.

**Table 1: Threshold criteria established for compliance of salinity control**

Locations below	Salinity in mg/L
Hoover Dam	723
Parker Dam	747
Imperial Dam	879

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**Table 2: Actual salinity values in 1970 before Congressional intervention**

Locations below	Salinity in mg/L
Hoover Dam	743
Parker Dam	760
Imperial Dam	896

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**Table 3: Actual salinity values as of 2008**

Locations below	Salinity in mg/L
Hoover Dam	622
Parker Dam	646
Imperial Dam	717

The natural processes that provided voluminous spring freshets from 1983-1986, 1995, and 1997 all contributed greatly to Reclamation realizing its thresholds. Table 4, for example, illustrates how drops in salinity levels following annual flows into Lake Powell in excess of 15 million acre-feet. With the exception of the 2011 snowmelt, freshets of this magnitude have not occurred since 1997. Consequently, an increase in the basin's salinity levels is easily observed. Also of note is that the high salinity values observed in 1970 were partly the result of the "critical drought period" that occurred from 1954 to 1965 during which the average annual flow was only 12.8 million acre-feet.

**Table 4: 40-years of observed flow-weighted average salinity**

Calendar Year (Numeric Criteria)	Below Hoover Dam (723 mg/L)	Below Parker Dam (747 mg/L)	At Imperial Dam (879 mg/L)
1970	743	760	896
1971	748	758	892
1972	724	734	861
1973	675	709	843
1974	681	702	834
1975	680	702	829
1976	674	690	822
1977	665	687	819
1978	678	688	812
1979	688	701	802
1980	691	712	760
1981	681	716	821
1982	679	713	827
1983	659	678	727
1984	598	611	675
1985	556	561	615
1986	517	535	577
1987	519	538	612
1988	529	540	648
1989	564	559	683
1990	587	600	702
1991	629	624	749
1992	657	651	767
1993	665	631	785
1994	667	673	796
1995	654	671	803
1996	618	648	768
1997	585	612	710
1998	559	559	655
1999	549	550	670
2000	539	549	661
2001	550	549	680
2002	561	572	689
2003	584	592	695
2004	625	644	729
2005	643	668	710
2006	646	671	720
2007	632	657	715
2008	622	646	717
2009 provisional	602	623	717

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**UNDERSTAND THE FUTURE**

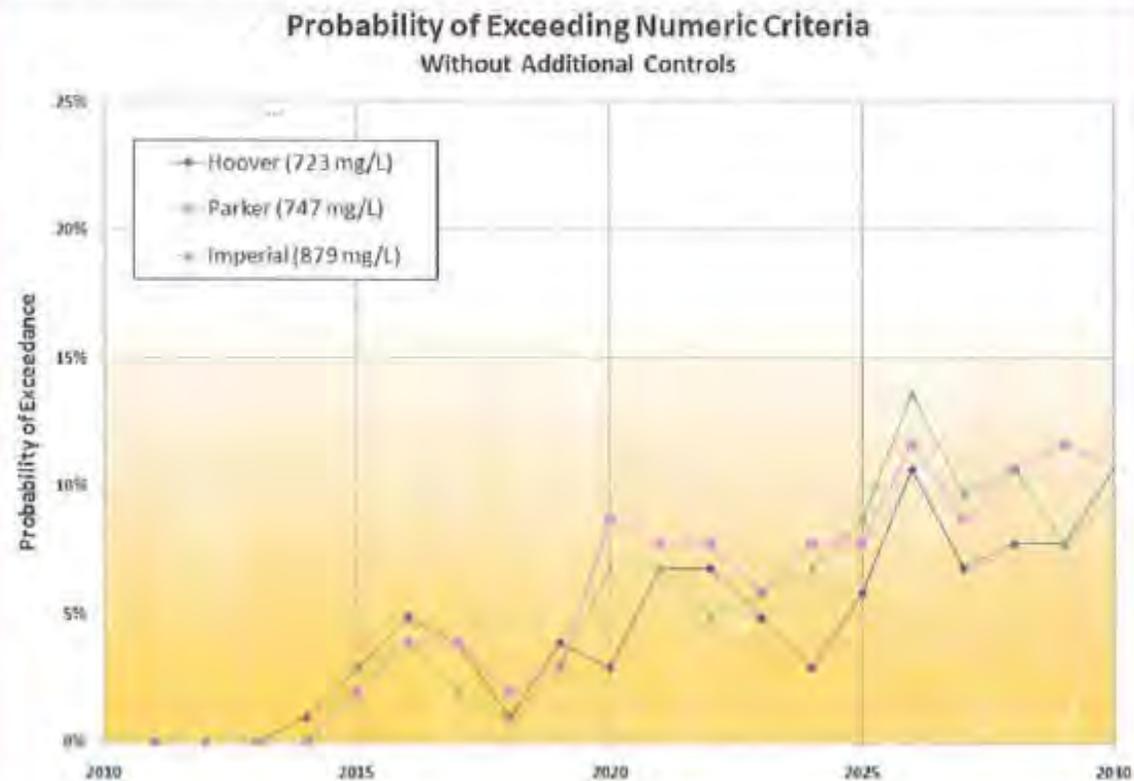
The Salinity Control Forum emphasizes that if agency mitigation plans do not progress with more programming and adequate funding, exceeding the numeric criteria is more likely to occur (Table 5). The Forum's long-term analyses is flimsy at best, employing

six-year old data and scenario on river flows that have long since been criticized as flawed due to their lack of sufficient attention to climate change impacts. Reclamation has presented in its Interim Report No.1 of June 2011, that the basin can expect a 1.5 million acre-feet reduction in annual supply by mid-century as a consequence of increased evaporation and sublimation of the snowpack. But climate scientists and hydrologists have warned that such reductions could near 4.5 million acre-feet by mid-century (Barnett and Pierce in Proceedings of the National Academy of Sciences, 2009). At a minimum Reclamation needs to note these and similar findings and offer a suite of scenarios that reflect the full range of likely futures facing the basin's hydrology.

Furthermore, the water columns within deep reservoirs such as Lakes Powell and Mead contain a dense layer of saline water below the level of their active storage pools. Once active storage is consumed, this inactive storage will have to be bypassed through the river outlet works and the salinity rates will skyrocket until the columns are once again submerged. Salinity, however will not be the only problem resulting from these inactive storage pools. These water columns also include corrosive hydrogen sulfide, and perilous low oxygen levels that will further threaten aquatic ecosystem within the reservoirs and downstream.

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**Table 5: created by the Salinity Control Forum**



Additionally, Upper Basin water users' plan to divert more and more water from the system, further degrading dilution capabilities also needs to be taken into consideration. So too must impacts to water quality surrounding the 2005 Energy Policy Act. Because the Colorado Plateau has untapped energy resources such as oil shale (kerogen) and tar sands (bitumen), the quest to bring these marginal resources to market is the death knell to the water resources that initiated fundamental prosperity to the watershed. It is illusional to tease corporations and the public to even consider that these resources could actually be proffered out of the ground successfully without altering the regional water cycle forever. The basin hasn't even finished reclaiming the legacy of messy energy extraction projects that threaten water resources from previous decades, let alone the projects that will soon be added to the inventory.

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For more than two decades investment in salinity control has risen steadily, as has the number of tons of salt removed from the system. There's nothing happening presently that will cause this trend to reverse, and as noted, future conditions in this era of climate change will likely render the problem much, much worse.

The Paradox Valley proposed action, and others like it, are not being presented within a context of a clear understanding of the real challenges ahead, so any and all actions pertaining to them should be curtailed until such an analysis is completed. And in so doing, an equally comprehensive evaluation of appropriate salinity control alternatives must be explored well beyond the current basket of technical controls that do very little to address the underlying causes of the increased salinity experienced over the past century. Not until a clear picture is presented of hydrologic extremes that may lie ahead, addressing periods of severe and sustained drought, and a probable maximum flood, can a proposed action like the Paradox Valley project be evaluated.

#### **GETTING SALINITY UNDER CONTROL**

Decreases in salinity must be achieved through reversing those vectors responsible for the problem including: salinity pollution from agriculture, evaporation from inefficient water storage, and loss of in-stream flows and habitat preservation due to excessive diversion. Each of these must be addressed in devising a comprehensive solution to not only resolve salinity problems in the basin, but working toward a more sustainable human-ecological balance in the Colorado River basin generally.

First and foremost Reclamation must compel farmers to begin shifting their irrigation practices and cropping strategies away from those that exacerbate the basin's salinity levels. For example, fallow or transform unproductive and cost-inefficient agricultural lands that contribute to the salinity problem overall. Unless farmers themselves are willing to finance the associated salinity control, projects like the Wellton-Mohawk must be decommissioned. Establish incentive systems that reward those reducing their pollution and penalize those who do not must be developed and implemented. Salinity is an external cost to their production that can no longer be ignored or tolerated; thus must be internalized into their operations.

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Reducing water consumption in both basins to match the new hydrologic norm should be evaluated. Much stricter rules and regulations must be put on all consumers of Colorado River water received via federal infrastructure. The Salinity Control Forum must staunchly advocate for conservation measures that will: 1) assure sufficient in-stream flows to maintain critical habitat and restore damaged ecosystem; 2) allow for increased flows to be used by Mexico for Colorado River delta restoration; and 3) assure that total consumption, including environmental flows, no longer exceed annual inflows.

Evaporation from above-ground reservoirs not only loses valuable water, but also contributes to increased salinity levels. Storing this water underground is an alternative to reduce overall evaporation losses from surface reservoirs by replenishing human-depleted aquifers. This is already occurring in confined aquifers within Arizona and California. There is sufficient capacity in the Basin and Range Province, for example, to store the combined storage contents of Lakes Mead and Powell.

In pursuing an expanded ground-water storage strategy, the decommissioning of redundant dams and reservoirs can be pursued. This will afford a head start on addressing the salinity problems inherent in managing the sediment backing up behind all of the basins reservoirs. Moreover, such decommissioning would afford unmatched habitat restoration potential for many areas that had previously been devastated or are currently threatened by dam and reservoir operations.

None of these options involve new infrastructure to manage natural brine inflows. They all work to collectively reverse the human-induced salinity as well as provide greater water supply resilience for Colorado River water users and improved habitat conditions for the basin's unique ecosystems.

#### **ABANDON THE PROPOSED ALTERNATIVE**

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No modifications should be undertaken that affect the Dolores River's stream bed as it passes through the Paradox Valley. This includes channelization, linings, check dams, siphons or tunnels. Recent studies of extreme flooding conducted on the Dolores River by Dr. Michael L. Cline (*Extreme flooding in the Dolores River Basin, Colorado and Utah: Insights from paleofloods, geochronology and hydroclimatic analysis*, 2010) indicate that engineered modifications in Paradox Valley, where the river would not be constrained between walls of bedrock, would fail over time. The meanders of the Dolores River through Paradox Valley indicate that the river channel has migrated over this broad floodplain throughout historic and prehistoric times. It is possible that floods in the future would damage any infrastructure Reclamation may choose to site here.

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Moreover, prehistoric slack water deposits along the Dolores River indicate that the magnitude of floods in the Dolores River basin are significantly higher than the spillway capacity of McPhee Dam, thus rendering the Dam useless and ineffective at best in preventing flood damage in the Paradox Valley, and more likely much worse should it catastrophically fail during such an event.

Reclamation should also avoid constructing brine evaporation ponds. The loss of 106  
vegetation cover would impair the enjoyment of scenic vistas, impair wildlife habitat, 107  
pose a contamination problem for migratory birds, and create a potential waste disposal 108  
problem with exorbitant costs and cumulative impacts. It would also be expensive to 109  
build, maintain, decommission and reclaim these evaporation ponds. Like the 16-year 110  
history of what now is clearly an injection well experiment, the long-term viability of such 111  
an approach is too uncertain and potentially environmentally costly.

The other places where deep well injection of brines into the Paradox Formation that 113  
some have argued are feasible include areas in eastern Utah. For example, Castle  
Valley, Spanish Valley and Lisbon Valley. However, the costs associated with such an 114  
alternative are quite significant considering the cost of the infrastructure, consumption of  
electrical energy and other numerous cumulative impacts.

Strategies that might offer relief include planting native phreatophyte plants to consume 115  
surplus groundwater flowing over salt domes via evapotranspiration would be an  
appropriate mitigation strategy for the Paradox Valley. Such a strategy would be an  
enhancement for wildlife habitat, and a pilot study for this kind of mitigation to control  
salinity may indeed be feasible and appropriate for Reclamation to try.

Additionally, the pilot program from "dewvaporation" technology may offer an alternative 116  
to evaporation ponds, especially if the quantity of hydrogen sulfide gas that is separated  
from the brine is sufficient enough to heat atmospheric air required for this innovative  
technology. Perhaps the heat from the electric pumps can also be utilized as a possible  
heat transfer mechanism for dewvaporation technology, in conjunction with applications  
of passive solar gain (Desalination and Water Purification Research and Development  
Report No. 120 by Reclamation, 2008).

However, such controls at the source should only be pursued for localized habitat 117  
restoration relating to Reclamation's activities that disrupt natural conditions. Moreover,  
instead of relying on any single mitigation strategy to solve the salinity challenges in the  
Paradox Valley, such as constructing evaporation ponds or just injecting brine, a more  
appropriate strategy would be to include numerous applications simultaneously,  
especially if they can significantly reduce cumulative impacts to the natural environment.

#### DECOMMISSIONING MCPHEE DAM

In addition to seeking out more efficient water storage mechanisms such as ground- 105  
water recharge, Reclamation should pursue the restoration of natural flows in the  
Dolores River basin by decommissioning McPhee Dam. The return of free-flowing water  
would assure healthy habitat conditions for the river corridor, return sufficient dilution  
capacity for the natural salt inputs from Paradox Valley, and reduce salinity by the  
application of irrigation water from the Dolores River on to the saline soils of  
southwestern Colorado. This would simultaneously improve the water quality of the San  
Juan River as well. Additionally, it should be noted that the San Juan River watershed  
contributes more sediment into Lake Powell than the Colorado and Green rivers  
combined (1986 Lake Powell Survey by Reclamation; REC-ERC-88-5).

Water currently under contract from McPhee reservoir is primarily used by the City of Cortez, the Dolores Water Conservancy District, the Montezuma Valley Irrigation District, and the Mountain Ute Tribe. The electricity that is generated at the dam is used to aid in the total cost of lifting the water from the Dolores River basin to the San Juan River basin.

None of this water is critical, because the original farmers established a successful dry-farming practice in the region before McPhee Dam was completed in 1984. The high cost of water from the Dolores Project has been a controversy since 1987, when the delivery canals were finally completed. Additionally, the USGS has identified the Dolores Project as a major contributor of salinity and selenium in the San Juan River basin (USGS Water-Resources Investigations Report 97-4008).

McPhee reservoir was built to augment an existing agricultural community in the San Juan River basin on soils that are naturally saline and high in selenium. Like all reservoirs in the Colorado River basin, McPhee Reservoir will be rendered useless by sediment fill, and in the interim time-period the dam may fail or be severely damaged by a probable maximum flood. Such a flood occurred in the watershed of the San Juan Mountains in October of 1911, and the estimated total volume of the week-long cloudburst was greater than the spillway capacity of the reservoirs that were authorized in this area in 1956 and 1968. For example, the peak discharge of the San Juan River at Bluff was estimated to be 150,000 cubic feet per second (USGS Open File Report 01-314 by Robert H. Webb et al., 2001).

The Dolores Water Conservancy District has recently decided to invest in the possible construction of a pumpback storage facility to produce more electricity from the water stored in McPhee Reservoir. This project will increase salinity due to incidental evaporation and seepage from two new reservoirs, and increase vulnerability when shortages are declared for downstream users or for increased flows to protect endangered fish. This project further demonstrates how water users in the basin are resistant to developing system resilient strategies.

Additional benefits of decommissioning McPhee Dam will include increasing the range of critical habitat for endangered and threatened native fish, seasonal non-motorized river recreation on the Dolores River, and decreased evaporation and seepage from McPhee Reservoir.

## CONCLUSION

For some time Living Rivers and a host of other stakeholders have requested that the Department of Interior pursue a basin-wide Programmatic Environmental Impact Statement to address water quantity, water quality and critical habitat for the Colorado River basin. Such a proposal has in fact been on the table for nearly four decades, but Reclamation and Interior continue to push back. The growing salinity problem that has precipitated this proposed action is yet another example as to the urgent need for such an undertaking. EIS processes for such a marginal activity that does not address any of the root problems affecting Colorado River water quality, storage and consumption, is a

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tremendous waste of the public's time and resources. The Colorado River water storage and delivery system is broken, and this proposed action by Reclamation, along with the other agency partners in salinity control (Bureau of Land Management, Department of Agriculture, and the Salinity Control Forum) will provide no long-term remedy. It's critical that the partnering agencies and Reclamation take a step back and begin to reevaluate this approach. Otherwise resolutions to resolve these mounting problems will only come via crisis management and court battles that themselves will only add further piecemeal impediments to the long-term viability of sustainable water resources management in the Colorado River Basin.

Sincerely yours,

/s/ John Weisheit

John Weisheit  
Living Rivers  
Conservation Director  
Colorado Riverkeeper

/s/ Hilary White

Hilary White  
Sheep Mountain Alliance  
Director

/s/ Laurel Hagen

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Canyonlands Watershed Council  
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/s/ Taylor McKinnon

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November 26, 2012

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Delivered via email to Terry Stroh, TStroh@usbr.gov

Re: Paradox Valley Salinity Control Unit Evaluation of Brine Disposal Alternatives – Scoping Comments

Dear Mr. Warner and Mr. Stroh:

We appreciate the opportunity to comment on the Bureau of Reclamation's proposed Paradox Valley Salinity Control Unit Evaluation of Brine Disposal Alternatives. These scoping comments are submitted on behalf of The Wilderness Society, San Juan Citizens Alliance, Colorado Environmental Coalition, and High Country Citizens Alliance. Our organizations are heavily invested in conservation programs in the Dolores River Basin and the Colorado River Basin and share goals to preserve the irreplaceable natural and cultural heritage of the Dolores River and nearby public lands.

The Wilderness Society (TWS) is a national organization with more than a half a million members and supporters nation-wide, and an active membership in Colorado. Our members, volunteers and staff live, work and recreate in the Dolores basin and in the vicinity of the proposed project. The mission of The Wilderness Society is to protect wilderness and inspire Americans to care for our wild places. We have worked for more than 70 years to maintain the integrity of America's wilderness and public lands and ensure that land management practices are sustainable and based on sound science to ensure that the ecological integrity of the land is maintained. The Dolores Basin comprises an area of program focus for us, where we are particularly interested in preserving wilderness and backcountry areas, opportunities for primitive recreational experience, and unique ecological values.

San Juan Citizens Alliance (SJCA) has been the lead conservation organization working to support sustainable stewardship in Southwest Colorado for 25 years. SJCA is a grassroots organization dedicated to social, economic and environmental justice in the San Juan and Dolores Basins. We organize residents to protect our water and air, our public lands, our rural character, and our unique quality of life while embracing the diversity of our region's people, economy and ecology. Our members live, work, play and are deeply engaged with our public lands and water ways. SJCA is involved in collaborative efforts in the Dolores Basin including the Dolores River Dialogue and the Lower Dolores River Working Group and is actively involved in the protection and restoration of the landscape, natural flow regime, native fish populations, and water quality.

High Country Citizens' Alliance (HCCA) is a grassroots environmental organization with over 600 members located in Crested Butte, Colorado. The mission of High County Citizens' Alliance is to champion the protection, conservation and preservation of the natural ecosystems within the Upper Gunnison River Basin. HCCA's water program advocates for improved

instream flows, water conservation, water quality regulation, and collaborative initiatives to improve the benefits of water for everyone.

Colorado Environmental Coalition (CEC) is a Colorado-based environmental advocacy organization with two field offices in western Colorado and a main office in Denver, Colorado. CEC has more than 4,000 individual members and over 90 affiliated organizations. CEC campaigns engage citizens in the protection of Colorado's wild places, healthy rivers, wildlife and quality of life. CEC is currently in the process of merging with Colorado Conservation Voters, that merger will be complete January 1, 2013 and the new organization will be called Conservation Colorado.

.101 Through the ensuing NEPA process, we expect and encourage a full and thorough review  
.102 of the environmental and socioeconomic impacts of federal salinity control actions, both in the  
Paradox Valley and more broadly. We believe that for salinity treatment to truly be successful  
.103 and sustainable in the long term, a comprehensive approach that considers the full Dolores River  
Basin, and perhaps Colorado River Basin, is warranted.

#### **Purpose and Need:**

The Paradox Valley Salinity Control Unit provides beneficial improvements to the water quality of the Dolores River, preventing on an annual basis approximately 110,000 tons of salt from entering the river as it travels north through Paradox Valley and toward its confluence with the Colorado River. Groundwater brine from Paradox Valley is intercepted by shallow wells before loading into the Dolores, and then injected into a deep well, contributing to an overall reduction of salinity in the Colorado River Basin. The benefits of the Paradox project include desirable improvements in habitat for Dolores and Colorado River fish species and improved water quality downstream. The Bureau of Reclamation (BOR) has stated its intent to prepare an Environmental Impact Statement (EIS), which we wholly agree with. BOR has also stated that initial alternatives to be considered for brine disposal include: development of a new injection well, use of evaporation ponds or a combination of the two methods.

The possibility of fully replacing the current deep well brine injection system with evaporation ponds, as contemplated by the BOR, causes considerable concern regarding potential substantial impacts including injuries and deaths to sensitive migratory bird species protected by international treaty; creation of a permanent, above-grade waste landfill in Paradox Valley; altering the scenic and agricultural nature of the surrounding area impacts to the Dolores River corridor riparian zones and wetlands, habitat for sensitive species, potential BLM Areas of Critical Environmental Concern; and the proposed suitability of the middle Dolores River for Wild & Scenic River status. On the other hand, the deep-well injection system poses concerns for its existing seismic impacts which will require a carefully considered approach to identify appropriate locations for its extension or replacement. No matter the brine removal technique, the potential benefits and adverse impact on imperiled native fish species, including those already protected by the Endangered Species Act, poses difficult questions that need to be addressed in consultation with the U.S. Fish and Wildlife Service. All of these potential impacts would be the result of major actions by the Bureau of Reclamation that trigger the full analysis of an Environmental Impact Statement under NEPA's threshold.

.115 Increasingly, Colorado Basin-wide salinity-control efforts are recognized as insufficient to meet water quality standards in the lower basin and across the international boundary with Mexico over the long term, particularly in light of over-allocation of water resources, storage

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evaporation and capacity reduction, and standing agricultural practices. It is well recognized that it will be more difficult in the future for the Bureau of Reclamation to fulfill the directives of the Salinity Control Act as demands on the basin continue to increase. The Paradox deep-well injection project currently accounts for approximately one-tenth of total salt removed from the Upper and Lower Colorado River Basins, despite its location on an upper basin tributary. The general value of the Paradox Valley Salinity Control Unit is of measurable and significant importance to federal agency actions to control salinity in the entire Colorado River Basin. A

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full, basin-wide Environmental Impact Statement is appropriate, warranted and desired in order to identify alternatives and fully analyze the impacts triggered by these major actions by federal agencies. Since the passage of the Salinity Control Act in 1974, such a comprehensive analysis has been lacking, but the time and need for it now are pressing.

### **Cumulative Impacts and Connected Issues:**

Salinity-control projects have been implemented over the past several decades by multiple federal agencies, including the Bureau of Reclamation, the Bureau of Land Management and the U.S. Department of Agriculture. Despite these efforts, increases in salinity can be expected from future extractive energy development throughout the basin, higher reservoir evaporation rates and lower high-flow periods due to global climate change and drought patterns, and decreased quantity due to over-allocation and increased consumption. Around the turn of this century, water managers recognized that the Colorado River Basin was out of balance and demand had exceeded supply. This recognition resulted in formal policy as the SECURE Water Act of 2009, which defined safe and adequate water supplies as fundamental to the security of the nation and identified global climate change as a factor in protecting those supplies.

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Analysis of the brine disposal alternative at the Paradox Valley Unit must consider the likelihood that salinity control methods will require more action in the future due to these trends and complications. While approximately 47 percent of the salt in the Colorado River is from naturally occurring sources -- such as the brine aquifer that feeds the Dolores River in Paradox Valley -- that proportion is likely to change in the future, requiring a greater focus and attention to the underlying anthropogenic causes of salinity. In a sense, addressing the foundational issues of conservation, storage, diversions, flow management, agricultural and irrigation techniques, energy development, and supply and demand as they relate to salinity content and the overall health and vitality of the Colorado River Basin cannot be isolated from proper analysis and the search for the best solutions both within Paradox Valley and throughout the watershed. Conducting an Environmental Impact Statement for the Salinity Control Program will facilitate analysis of these issues, but it should be inseparable from the broadest possible embrace of understanding regional development and multiple federal actions that impact shared goals of managing the Dolores and Colorado Rivers sustainably for the future.

Among these is ongoing mineral and energy exploration and extraction throughout the Upper Colorado River Basin. Oil and gas drilling activities and associated hydraulic fracturing have increased substantially, creating significant activity and development across the Colorado Plateau. Extensive areas of western Colorado and eastern Utah are leased or soon to be leased for natural gas development. The Dolores River watershed and its sensitive ecosystems and habitat are experiencing increased pressures from mineral extraction such as potash, uranium, carbon dioxide and base metals. With respect to current interest in potash exploration in the Dolores

River Basin, BLM's Tres Rios Field Office recently issued an Environmental Assessment for potash exploration along the Dolores, south of Paradox Valley, near Egnar, Colorado.<sup>1</sup> This EA notes that the proposed potash mining project could affect 40,000 acres, in a region upstream of the Paradox salinity control unit.

Due to overlapping impacts, the Bureau of Reclamation analysis needs to be coordinated with the ongoing Department of Energy preparation of the Programmatic Environmental Impact Statement of its Uranium Leasing Program in the Dolores and San Miguel River Basins. The increased level of interest and activity in expanding mineral extraction within the Upper Colorado River Basin generates individual actions that each contribute to incremental increases in salinity; the concomitant downstream impacts must be analyzed for their cumulative effects.

Any federal action in Paradox Valley must be understood to be of intense interest and concern on the local, regional, and even national level. For generations, the diverse communities and stakeholders of the Dolores River Basin have valued the river for its contributions to local life, local economies and the character of the region. Local efforts to protect the Dolores River have flourished in recent years through the collaborative-based efforts of the Lower Dolores Working Group, Dolores River Coalition, and other cooperative groups. Collaborative efforts

among conservation organizations have focused on the abundant and diverse conservation values of the Paradox Valley that are deserving of protection. An important focus of conservation initiatives has been the revitalization of native fisheries and populations in the San Miguel and Dolores basins. Salinity is a negative factor in the recovery of native species. A variety of locally-based efforts seek to promote sustainable recreation and tourism opportunities, including mountain biking and heritage tourism. All of these efforts have fostered increased stewardship

over areas with sensitive habitat, wild lands characteristics or special recreational, cultural or scenic values.

The existing collaboration among diverse stakeholders throughout the Dolores River Basin should be considered as a weighty and important framework underlying any analysis of the Paradox Unit's Evaluation of Brine Disposal Alternatives. These related actions and others – from grassroots outreach to federal agency projects to national policy directives – are interwoven with changing regional development patterns. The Colorado River Basin Salinity Control Program, too, is interwoven into the collective impact of multiple and competing uses imposed on the Dolores River.

#### Range of Alternatives:

The Bureau of Reclamation should be creative and ambitious in its development of alternatives, as the possibilities for addressing salinity in the Colorado River Basin are numerous. Under all alternatives, the BOR should ensure the continued delivery of the 700 acre-feet of augmentation water stored in McPhee Reservoir. Any reduction of water operated as a part of McPhee Reservoir's "fish pool" could trigger mandatory supplementation of the NEPA analysis for the Dolores Project. Specifically, supplementation may be necessary to examine the impacts

<sup>1</sup>RM Potash Exploration Project, Environmental Assessment DOI-BLM-CO-S010-2009-0076, : [blm.gov/pgdata/etc/medialib/blm/co/information/nepa/san\\_juan\\_public\\_land/trfo\\_nepa\\_docs/Par1940/File.dat/09-76%20RM\\_Potash\\_Final\\_EA\\_2012-1018.pdf](http://blm.gov/pgdata/etc/medialib/blm/co/information/nepa/san_juan_public_land/trfo_nepa_docs/Par1940/File.dat/09-76%20RM_Potash_Final_EA_2012-1018.pdf)

.123 cont.

of a reduction of flows to native fish populations, in light of the most recent scientific research<sup>2</sup> finding evidence of deteriorating viability of native fish populations in the Dolores River below McPhee Dam.<sup>3</sup> If additional augmentation water is needed, an assessment of that need should be described under the appropriate alternatives.

*No Action Alternative*

.124 A No Action alternative, which by law needs to be prepared. Although we do not feel "no  
action" is preferred given Deep Well No 1 nearing capacity. BOR will need to investigate the  
feasibility of continuing the existing brine injection system or expanding it to increase disposal  
capacity. The existing project is known to have caused a 4.3 magnitude earthquake in Paradox  
.113 Valley in June 2000, but seismic events have registered lower magnitudes over time with the  
implementation of two annual shutdown periods. A full explanation of this event and measures  
to avoid its recurrence should be presented in the Draft EIS. A No Action alternative should  
thoroughly investigate all ramifications of increased seismic events caused by pressure injections  
in light of existing and future development within Paradox Valley, including the proposed Piñon  
Ridge Uranium Mill to the east. Mitigation of seismic events should include investigating the  
.124 feasibility of replacing the current deep injection well with another in a new site, or operating  
multiple wells together in order to increase rest periods.

*Development of a new injection well Alternative*

The development of a new injection well to replace Deep Well No. 1 should be  
thoroughly analyzed. The current system appears to be working so replacing Deep Well No. 1  
with a new deep-well(s) would likely present the least impact to the natural, agricultural,  
recreational, and cultural values of the Paradox Valley and Dolores River Basin. It is important  
that analysis of this alternative fully consider the potential environmental and socioeconomic  
.125 benefits to an alternative that would avoid the large surface disturbance associated with  
evaporation ponds. As BOR has recognized, a large extent of evaporation ponds in Paradox  
.106 Valley would significantly change the character of this currently rural, highly scenic area. Thus  
the benefits of preserving the rural and scenic qualities of the area should be fully recognized in  
.120 the analysis, as these qualities hold economic value for tourism and recreation and social value  
.107 for preservation of intact rural culture.

*Use of Evaporation Ponds*

.126 Given associated problems evaporation pond sites identified in BOR's Paradox  
Evaporation Pond Pilot Study scoping notice dated November 18, 2011, and accompanying map,  
additional sites for the evaporation ponds must be analyzed in any alternatives contemplating the  
use of evaporation ponds. Site 3 on the November 18, 2011, scoping map is problematic because  
.112 of its proximity and possible encroachment into a segment of the Dolores River recommended  
for Suitability for Wild & Scenic River status through an extensive public process that included

<sup>2</sup> Bestgen, K. R., P. Budy, and W. J. Miller. 2011. Status and trends of flannelmouth sucker *Catostomus latipinnis*, bluehead sucker *Catostomus discobolus*, and roundtail chub *Gila robusta*, in the Dolores River, Colorado, and opportunities for population improvement: Phase II Report.  
<http://ocs.fortlewis.edu/drd/pdf/DoloresRiverPhaseIIFinalAugust2011-appendices.pdf>

<sup>3</sup> Indeed, this evidence may trigger mandatory supplementation of the NEPA analysis for the Dolores Project, regardless of which alternative the Bureau selects in connection with the proposed Paradox Valley Evaporation Pond Pilot Study.

the Bureau of Land Management Southwest Resource Advisory Council (RAC) and Uncompahgre Field Office SubRAC. Site 2 on the scoping map is problematic for its proximity to a section of the Dolores River with degraded riparian habitat and disturbed natural flows that is already impaired and in need of restoration. .108

.127 The permanent storage and creation of landfills to store toxic waste from evaporation ponds in Paradox Valley should be excluded from consideration in all alternatives. All evaporate waste that may be created by the Paradox Valley Salinity Control Project should be removed and permanently stored in a licensed hazardous waste landfill in a suitable location. In addition, all .128 alternatives that contemplate the use of evaporation ponds should include specific provisions for monitoring for groundwater contamination, surface run-off, and impacts to wildlife and .129 vegetation. Further, all alternatives should specify the best available technology for preventing .130 leakage of evaporative ponds, and detail the expected materials and construction methods. .131

*Other Aspects for Consideration in Multiple Alternatives*

.132 1. Mitigation of Agricultural Practices: Salinity in the Colorado River Basin is greatly affected by agricultural practices and irrigation techniques, and an alternative should be developed to mitigate these impacts in the Dolores River Basin. The feasibility of implementing irrigation improvements should be investigated as a positive and supplemental measure to reduce salinity above and beyond existing measures while also reducing consumption. Water percolation from unlined irrigation ditches and stock ponds contributes to salt-loading in soils and increased saline runoff. Potential mitigation measures include creating cooperative programs with ranchers and farmers to improve water delivery controls, line ditches or build delivery pipes, and intercepting runoff.

.133 2. Natural Habitat Restoration: An alternative emphasizing the salinity-reduction benefits of natural habitat restoration should also be developed. The Dolores River has been invaded by tamarisk in many sections, an indication of the poor health of the riparian corridor as well as the imbalance in salinity levels in the river. Current tamarisk eradication efforts along the Dolores River are beneficial to the health of habitat but also reduce salinity and improve the natural filtration of riparian zones. These efforts can be expanded and should be investigated as another tool for reducing salinity. Restoration of native cottonwood habitat zones can be expected to bring multiple environmental improvements.

.134 3. Renewable Energy Sources: The feasibility of using renewable energy sources should be incorporated into alternatives. The Bureau of Reclamation is planning to deploy a solar-powered desalination pilot project at the Brackish Groundwater Research Facility in Alamogordo, N.M. In other instances, the BOR is researching technology that combines desalination with wind or solar power, or co-location of desalination facilities with power generators. The use of solar stills are another possibility in Paradox Valley, which has the benefit of returning a freshwater supply to the river.

4. Changing Water Management Approaches: The Bureau of Reclamation is currently conducting an exhaustive Supply and Demand Study for the Colorado River that addresses the imbalance between the Upper and Lower Basins, and the reliance of lower-basin users to have water problems such as salinity solved by upper basin suppliers. An alternative for the Paradox

Valley Salinity Control Project should be developed that takes into consideration the changing approach of the Bureau of Reclamation toward water management and any recommendations forthcoming from the Supply and Demand Study. An alternative that evaluates the impacts of managing natural Dolores River flows and increasing releases from McPhee Reservoir as a means of reducing salinity should be developed and considered.

5. Harvesting Brine: An alternative should be developed and considered that would incorporate public-private partnerships to extract commercially valuable compounds from the brine and process materials in an environmentally responsible way to both address materials produced by salinity treatment and contribute to local economic development.

#### Environmental Impacts Analysis:

The Bureau of Reclamation's analysis of the Paradox Valley Salinity Control Project should comprehensively examine impacts to the environment and ecosystem of Paradox Valley and the riparian system and associated wetlands of the Dolores River. The analysis of impacts should also consider potential impacts to local communities and economies, western heritage and culture, and recreation and tourism. These impacts include but are not limited to:

1. Water Quantity and Quality: The impacts on flows and water quality in the Dolores River and the necessity to mitigate the impacts of salinity on native fish species and stimulate their recovery.

2. Riparian Zone and Wetlands: The impacts of salinity control on the riparian areas and associated wetlands of the Dolores River, East Paradox Creek and West Paradox Creek, including the condition of vegetation and habitat.

3. Groundwater Depletion: The impacts to Paradox Valley hydrogeology from depleting the brine aquifer and intercepting underground flows into the Dolores River.

4. Brine Character: Analysis of the amount of natural salt-loading into the Dolores River and its natural character and flow variations as a means of developing more effective salinity control techniques.

5. Air Quality and Odors: Disclosure and analysis of air emissions associated with an evaporation pond, including the release of hydrogen sulfide, and potential dust releases from exposure of evaporative residues.

6. Soil Quality and Impacts to Soil Crusts: Analysis of soil conditions at any proposed evaporation sites to determine suitability of locating ponds; and assessment of impairment of soil crusts from surface disturbance. Analysis of impacts to soil crusts is especially important in this vicinity, as impaired soil crusts can lead to increased ambient dust, in turn leading to increased dust storms and dust-on-snow. Increasing dust-on-snow conditions have been associated with altered spring run-off regimes in the San Juan Mountains. Further, the BLM has identified soil crusts in the East Paradox vicinity as having exceptional ecological value, and warranting consideration for inclusion in an Area of Critical Environmental Concern (ACEC).

7. Birds: The impacts of evaporation ponds on birds protected by the Migratory Bird Treaty Act, by the Bald and Golden Eagle Protection Act, on bird species of special concern or with critical habitat in the region, and state and federal candidate and listed species. Of particular concern are the potential impacts to birds that have a particular need or affinity for the habitat characteristics of the project area, including cliff-nesting raptors, shorebirds, wading birds, waterfowl, swifts and swallows, and other riparian-associated birds. Such birds of significant concern include, but are not limited to:

- Peregrine falcons, a bird of state special concern, known to nest in several locations in or near the project area.
- Common merganser and Pied-billed grebe, known to breed in the project vicinity
- Great blue heron, known to breed in the project vicinity
- Black phoebe, a riparian-associated passerine with very limited range in Colorado, known to breed in the project vicinity
- Spotted sandpiper, known to breed in the project vicinity
- White-throated swift, Northern rough-winged swallow, and bank swallow, known to breed in the project vicinity

(See "Birds of Western Colorado Plateau and Mesa Country," Righter, Levad, Dexter and Potter, 2004).

8. Bats: Impacts to bat habitat and foraging. This is especially relevant as the vicinity of the project area provides both roosting and foraging habitat attractive to bats, including caves and mines for roosting; and water sources, including the river and potential evaporation ponds, producing drinking water and insects for foraging. The combined effect of evaporation ponds and associated insects attracting bats, with the proposed noise emitters for the ponds, could have significant impact on bats and their acoustic-based navigation and feeding methods. At least eight different species of bats have been documented in Paradox Valley, including one or two BLM sensitive species (see "Bats in the Paradox Valley Area..." by Mark A. Hayes, University of Northern Colorado, 2008).

9. Rare plants and plant communities: Direct, indirect and cumulative impacts to rare plants and plant communities. This consideration is especially important because a number of rare and unique plants and plants communities have been documented in and near the project area. In particular, the globally rare New Mexico privet riparian vegetation community is found near the project area along the Dolores and San Miguel Rivers; occurrences of the globally rare Naturita milkvetch appear to lie within or very near the project area; the Paradox breadroot and Payson lupine occur nearby in the Paradox Valley; and rare and uncommon grassland communities occur nearby in the Paradox Valley. The potential dissemination of invasive species, effects on pollinators, and other indirect impacts on rare plants and vegetation communities should be included in the analysis.

10. Wildlife Habitat: Impacts of evaporation ponds on wildlife species, including migratory patterns and habitats, the use of winter and severe winter range, calving areas and breeding grounds.

Of particular note is the mapped occurrence of a Gunnison prairie dog colony in or very near the project area. Not only is this species of conservation concern in its own right, the

.114 cont

presence of a prairie dog colony indicates the potential for impacts on many associated species, including reptiles, burrowing owls, and raptors and mammals that are drawn to feed on the prairie dog colony.

The proposed project appears to be located within or very near the following mapped (CDOW 2010) habitats for economically important game species, and impacts to these species and associated hunting activities should be assessed:

- Elk severe winter range
- Elk winter concentration area
- Mule deer severe winter range
- Mule deer winter concentration

Impacts should be especially carefully assessed for mammals that utilize the river or riparian corridor for movement corridors, drinking water or breeding. Among the mammals of special conservation interest that utilize the vicinity of the Dolores and San Miguel rivers and river corridors are river otter, a state species of special concern, and big-horned sheep.

.114

11. Fish: The potential impacts to native fish must be thoroughly assessed. Native fish are of great conservation concern in the Dolores River, and any adverse impacts must be avoided to species of concern including but not limited to: bluehead sucker, flannelmouth sucker, roundtail chub. Potential impacts on fish species protected by the Endangered Species Act should be addressed in consultation with the U.S. Fish and Wildlife Service.

.110

12. Threatened and Endangered Species: Analysis of impacts of the proposed action and its connected actions to species listed as threatened or endangered under the Endangered Species Act.

.107

13. Livestock: Impacts to livestock on adjacent lands and the potential loss of grazing areas.

.143

14. Nuisances: Impacts of wildlife mitigation measures such as netting, flashing lights, noise cannons, bioacoustics, water sprays and the visual impacts of brine coloring on nearby residents, visitors to the valley and wildlife.

.106

15. Scenic Viewshed: Impacts to the scenic views and attractiveness of the region to visitors as well as to the rustic and agrarian character of Paradox Valley.

.122

16. Cultural Resources: Analysis and surveys of the project area to identify and protect paleontologic, archeological, cultural and historic resources.

.120

17. Recreation: Impacts to boaters, paddlers, anglers and other river-based recreational users.

Impacts to hikers, equestrians, birdwatchers and other recreational users who utilize the river corridor and adjoining lands, and whose experience may be affected by surface facilities, scenic views, sounds, ability to view wildlife, and access to preferred routes of travel;

Hunting, fishing, and other wildlife-based recreational use that depends on access to the river and nearby wildlife habitat, and depends on maintenance of hunting and fishing stock and movement corridors of wildlife.

.120	<p>18. Research and Natural History Activities: Impacts to scientific researchers and natural and human history aficionados, including botanists, avian monitors, geologists and rock hounds, historians, and anthropologists.</p>
.111	<p>19. Land Management Designations and Public Lands Planning Processes: Analysis and avoidance of existing and proposed special land management designation areas, including but not limited to: river segments recommended for Wild &amp; Scenic River Suitability; Areas of Critical Environmental Concern (ACECs); Special Recreation Management Areas; proposed National Conservation Areas; Wilderness Study Areas; Lands with Wilderness Characteristics; citizen-proposed Wilderness Areas; and designated critical habitats for sensitive species.</p>
.121	<p>These considerations are especially important because the proposed project is located within a region currently undergoing Resource Management Plan Revision for the BLM Tres Rios and Uncompahgre Field Offices. It is important that these key regional land management planning processes be able to maintain their decision space and a reasonable range of alternatives, particularly as these alternatives currently include a number of potential special management areas that could be affected by the proposed project.</p>
.125	<p>The broad range of sensitive resources potentially meriting protection through special designations is reflected in the range of ACECs included in the BLM Uncompahgre Field Office Draft ACEC study. The proposed project may impact the following potential ACECs: Dolores River Canyon, West Paradox and East Paradox.</p>
.114	<p>20. Emergency Preparedness: Analysis of likelihood of natural catastrophe, extreme weather events, flooding, wildfire and other disasters that could cause the failure or malfunction of evaporative compounds and potential damages and impacts to the Dolores River and Paradox Valley.</p>
.136	<p>21. Economic Development: Analysis of feasibility of harvesting commercial byproducts from evaporate material; analysis of potential contributions to local economies from a desalinization plant utilizing renewable energy.</p>
.116	<p>22. Area Development: Analysis of the cumulative impacts of water depletion, seismic activity, drilling and other salinity-control activities, including consideration of any potential interaction with the pending development of a uranium milling facility and tailings compound nearby.</p>
.127	<p>23. Waste: Analysis of impacts from storage, disposal and permanent management of evaporate waste material and costs of removal from Paradox Valley.</p>
.142	<p>24. Energy: Analysis of feasibility of powering the Paradox Valley Salinity Control Project with non-polluting renewable energy sources.</p>
.134	<p>25. Alternative Technologies: Analysis of feasibility of using alternative desalinization technologies, such as devaporation, zero liquid discharge crystallization and reverse oxidation.</p>

**Conclusion:**

The salinity and concentration of salts in the Dolores and Colorado Rivers are influenced by multiple factors, including reservoir storage, diversions, climatic conditions, seasonal variation and drought patterns, natural runoff flows, groundwater pumping, agricultural and irrigation practices, and salinity-control projects. The connection and complexity of these factors must be considered together for any analysis to be successful in developing appropriate action alternatives that are protective and beneficial to both communities and the environment.

The Paradox Valley is a special landscape deserving of protection. Real solutions to the salinity problems of the Colorado River Basin can be found in developing alternatives that embrace multiple approaches and root their success in sound science and management techniques that improve the health of land and water. A potential large-scale evaporation pond complex and long-term toxic waste storage pose severe challenges to the area's conservation values and could preclude the development of the region for tourism and recreation. A new deep-well injection site(s) would likely be more compatible with the recreational and agricultural uses of the Paradox Valley. Both the Dolores and the Colorado River face increasing demands for water and the cumulative impacts of depleting supplies, degrading quality, energy development and over-allocation. Salinity-control policies must take these factors into consideration and identify solutions that help achieve shared community goals of revitalizing and protecting watersheds to benefit future generations.

Thank you for your consideration of these comments.

Sincerely,

Barbara Hawke  
Dolores River Basin Wildlands Coordinator  
The Wilderness Society  
1617 American Way  
Montrose, Colorado  
barbara\_hawke@tws.org  
970-596-6697

Becky Long  
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Colorado Environmental Coalition  
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Dan Randolph  
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Jen Bock  
Water Director  
High Country Citizens Alliance  
PO Box 1066  
Crested Butte, CO 81224  
jen@hccaonline.org  
970-349-7104

Mr. Terry Stroh  
 Bureau of Reclamation  
 2764 Compass Drive, Suite 106  
 Grand Junction, Colorado 81506

Delivered via email to: [tstroh@usbr.gov](mailto:tstroh@usbr.gov) / [anicholas@usbr.gov](mailto:anicholas@usbr.gov)  
 Re: Paradox Valley Salinity Control

November 3, 2012

Dear Mr. Stroh,

I am grateful to have had the opportunity to attend your September 27<sup>th</sup> Public Scoping Meeting in Grand Junction. Your presentation on brine disposal and desalination was thorough and educational. I was also pleased to have had the chance to voice my opinion regarding the proposed evaporation ponds in Paradox Valley.

As you know, my husband and I own 120 acres on the east side of the Dolores River and have enjoyed it for over 24 years. Though injection wells are not the perfect alternative, they would certainly be our preferred option. At the meeting, I even suggested building the ponds in Uravan. If they must be built, why not build them in a place that has already been impacted by previous development?

Beyond the obvious environmental impacts of evaporation ponds in Paradox Valley, we think it's important to factor in the visual footprint of such a proposed facility. Not only would the development impact the immediate ground on which it sat, but the view of the entire valley would also be affected.

Evaporation ponds last about 25 years. We have already owned our land for 24 years and intend it to leave it a legacy for our son and his family. Evaporation ponds are only temporary, but if built too close, they will ruin the integrity and value of our land forever.

We ask everyone who is part of this decision process to go and look at Paradox Valley and see for themselves—Paradox Valley is undeniably one of the most beautiful areas in western Colorado.

Please, add these comments to our previous letter dated August 19, 2012. And again, we thank you for your time and careful consideration with this project.

Sincerely,

Kathleen D. Cooney  
 Charles M. Schildt  
 895 Locust Lane  
 Moab, Utah 84532

**From:** [Mike Eytel](#)  
**To:** [Stroh, Terence L. \(Terry\)](#)  
**Subject:** Paradox Scoping Mtg  
**Date:** Friday, September 28, 2012 3:26:50 PM

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Terry – Good afternoon. Unfortunately I was unable to make any of the scoping meetings. I am interested in any materials which may be available regarding the EIS. Let me know when you have a minute. Have a nice weekend!

Regards,  
Mike

Mike Eytel | Water Resource Specialist  
[meytel@crwd.org](mailto:meytel@crwd.org) | [www.ColoradoRiverDistrict.org](http://www.ColoradoRiverDistrict.org)  
T: 970.945.8522, ext. 215 | C: 970.485.0483



Miller - DNR, Steve <[steve.miller@state.co.us](mailto:steve.miller@state.co.us)> Dec 7 (5 days ago)

to Jennifer, Ted, Steve, David, Dave, Don, me, Terence

CWCB won't comment further on the scoping meetings or process, although we thought that was done well, and gave the public good insight into the need for additional/alternate/replacement brine disposal methods at Paradox. Instead of commenting, we are committed to working with USBR throughout the study and NEPA process as a cooperating agency.

**Steve Miller, Water Resource Specialist**  
**Interstate, Federal, and Water Information Section**  
**Colorado Water Conservation Board**  
**Department of Natural Resources**  
1313 Sherman Street, Room 721  
Denver, CO 80203  
Phone: (303) 866-3441 Ext. 3228  
Cell (303) 829-1650  
Fax: (303) 866-4474  
[steve.miller@state.co.us](mailto:steve.miller@state.co.us)  
[www.cwcb.state.co.us](http://www.cwcb.state.co.us)

**From:** [Rosemary Griffin](#)  
**To:** [Stroh, Terence L. \(Terri\)](#)  
**Subject:** salinity project  
**Date:** Wednesday, September 26, 2012 3:14:55 PM

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Hi tstroh, I meant to go to the meeting last night at the paradox charter school, but I didn't know it was last night because I never got an email from you. I checked my spam, not there either. Also, there was no announcement posted at the school, nor at the Bedrock Post Office. I think you need to at least call our post office and ask them to print up an announcement of future meetings! ! ! (859-7318) I am teaching today and tomorrow, so I will not be able to go to Montrose or Junction. I still am AGAINST an evaporative pond if you will be blasting off charges every 20 minutes, though I had heard that this idea was nixed because it was inadvertently planned in a flood plan. Sincerely, Rose Griffin, owner, Bedrock Store.

112

**From:** [Hannah Holm](#)  
**To:** [Stroh, Terence L. \(Terry\)](#)  
**Subject:** media releases  
**Date:** Friday, September 28, 2012 11:33:46 AM

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.101

Hi, I coordinate the Water Center at CMU and just saw you had a meeting here on campus last night about the salinity control project in Paradox that I didn't know about! Could you please add me to your list for media releases, since I try to help spread the word about all kinds of water-related events in the area?

Thanks,  
Hannah

Hannah Holm, Coordinator  
Water Center at Colorado Mesa University  
[www.coloradomesa.edu/WaterCenter](http://www.coloradomesa.edu/WaterCenter)  
970-683-1133

Follow the Water Center on Social Media for breaking news:  
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<http://twitter.com/WaterCenterCMU>

Terry Stroh  
Bureau of Reclamation  
2764 Compass Drive, Suite 106  
Grand Junction, Colorado 81506

Re: Paradox Salinity Scoping Comments  
From: Karen Hart  
P.O. Box 307, 19988 T5 Road  
Paradox, CO 81429-0307  
[greenranch@sbcglobal.net](mailto:greenranch@sbcglobal.net)

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SERIALIZED	FILED	FILED
CLERK	CLERK	CLERK
10/17	TS	Stroh

101 I have had continuing concerns and objections to the deep well injection of brine at the Paradox salinity site since its beginning, in particular regarding the seismic activity caused by it. Due to the unpredictable consequences of continuing seismic activity causing potential collapsing of substrate or affecting geological surroundings, I object to continuing any deep well injection methods for brine control.

102 The natural springs that rise at the lower levels of the Carpenter Ridge have been used agriculturally for over a hundred years, and we ourselves have a substantial investment in surface piping from source to fields and orchards. Although I have not witnessed any visible variation in the output of the five springs that lie on the north side of this property in the 26 years I have owned it, I am aware of various damaging seismic effects on local and nearby wells.

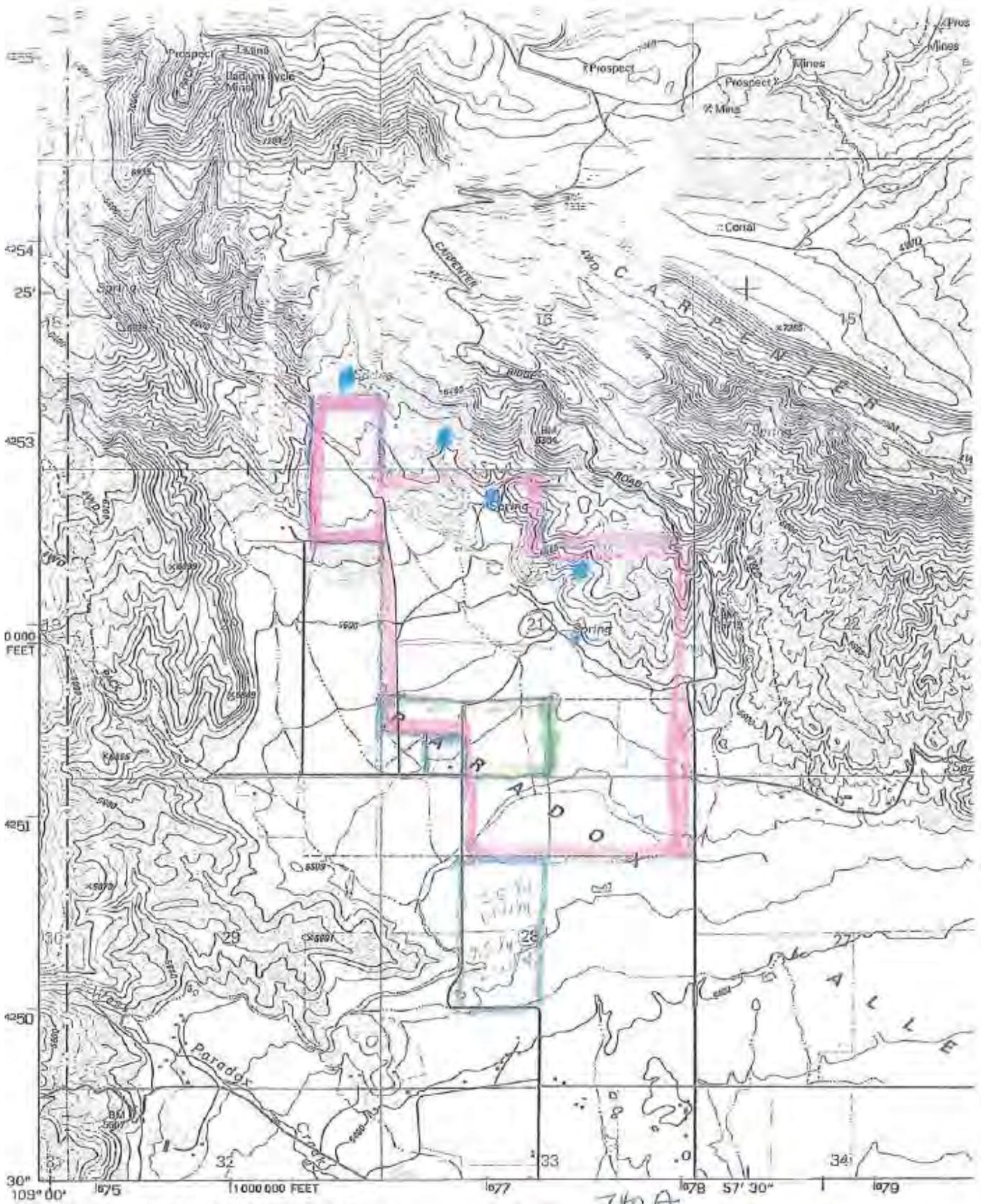
103 We have also had several instances of sink holes appearing; they may be a washout collapse of underlying gypsum strata, a result of seismic activity, or other unknown natural cause.

104 In my opinion, any seismic activity attributed to the salt project is undesirable and subject to the law of unintended consequences, as well as potentially damaging to our sources of fresh water in the Paradox Valley.

Thanks for the scoping meeting here and the opportunity to make these comments.

*Karen Hart*

*In enclosing a copy of Hart Ranch location with 5 spring areas marked in blue. I would obviously prefer a surface approach to dealing with the valley load of salt entering the river. k*



Produced by the United States Geological Survey  
 Control by USGS and NOS/NOAA  
 Compiled from aerial photographs taken 1947. Revised from aerial

240 A  
 290 A  
 Hart Ranch



# Paradox Valley Salinity Control Unit Scoping Meetings 2012 NOV -5 PM 1:30 Comment Sheet

We welcome your comments and concerns on the Paradox Valley Salinity Control Unit Alternatives. Comments can be handed in at this scoping meeting, e-mailed to [tstroh@usbr.gov](mailto:tstroh@usbr.gov), or mailed to Area Manger, Bureau of Reclamation, 2764 Compass Dr., Suite 106, Grand Junction, CO 81506.

(Optional) Name Reed Hayes  
Address Box 455  
Paradox Co. 81429

Email Address

Comments: I would rather have  
evaporating ponds. As for migrating  
birds checked the Potash ponds they  
have been in service for over 40 years &  
have never had a migratory bird problem

.101

Reed Hayes Jean Hayes

also - know about the Dead Sea & the  
Great Salt Lake?

(over)

115

Stroh, Terence

11:27 AM (1 hour ago)

To: me, Andrew, Vernon

FYI

----- Forwarded message -----

From: **Ken Curtis** <[kcurtis@frontier.net](mailto:kcurtis@frontier.net)>  
Date: Wed, Dec 19, 2012 at 11:09 AM  
Subject: Paradox Valley Salinity Control Unit  
To: [tstroh@usbr.gov](mailto:tstroh@usbr.gov)  
Cc: [paradoxeis@usbr.gov](mailto:paradoxeis@usbr.gov), [mpreston@frontier.net](mailto:mpreston@frontier.net)

Terry,

Good to catch up with you yesterday. The Dolores Water Conservancy District (DWCD) has greatly appreciated working with Reclamation to complete the Dolores Project just a few short years ago. The benefits to SW Colorado have been tremendous. As a Colorado River water user, DWCD, has participated and supported efforts to reduce salinity across the whole basin and more specifically worked with Reclamation on releases for augmentation. DWCD would like to continue supporting the Paradox Unit operating to the benefit of all Colorado River water users.

I had not thought to bring the Paradox EIS process to the Board at this early stage, but would like to be included on the appropriate contact lists so I can keep them informed of your progress. At some later stage I will seek a Board action of support to submit for your official record.

Thanks  
Ken Curtis  
DWCD Engineer

----- Forwarded message -----

From: **Terry Gulliver** <[TGulliver@norwestcorp.com](mailto:TGulliver@norwestcorp.com)>

Date: Mon, Nov 12, 2012 at 12:03 PM

Subject: Paradox water rights questions

To: "[tstroh@usbr.gov](mailto:tstroh@usbr.gov)" <[tstroh@usbr.gov](mailto:tstroh@usbr.gov)>

Can you answer me the following questions please? I have an interest in use of (another) groundwater brine that is tributary to the Colorado River, and do not understand how the Paradox Unit fits in the state water program.

- Please affirm that the brine intercepted by the pumping wells is tributary to the Colorado River under state law.
- Please affirm the pumped water is appropriated through the SEO.
- Is this a "beneficial use", or a remediation?
- Does the appropriation require augmentation to compensate the flow lost to the river?
- If it does, where does such augmentation occur?
- If not, what is the dispensation?

**Terry Gulliver**

*Hydrogeologist*

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**NORWEST CORPORATION**

950 S. Cherry St., Suite 800

Denver, Colorado 80246

Phone: 303.782.0164 x118

Direct: 720.889.6118

Cell: 720.320.2410

Fax: 303.782.2560

Email: [tgulliver@norwestcorp.com](mailto:tgulliver@norwestcorp.com)

**From:** [Perrinna Pisano](#)  
**To:** [Shull, Terence L. \(Terry\); Ewamer@ustr.gov](#)  
**Cc:** [Nicholas, Andrew J](#)  
**Subject:** Paradox Valley Salinity Control Unit  
**Date:** Friday, November 23, 2012 3:57:26 PM

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Dear Sirs,

This email is in response to your letter of sept 13 regarding concerns over proposed injection well sites for the proposed new facility to replace the current facility in bedrock.

My husband Anthony and I are new property owners in Paradox Valley, specifically Bedrock.

It recently came to our attention that the possible site you have chosen is on X road, directly

across the street from our property. My husband and I recently had a meeting with Andy Nicholas

to discuss our concerns. Andy assured us that nothing had been decided and that this particular site

was only one of many that the Bureau was considering.

I am writing to you now to urge you to take this site off the table as a possibility. There are at least 5 property owners

that would be adversely affected by this site. Just the possibility of it would have an adverse affect on our property values and even the ability to sell our properties, if the need arose, as this would be considered pertinent information that would require full disclosure. If the project actually went through, our property value would virtually be destroyed as would our

right to quiet enjoyment. (As the site is directly across from us, the lights

would be shining into our bedroom nightly,

not to mention the increased traffic on our little road, construction trucks,

noise, etc!)

Every citizen has the right to expect to be protected by our government, not destroyed by it.

While I can appreciate the need to remove the salt from the river to protect our neighbors downstream,

is it right or fair to destroy our property values, right to privacy, and the beauty of our town to do it?

With such a small population in this area, and thousands of acres of

uninhabited land where no one would be affected, does it makes sense to choose a parcel that would adversely affect many, and cause enmity among the local population? Not to mention the lawsuits that would ensue if such a thing were to happen, a scenario where, as I'm sure you'd agree, no matter who wins, everyone loses! I was informed that there will soon be one or more studies done to determine other possibilities, as well as the viability, of this site as well as others. I would very much like to be informed of the outcome of these studies and be allowed to give testimony, where appropriate. However, again,

.106

I urge you to fully consider every viable solution, such as horizontal drilling, to either keep the site you already have, or to choose a site or method that will not negatively impact any of the residents in this community.

Please feel free to contact me regarding this matter either by email or phone at (979) 518-3797

Respectfully,

*Sarah and Anthony Pisano  
9762 X road and 10062 x road  
Bedrock, CO 81411*

118

**From:** Cheryl\_Eckhardt@nps.gov on behalf of IMRextrev@nps.gov  
**Sent:** Friday, November 09, 2012 7:47 AM  
**To:** BOR WCAO DL Paradox EIS  
**Cc:** waso\_eqd\_extrev@nps.gov  
**Subject:** No Comment DEC-12/0107, Paradox Valley Unit

To Whom It May Concern:

NPS has no comment on the subject project.

Regards,  
Cheryl Eckhardt

---

Environmental Quality External Review Team  
National Park Service  
Intermountain Region (AZ, CO, NM, MT, OK, TX, UT, WY)  
[IMRextrev@nps.gov](mailto:IMRextrev@nps.gov)

**From:** Anne Urbanek [<mailto:anneurbanek@ebv.net>]  
**Sent:** Friday, November 23, 2012 3:20 PM  
**To:** Nicholas, Andrew J  
**Subject:** Paradox Valley

Dear Mr. Nicholas,

Kathy Cooney gave me your address. She has talked to you about the plans for the evaporative salt ponds. I own 30 acres between her land and Highway 90. The west side of our land is adjacent to the pie-shaped piece of government land that ends at the corner of River Road and Highway 90.

I walked up to the top of the hill Wednesday, November 30th. I noticed a piece of surveyor's tape tied on to the pole we put up when we surveyed our land and more tape on the fence at the other corner. Ten years ago, I put large pieces of Mahogany Obsidian at each corner of our land. The two pieces at the surveyed corners, SW and NW, are gone. They aren't terribly expensive as far as Crystals go, but did cost \$3.00 a pound and they were around 6 to 8 pounds each. I suppose your surveyors just thought they had found some pretty rocks, but they might have wondered about the fact that they were not like the local rocks, and that they were both at the corners they just marked, and on my side of the pole. I brought my other two pieces home as I don't know if you will be surveying the East side of my property. They are 8 and 6 pounds. I carried two missing Mahogany Obsidian pieces up to the top of the hill on the west side in a backpack, and I know they were heavy. But I was a young and spry 66 year old then. I've spent on the average of 6 weeks a year over there. My husband's ashes are in a fenced area near the gate on the East side. It is hard enough to think our land won't be there for us anymore if you put in those evaporative ponds. But I do like to think what is on my property will stay there until we have to sell.

Kathy never mentioned if the government wants to buy our land. Her friend who has her 40 acres up for sale has been contacted by a realtor who is in touch with a gypsum mining company. I was unable to come to the meetings, but I am sure Kathy presented our side very well. If there is a mailing list for information about the ponds, please put my name on it.

The missing rocks are Mahogany Obsidian, shiny black with brown markings, 6 to 8 pounds each. If the surveyors would like to return them, they can leave them inside near my gate. I haven't locked it as the lock is full of sand and I'm afraid might not open if I close it one more time. I left the open lock to hold the chain around my gate and would appreciate if they would put it back as I left it.

Sincerely,  
 Anne Urbanek

120

Mr. Terry Stroh  
Bureau of Reclamation  
2764 Compass Drive, Suite 106  
Grand Junction, Colorado 81506

Delivered via email to: [tstroh@usbr.gov](mailto:tstroh@usbr.gov)  
Re: Paradox Valley Salinity Control

November 7, 2012

Dear Mr. Stroh,

I have owned 40 acres on the east side of the Dolores River in Paradox Valley for 15 years and am writing to you to voice my concerns regarding the proposal to build evaporation ponds in the valley for desalination of the Dolores River. It is my understanding that some of the proposed sites are very close to my property. Although  
101 adverse environmental impacts on migratory birds and animals are my main concern, 102  
104 such a facility would also negatively impact the scenic beauty of the entire area with a 103  
concomitant decrease in property values and quality of life for all. Injection wells would be my preferred alternative solution for salinity treatment, but only if all other options have been seriously evaluated.

Thank you for your consideration.

Sincerely,

Rebecca Wilson Vande Voorde  
24027 Hawley Creek Rd.  
Monroe, OR 97456

----- Forwarded message -----

From: **Reed, Linda C** <[lreed@blm.gov](mailto:lreed@blm.gov)>

Date: Mon, Nov 26, 2012 at 4:23 PM

Subject: Paradox Valley Salinity Control - Scoping Comments Due

To: "Stroh, Terence L. (Terry)" <[TStroh@usbr.gov](mailto:TStroh@usbr.gov)>

Cc: "Sharrow, Barbara L." <[bsharrow@blm.gov](mailto:bsharrow@blm.gov)>, "Pfifer, Teresa A" <[tpfifer@blm.gov](mailto:tpfifer@blm.gov)>

Terry,

After attending BR's scoping meeting in Montrose back in September, I sent an email to our Field Office managers summarizing the scoping meeting. Additionally at our staff meeting in October, I mentioned BR's project, offered the additional websites provided at the scoping meeting and invited staff to provide comments. I volunteered with management and staff to coordinate BLM's comments and provide them all together to BR.

As of this moment, I have not received any comments from BLM staff or managers.

I just wanted to let you know this, since today is the due date for scoping comments.

Linda

## ATTACHMENT B – Pilot Pond Scoping Comments

201

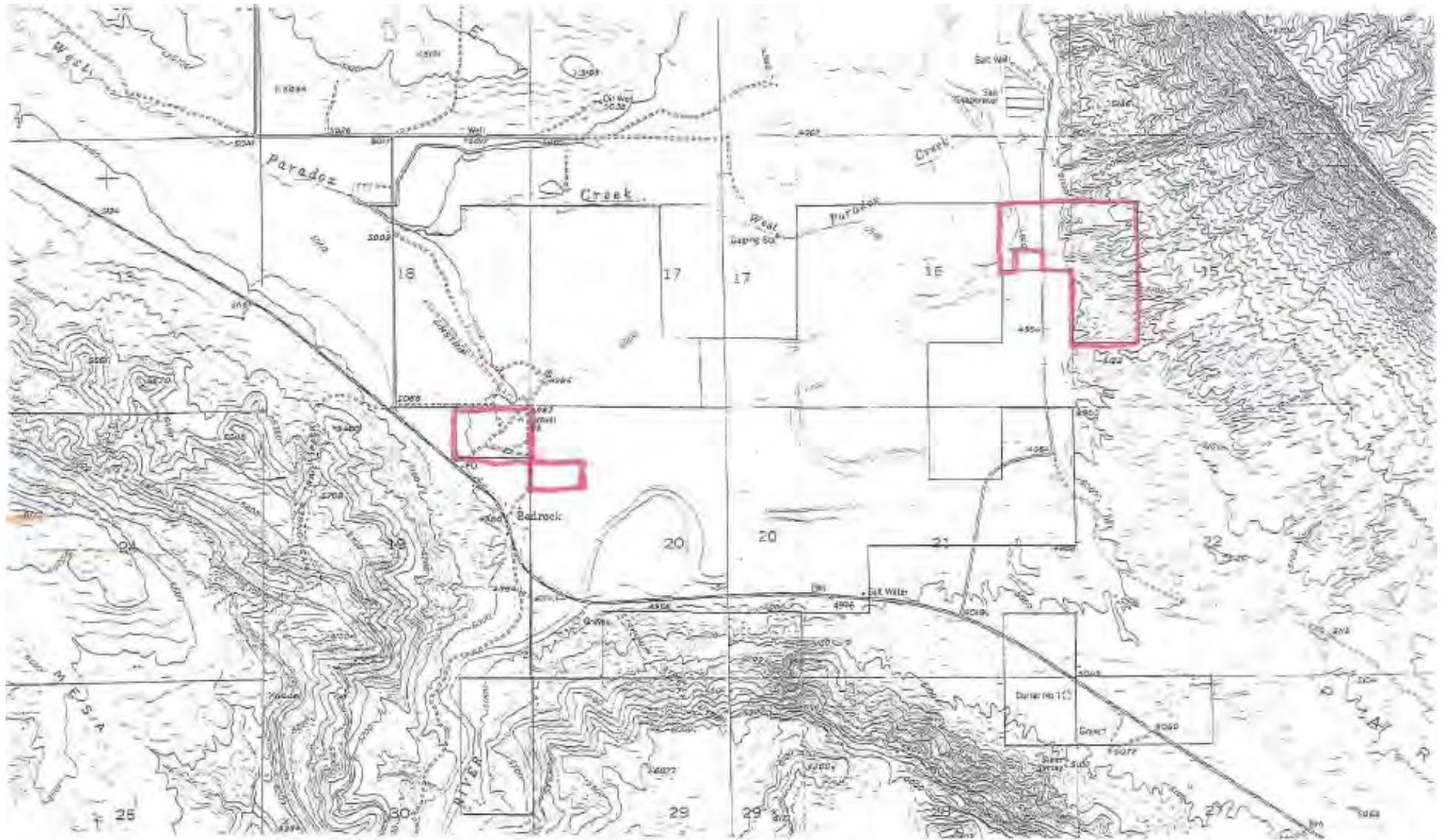
**From:** [Allison Wolff](#)  
**To:** [Stroh, Terence L. \(Terry\)](#)  
**Cc:** [Allison Wolff](#)  
**Subject:** Please conduct and EIS for salinity control in Paradox Valley  
**Date:** Friday, January 27, 2012 12:25:57 PM

---

Dear Bureau of Reclamation,

.101 I implore you to conduct a full Environmental Impact Statement (EIS) for salinity control in Paradox  
Valley before allowing an evaporative pond to be built. Although the deep injection system creates  
.102 concerns over seismic impacts and is reaching capacity, the Bureau should thoroughly examine the  
alternatives available and avoid creating permanent toxic waste dumps in Paradox Valley. Please, .103  
for the sake of our children and the environment in this beautiful valley, please fully assess all  
possible environmental impacts before allowing this plan to move forward.

Allison Wolff  
PO Box 2857  
Telluride, CO  
81435  
O: 970-728-7997  
C: 415-312-0000  
[www.vibrantplanet.net](http://www.vibrantplanet.net)



STANLEY H. VOELKEL INTERESTS

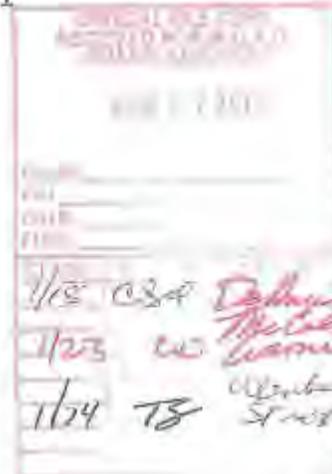
2011 DEC 21 PM 5:04

20111 Rose Fair Court

Katy, Texas 77450

Telephone: 281-578-0941 Fax: 281-578-7811

Email: [stanleyvoelkel@att.net](mailto:stanleyvoelkel@att.net)



December 20, 2011

Carol De Angelis  
Area Manager  
Bureau of Reclamation  
2761 Compass Drive, Suite 106  
Grand Junction, CO 81506

Dear Ms DeAngelis

This letter is for the purpose of providing comments with respect to the proposed surface evaporation ponds as described in your letter dated November 18, 2011.

I am very concerned about the detrimental effect that the ponds and operation thereof would have on the human environment and on the value of my property .101  
in the immediate area of the proposed pond.

.102 The use of noise cannons, flashing lights and possible other methods would have .103  
a severe detrimental effect on the normal living conditions for the local residents.

.101 I own 115 acres adjacent to or very near the proposed pond. There is no question in my mind that the pond and operating activities would basically make this land worthless. In addition, I own 35 acres with an expensive house near the Bedrock store, and I believe that the proposed operations would reduce the value of this property considerably.

For your information, enclosed is a plat showing the properties that I own (encircled in red).

Sincerely,

203

**From:** [JOLANA VANKOVA](#)  
**To:** [Stroh, Terence L. \(Terry\)](#)  
**Subject:** Paradox Valley river - desalting project- call for full Environmental Impact Study  
**Date:** Sunday, January 29, 2012 4:16:28 PM

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To: Terry Stroh, Area Manager, Bureau of Reclamation, [TStroh@usbr.gov](mailto:TStroh@usbr.gov)

Dear Terry Stroh,

.101

In regards to the Paradox Valley project testing evaporation pools, **I call for full Environmental impact study.**

Just like in the old proverbial case of DDT we often cannot even imagine what the impact could be...Yet in long term the impact can be catastrophic in a fragile environment of the fragile South West.

In the past I have seen various projects touted as 'a simple impact assessment is enough'.

.103

It is not enough for this possibly large future project, impact on wild life, recreation and tourism dollars !

.102

Therefor I say Full Environmental Impact Study is quite justified.

Thank you,  
Jolana Vanek  
[jolanavanek@yahoo.com](mailto:jolanavanek@yahoo.com)  
POBox 1555, 19 Boulders,  
San Miguel County, CO 81435



204

## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Ecological Services  
764 Horizon Drive, Building B  
Grand Junction, Colorado 81506-3946



IN REPLY REFER TO:

ES/CO:

TAILS 06E24100-2012-CPA-0011

January 30, 2012

Memorandum

To: Bureau of Reclamation, Western Colorado Area Office, Grand Junction, Colorado

From: Acting Western Colorado Supervisor, Fish and Wildlife Service, Ecological Services, Grand Junction, Colorado

Subject: Comments on the Paradox Salinity Control Evaporation Pond Pilot Study

The Fish and Wildlife Service (Service) has reviewed the information provided for a pilot project to construct an evaporation pond pilot project. The proposal as outlined would be to construct evaporation ponds between 1 to 15 acres in size to evaluate the feasibility of utilizing evaporation ponds as a method for long term salt removal. The pilot project would be operated for a period of from 3 to 5 years to gather information on evaporation rates, advanced evaporation techniques and operational costs.

101

A similar project was proposed several years ago and the Service was opposed to the project at that time because of the potential for adverse impacts to migratory birds. The Service's concerns for impacts to migratory birds has not changed as we continue to believe that open brine evaporation has the potential to negatively impact migratory birds. The migratory bird treaty act (Act) does not have provisions to allow for take and so if birds should die in the pit the Bureau of Reclamation (Reclamation) will be held responsible for their death. The Act provides stiff penalties for actions that take migratory birds.

102

We have stated that to protect migratory birds the ponds will most likely need to be netted and if they are not netted initially the supports will need to be installed to allow the net to be pulled over the ponds, should the brine cause adverse impacts to migratory birds. We note that in your summary sheet you plan to try various means including active and passive deterrents to deter birds from using the ponds. While these methods may provide protection for the ponds without netting it will be important to have staff on hand daily to visually inspect the ponds for birds that may become trapped in the brine and remove and rehabilitate them if they show adverse effects from the brine solution.

103 Pond placement is also a concern of the Service. One site that has been evaluated is adjacent to the Dolores River and could be subject to erosion during high flow events. Also, long term disposal at a site close to the river could lead to dike failure that would allow the stored brine to enter the river. Site location should be closely evaluated to lessen the potential for storage failure that could ultimately allow the brine to enter the river.

104 The project as it is currently operating, as a deep well injection site, has worked relatively well and has no known impacts to migratory birds or other wildlife in the area. We believe that this technique has proven itself to be successful and that future expansion of the deep well injection system would better provide the means to rid the Colorado River of excess salt without the need to evaluate the impacts evaporation may have on migratory birds and other wildlife in the area. We support the idea of developing additional wells or other means to extend the life of the existing well so that the salt brine is not placed on the ground surface where it has the potential of impacting wildlife and entering the river.

Our Salinity Coordinator plans to continue to work closely with your development team to oversee the project design and development to lessen the potential of adversely impacting migratory birds and other wildlife. If you have any questions concerning our comments please contact Rick Krueger, the Service's Salinity Coordinator at 970-243-2778, extension 17.

205 (see letter 107 for full review)



**The Wilderness Society  
San Juan Citizens Alliance**

Mr. Terry Stroh  
Area Manager  
Bureau of Reclamation  
2764 Compass Drive, Suite 106  
Grand Junction, Colorado, 81506

Delivered via email to: TStroh@usbr.gov

Re: Paradox Valley Salinity Control and Evaporation Pond Pilot Study – Scoping Comments

January 30, 2012

Dear Mr. Stroh:

We appreciate the opportunity to comment on the Bureau of Reclamation's proposed Paradox Valley Evaporation Pond Pilot Study. These scoping comments are submitted on behalf of The Wilderness Society and the San Juan Citizens Alliance. Our organizations are heavily invested in conservation programs in the Dolores River Basin, and share goals to preserve the irreplaceable natural and cultural heritage of the Dolores River and nearby public lands.

The Wilderness Society (TWS) is a national organization with more than a half a million members and supporters nation-wide, and an active membership in Colorado. Our members, volunteers and staff live, work and recreate in the Dolores basin and in the vicinity of the proposed project. The mission of The Wilderness Society is to protect wilderness and inspire Americans to care for our wild places. We have worked for more than 70 years to maintain the integrity of America's wilderness and public lands and ensure that land management practices are sustainable and based on sound science to ensure that the ecological integrity of the land is maintained. The Dolores Basin comprises an area of program focus for us, where we are particularly interested in preserving wilderness and backcountry areas, opportunities for primitive recreational experience, and unique ecological values.

San Juan Citizens Alliance (SJCA) has been the lead conservation organization working to support sustainable stewardship in Southwest Colorado for 25 years. SJCA is a grassroots organization dedicated to social, economic and environmental justice in the San Juan Basin. We organize residents to protect our water and air, our public lands, our rural character, and our unique quality of life while embracing the diversity of our region's people, economy and ecology. Our members live, work, play and are deeply engaged with our public lands.

Through the ensuing NEPA process, we expect and encourage a full and thorough review of the environmental and socioeconomic impacts of federal salinity control actions, both in the Paradox valley and more broadly. We believe that for salinity treatment to truly be successful and sustainable in the long term, a comprehensive approach that considers the full Dolores River Basin, and perhaps Colorado River Basin, is warranted.

#### **Purpose and Need:**

The Paradox Valley Salinity Control Project provides beneficial improvements to the water quality of the Dolores River, preventing on an annual basis approximately 110,000 tons of salt from entering the river as it travels north through Paradox Valley and toward its confluence with the Colorado. Groundwater brine from Paradox Valley is intercepted by shallow wells before loading into the Dolores, treated and then injected into a deep well, contributing to an overall reduction of salinity in the Lower Colorado River Basin. Although the benefits of the Paradox project include desirable improvements in habitat for Dolores and Colorado River fish species and improved water quality downstream, the Bureau of Reclamation's stated intent of replacing the current deep well brine injection system causes considerable concern regarding potential substantial impacts associated with many of the possible action alternatives, especially the potential development of the Evaporation Pond Pilot Study into a large-scale evaporative complex. Concurrently, the deep-well injection system poses concerns for its existing seismic impacts which will require a carefully considered approach to identify appropriate alternatives for its extension or replacement.

The Bureau of Reclamation contemplates implementing the Evaporation Pond Pilot Study under the recommendation of the Colorado River Salinity Control Forum and conducting an Environmental Assessment to site the pilot pond in close proximity to the Dolores River with a minimum of three potential sites to be examined. The pilot pond may create significant environmental impacts requiring substantial mitigation that will affect Paradox Valley, nearby residents and wildlife. The scope of the action contemplated, particularly when considered within the true context of potential build-out of surface evaporation ponds, cannot be adequately analyzed through an Environmental Assessment (EA), but rather requires the detailed and thorough NEPA analysis of an Environmental Impact Statement (EIS). The need for more extensive analysis is underscored by the severity of impacts already anticipated in the Bureau of Reclamation Scoping Notice to include injuries and deaths to sensitive migratory bird species protected by international treaty, and creation of a permanent, above-grade waste landfill in Paradox Valley, altering the scenic and agricultural nature of the surrounding area. The pilot pond will cause impacts to the Dolores River corridor, riparian zones and wetlands, habitat for sensitive species, potential BLM Areas of Critical Environmental Concern, and the proposed suitability of the middle Dolores River for Wild & Scenic River status. These potential impacts are the result of major actions by the Bureau of Reclamation that trigger the full analysis of an Environmental Impact Statement under NEPA's threshold. The potential benefits and adverse impact on imperiled native fish species, including those already protected by the Endangered Species Act, poses difficult questions that need to be addressed in consultation with the U.S. Fish and Wildlife Service. In sum, there is no question that the study will necessarily evolve into an on-the-ground project that will be the source of a wide array of impacts, therefore an EA with its pre-determined Finding of No Significant Impact is inadequate, with an EIS being the required NEPA process.

101

Because the Evaporation Pond Pilot Study is formally recommended by the Colorado River Salinity Control Forum under the authority of congressional mandate, it is better understood as the first federally directed phase of implementing a large-scale evaporation project in the Colorado River Basin than as a site-specific project on the Dolores River. Increasingly, the basin-wide salinity-control efforts are recognized as insufficient to meet water quality standards in the lower basin and across the international boundary with Mexico over the long term, particularly in light of over-allocation of water resources, storage evaporation and capacity reduction, and standing agricultural practices. It is well recognized that it will be more difficult in the future for the Bureau of Reclamation to fulfill the directives of the Salinity Control Act as demands on the basin continue to increase. The Paradox deep-well injection project currently accounts for approximately one-tenth of total salt removed from the Upper and Lower Colorado River Basins, despite its location on an upper basin tributary. The Evaporation Pond Pilot Study contemplates the construction of a 20- to 40-acre evaporation compound that, if demonstrated to be feasible, will be expanded to a major complex of evaporation ponds at an estimated size of 800 acres that will create the future need for permanent hazardous waste management. Not only is the pilot project significant in terms of footprint and specific impacts to Paradox Valley, but the general value of the Paradox Valley Salinity Control Project is of measurable and significant importance to federal agency actions to control salinity in the entire Colorado River Basin. A full Environmental Impact Statement is appropriate, warranted and desired in order to identify alternatives and fully analyze the impacts triggered by these major actions by federal agencies. Since the passage of the Salinity Control Act in 1974, such a comprehensive analysis has been lacking, but the time and need for it now are pressing.

#### **Cumulative Impacts and Connected Issues:**

Salinity-control projects have been implemented over the past several decades by multiple federal agencies, including the Bureau of Reclamation, the Bureau of Land Management and the U.S. Department of Agriculture. Despite these efforts, increases in salinity can be expected from future extractive energy development throughout the basin, higher reservoir evaporation rates and lower high-flow periods due to global climate change and drought patterns, and decreased quantity due to over-allocation and increased consumption. Around the turn of this century, water managers recognized that the Colorado River Basin was out of balance and demand had exceeded supply. This recognition resulted in formal policy as the SECURE Water Act of 2009, which defined safe and adequate water supplies as fundamental to the security of the nation and identified global climate change as a factor in protecting those supplies.

Analysis of the Paradox Evaporation Pond Pilot Study must consider the likelihood that salinity control methods will require more action in the future due to these trends and complications. While approximately 47 percent of the salt in the Colorado River is from naturally occurring sources -- such as the brine aquifer that feeds the Dolores River in Paradox Valley -- that proportion is likely to change in the future, requiring a greater focus and attention to the underlying anthropogenic causes of salinity. In a sense, addressing the foundational issues of conservation, storage, diversions, flow management, agricultural and irrigation techniques, energy development, and supply and demand as they relate to salinity content and the overall health and vitality of the Colorado River Basin cannot be isolated from proper analysis and the search for the best solutions both within Paradox Valley and throughout the watershed.

Conducting an Environmental Impact Statement for the Salinity Control Program will facilitate analysis of these issues, but it should be inseparable from the broadest possible embrace of understanding regional development and multiple federal actions that impact shared goals of managing the Dolores and Colorado Rivers sustainably for the future.

Among these is the recent boom in mineral and energy exploration and extraction throughout the Upper Colorado River Basin. Oil and gas drilling activities and associated hydraulic fracturing have increased substantially, creating significant activity and development across the Colorado Plateau. Extensive areas of western Colorado and eastern Utah are recently leased or soon to be leased for natural gas development. The Dolores River watershed and its sensitive ecosystems and habitat are experiencing increased pressures from mineral extraction such as potash, uranium, carbon and base metals. Due to overlapping impacts, the Bureau of Reclamation analysis needs to be coordinated with the ongoing Department of Energy preparation of the Programmatic Environmental Impact Statement of its Uranium Leasing Program in the Dolores and San Miguel River Basins. The increased level of interest and activity in expanding mineral extraction within the Upper Colorado River Basin generates individual actions that each contribute to incremental increases in salinity; the concomitant downstream impacts must be analyzed for their cumulative effects.

Any federal action in Paradox Valley must be understood to be of intense interest and concern on the local, regional, and even national level. For generations, the diverse communities and stakeholders of the Dolores River Basin have valued the river for its contributions to local life, local economies and the character of the region. Local efforts to protect the Dolores River have flourished in recent years through the collaborative-based efforts of the Lower Dolores Working Group, Dolores River Coalition, and other cooperative groups. Collaborative efforts among conservation organizations have focused on the abundant and diverse conservation values of the Paradox Valley that are deserving of protection. An important focus of conservation initiatives has been the revitalization of native fisheries and populations in the San Miguel and Dolores basins. Salinity is a negative factor in the recovery of native species. A variety of locally-based efforts seek to promote sustainable recreation and tourism opportunities, including mountain biking and heritage tourism. All of these efforts have fostered increased stewardship over areas with sensitive habitat, wild lands characteristics or special recreational, cultural or scenic values.

The existing collaboration among diverse stakeholders throughout the Dolores River Basin should be considered as a weighty and important framework underlying any analysis of the Paradox Valley Evaporation Pond Pilot Study. These related actions and others -- from grassroots outreach to federal agency projects to national policy directives -- are interwoven with changing regional development patterns. The Colorado River Basin Salinity Control Program, too, is interwoven into the collective impact of multiple and competing uses imposed on the Dolores River.

#### **Range of Alternatives:**

The Bureau of Reclamation should be creative and ambitious in its development of alternatives, as the possibilities for addressing salinity in the Colorado River Basin are numerous and the challenges associated with a large-scale evaporation pond complex are great.

Given associated problems of the three evaporation pond sites identified in the scoping notice and map, additional sites for the Paradox Valley Evaporation Pond Pilot Study must be

analyzed. Site 3 on the scoping map is problematic because of its proximity and possible encroachment into a segment of the Dolores River recommended for Suitability for Wild & Scenic River status through an extensive public process that included the Bureau of Land Management Southwest Resource Advisory Council (RAC) and Uncompahgre Field Office SubRAC. Site 2 on the scoping map is problematic for its proximity to a section of the Dolores River with degraded riparian habitat and disturbed natural flows that is already impaired and in need of restoration.

The permanent storage and creation of landfills to store toxic waste from evaporation ponds in Paradox Valley should be excluded from consideration in all alternatives. All evaporate waste created by the Paradox Valley Salinity Control Project should be removed and permanently stored in a licensed hazardous waste landfill in a suitable location. In addition, all alternatives should include specific provisions for monitoring for groundwater contamination, surface run-off, and impacts to wildlife and vegetation. Further, all alternatives should specify the best available technology for preventing leakage of evaporative ponds, and detail the expected materials and construction methods.

A No Action alternative should investigate the feasibility of continuing the existing brine injection system or expanding it to increase disposal capacity as a best possible scenario for avoidance of higher impact methods. The existing project is known to have caused a 4.3 magnitude earthquake in Paradox Valley in June 2000, but seismic events have registered lower magnitudes over time with the implementation of two annual shutdown periods. A full explanation of this event and measures to avoid its recurrence should be presented in the Draft EIS. A No Action alternative should thoroughly investigate all ramifications of increased seismic events caused by pressure injections in light of existing and future development within Paradox Valley, including the proposed Piñon Ridge Uranium Mill to the east. Mitigation of seismic events should include investigating the feasibility of replacing the current deep injection well with another in a new site, or operating multiple wells together in order to increase rest periods.

Salinity in the Colorado River Basin is greatly affected by agricultural practices and irrigation techniques, and an alternative should be developed to mitigate these impacts in the Dolores River Basin. The feasibility of implementing irrigation improvements should be investigated as a positive and supplemental measure to reduce salinity above and beyond existing measures while also reducing consumption. Water percolation from unlined irrigation ditches and stock ponds contributes to salt-loading in soils and increased saline runoff. Potential mitigation measures include creating cooperative programs with ranchers and farmers to improve water delivery controls, line ditches or build delivery pipes, and intercepting runoff.

An alternative emphasizing the salinity-reduction benefits of natural habitat restoration should also be developed. The Dolores River has been invaded by tamarisk in many sections, an indication of the poor health of the riparian corridor as well as the imbalance in salinity levels in the river. Federal tamarisk eradication efforts are beneficial to the health of habitat but also reduce salinity and improve the natural filtration of riparian zones. These efforts can be expanded and should be investigated as another tool for reducing salinity. Restoration of native cottonwood habitat zones can be expected to bring multiple environmental improvements.

The feasibility of using renewable energy sources should be incorporated into alternatives. The Bureau of Reclamation is planning to deploy a solar-powered desalinization pilot project this year at the Brackish Groundwater Research Facility in Alamogordo, N.M. In other instances, the Bureau is researching technology that combines desalinization with wind or

solar power, or co-location of desalinization facilities with power generators. The use of solar stills are another possibility in Paradox Valley, which has the benefit of returning a freshwater supply to the river.

The Bureau of Reclamation is currently conducting an exhaustive Supply and Demand Study for the Colorado River that addresses the imbalance between the Upper and Lower Basins, and the reliance of lower-basin users to have water problems such as salinity solved by upper basin suppliers. The Supply and Demand Study will analyze the impact and benefits of increasing natural flows in the river through the possible removal of dams, which are a major contributor to the siltation of rivers. An alternative for the Paradox Valley Salinity Control Project should be developed that takes into consideration the changing approach of the Bureau of Reclamation toward water management and any recommendations forthcoming from the Supply and Demand Study. An alternative that evaluates the impacts of managing natural Dolores River flows and increasing releases from McPhee Reservoir as a means of reducing salinity should be developed and considered.

### **Environmental Impacts Analysis:**

The Bureau of Reclamation's analysis of the Paradox Valley Salinity Control Project should comprehensively examine impacts to the environment and ecosystem of Paradox Valley and the riparian system and associated wetlands of the Dolores River. The analysis of impacts should also consider potential impacts to local communities and economies, western heritage and culture, and recreation and tourism. These impacts include:

1. **Water Quantity and Quality:** The impacts of increasing flows in the Dolores in order to mitigate the impacts of salinity on native fish species and stimulate their recovery;

2. **Riparian Zone and Wetlands:** The impacts of salinity control on the riparian areas and associated wetlands of the Dolores River, East Paradox Creek and West Paradox Creek, including the condition of vegetation and habitat;

3. **Groundwater Depletion:** The impacts to Paradox Valley hydrogeology from depleting the brine aquifer and intercepting underground flows into the Dolores River;

4. **Brine Character:** Analysis of the amount of natural salt-loading into the Dolores River and its natural character and flow variations as a means of developing more effective salinity control techniques;

5. **Air Quality and Odors:** Disclosure and analysis of air emissions associated with an evaporation pond, including the release of hydrogen sulfide, and potential dust releases from exposure of evaporative residues;

6. **Soil Quality and Impacts to Soil Crusts:** Analysis of soil conditions at proposed evaporation sites to determine suitability of locating ponds; and assessment of impairment of soil crusts from surface disturbance. Analysis of impacts to soil crusts is especially important in this vicinity, as impaired soil crusts can lead to increased ambient dust, in turn leading to increased dust storms and dust-on-snow. Increasing dust-on-snow conditions have been associated with

altered spring run-off regimes in the San Juan Mountains. Further, the BLM has identified soil crusts in the East Paradox vicinity as having exceptional ecological value, and warranting consideration for inclusion in an Area of Critical Environmental Concern (ACEC).

7. Birds: The impacts of evaporation ponds on birds protected by the Migratory Bird Treaty Act, by the Bald and Golden Eagle Protection Act, on bird species of special concern or with critical habitat in the region, and state and federal candidate and listed species. Of particular concern are the potential impacts to birds that have a particular need or affinity for the habitat characteristics of the project area, including cliff-nesting raptors, shorebirds, wading birds, waterfowl, swifts and swallows, and other riparian-associated birds. Such birds of significant concern include, but are not limited to:

- Peregrine falcons, a bird of state special concern, known to nest in several locations in or near the project area.
- Common merganser and Pied-billed grebe, known to breed in the project vicinity
- Great blue heron, known to breed in the project vicinity
- Black phoebe, a riparian-associated passerine with very limited range in Colorado, known to breed in the project vicinity
- Spotted sandpiper, known to breed in the project vicinity
- White-throated swift, Northern rough-winged swallow, and bank swallow, known to breed in the project vicinity

(See "Birds of Western Colorado Plateau and Mesa Country," Righter, Leyad, Dexter and Potter, 2004).

8. Bats: Impacts to bat habitat and foraging. This is especially relevant as the vicinity of the project area provides both roosting and foraging habitat attractive to bats, including caves and mines for roosting; and water sources, including the river and potential evaporation ponds, producing drinking water and insects for foraging. The combined effect of evaporation ponds and associated insects attracting bats, with the proposed noise emitters for the ponds, could have significant impact on bats and their acoustic-based navigation and feeding methods. At least eight different species of bats have been documented in Paradox Valley, including one or two BLM sensitive species (see "Bats in the Paradox Valley Area..." by Mark A. Hayes, University of Northern Colorado, 2008).

9. Rare plants and plant communities: Direct, indirect and cumulative impacts to rare plants and plant communities. This consideration is especially important because a number of rare and unique plants and plants communities have been documented in and near the project area. In particular, the globally rare New Mexico privet riparian vegetation community is found near the project area along the Dolores and San Miguel Rivers; occurrences of the globally rare Naturita milkvetch appear to lie within or very near the project area; the Paradox breadroot and Payson lupine occur nearby in the Paradox Valley; and rare and uncommon grassland communities occur nearby in the Paradox Valley. The potential dissemination of invasive species, effects on pollinators, and other indirect impacts on rare plants and vegetation communities should be included in the analysis.

10. **Wildlife Habitat:** Impacts of evaporation ponds on wildlife species, including migratory patterns and habitats, the use of winter and severe winter range, calving areas and breeding grounds;

Of particular note is the mapped occurrence of a Gunnison prairie dog colony in or very near the project area. Not only is this species of conservation concern in its own right, the presence of a prairie dog colony indicates the potential for impacts on many associated species, including reptiles, burrowing owls, and raptors and mammals that are drawn to feed on the prairie dog colony.

The proposed project appears to be located within or very near the following mapped (CDOW 2010) habitats for economically important game species, and impacts to these species and associated hunting activities should be assessed:

- Elk severe winter range
- Elk winter concentration area
- Mule deer severe winter range
- Mule deer winter concentration

Impacts should be especially carefully assessed for mammals that utilize the river or riparian corridor for movement corridors, drinking water or breeding. Among the mammals of special conservation interest that utilize the vicinity of the Dolores and San Miguel rivers and river corridors are river otter, a state species of special concern, and big-horned sheep.

11. **Fish:** The potential impacts to native fish must be thoroughly assessed. Native fish are of great conservation concern in the Dolores River, and any adverse impacts must be avoided to species of concern including but not limited to: Bluehead sucker, Flannelmouth sucker, Roundtail chub, and Colorado pikeminnow.

12. **Livestock:** Impacts to livestock on adjacent lands and the potential loss of grazing areas;

13. **Nuisances:** Impacts of wildlife mitigation measures such as netting, flashing lights, noise cannons, bioacoustics, water sprays and the visual impacts of brine coloring on nearby residents, visitors to the valley and wildlife;

14. **Scenic Viewshed:** Impacts to the scenic views and attractiveness of the region to visitors as well as to the rustic and agrarian character of Paradox Valley;

15. **Cultural Resources:** Analysis and surveys of the project area to identify and protect paleontologic, archeological, cultural and historic resources;

16. **Recreation:** Impacts to boaters, paddlers, anglers and other river-based recreational users;

Impacts to hikers, equestrians, birdwatchers and other recreational users who utilize the river corridor and adjoining lands, and whose experience may be affected by surface facilities, scenic views, sounds, ability to view wildlife, and access to preferred routes of travel;

Hunting, fishing, and other wildlife-based recreational use that depends on access to the river and nearby wildlife habitat, and depends on maintenance of hunting and fishing stock and movement corridors of wildlife;

Research and Natural History Activities: Impacts to scientific researchers and natural and human history aficionados, including botanists, avian monitors, geologists and rock hounds, historians, and anthropologists;

17. Land Management Designations and Public Lands Planning Processes:

Analysis and avoidance of existing and proposed special land management designation areas, including but not limited to; river segments recommended for Wild & Scenic River Suitability; Areas of Critical Environmental Concern (ACECs); Special Recreation Management Areas; proposed National Conservation Areas; Wilderness Study Areas; Lands with Wilderness Characteristics; citizen-proposed Wilderness Areas; and designated critical habitats for sensitive species.

These considerations are especially important because the proposed project is located within a region currently undergoing Resource Management Plan Revision for the BLM Tres Rios and Uncompahgre Field Offices. It is important that these key regional land management planning processes be able to maintain their decision space and a reasonable range of alternatives, particularly as these alternatives currently include a number of potential special management areas that could be affected by the proposed project.

The broad range of sensitive resources potentially meriting protection through special designations is reflected in the range of ACECs included in the BLM Uncompahgre Field Office Draft ACEC study. The proposed project may impact the following potential ACECs: Dolores River Canyon, West Paradox and East Paradox.

18. Emergency Preparedness: Analysis of likelihood of natural catastrophe, extreme weather events, flooding, wildfire and other disasters that could cause the failure or malfunction of evaporative compounds and potential damages and impacts to the Dolores River and Paradox Valley;

19. Economic Development: Analysis of feasibility of harvesting commercial byproducts from evaporate material; analysis of potential contributions to local economies from a desalinization plant utilizing renewable energy;

20. Area Development: Analysis of the cumulative impacts of water depletion, seismic activity, drilling and other salinity-control activities, including consideration of any potential interaction with the pending development of a uranium milling facility and tailings compound nearby;

21. Waste: Analysis of impacts from storage, disposal and permanent management of evaporate waste material and costs of removal from Paradox Valley;

22. Energy: Analysis of feasibility of powering the Paradox Valley Salinity Control Project with non-polluting renewable energy sources.

23. Alternative Technologies: Analysis of feasibility of using alternative desalinization technologies, such as devaporation, zero liquid discharge crystallization and reverse oxidation.

## Conclusion:

The salinity and concentration of salts in the Dolores and Colorado Rivers are influenced by multiple factors, including reservoir storage, diversions, climatic conditions, seasonal variation and drought patterns, natural runoff flows, groundwater pumping, agricultural and irrigation practices, and salinity-control projects. The connection and complexity of these factors must be considered together for any analysis to be successful in developing appropriate action alternatives that are protective and beneficial to both communities and the environment.

The Paradox Valley is a special landscape deserving of protection and a large-scale evaporation pond complex and long-term toxic waste storage pose severe challenges to the area's conservation values. Real solutions to the salinity problems of the Colorado River Basin can be found in developing alternatives that embrace multiple approaches and root their success in sound science and management techniques that improve the health of land and water. Both the Dolores and the Colorado face increasing demands for water and the cumulative impacts of depleting supplies, degrading quality, energy development and over-allocation. Salinity-control policies must take these factors into consideration and identify solutions that help achieve shared community goals of revitalizing and protecting watersheds to benefit future generations.

Thank you for your consideration of these comments.

Sincerely,

Barbara Hawke  
Dolores River Basin Wildlands Coordinator  
The Wilderness Society  
1617 American Way  
Montrose, Colorado  
970-596-6697

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# Colorado River District

**75 Years**

**Protecting Western Colorado Water**



Terry Stroh  
 US Bureau of Reclamation  
 2764 Compass Drive, Suite 106  
 Grand Junction, CO 81506

January 30, 2011

**RE: Comments on Paradox Evaporation Pond Pilot Study**

*VIA E-MAIL*

Terry –

This letter contains the comments of the Colorado River District (“River District”) on the Paradox Evaporation Pond Pilot Study and associated scoping process. The River District is a political subdivision of the state of Colorado, created pursuant to C.R.S. § 37-46-101, *et seq.* The River District is comprised of all or parts of 15 western Colorado counties within the drainage basin of the Colorado River and its principal tributaries, including the Yampa, White and Gunnison Rivers. The River District was formed for the purpose of the conservation, use and development of the water resources of the Colorado River Basin for the benefit of all of the inhabitants of the District. The River District also is charged with safeguarding Colorado’s entitlement to water under the Colorado River Compact. In addition, the River District participates as a full member of the technical workgroup of the Colorado River Basin Salinity Control Forum.

The River District strongly supports the Paradox Evaporation Pond Pilot Study. This type of salinity control project is an excellent and proven way to reduce salt loading to the Upper Colorado River Basin and to reduce significant economic damages in the Lower Colorado River Basin. In addition, such a salinity control project not only helps ensure that Upper Colorado River water users can develop their water resources it helps avoid economic damages to Lower Colorado River Basin interests and ensures that federal interests can comply with treaty obligations to the Republic of Mexico.

In fact, it is now imperative to develop a cost effective replacement or even an augmentation, to the currently very effective deep injection well. As correctly stated in the Scoping documents, “The existing deep-injection well, completed in 1988 by Reclamation, is nearing the end of its useful life and **action will be needed by Reclamation to continue long term salinity control at the Paradox Unit.** To best understand the cost effective alternatives for brine disposal, this Pilot

Project will provide crucial data and information. Such information must be developed to accurately determine a future course of action and intercompare potential alternatives such as

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either a new injection well or a less energy intensive evaporation facility for critical salt control efforts. Such salinity control alternatives could be implemented separately or used conjunctively.

Importantly, should no viable alternative be explored or to be available to replace the eventual non-functioning injection well, approximately 110,000 tons of salt will immediately enter the Dolores River degrading the water quality of the main stem of the Colorado River and loading the Colorado River Basin and eventually adversely impacting the system all the way to Mexico.

In addition, the River District believes that the pilot is necessary to:

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- Proactively address technical issues, questions and/or concerns that will arise in any future evaluation (e.g., NEPA compliance) of alternatives analysis and/or a full scale replacement salinity control project;

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- Meet the intent and objectives of basinwide salinity control efforts and further the ability of the State of Colorado to fully develop its allocation under applicable Colorado River Compacts and the Law of the River;

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- Meet the stated desires of Salinity Control Forum members and their representative agencies to address important technical and financial issues to help to complete the EA in a timely manner;
- Meet the stated desires the representatives of the seven Basin States, and their representative agencies to address important technical and financial issues to help to complete the EA in a timely manner and to recognize that the concept of the evaporation pilot has been developed cooperatively and the project will contain monitoring and safeguards to curtail impacts, if and, as they arise; and
- Help the United States and USBR meet their long term commitments, legislative mandates

In conclusion, the River District strongly supports the Paradox Evaporation Pond Pilot Study. This project is the best approach to provide essential information that will help answer important questions related a sustainable and uninterrupted crucial salinity control efforts.

Sincerely,

David Kanzer, P.E.  
Senior Water Resources Engineer

## 207 (see letter 107 for full review)

Mr. Terry Stroh  
Area Manager  
Bureau of Reclamation  
2764 Compass Drive, Suite 106  
Grand Junction, Colorado, 81506

Delivered via email to: TStroh@usbr.gov

Re: Scoping comments on Paradox Valley Evaporation Pond Pilot Study

January 30, 2012

Dear Mr. Stroh,

Thank you for the opportunity to comment on the Bureau of Reclamation's proposed Paradox Valley Evaporation Pond Pilot Study. These scoping comments are prepared on behalf of the undersigned organizations, representing members in the Dolores River Basin and throughout the United States. These organizations share a desire to protect the Paradox Valley, the Dolores River and the Upper Colorado River Basin and share a sense of stewardship over the ecosystems, rivers and landscapes of the Colorado Plateau. As such, these organizations welcome the opportunity to fully participate in the National Environmental Policy Act process related to the Paradox Valley Salinity Control Project conducted by the Bureau of Reclamation and expect and encourage a full and thorough review of the environmental and socioeconomic impacts of federal salinity control actions throughout the basin.

### **Purpose and Need:**

.101 The Paradox Valley Salinity Control Project provides beneficial improvements to the water quality of the Dolores River, preventing on an annual basis approximately 110,000 tons of salt from entering the river as it travels north through Paradox Valley and toward its confluence with the Colorado. Groundwater brine from Paradox Valley is intercepted by shallow wells before loading into the Dolores, then is treated and injected into a deep well, contributing to an overall reduction of salinity in the Lower Colorado River Basin. Although the benefits of the Paradox project include desirable improvements in habitat for Dolores and Colorado River fish .102 species and improved water quality downstream, the Bureau of Reclamation's stated intent of replacing the current deep well brine injection system causes thorny and substantial impacts associated with many of the possible action alternatives and especially with the development of the Evaporation Pond Pilot Study into a large-scale evaporative complex. Concurrently, the deep injection system poses concerns for its existing seismic impacts which will require a considered .103 and detailed approach to identify appropriate alternatives for its extension or replacement.

The Bureau of Reclamation contemplates implementing the Evaporation Pond Pilot Study under the recommendation of the Colorado River Salinity Control Forum and conducting an Environmental Assessment to site the pilot pond in close proximity to the Dolores River with a minimum of three potential sites to be examined. The pilot pond will create significant environmental impacts requiring substantial mitigation that will affect Paradox Valley, nearby

.104 residents and wildlife. The scope of the action contemplated, particularly when considered within  
.105 the true context of potential build-out of surface evaporation ponds, cannot be adequately  
analyzed in an Environmental Assessment but, rather, requires the detailed and thorough NEPA  
analysis of an Environmental Impact Statement. The need for more extensive analysis is  
.106 underscored by the severity of impacts already anticipated in the Bureau of Reclamation Scoping  
Notice to include injuries and deaths to sensitive migratory bird species protected by  
.108 international treaty through the creation of a permanent, above-grade waste landfill in Paradox  
Valley. The pilot pond will emit foul odors and may require the use of netting, brine coloring,  
.109 noise cannons, flashing lights, bioacoustics and radar detection. The pilot pond will alter the  
.110 scenic and agricultural nature of the surrounding area; cause impacts to the Dolores River  
corridor, riparian zones and wetlands; habitat for sensitive species; proposed BLM Areas of  
.111 Critical Environmental Concern; and the proposed suitability of the middle Dolores River for  
.113 Wild & Scenic River status. These potential impacts are the result of major actions by the Bureau  
.114 of Reclamation that trigger the full analysis of an Environmental Impact Statement under NEPA's  
.116 threshold. The potential benefits and adverse impact on imperiled native river fish, including  
.117 those already protected by the Endangered Species Act, poses difficult questions that need to be  
.118 addressed in consultation with the U.S. Fish & Wildlife Service.

Because the Evaporation Pond Pilot Study is formally recommended by the Colorado River Salinity Control Forum under the authority of congressional mandate, it is better understood as the first federally directed phase of implementing a large-scale evaporation project in the Colorado River Basin than as a site-specific project on the Dolores River. Increasingly, the basin-wide salinity-control efforts are recognized as insufficient to meet water quality standards in the lower basin and across the international boundary with Mexico over the long term, particularly in light of over-allocation of water resources, storage evaporation and capacity reduction, and standing agricultural practices. It is well recognized that it will be more difficult in the future for the Bureau of Reclamation to fulfill the directives of the Salinity Control Act as demands on the basin continue to increase. The Paradox deep injection project currently accounts for approximately one-tenth of total salt removed from the Upper and Lower Colorado River Basins, despite its location on an upper basin tributary. The Evaporation Pond Pilot Study contemplates the construction of a 20- to 40-acre evaporation compound that, if demonstrated to be feasible, will be expanded to a major complex of evaporation ponds at an estimated size of 800 acres that will create the future need for permanent hazardous waste management. Not only is the pilot project significant in terms of footprint and specific impacts to Paradox Valley, but the general value of the Paradox Valley Salinity Control Project is of measurable and significant importance to federal agency actions to control salinity in the entire Colorado River Basin. A

Programmatic Environmental Impact Statement is appropriate, warranted and desired in order to identify alternatives and fully analyze the impacts triggered by these major actions by federal

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agencies. Since the passage of the Salinity Control Act in 1974, such a comprehensive analysis of basin-wide control efforts has been lacking, but the time and need for it now are pressing.

#### **Cumulative Impacts and Connected Issues:**

Salinity-control projects have been implemented over the past several decades by multiple federal agencies, including the Bureau of Reclamation, the Bureau of Land Management and the U.S. Department of Agriculture. Despite these efforts, increases in salinity can be expected from future extractive energy development throughout the basin, higher reservoir evaporation rates and lower high-flow periods due to global climate change and drought patterns, and decreased quantity due to over-allocation and increased consumption. Around the turn of this century, water managers recognized that the Colorado River Basin was out of balance and demand had exceeded supply. This recognition resulted in formal policy as the SECURE Water Act of 2009, which defined safe and adequate water supplies as fundamental to the security of the nation and identified global climate change as a factor in protecting those supplies.

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Analysis of the Paradox Evaporation Pond Pilot Study must consider the likelihood that salinity control methods will require more action in the future due to these trends and complications. While approximately 47 percent of the salt in the Colorado River is from naturally occurring sources – such as the brine aquifer that feeds the Dolores River in Paradox Valley – that proportion is likely to change in the future, requiring a greater focus and attention to the underlying anthropogenic causes of salinity. In a sense, addressing the foundational issues of conservation, storage, diversions, flow management, agricultural and irrigation techniques, energy development, and supply and demand as they relate to salinity content and the overall health and vitality of the Colorado River Basin cannot be isolated from proper analysis and the search for the best solutions both within Paradox Valley and throughout the watershed. Conducting a Programmatic Environmental Impact Statement for the Salinity Control Program will facilitate analysis of these issues, but it should be inseparable from the broadest possible embrace of understanding regional development and multiple federal actions that impact shared goals of managing the Dolores and Colorado Rivers sustainably for the future.

Among these is the recent boom in mineral and energy exploration and extraction throughout the Upper Colorado River Basin facilitated by the Energy Policy Act of 2005 and other national policy directives to develop traditional and alternative domestic energy sources. Oil and gas drilling activities and associated hydraulic fracturing have increased substantially, creating significant activity and development across the Colorado Plateau. Extensive areas of western Colorado and eastern Utah are recently leased or soon to be leased for natural gas development. The Dolores River watershed and its sensitive ecosystems and habitat are experiencing increased pressures from mineral extraction such as potash, uranium, carbon and base metals. Due to overlapping impacts, the Bureau of Reclamation analysis needs to be coordinated with the ongoing Department of Energy preparation of the Programmatic Environmental Impact Statement of its Uranium Leasing Program in the Dolores and San Miguel

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River Basins. The federal promotion of uranium mining has increased the level of interest and activity in expanding mineral extraction within the Upper Colorado River Basin, with each individual action contributing to incremental increases in salinity that cause new downstream impacts that must be analyzed for their cumulative effects.

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Any federal action in Paradox Valley must be understood to be of intense interest and concern on the local, regional and even national level. For generations, the diverse communities and stakeholders of the Dolores River Basin have valued the river for its contributions to local life, local economies and the character of the region. Efforts to protect the Dolores River have flourished in recent years through the collaborative-based efforts of the Lower Dolores Working Group, Dolores River Coalition and other cooperative groups. Collaborative efforts among conservation organizations have focused on the abundant and diverse conservation values of the Paradox Valley that are deserving of protection. A variety of locally based efforts seek to

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promote sustainable recreation and tourism opportunities, including mountain biking and heritage tourism. All of these efforts have fostered increased stewardship over areas with sensitive habitat, wild lands characteristics, or special recreational, cultural or scenic values.

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An important focus of conservation initiatives has been the revitalization of native fisheries and populations in the San Miguel and Dolores basins. Salinity is a negative factor in the recovery of native species. The formal recommendation of federal Wild & Scenic River status for 113 miles of the San Miguel and middle Dolores Rivers complements efforts to protect habitat. Other collaborative efforts have led to proposed BLM Areas of Critical Environmental Concern through land management agency planning and identifying ORVs, or "outstanding remarkable values" deserving of protection.

The existing collaboration among diverse stakeholders throughout the Dolores River Basin should be considered as a weighty and important framework underlying any analysis of the Paradox Valley Evaporation Pond Pilot Study: understanding the stewardship necessary for planning federal actions and understanding the deep level of support for shared goals to revitalize, protect and sustain responsible uses of the Dolores River watershed is imperative. These related actions and others -- from grassroots outreach to federal agency projects to national policy directives -- are interwoven with changing regional development patterns. The Colorado River Basin Salinity Control Program, too, is interwoven into the collective impact of multiple and competing uses imposed on the Dolores River. Like the Colorado, the Dolores is a beleaguered and imperiled waterway that is in dire need of more graceful and collaborative guidance.

**Range of Alternatives:**

The Bureau of Reclamation should be creative and ambitious in its development of alternatives, as the possibilities for addressing salinity in the Colorado River Basin are numerous and the outlook for developing a palatable alternative involving a large-scale evaporation pond complex is dim.

Duplicate  
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Additional sites for the Paradox Valley Evaporation Pond Pilot Study in addition to the three identified in the scoping notice and map must be developed and analyzed. Site 3 on the scoping map is problematic because of its proximity and possible encroachment into a segment of the Dolores River recommended for Suitability for Wild & Scenic status through an extensive public process that included the BLM Southwest Resource Advisory Council and Uncompahgre Field Office SubRAC. Site 2 on the scoping map is problematic for its proximity to a section of the Dolores River with degraded riparian habitat and disturbed natural flows that is already impaired and in need of restoration. Site 2 is also in a proposed Area of Critical Environmental Concern, where an evaporation pond would be an incompatible use.

The permanent storage and creation of landfills to handle toxic waste from evaporation ponds in Paradox Valley should be excluded from consideration in all alternatives. All evaporate waste created by the Paradox Valley Salinity Control Project should be removed and permanently stored in a licensed hazardous waste landfill in a suitable location. In addition, all alternatives should include specific provisions for monitoring for groundwater contamination, surface runoff, and impacts to wildlife and vegetation. Further, all alternatives should specify the best available technology for preventing leakage and detail the expected materials and construction methods.

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A No Action alternative should investigate the feasibility of continuing the existing brine injection system or expanding it to increase disposal capacity as a best possible scenario for avoidance of higher impact methods. The existing project is known to have caused a 4.3 magnitude earthquake in Paradox Valley in June 2000, but seismic events have registered lower magnitudes over time with the implementation of two annual shutdown periods. A full explanation of this event and measures to avoid its recurrence should be presented in the Draft EIS. A No Action alternative should thoroughly investigate all ramifications of increased seismic events caused by pressure injections in light of existing and future development within Paradox Valley, including the proposed Piñon Ridge Uranium Mill to the east. Mitigation of seismic events should include investigating the feasibility of replacing the current deep injection well with another in a new site, or operating multiple wells together in order to increase rest periods.

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Salinity in the Colorado River Basin is greatly affected by agricultural practices and irrigation techniques, and an alternative should be developed to mitigate these impacts in the Dolores River Basin. The feasibility of implementing irrigation improvements should be investigated as a positive and supplemental measure to reduce salinity above and beyond existing measures with the added value of increasing conservation. Water percolation from unlined irrigation ditches and stock ponds contributes to salt-loading in soils and increased saline runoff. Wastewater containing salts is released from underlying soils that have been irrigated and returned to the river. The Bureau of Reclamation's Huntington-Cleveland Salinity Control Project removes approximately 60,000 tons of salt from the Colorado River by improving irrigation infrastructure over 20,000 acres of croplands. Increasing similar efforts in the Dolores River watershed may also have cost-beneficial impacts that should be analyzed. Potential

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measures include creating cooperative programs with ranchers and farmers to improve water delivery controls, line ditches or build delivery pipes, develop the use of pivot or sprinkling techniques to conserve water and reduce traditional flood irrigation. Run-off should be intercepted, monitored and controlled to prevent salt-loading into streams. The use of control measures such as head gates, meters, and surge systems should be considered, as well as irrigation improvements that consider the work practices of area ranchers, many of whom may work offsite, and can be tended without undue burden.

Remainder  
of letter's  
comments  
are duplicates  
of letter 107

An alternative emphasizing the salinity-reduction benefits of natural habitat restoration should also be developed. The Dolores River has been invaded by tamarisk in many sections, an indication of the poor health of the riparian corridor as well as the imbalance in salinity levels in the river. Federal tamarisk eradication efforts are beneficial to the health of habitat but also reduce salinity and improve the natural filtration of riparian zones. These efforts can be expanded and should be investigated as another tool for reducing salinity. Restoration of native cottonwood habitat zones can be expected to bring multiple environmental improvements.

The feasibility of using renewable energy sources should be incorporated into alternatives. The Bureau of Reclamation is planning to deploy a solar-powered desalinization pilot project this year at the Brackish Groundwater Research Facility in Alamogordo, N.M. In other instances, the Bureau is researching technology that combines desalinization with wind or solar power, or co-location of desalinization facilities with power generators. The use of solar stills are another possibility in Paradox Valley, which has the potential benefit of returning a freshwater supply to the river.

The Bureau of Reclamation is currently conducting an exhaustive Supply and Demand Study for the Colorado River that addresses the imbalance between the Upper and Lower Basins, and the reliance of lower-basin users to have water problems such as salinity solved by upper-basin suppliers. The Supply and Demand Study will analyze the impact and benefits of increasing natural flows in the river through the possible removal of dams, which are a major contributor to the siltation of rivers. An alternative for the Paradox Valley Salinity Control Project should be developed that takes into consideration the changing approach of the Bureau of Reclamation toward water management and any recommendations forthcoming from the Supply and Demand Study. An alternative that evaluates the impacts of managing natural Dolores River flows and increasing releases from McPhee Reservoir as a means of reducing salinity should be developed and considered.

#### **Environmental Impacts Analysis:**

The Bureau of Reclamation's analysis of the Paradox Valley Salinity Control Project should comprehensively examine impacts to the environment and ecosystem of Paradox Valley and the riparian system and associated wetlands of the Dolores River. The analysis of impacts should also consider potential impacts to local communities and economies, Western heritage and culture, and recreation and tourism. These impacts include:

1. **Water Quantity and Quality:** The impacts of increasing flows in the Dolores in order to mitigate the impacts of salinity on native fish species and stimulate their recovery;

2. **Riparian Zone and Wetlands:** The impacts of salinity control on the riparian areas and associated wetlands of the Dolores River, East Paradox Creek and West Paradox Creek, including the condition of vegetation and habitat;

3. **Groundwater Depletion:** The impacts to Paradox Valley hydrogeology from depleting the brine aquifer and intercepting underground flows into the Dolores River;

4. **Brine Character:** Analysis of the amount of natural salt-loading into the Dolores River and its natural character and flow variations as a means of developing more effective salinity control techniques;

5. **Air Quality and Odors:** Disclosure and analysis of air emissions associated with an evaporation pond, including the release and odor of hydrogen sulfide, and potential dust releases from exposure of evaporative residues;

6. **Soil Quality and Impacts to Soil Crusts:** Analysis of soil conditions at proposed evaporation sites to determine suitability of locating ponds; and assessment of impairment of soil crusts from surface disturbance. Analysis of impacts to soil crusts is especially important in this vicinity, as impaired soil crusts can lead to increased ambient dust, in turn leading to increased dust storms and dust-on-snow. Increasing dust-on-snow conditions have been associated with altered spring run-off regimes in the San Juan Mountains. Further, the BLM has identified soil crusts in the East Paradox vicinity as having exceptional ecological value, warranting consideration for inclusion in an Area of Critical Environmental Concern;

7. **Birds:** The impacts of evaporation ponds on birds protected by the Migratory Bird Treaty Act, by the Bald and Golden Eagle Protection Act, on bird species of special concern or with critical habitat in the region, and state and federal candidate and listed species. Of particular concern are the potential impacts to birds that have a particular need or affinity for the habitat characteristics of the project area, including cliff-nesting raptors, shorebirds, wading birds, waterfowl, swifts and swallows, and other riparian-associated birds. (See "Birds of Western Colorado Plateau and Mesa Country," Righter, Levad, Dexter and Potter, 2004.) Such birds of significant concern include, but are not limited, to:

- Peregrine falcons, a bird of state special concern, known to nest in several locations in or near the project area;
- Common merganser and Pied-billed grebe, known to breed in the project vicinity;
- Great blue heron, known to breed in the project vicinity;
- Black phoebe, a riparian-associated passerine with very limited range in Colorado, known to breed in the project vicinity;
- Spotted sandpiper, known to breed in the project vicinity;

- White-throated swift, Northern rough-winged swallow, and bank swallow, known to breed in the project vicinity;

8. Bats: Impacts to bat habitat and foraging. The vicinity of the project area provides both roosting and foraging habitat attractive to bats, including caves and mines for roosting; and water sources, including the river and potential evaporation ponds, producing drinking water and insects for foraging. The combined effect of evaporation ponds and associated insects attracting bats, with the proposed noise emitters for the ponds, could have significant impact on bats and their acoustic-based navigation and feeding methods. At least eight different species of bats have been documented in Paradox Valley, including one or two BLM sensitive species (see “Bats in the Paradox Valley Area and Gunnison Gorge National Conservation Area: Results of Mist-Netting and Acoustic Surveys During 2008” by Mark A. Hayes, University of Northern Colorado, 2008);

9. Rare Plants and Plant Communities: Direct, indirect and cumulative impacts to rare plants and plant communities. This consideration is especially important because a number of rare and unique plants and plants communities have been documented in and near the project area. In particular, the globally rare New Mexico privet riparian vegetation community is found near the project area along the Dolores and San Miguel Rivers; occurrences of the globally rare Naturita milkvetch appear to lie within or very near the project area; the Paradox breadroot and Payson lupine occur nearby in the Paradox Valley; and rare and uncommon grassland communities occur nearby in the Paradox Valley. The potential dissemination of invasive species, effects on pollinators, and other indirect impacts on rare plants and vegetation communities should be included in the analysis;

10. Wildlife Habitat: Impacts of evaporation ponds on wildlife species, including migratory patterns and habitats, the use of winter and severe winter range, calving areas and breeding grounds. Of particular note is the mapped occurrence of a Gunnison prairie dog colony in or very near the project area. Not only is this a species of conservation concern in its own right, the presence of a prairie dog colony indicates the potential for impacts on many associated species, including reptiles, burrowing owls, and raptors and mammals that are drawn to feed on the prairie dog colony. The proposed project also appears to be located within or very near the following mapped (CDOW 2010) habitats for economically important game species, and impacts to these species and associated hunting activities should be assessed:

- Elk severe winter range
- Elk winter concentration area
- Mule deer severe winter range
- Mule deer winter concentration

Impacts should be especially carefully assessed for mammals that utilize the river or riparian corridor for movement corridors, drinking water or breeding. Among the mammals of special conservation interest that utilize the vicinity of the Dolores and San Miguel rivers and river corridors are river otter, a state species of special concern, and big-horned sheep;

11. Fish: The potential impacts to native fish must be thoroughly assessed. Native fish are of great conservation concern in the Dolores River, and any adverse impacts must be avoided to species of concern including but not limited to: Bluehead sucker, Flannelmouth sucker, Roundtail chub, and Colorado pikeminnow;

12. Threatened and Endangered Species: Analysis of impacts of the proposed action and its connected actions to species listed as threatened or endangered under the Endangered Species Act;

13. Fish and Wildlife Values: Analysis of impacts to fish and wildlife should consider the directive of the Colorado River Basin Salinity Control Act that "incidental fish and wildlife values" foregone through salinity-control projects must be replaced;

14. Livestock: Impacts to livestock on adjacent lands and the potential loss of grazing areas;

15. Nuisances: Impacts of wildlife mitigation measures such as netting, flashing lights, noise cannons, bioacoustics, water sprays and the visual impacts of brine coloring on nearby residents, visitors to the valley and wildlife;

16. Scenic Viewshed: Impacts to the scenic views and attractiveness of the region to visitors as well as to the rustic and agrarian character of Paradox Valley;

17. Cultural Resources: Analysis and surveys of the project area to identify and protect paleontologic, archeological, cultural and historic resources;

18. Research and Natural History Activities: Impacts to scientific researchers and natural and human history aficionados, including botanists, avian monitors, geologists and rock hounds, historians, and anthropologists;

19. Recreation: Impacts to boaters, paddlers, anglers and other river-based recreational users; impacts to hikers, equestrians, birdwatchers and other recreational users who utilize the river corridor and adjoining lands, and whose experience may be affected by surface facilities, scenic views, sounds, ability to view wildlife, and access to preferred routes of travel; impacts to hunting, fishing, and other wildlife-based recreational use that depends on access to the river and nearby wildlife habitat, and depends on maintenance of hunting and fishing stock and movement corridors of wildlife;

20. Land Management Designations and Public Lands Planning Process: Analysis and avoidance of existing and proposed special land management designation areas, including but not limited to: river segments recommended for Wild & Scenic River Suitability, Areas of Critical Environmental Concern, Special Recreation Management Areas, proposed National Conservation Areas, Wilderness Study Areas, citizen-proposed Wilderness Areas, and designated

critical habitats for sensitive species. These considerations are especially important because the proposed project is located within a region currently undergoing Resource Management Plan Revision for the BLM Tres Rios and Uncompahgre Field Offices. It is important that these key regional land management planning processes be able to maintain their decision space and a reasonable range of alternatives, particularly as these alternatives currently include a number of potential special management areas that could be affected by the proposed project. The broad range of sensitive resources potentially meriting protection through special designations is reflected in the range of ACECs included in the BLM Uncompahgre Field Office Draft ACEC study. The proposed project may impact the following potential ACECs: Dolores River Canyon, West Paradox and East Paradox;

21. **Emergency Preparedness:** Analysis of likelihood of natural catastrophe, extreme weather events, flooding, wildfire and other disasters that could cause the failure or malfunction of evaporative compounds and potential damages and impacts to the Dolores River and Paradox Valley;

22. **Economic Development:** Analysis of feasibility of harvesting commercial byproducts from evaporate material; analysis of potential contributions to local economies from a desalinization plant utilizing renewable energy;

23. **Area Development:** Analysis of the cumulative impacts of water depletion, seismic activity, drilling and other salinity-control activities, including consideration of any potential interaction with the pending development of a uranium milling facility and tailings compound nearby;

24. **Waste:** Analysis of impacts from storage, disposal and permanent management of evaporate waste material and costs of removal from Paradox Valley;

25. **Energy:** Analysis of feasibility of powering the Paradox Valley Salinity Control Project with non-polluting renewable energy sources;

26. **Alternative Technologies:** Analysis of feasibility of using alternative desalinization technologies, such as devaporation, zero liquid discharge crystallization and reverse osmosis.

### **Conclusion:**

The salinity and concentration of salts in the Dolores and Colorado Rivers are influenced by multiple factors, including reservoir storage, diversions, climatic conditions, seasonal variation and drought patterns, natural runoff flows, groundwater pumping, agricultural and irrigation practices, and salinity-control projects. The connection and complexity of these factors must be considered together for any analysis to be successful in developing appropriate action alternatives that are protective and beneficial to both communities and the environment.

The Paradox Valley is a special landscape deserving of protection and a large-scale evaporation pond complex and long-term toxic waste storage pose severe challenges to the area's conservation values, and are inappropriate uses in both definition and concept. Real solutions to the salinity problems of the Colorado River Basin can be found in developing alternatives that embrace multiple approaches and root their success in sound science and management techniques that improve the health of land and water. Both the Dolores and the Colorado face increasing demands for water and the cumulative impacts of depleting supplies, degrading quality, energy development, over-allocation and lack of conservation. Salinity-control policies must take these factors into consideration and identify solutions that help achieve shared community goals of revitalizing and protecting watersheds to benefit future generations.

Thank you for your consideration of these comments.

Sincerely,

Sheep Mountain Alliance  
Hilary White, Executive Director  
P.O. Box 389  
Telluride, CO 81435  
[hilary@sheepmountainalliance.org](mailto:hilary@sheepmountainalliance.org)

Living Rivers and Colorado Riverkeeper  
John Weisheit, Conservation Director  
P.O. Box 466  
Moab, Utah 84532  
[john@livingrivers.org](mailto:john@livingrivers.org)

Rocky Mountain Chapter of the Sierra Club  
Kirkwood M. Cunningham, Team Leader  
Water Quality and Wetlands Team  
977 7th Street  
Boulder, CO 80302  
[kirk.cunningham@rmc.sierraclub.org](mailto:kirk.cunningham@rmc.sierraclub.org)

Rocky Mountain Recreation Initiative  
Roz McClellan, Director  
1567 Twin Sisters Rd.  
Nederland, CO 80466  
303-447-9409

Dvorak Raft, Kayak & Fishing Expeditions  
Bill Dvorak, President

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Center for Biological Diversity  
Taylor McKinnon, Public Lands Campaigns Director  
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Flagstaff, AZ 86002-1178  
928-310-6713  
[www.biologicaldiversity.org](http://www.biologicaldiversity.org)

Canyonlands Watershed Council  
Laurel Hagen, Executive Director  
P.O. Box 804  
Moab, Utah 84532  
[laurel@farcountry.org](mailto:laurel@farcountry.org)

High Country Citizens' Alliance  
Dan Morse, Executive Director  
P.O. Box 1066  
Crested Butte, CO 81224  
970-349-7104  
[dan@hccaonline.org](mailto:dan@hccaonline.org)

Western Colorado Congress  
Gretchen Nicholoff, President  
P.O. Box 1931  
Grand Junction, CO 81501  
970-256-7650  
[www.wccongress.org](http://www.wccongress.org)

Biodiversity Conservation Alliance  
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P.O. Box 1512  
Laramie, Wyoming 82073  
307-742-7978  
[duane@voiceforthewild.org](mailto:duane@voiceforthewild.org)  
[www.voiceforthewild.org](http://www.voiceforthewild.org)

Grand Canyon Trust  
Laura Kamala, Director of Utah Programs  
HC 64 Box 1705  
Castle Valley, Utah 84532

[laurakamala@gmail.com](mailto:laurakamala@gmail.com)

Colorado Environmental Coalition

Elise Jones, Executive Director

1536 Wynkoop, # 5C

Denver, CO 80202

303-534-7066

<http://www.ourcolorado.org/>

**From:** Spark Promotions - Jennifer Shimkonis  
**To:** Stroh, Terence J. (Terence)  
**Subject:** Comment on Paradox Valley Evaporation Pond Pilot Study  
**Date:** Sunday, January 29, 2012 7:41:29 AM

---

Dear Bureau of Reclamation,

.101 Please choose to conduct a full Environmental Impact Statement (EIS) for salinity control in Paradox Valley before allowing an evaporative pond to be built.

.103 Although the deep injection system creates concerns over seismic impacts and is reaching capacity, the Bureau should thoroughly examine the alternatives available and avoid creating permanent toxic waste dumps in Paradox Valley. .102

.104 For those of us that live in this region, it is VERY important to us to protect the environment in this beautiful valley, please fully assess all possible environmental impacts before allowing this plan to move forward. It will have far-reaching and long-lasting effects on all of us including wildlife. .105

Thank you for your consideration.

Sincerely,  
Jennifer Shimkonis  
Telluride, Colorado

209

**From:** [Sherman, Priscilla](#)  
**To:** [Stroh, Terence L. \(Terry\)](#)  
**Subject:** Paradox Valley Pilot Pond  
**Date:** Saturday, January 28, 2012 7:40:36 AM

---

Dear Mr. Stroh,

It has come to my attention that the Bureau of Reclamation is considering building a 800 acre pond complex to replace the current injection system with a large scale evaporating pond complex. I urge you to conduct a full environmental impact study before proceeding with this option to make certain that this is the best option for all things considered.

.101

**Thank you for your time and consideration in this very important matter.**

Priscilla Sherman  
**Durango, CO**

--  
Priscilla Sherman

210

**From:** [Jennifer Thurston](#)  
**To:** [Stroh, Terence J. \(Terry\)](#)  
**Subject:** Paradox Valley salinity control  
**Date:** Friday, December 02, 2011 8:18:12 AM

---

Hello Terry,

I am reviewing the scoping documents for the Paradox Valley Salinity Control Project. I have your initial scoping background document, but it references a map of potential sites for the pond pilot study, which I do not have. Can you kindly send me the map?

-101

If you have a copy or a link to the full pilot proposal, would you send that as well?

Is there an online source where all scoping and NEPA materials related to this project will be posted?

I appreciate your help. Thanks,

Jennifer Thurston  
cell: 212-473-7717  
Sheep Mountain Alliance

From: [Robyn Shaw](#)  
To: [Stroh, Terence L. \(Terry\)](#)  
Subject: Paradox Valley  
Date: Friday, January 27, 2012 12:37:25 PM

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Dear Bureau of Reclamation,

.101 I implore you to conduct a full Environmental Impact Statement (EIS) for salinity control in Paradox  
.102 Valley before allowing an evaporative pond to be built. Although the deep injection system creates  
concerns over seismic impacts and is reaching capacity, the Bureau should thoroughly examine the  
alternatives available and avoid creating permanent toxic waste dumps in Paradox Valley. Please, .103  
for the sake of our children and the environment in this beautiful valley, please fully assess all  
possible environmental impacts before allowing this plan to move forward.

Robyn Shaw

212

**From:** [Kate Schofield](#)  
**To:** [Stroh, Terence J. \(Terry\)](#)  
**Subject:** Paradox Valley EIS  
**Date:** Wednesday, February 01, 2012 3:07:52 PM

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Dear Bureau of Reclamation,

.101 I implore you to conduct a full Environmental Impact Statement (EIS) for salinity control in Paradox  
Valley before allowing an evaporative pond to be built. Although the deep injection system creates  
.102 concerns over seismic impacts and is reaching capacity, the Bureau should thoroughly examine the  
alternatives available and avoid creating permanent toxic waste dumps in Paradox Valley. Please,  
for the sake of our children, their future and the environment in this beautiful valley, please fully  
assess all possible environmental impacts before allowing this plan to move forward.

---

Kate Schofield Frerichs  
organize & organize events  
and  
Ranch Management & Care

po box 3372 telluride, co 81435  
970.728.4130 h.  
970.708.1457 c.

**From:** [Rosemary Griffin](#)  
**To:** [Stroh, Terence L. \(Terry\)](#)  
**Subject:** Comment on pilot study for Bedrock  
**Date:** Sunday, November 27, 2011 11:36:38 AM

---

Dear Terry Stroh, I've read the announcement about trying to evaporate the Dolores River salt in ponds. On the one hand, the pond idea is great...we are tired of

.101 having earthquakes here! However, I really do NOT like the idea of using noise  
cannons to deter migratory birds from landing in the ponds. Noise cannons would  
definitely have an impact on the human environment, and as I live fairly close to  
.102 the site, I think I would be able to hear the cannons. That would cause stress, to  
know you will hear it again, and then, there it is...like a ticking clock that is driving  
someone crazy. The cannons might also affect chickens that are laying, or other  
undomesticated animals. The idea of netting seems better. I wish I could be at the  
meeting, but I have a prior engagement in Telluride that same evening. Please .103  
consider this noise issue! Rose Griffin, 9812 Hwy 90, Bedrock, Co. 81411.

January 2, 2012

Terry Stroh  
 Bureau of Reclamation  
 2764 Compass Drive, Suite 106  
 Grand Junction, Colorado 81516

Re: Comments concerning proposed Paradox evaporation pond study

Terry,

My wife and I own 80 acres along the East side of the Dolores River between the Reclamation office and the salt injection plant. We currently live in SW Wyoming but plan to move to the area in about two years. We are currently planning and constructing a resort on our property consisting of five lodging units and a 14 space RV park, recently approved by the Montrose County Commissioners. The RV park should be finished sometime next year.

.101 Closing the salt injection facility would have a positive effect on our future plans as it would  
 .102 greatly reduce the traffic to and from the plant since the access road crosses our property and  
 .103 would also reduce other impacts such as noise, lights, privacy, etc. We are actually looking  
 forward for the day when the plant closes and the road will be used primarily by us. .104 .105

We have a few concerns about the proposed evaporation ponds as a method of salt removal.

1. Bird deterrents such as flashing lights and especially noise cannons may have a negative impact on the area, especially with our resort which could possibly become somewhat  
 .105 of a nuisance for our patrons and possibly cause us to lose business and revenue and ultimately affect our ability to make a living in the area which is already difficult.
- .106 2. Possible odors are also a concern. As stated in your letter, Hydrogen Sulfide removal would need to be done. Also, odors may also be produced by biological decomposition, enhanced by wind, also resulting in a negative impact. We live near the Great Salt Lake which routinely produces foul odors caused by decomposition of plants and animals such as bacteria, algae, brine shrimp and brine flies. Local residents refer to this as "lake stink" which is especially noticeable when the wind churns shallow water along the shorelines. A large scale evaporation pond project may have a similar affect.

Possible alternatives; We would like to see other alternatives used, such as drilling another  
 .107 deep injection well or possibly piping the brine to another less populated location where there  
 .108 would be less human impact, such as the East end of the Paradox valley, possibly near the proposed Uranium Mill site where there will already be impacts from the mill operation.

Sincerely,

Randall and Betty Roper

Cc: Andy Nicholas, Paradox manager

**From:** Anne Reeser  
**To:** Shih, Terence L. (Terry)  
**Subject:** Paradox Valley Evaporation Pond Pilot Study  
**Date:** Monday, January 30, 2012 10:24:46 AM

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Dear Bureau of Reclamation,

.101 I implore you to conduct a full Environmental Impact Statement (EIS) for salinity control in Paradox  
.102 Valley before allowing an evaporative pond to be built. Although the deep injection system creates  
concerns over seismic impacts and is reaching capacity, the Bureau should thoroughly examine the  
alternatives available and avoid creating permanent toxic waste dumps in Paradox Valley. Please, .103  
for the sake of our children and the environment in this beautiful valley, please fully assess all  
possible environmental impacts before allowing this plan to move forward.

--  
Anne Reeser  
Creative Director / Production Manager  
The Watch Newspapers  
125 W. Pacific Ave.  
Telluride, CO 81435  
970.728.4496, ext. 105  
[www.watchnewspapers.com](http://www.watchnewspapers.com)

**From:** [corinne.platt](#)  
**To:** [Stroh, Terence L. \(Terry\)](#)  
**Subject:** EIS Paradox Valley  
**Date:** Tuesday, January 31, 2012 1:31:43 PM

---

Dear Bureau of Reclamation,

.101 I implore you to conduct a full Environmental Impact Statement (EIS) for salinity control in Paradox  
.102 Valley before allowing an evaporative pond to be built. Although the deep injection system creates  
concerns over seismic impacts and is reaching capacity, the Bureau should thoroughly examine the  
alternatives available and avoid creating permanent toxic waste dumps in Paradox Valley. Please, .103  
for the sake of our children and the environment in this beautiful valley, please fully assess all  
possible environmental impacts before allowing this plan to move forward.

Gratefully,  
Corinne Platt  
PO Box 678  
Ophir, CO 81426

**From:** [hunter hogan](#)  
**To:** [Stroh, Terence L. \(Terry\)](#)  
**CC:** [Nicholas, Andrew J](#)  
**Subject:** WCG-SPMcCALL, ENV-6.00  
**Date:** Sunday, December 11, 2011 12:26:02 PM

---

Dear Mr Stroh and Mr.Nicholas, We are in receipt of your letter dated Nov.18,2011 re: the above subject,

My husband and I are residents of Bedrock, and live on X. Rd. We realize the program of removing salt from the Delores River has to continue and we ask that consideration be given to us, and everyone who lives in Bedrock. I know we are a small community but we value our lifestyle...it is why we chose to live here. We have heard thru the grapevine that consideration is being given to drilling a new well off X rd. and also Monogram Mesa. The location by X Rd. is only 200 yds from our house! This would be a terrible installation for us and our quiet way of life. X road would be destroyed and it already lacks maintenance. I do not think it needs any further explaining. We hope you would consider Monogram Mesa where as we understand the impact would be minimal. With regard to the evaporation ponds we have also heard that the smell of sulphur would be terrible. Is this true? Also would the ponds be fenced to protect wildlife? and rumor has it canon fire would go off at intervals to scare away wildlife. There is still an old pond site shown north on the map that is a terrible mess that has never been cleaned up and we have wondered many times how the site could be left like that. We hope that if your choice is to go with the ponds that they will be fenced and canon noise not used. One reason we all live here is for the quiet and wildlife. We hope that you will consider the scenarios when making a decision. I am sorry we missed the meeting Dec.6 as we were out of town and we hope to attend the next one.  
 sincerely, Hunter Hogan and Anthony Percival

**From:** [Marshall Pendergrass](#)  
**To:** [Shoh, Terence L. \(TRHV\)](#)  
**Subject:** Paradox Unit  
**Date:** Thursday, December 15, 2011 11:47:09 AM

---

I attended the presentation in Montrose last and want to first congratulate the Bureau of Reclamation for their many years of work -and successful results - on the Paradox Valley Unit operations. I had no idea of the magnitude of the problem and of the success BOR has demonstrated with the current facilities.

My comments are provided below:

- .101 - BOR should pursue the Evaporation Pond Pilot Study as quickly as possible
- .102 - BOR should investigate using private land purchase as way to get the best site and obtain local support
- .103 - Commercialization options should be evaluated in parallel with the pilot study as a means to off-set some of the cost and bring some new industry to the area

Th presentation was very well done - good history and having operations manager there really helped with the questions.

Best of luck in the project!

Marshall Pendergrass

Mr. Terry Stroh  
Bureau of Reclamation  
2764 Compass Drive, Suite 106  
Grand Junction, Colorado 81506

Delivered via email to: tstroh@usbr.gov  
Re: Paradox Valley Evaporation Ponds

August 19, 2012

Dear Mr. Stroh,

We own 120 acres in Paradox Valley adjacent to one of your proposed salt evaporation ponds. This proposal was only recently brought to our attention on August 13, 2012.

We have owned this land for over 24 years. During that time we have fenced approximately 60 acres, which restored many of the native grasses and vegetation to their natural state. Because of these improvements it now supports a variety of animals.

.101 Beyond the visually obstructive nature of the ponds, there are many .102  
environmental factors to consider, such as groundwater depletion, impairment of  
.103 water and soil quality, negative impacts to the native bird and fish population, and  
.104 disruption to the winter range of elk. .105

.106 Something that is commonly over-looked is the wind factor. There is little wind  
.107 data collected for such projects, and all potential wind should be considered a  
source of negative impact, especially in Paradox Valley. Considering your  
proposed ponds are adjacent to our land, wind data must be collected in order to  
.108 prevent unwanted waste from impacting or damaging our property. .109

We have spent over 24 years enjoying our land and the valley. We built a small cabin there using only hand tools. It is a special place for all of us and we want to keep it a special place.

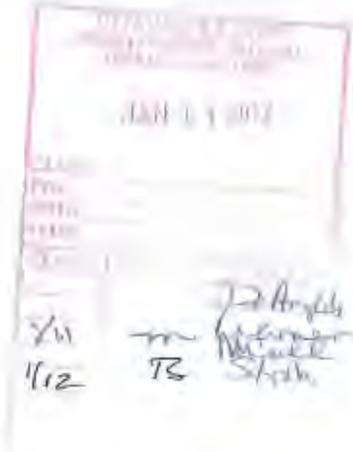
Let this be our official comment that we are strongly opposed to the suggested evaporation ponds and we intend to use our Declaration in Standing as stake holders for this decision process. We thank you for your time and careful consideration with this project.

Sincerely,

*Kathleen D. Cooney Charles M. Schildt Charles D. Schildt*

Kathleen D, Cooney, Charles M. Schildt, Charles D. Schildt  
895 Locust Lane  
Moab, Utah 84532

220



January 9, 2012

Carol DeAngelis  
Area Manager  
Bureau of Reclamation  
2764 Compass Drive, Suite 106  
Grand Junction, CO 81506

Submitted VIA US Certified Mail

Re: Paradox Valley Salinity Control: Development of a Paradox Evaporation Pond Pilot Study

Ms. DeAngelis:

As the Planning and Development Director for Montrose County, Colorado, I am hereby submitting comments on behalf of county staff with regard to the above referenced pilot study.

.101

.102

Based on the map attached to the formal request for input, it appears that all of the potential pilot study sites are located in Montrose County. As a result, there will likely be a need for BOR and the County to coordinate the development of these sites. Specifically, County Road "Y11" may be impacted by construction and monitoring activities. As BOR advances the pilot study, we respectfully request that updates be provided so that staff and the County's elected officials may remain aware of the status of this locally important project.

We recognize the need to mitigate salinity in the Dolores and Colorado Rivers. The efforts of the BOR in response to the Colorado River Basin Salinity Control Act are appreciated. If collaboration with the County Planning and Development Department would be helpful to BOR staff, please do not hesitate to contact us.

Thank you for the opportunity to comment on the proposed pilot study. We look forward to continued involvement in this and other projects.

Sincerely,

Steve White  
Planning and Development Director

221

**From:** [linda miller](#)  
**To:** [Stroh, Terence J. \(Terry\)](#)  
**Subject:** Paradox Valley De-Salinization Project  
**Date:** Sunday, January 29, 2012 3:26:24 PM

---

To Whom it May Concern:

.101 The salinity of the Colorado River is an issue that encompasses the whole Colorado River Watershed. It is essential that we understand the scope of the problem and that a cumulative cost-benefit analysis of the watershed be undertaken.

.102 Plans for evaporation ponds in the Paradox Valley is just part of the solution. Is it a solution and what is the scope of the total salinization of the watershed. It seems to me that the total watershed must be looked at and each contributing source be examined.

.103 An Environmental Assessment is not adequate. Even an Environmental Impact Statement needs to include more than just this source of salinity. But, at the very least it must be done.

Sincerely

Linda Miller  
Telluride, Colorado

**From:** [Kameron Gerber](#)  
**To:** [Stroh, Terence L. \(Terry\)](#)  
**Subject:** Paradox Valley Evaporation Pond Pilot Study  
**Date:** Thursday, March 01, 2012 3:35:15 PM

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Dear Bureau of Reclamation,

.101 I implore you to conduct a full Environmental Impact Statement (EIS) for salinity control in Paradox  
Valley before allowing an evaporative pond to be built. Although the deep injection system creates  
.102 concerns over seismic impacts and is reaching capacity, the Bureau should thoroughly examine the  
alternatives available and avoid creating permanent toxic waste dumps in Paradox Valley. Please, .103  
for the sake of our children and the environment in this beautiful valley, please fully assess all  
possible environmental impacts before allowing this plan to move forward.

Kameron Gerber  
Telluride, Colorado

223

**From:** Brandt  
**To:** [Stroh, Terence J. \(Terry\)](#)  
**Subject:** Impact Statement (EIS) for salinity control in Paradox Valley  
**Date:** Saturday, January 28, 2012 10:05:18 PM

---

Hello Mr. Stroh,

101

I would very much like to see the Bureau of Reclamation conduct a full Environmental Impact Statement (EIS) for salinity control in Paradox Valley.

Thanks you

Brandt Garber

**From:** [Cindy Fusting](#)  
**To:** [Stroh, Terence L. \(Terry\)](#)  
**Subject:** Paradox Valley EIS  
**Date:** Friday, January 27, 2012 2:54:14 PM

---

Dear Bureau of Reclamation,

.101 It is imperative that a full Environmental Impact Statement (EIS) for salinity control in Paradox  
Valley must be conducted before allowing an evaporative pond to be built. Although the deep  
.102 injection system creates concerns over seismic impacts and is reaching capacity, the Bureau should  
thoroughly examine the alternatives available and avoid creating permanent toxic waste dumps in .103  
Paradox Valley. Please, for the sake of our children and the environment in this beautiful valley,  
you must fully assess and account for all possible environmental impacts before allowing this plan  
to move forward.

Cynthia Fusting  
PO Box 2488  
Telluride, CO 81435  
970-708-5069  
[cindyfusting@mac.com](mailto:cindyfusting@mac.com)

225

**From:** [Kate Schofield](#)  
**To:** [Stroh, Terence L. \(Terry\)](#)  
**Subject:** Paradox Valley EIS  
**Date:** Wednesday, February 01, 2012 3:07:52 PM

---

Dear Bureau of Reclamation,

.101

I implore you to conduct a full Environmental Impact Statement (EIS) for salinity control in Paradox Valley before allowing an evaporative pond to be built. Although the deep injection system creates concerns over seismic impacts and is reaching capacity, the Bureau should thoroughly examine the alternatives available and avoid creating permanent toxic waste dumps in Paradox Valley. Please, for the sake of our children, their future and the environment in this beautiful valley, please fully assess all possible environmental impacts before allowing this plan to move forward.

.102

.103

—  
Kate Schofield Frerichs  
organize & organize events  
and  
Ranch Management & Care

po box 3372 telluride, co 81435  
970.728.4130 h.  
970.708.1457 c.

226

**From:** [Allen.Dana@epamail.epa.gov](mailto:Allen.Dana@epamail.epa.gov)  
**To:** [Stroh, Terence L. \(Tommy\); ANicolas@usbr.gov](mailto:Stroh.Terence.L.(Tommy):ANicolas@usbr.gov)  
**Subject:** Paradox Valley EA  
**Date:** Tuesday, December 13, 2011 2:58:25 PM

---

.101

Is there a schedule for the Environmental Assessment for Development of a Paradox Evaporation Pond Pilot Study? In particular, when will the EA will be out for review and comment. Thank you.

Let me know if you need any help on the UIC permit stuff for the 2nd well alternative.

---

Dana Allen [allen.dana@epa.gov](mailto:allen.dana@epa.gov)  
EPA Region 8 (EPR-N)  
1595 Wynkoop St.  
Denver, CO 80202-1129  
(303) 312-6870, Fax (303) 312-7203

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2011 DEC -9 PM 2:20 Paradox Evaporation Pond Pilot Study  
Comment Sheet

We welcome your comments and concerns on the Paradox Evaporation Pond Pilot Study plan. Comments can be handed in at this scoping meeting, e-mailed to tstroh@usbr.gov, or mailed to Area Manger, Bureau of Reclamation, 2764 Compass Dr., Suite 106, Grand Junction, CO 81506.

(Optional) Name Rick Diamond

Address 23025 rd 900 (Box 31)

Bedrock 81411 959-73921

Comments: My concerns are

A loss of habitat for wintering animals .101

Loss of nesting habitat for spring nesting  
birds.

.102

It looks like it would be hard to protect  
the trap ponds safe from unusual weather events  
such as cloud bursts or rain on snow flooding.  
As an example you need look up the San Miguel fire  
a few miles.

.103

It is peaceful & quiet on the Paradox valley  
and would be concerned about how you would keep  
animals away from the trap ponds with snow  
bursts.

.104

(over)

From: [Johnson, Charles](#)  
To: [Stroh, Terence L. \(Terry\)](#); [Illenberg, Brent B.](#); [steve.miller@state.co.us](#)  
Cc: [Baughman, Gary](#); [Gunderson, Steve](#)  
Subject: Draft Solid Waste Impoundment Regulations  
Date: Tuesday, November 29, 2011 11:47:10 AM  
Attachments: [Section 9-Draft regs 11-17-11.doc](#) → Draft; Did not print

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Terry, Brent and Steve:

- .101 A copy of the [draft solid waste impoundment regulations](#) is attached for your review and consideration. I also provided some earlier information on [companies that indicate they are capable of in-vessel treatment of the volumes and types of groundwater you are expecting. They](#)
- .102 [may provide a valuable resource in the form of treated water that could be available for reuse in the area.](#) Please let me know if you'd like additional information to consider as part of this or an additional pilot study. Thanks, Charles

Charles G. Johnson, Manager  
Solid Waste and Materials Management Program  
Hazardous Materials and Waste Management Division  
Phone: 303-692-3348  
Email: [charles.johnson@state.co.us](mailto:charles.johnson@state.co.us)

**From:** [Annie Carlson](#)  
**To:** [Shadi, Tessa L. \(Terry\)](#)  
**Subject:** EIS for salinity control in Paradox Valley  
**Date:** Friday, January 27, 2012 12:41:02 PM

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Dear Bureau of Reclamation,

.101

.102

I implore you to conduct a full Environmental Impact Statement (EIS) for salinity control in Paradox Valley before allowing an evaporative pond to be built. Although the deep injection system creates concerns over seismic impacts and is reaching capacity, the Bureau should thoroughly examine the alternatives available and avoid creating permanent toxic waste dumps in Paradox Valley. Please, for the sake of our children and the environment in this beautiful valley, please fully assess all possible environmental impacts before allowing this plan to move forward.

.103

Annie Carlson  
PO Box 2430  
Telluride, CO 81435

230

**From:** [Greg Babush](#)  
**To:** [Shah, Terence J. \(Terry\)](#)  
**Subject:** paradox valley salinity control  
**Date:** Friday, January 27, 2012 4:52:22 PM

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.101

Please don't try to fix one problem by creating another problem. Please conduct a full environmental impact statement EIS before moving forward with anything in Paradox Valley!

thank you!

**Greg Babush**

119407 0000-0000

[greg@gregbabush.com](mailto:greg@gregbabush.com)  
<http://www.gregbabush.com>  
<http://blog.gregbabush.com>

## ATTACHMENT C – Combined Comment Summary

<b><u>ISSUES AND TOPICS</u></b>	<b><u>COMMENT</u></b>	<b><u>COMMENT NUMBER</u></b>
<b>ALTERNATIVES</b>	Include alternative well locations and operational scenarios to allow flexibility and adaptive management.	101.102
	Include evaporation ponds as sub-alternative to injection well alternative to improve efficiency of injection wells and provide emergency storage	101.104
	Evaluate 1) alternating well usage; 2) running both wells at the same time with lower volumes and potential pressures; and 3) examining rest period durations to optimize operations and maximize well life.	101.110
	Use groundwater modeling to evaluate potential well locations to identify optimal spacing between wells. Other siting criteria should include land ownership, cost, and construction impacts.	101.111
	Raise the maximum allowable pressure within the existing well.	102.102
	Evaluate alternatives of drilling well and/or use of evaporation ponds	103.103
	Evaluate all potential viable alternatives, including a replacement injection well and evaporation ponds	104.102
	Look at opportunities to reduce human-generated salinity by changing farming and irrigation practices	106.102

<b><u>ISSUES AND TOPICS</u></b>	<b><u>COMMENT</u></b>	<b><u>COMMENT NUMBER</u></b>
	Alternative Basinwide EIS -- Prior to pursuing this action, Reclamation must first develop a more holistic, long-term management plan for Colorado River water resources that extends well beyond the Paradox Valley project and the salinity control program as a whole.	106.103
	For salinity treatment to be truly successful and sustainable in the long term, consider a comprehensive approach for the full Dolores River Basin and perhaps Colorado River Basin	107.103
	No modification should be undertaken that affects the Dolores River's stream bed as it passes through the Paradox Valley.	106.104
	Consider other locations for deep well injection into the Paradox Formation, e.g., Castle Valley, Spanish Valley, and Lisbon Valley in eastern Utah.	106.113
	Alternative of planting native phreatophytes to consume surplus groundwater flowing over salt domes via evapotranspiration	106.115
	Alternative of "dewvaporation" technology, as per Desalination and Water Purification Research and Development Report No. 120 by Reclamation, 2008	106.116
	Include numerous applications simultaneously, rather than any single mitigation strategy, to reduce cumulative impacts to the natural environment	106.117
	Decommission McPhee Reservoir	106.105
	Under all alternatives, ensure continued delivery of 700 acre-feet of augmentation water stored in McPhee Reservoir including effects on native fish in Dolores River and if additional augmentation water is needed, assess that need as well.	107.123

<b><u>ISSUES AND TOPICS</u></b>	<b><u>COMMENT</u></b>	<b><u>COMMENT NUMBER</u></b>
	Investigate feasibility of continuing the existing brine injection system, expanding it to increase disposal capacity, or operating multiple wells together in order to increase rest periods.	107.124
	Consider additional sites for evaporation ponds, considering comments/issues identified in the evaporation pond pilot study	107.126
	Permanent storage and creation of landfills to store toxic waste from evaporation ponds in Paradox Valley should be excluded from consideration in all alternatives. All evaporate waste that may be created by the project should be removed and permanently stored in a licensed hazardous waste landfill in a suitable location.	107.127
	All alternatives should include provisions for monitoring resources (groundwater, surface water runoff, wildlife, vegetation)	107.130
	All alternatives should specify best available technology for preventing leakage of evaporative ponds, and detail the expected materials and construction methods.	107.131
	Consider feasibility of implementing irrigation improvements as a supplemental measure to reduce salinity above and beyond existing measures while also reducing consumption. Potential mitigation measures include creating cooperative programs with ranchers and farmers to improve water delivery controls, line ditches or build delivery pipes, and intercept runoff.	107.132
	Investigate expanding Tamarisk eradication efforts as another tool for reducing salinity. Restoration of native cottonwood habitat zones can be expected to bring multiple environmental improvements.	107.133

<b><u>ISSUES AND TOPICS</u></b>	<b><u>COMMENT</u></b>	<b><u>COMMENT NUMBER</u></b>
	Investigate feasibility of using renewable energy sources incorporated into alternatives. USBR is planning to deploy a solar-powered desalinization pilot project at the Brackish Groundwater Research Facility in Alamogordo, NM. Also, BOR is researching technology combining desalination with wind or solar power, or co-location of desalination facilities with power generators. Analyze feasibility of using alternative desalinization technologies, such as dewvaporation, zero liquid discharge crystallization, and reverse oxidation.	107.134
	Develop and consider the impacts of managing natural Dolores river flows and increasing releases from McPhee Reservoir as a means of reducing salinity (taking into consideration USBR's changing approach to water management and any recommendations in the Supply and Demand Study)	107.135
	Consider an alternative that would incorporate public-private partnerships to extract commercially valuable compounds from the brine and process materials in an environmentally responsible way to both address materials produced by salinity treatment and contribute to local economic development.	107.136
	Consider alternative of building the ponds in Uravan, or in a place that has already been impacted by previous development	108.101
	Consider horizontal drilling, or keep the site you already have, or choose a site that will not negatively impact any of the residents in this community.	117.106
	Ponds should be netted to protect migratory birds and consider including active and passive deterrents and monitoring to visually inspect, remove and rehabilitate birds if they show adverse effects	204.102
	Consider pond placement and long-term disposal areas outside of areas that are subject to erosion during high flow events, e.g., Dolores River, to lessen the potential for storage failure that could ultimately allow the brine to enter the river.	204.103
	Consider cost effective alternative for brine disposal, including either new injection well or a less energy intensive evaporation facility either separately or used conjunctively.	206.102

<b><u>ISSUES AND TOPICS</u></b>	<b><u>COMMENT</u></b>	<b><u>COMMENT NUMBER</u></b>
	An evaporation pond alternative should require the use of netting, brine coloring, noise cannons, flashing lights, bioacoustics and radar detection.	207.109
	Consider an alternative of changing agricultural and irrigation practices in the Dolores River Basin	207.124
	Consider netting the ponds instead of noise cannons.	213.103
	Close the salt injection facility	214.101
	Consider drilling another deep injection well	214.107
	Consider piping the brine to another less populated location where there would be less human impact, such as the East end of the Paradox valley, possibly near the proposed Uranium Mill site where there will already be impacts from the mill operation	214.108
	Consider a location other than near X Road. Monogram Mesa would be preferable; impacts minimal.	217.102
	Investigate private land purchase to get best site and obtain local support	218.102
	Evaluate commercialization options in parallel with a pilot pond study to offset some of the cost and bring new industry to the area	218.103
	Consider companies that are capable of in-vessel treatment of the volumes and types of groundwater you are expecting. They may provide a valuable resource in the form of treated water that could be available for reuse in the area.	228.102
<b>NEPA PROCESS</b>		101.101
		101.103

<b><u>ISSUES AND TOPICS</u></b>	<b><u>COMMENT</u></b>	<b><u>COMMENT NUMBER</u></b>
		103.101
		104.101
		111.101
		112.101
		201.101
		203.101
		205.101
		207.105
		207.120
		208.101
		209.101
		210.101
		211.101
		212.101
		215.101
		216.101
		218.101
		220.102
		221.103
		222.101
		223.101
		224.101
		225.101
		226.101
		229.101
		230.101
<b>NEPA Process - cumulative actions</b>		105.108
	EA for potash exploration near Egnar, CO	107.117

<b><u>ISSUES AND TOPICS</u></b>	<b><u>COMMENT</u></b>	<b><u>COMMENT NUMBER</u></b>
	uranium exploration incl. Pinon Ridge Uranium Mill	107.118
<b>PHYSICAL</b>		
Surface Water		105.116
Monitoring		107.129
Ground Water	Well	101.108
	Well	101.109
		113.102
		219.102
Monitoring		107.128
Drinking Water (fresh water, UIC Program)		105.106
		113.104
Water Quality (Section 303(d))		105.101
		107.115
		206.103
		207.101
		219.103
		221.102
Water Quantity, incl. Surface Water, Dolores River		105.102
		106.101
		207.112
Water Rights / Law		206.104
Wetlands and Streams (Delineation, 404(b)(1) Alternatives Analysis, Section 404 CWA)		107.109
		207.114
Geology		

<b><u>ISSUES AND TOPICS</u></b>	<b><u>COMMENT</u></b>	<b><u>COMMENT NUMBER</u></b>
Surface		113.103
Soil/Cyanobacteria		107.139
		219.104
Seismicity		105.103
		107.113
		113.101
		201.102
		207.103
		208.102
		211.102
		212.102
		213.101
		215.102
		216.102
		222.102
		224.102
		225.102
		229.102
Pollution Control		
Noise		107.143
		111.102
		117.102
		202.102
		213.102
		214.103
		217.105
		227.104
Light		117.103

<b><u>ISSUES AND TOPICS</u></b>	<b><u>COMMENT</u></b>	<b><u>COMMENT NUMBER</u></b>
		202.103
		214.104
Air Quality (Clean Air Act) particulates and odor		107.138
		207.108
		214.106
		217.103
	wind	219.107
Climate Change		105.104
		107.140
		227.103
Solid Waste / Hazardous Waste (RCRA)		101.106
		105.112
		106.109
		107.105
		107.137
		201.103
		207.107
		208.103
		211.103
		212.103
		215.103
		216.103
		219.108
		222.103
		224.103
		225.103
		228.101

<b><u>ISSUES AND TOPICS</u></b>	<b><u>COMMENT</u></b>	<b><u>COMMENT NUMBER</u></b>
		229.103
Energy Use and Conservation (power lines, electricity)		106.114
		107.142
Wild and Scenic Rivers		107.112
		207.117
<b>BIOLOGICAL/ NATURAL ENVIRONMENT</b>		
Threatened & Endangered Species / Critical Habitat		105.105
		107.110
		207.118
Biological Assessment		
Special Status / Sensitive Species		207.115
Vegetation Associations, Cover		105.110
Riparian, Desert Shrubland, Grassland, Pinon/Juniper		107.108
		207.113
Wildlife		101.105
		105.111
		106.107
	Fisheries, Bats, etc.	107.114
		120.102
		203.102
		204.104
		207.102
		208.105
		217.104

<b><u>ISSUES AND TOPICS</u></b>	<b><u>COMMENT</u></b>	<b><u>COMMENT NUMBER</u></b>
	fish, elk	219.106
		227.101
Birds (incl. Migratory Bird Treaty Act and Eagle Protection Act)		106.108
		107.104
		114.101
		120.101
		204.101
		207.106
		219.105
		227.102
Ecosystem Services analysis		105.107
Environment		107.101
<b>SOCIOECONOMIC</b>		107.102
		107.119
		108.103
	property values	117.101
	community	117.105
	community, property values, land use	119.101
	property values and quality of life	120.104
	property values	202.101
		207.104
		208.104
		214.105
		217.101
	property damage	219.109
Land Use		107.121

<b><u>ISSUES AND TOPICS</u></b>	<b><u>COMMENT</u></b>	<b><u>COMMENT NUMBER</u></b>
Areas of Critical Environmental Concern		107.111
		207.116
Area of surface disturbance		107.125
Consistency with Federal, State, Local Plans and Programs		206.105
		207.119
Agricultural / Farmland / Grazing		107.107
		207.111
Visual/ Resources/Aesthetics/ Landscape/Scenery		105.109
		105.113
		106.106
		107.106
		108.102
		120.103
		207.110
		219.101
Recreation and Tourism		107.120
		203.103
		207.122
Traffic (short-term and long-term)		117.104
		214.102
		220.101
Construction Impacts		
O&M Cost Analysis		
Cost-Benefit	Well and Evap Ponds	102.101
	Well and Evap Ponds	103.102
	Evap Ponds	106.110

<b><u>ISSUES AND TOPICS</u></b>	<b><u>COMMENT</u></b>	<b><u>COMMENT NUMBER</u></b>
	cumulative cost-benefit analysis of watershed	221.101
Alternatives Cost Effectiveness		206.101
Public Health and Safety	Well	102.103
		107.141
<b><u>CULTURAL RESOURCES</u></b>		107.122
		207.123
<b><u>OTHER NEPA CONSIDERATIONS</u></b>		
Short-Term Uses of Environment and Long-Term Productivity		106.112
Cumulative Impacts		105.115
		106.111
	Development throughout basin is leading to increases in salinity from future extractive energy development, climate change and drought patterns	107.116
		207.121
	Old pond site to the north was never cleaned up and is a mess.	217.106
Permits, Licenses and Approvals Needed to Implement the Proposal	Well	101.107