

RECLAMATION

Managing Water in the West

Scoping Report- Paradox Valley Unit EIS

January 2013



Paradox Valley

Bureau of Reclamation
Western Colorado Area Office
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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.

Public involvement will be an important activity in the development and analysis of alternatives. The first phase of the public involvement process is “scoping” and is designed to help determine significant issues and alternatives to be addressed. Scoping is defined as “an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to the proposed action.” This report summarizes the findings of the 2012 scoping period.

A draft and 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 PVU.

If during the process, based on studies and public input, Reclamation concludes the proposed action would have no significant impact on the human environment, preparation of an Environmental Impact Statement would not be required and an environmental assessment (EA) would be prepared. If appropriate, a Finding of No Significant Impact (FONSI) would be the final product prepared under the EA.

The Paradox Valley was formed from the collapse of a salt anticline (dome) located in southwestern Colorado. The Dolores River, as it passes through the valley, historically picked up an estimated 205,000 tons of salt annually. The Colorado River Basin Salinity Control Act (Public Law 93-320) of 1974 authorized Reclamation to investigate and construct the PVU. The PVU currently intercepts brine groundwater and disposes of it by deep well injection. Approximately 110,000 tons of salt that would otherwise enter the Dolores River annually is injected into a 15,932 foot deep well located near Bedrock, Colorado. The PVU is designed to prevent this natural salt load from entering the river and degrading the water quality of the main stem of the Colorado River.

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. A new injection well alternative and an evaporation pond alternative, as well as other alternatives are being considered for future brine disposal.

The initial definition of the proposed action is to identify, evaluate, and implement brine disposal alternatives to replace or supplement the existing brine injection well.

The need for the proposed action is defined as follows: The PVU is one of the most effective salinity control projects in the Colorado River Basin and provides about 10 percent of the total salinity control in the Colorado River at Imperial Dam. Because the existing brine injection well is nearing the end of its useful life, another well or alternative brine disposal mechanism is 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.

There are desired goals that should be addressed in alternatives. The following goals of the proposed actions are recognized:

- Protect existing land uses and not adversely affect landowners in the area
- Provide for uninterrupted brine disposal to the extent possible
- Avoid levels of seismic activity that could damage property
- Avoid impacts to wildlife resources including migratory waterfowl
- Maintain or improve cost effectiveness of the project

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

2. Public Scoping Activities

Several methods were used to inform the public and solicit comments on preparation of the EIS. These methods included publication of a Notice of Intent in the Federal Register, press releases, preparation and mailing of information packets, scoping announcements, and public scoping meetings.

The formal scoping period began on September 10, 2012 with the publication of a Notice of Intent in the Federal Register. The Notice described Reclamation's intent to prepare an EIS, announced public meeting dates, and solicited public comments. The comment period extended to November 26, 2012.

Reclamation distributed an announcement of the scoping meetings along with background information to an initial EIS mailing list of approximately 280 individuals, landowners, organizations, agencies, and Tribal governments. The announcement requested written comments as well as attendance at the scoping meetings. News releases and personal contacts were also used to notify people of the scoping meetings.

Public scoping meetings were held September 25, 26, and 27 in Paradox, Montrose, and Grand Junction, respectively. Representatives from federal, state, and local agencies attended the meetings, as well as members of the public. At the meetings, Reclamation presented background information and listened to public comment and questions. Forms were also provided for written comments.

A website has been developed to provide updated information on the EIS process (www.usbr.gov/uc/wcao/ - Quick Links-General-Paradox Valley Unit) and an e-mail address to obtain information or offer comments on the EIS has been established (paradoxeis@usbr.gov).

Previously, in January 2012, scoping meetings were held in Paradox and Montrose to discuss a pilot evaporation pond study being considered. The initial idea was to construct a small evaporation pond to treat brine and help determine effects of a larger scale evaporation pond program. The report for this exercise is included in Attachment B. Much of the input is relevant to the present scoping program.

3. General Scoping Results

Scoping input was recorded from the scoping meetings held in Paradox, Montrose, and Grand Junction. In addition, written input was received from approximately 25 agencies, individuals, and organizations. Copies of agency and organization letters are included in Attachment A.

The following section of this report summarizes comments and concerns received at the scoping meetings; information is presented by specific topics. The information is a compilation of information presented and no attempt is made to analyze/support/or refute the comments. If a response was given by Reclamation at the meetings, it is presented in *italics*.

General considerations:

- Are there any results from the helicopter survey done recently? (*A report will be published and will be made available. Initial results show brine surfacing near the river as generally believed.*)
- Can the PowerPoint presentation be made available? (*It will be placed on the web.*)
- Can the PowerPoint be provided to the Salinity Control Forum?
- Concerned with any alternatives that create noise disturbance to residences.
- How has the present project affected fisheries in the Dolores River in the Paradox Valley? Are there pre-project data? Have fish populations improved?
- Agencies should let Reclamation know if they want to be cooperators on the EIS. Salinity Forum would probably not qualify to be a cooperating agency under Council of Environmental Quality (CEQ) rules; however, member states could be cooperating agencies.

- Economics should be considered. What are economic impacts on recreation and tourism? What are economic effects of salt reduction? Will you use an IMPLAN type methodology to study economic impacts?
- Jobs in the Paradox area should be part of any economic analysis.
- Jobs in the local area are important. Can you give job preference to local people?
- Some alternatives would favor the possibility of local employment/contractors, i.e. evaporation pond construction and maintenance would provide local jobs.
- Was the present injection well contracted? (*Yes, very specialized work*).
- Energy cost is very important in selecting an alternative.
- Salinity Forum is doing a study on upper basin economic effects and should be used in the economic analysis.
- There are a lot of proposed projects in the general area. How will cumulative impacts be presented?
- When looking at cumulative impacts, Reclamation should only consider realistic projects.
- Is brine inflow to the river affected by changes in river flow? (*No, it is mostly independent of river flows.*)
- Who is the lead Federal agency in the National Environmental Policy Act (NEPA) process? (*Reclamation*).
- Who is the decision maker? (*The Record of Decision is generally approved by the Regional Director in Salt Lake City. On some projects, the decision is elevated to the Commissioner in Washington D.C.*)
- How is the EIS paid for? (*Funded by Reclamation appropriated funds and power revenues*).

Deep Well Injection Alternatives:

- Concerned that deep well injection causes seismic activity and harms domestic wells.
- What was seismic activity before and after the present injection well?
- What causes the increase in pressure in the existing well?
- What is present operation cost of injection well? (*Estimated at 3.2 million dollars/year.*)
- Did previous NEPA document (EA) provide coverage already for a second injection well?
- What is the maximum injection pressure allowable based on? (*Based on data collected; Environmental Protection Agency (EPA) and Reclamation worked together to develop. Would vary from one well to another.*)
- If a new injection well is proposed in the EIS, can that EIS be used by the EPA for their permitting? Would not want to do NEPA twice. Will EPA be a cooperating agency?
- Would a new well inject into the Leadville limestone formation?
- Why does the present well have to be shut down periodically?
- What is the cost/ton of salt disposed of under the present injection well? (*Estimated at \$60-\$65/ton based on 25-year life span and considering development and operation costs.*)

Evaporation Pond Alternatives:

- There are evaporation ponds at Moab that have worked successfully for 40 years and have not had waterfowl problems.
- Potash ponds near Moab do not have netting and have not had waterfowl problems for 40 years.
- Would noise “cannons” work to keep waterfowl and other birds away from evaporation ponds? (*In some cases, birds get used to the noise. There is also technology using radar detection that sets the noise maker off only when birds present, and this may prevent birds from becoming acclimated to the noise.*)
- Are there studies on wildlife impact/mitigation for evaporation ponds in other areas?
- Would netting of ponds prevent potential problems with bats being harmed in the brine ponds? Recent investigations have found the spotted bat species in the area which is a rare species.
- Prefer evaporation ponds; for example they would avoid problems with seismic activity that occurs with the present injection well. Seismic activity from the present well has reduced the yield of my domestic well.
- EPA pointed out many problems with evaporation ponds during previous studies. How would there be fewer impacts now?
- What would the life span of the evaporation pond alternative be?
- If an 800 acre site was needed, how long would it last?
- Would the evaporation ponds be lined? (*Yes, ponds would be lined for groundwater protection per state landfill regulations; double lining might be needed and groundwater would be monitored.*)
- If evaporation ponds are used, would the salt make it back to the river someday?
- If BLM land was used for pond, it would have to be withdrawn. Use of Reclamation land for brine disposal needs to be approved by Commissioner (Washington).
- Have “pilot” pond locations been identified? Last December, Reclamation pointed out 3 potential sites.
- Have full-scale pond sites been located? (*Not at this time.*)
- As soon as pond sites are located, the public should be informed.
- Ponds should not be constructed anywhere where they would affect residences or private landowners.
- In the schedule, when would pilot pond be constructed?
- Would the pilot pond be a 20-acre pond?
- How many gallons would be treated at the pilot study pond?
- What would the cost/ton of salt disposed of be for an evaporation pond?
- The State of Colorado is interested in evaluating evaporation ponds because of reduced energy costs, public land availability, and proven technology.
- An 800-acre evaporation pond is a significant amount of land.

Other Alternatives:

- Could you consider lining the channel of the Dolores River in Paradox Valley so that brine did not enter the river? (*It is believed that brine would still come to the surface and eventually enter the river system*).
- Can groundwater entering the valley (from the LaSalle's) be intercepted to reduce entry of brine into the Dolores River? Can you look at barrier to prevent recharge? (*USGS has concluded that groundwater sources are too diffuse over a large area to intercept*).
- Can you burn salt and produce energy? (*Salt is a mineral and burning would not dispose of it.*)
- Do alternatives have to be in the Dolores River/Paradox Valley?
- What do you mean by a "commercial operation" alternative?
- Seems that there is a need for a pilot study to test other alternatives, not just to test evaporation ponds.

No Action Alternatives

- If Reclamation determined to take No Action at Paradox, would Reclamation look at alternative salinity control projects elsewhere as part of this EIS process? (*Other alternatives would be investigated but not as part of this Paradox EIS process*).
- What are the impacts of No Action?

4. Written Input from agencies, organizations, and public

Written input received following the September 2012 scoping meetings is summarized in the following paragraphs. Copies of agency and organization letters are included in Attachment A.

Agencies

Environmental Protection Agency: Recommends investigating various injection well locations and operational scenarios, including operating both a new well and the existing well to extend useful life of the wells. Also consider combination of injection well and evaporation pond. Consider options to maximize well life and address seismic issues. Potential well locations should be evaluated using groundwater modeling and other criteria.

Evaporation ponds have potential fish and wildlife concerns as well as long-term closure issues.

A new injection well would require a Class 5 UIC permit from EPA; information developed for the EIS should include all information needed for permit application.

Montrose County: Considering the cost of a new well facility and the many issues associated with evaporation ponds, the alternative of raising the maximum allowable pressure within the existing well should also be considered.

National Park Service: The NPS reported that they had no comments.

Organizations

Colorado River Board of California: Continued benefits of the Paradox Unit are vital to the water quality of the Colorado River; therefore, the process should be expedited to evaluate new injection well and evaporation pond alternatives. Lack of progress is a concern.

Colorado River Basin Salinity Control Forum: Supports expeditious evaluation of alternatives. Loss of the Paradox Unit brine disposal would lead to \$20-25 million of annual quantified damages to water users. Evaporation ponds and a new injection well alternative should be fully and fairly considered.

Living Rivers with Colorado Riverkeeper, Sheep Mountain Alliance, Canyonlands Watershed Council, Center for Biological Diversity, and Grand Canyon Trust: Human caused sources of salinity such as irrigation, transmountain diversions, and reservoir evaporation should be addressed before addressing natural sources such as the Paradox Valley.

A clear understanding of the effect of past river management activities and of future hydrologic extremes is needed prior to considering actions like the Paradox Valley Unit. Decreases in salinity should be achieved through reversing activities that cause the problem—such as irrigated agriculture, reservoir evaporation, and loss of instream flows. Reducing water consumption and expanding groundwater storage are needed.

Potential for future extreme flooding should preclude infrastructure in the Dolores floodplain – the floodplain based on future flooding scenarios. Evaporation ponds should be avoided due to wildlife issues and long-term disposal problems. Long-term viability of evaporation ponds and injection wells is limited.

Decommissioning McPhee Dam would increase the dilution capacity of the Dolores River and reduce salinity loading from agriculture.

Department of the Interior should pursue a basin-wide Programmatic Environmental Impact Statement to address water quantity, water quality, and critical habitat for the Colorado River basin and to address root problems facing the basin. Projects such as the Paradox Unit do not provide any long-term remedies.

The Wilderness Society, San Juan Citizens Alliance, Colorado Environmental Coalition, and High Country Citizens Alliance: A comprehensive approach to salinity control is needed that considers the entire Dolores River Basin and perhaps the Colorado River Basin.

Evaporation pond issues include effects on wildlife, long-term maintenance of the disposal sites, agriculture and other land uses, riparian areas, potential BLM Areas of Critical Environmental Concern, and the proposed suitability of the middle Dolores River for Wild and Scenic river status.

Deep well injection brings up seismic activity concerns.

A basin-wide study is needed to address the basic causes of salinity and long-term control options. Reservoir storage, diversions, flow management, irrigation, and energy development need to be addressed in relation to the salinity problem.

Due to overlapping impacts, the Paradox Unit analysis should be coordinated with Department of Energy Programmatic Environmental Impact Statement on uranium leasing.

Existing collaborative work of many organizations interested in the Dolores River should be considered in the analysis.

Alternatives should ensure the continued delivery of the 700 acre-feet (af) of augmentation water from McPhee Reservoir.

Seismic activity should be addressed and mitigation measures proposed. 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. Evaporate waste should be removed and permanently stored in a licensed hazardous waste landfill.

Other elements of alternatives to consider include improvement of agricultural practices, natural habitat restoration, use of renewable energy sources, changing water management practices in the basin, and commercial use of brine.

A comprehensive list of resources potentially affected was provided. Action alternatives should be protective and beneficial to both communities and the environment.

Individuals

Comments were received from seven individual landowners in the project area. Concerns included:

Evaporation ponds: Evaporation ponds near or adjacent to private lands would adversely affect the private land values and uses. Noise used to prevent bird use of ponds

would be very disturbing to people. If evaporation ponds needed, consider sites of old Uravan ponds.

Would prefer evaporation pond over deep well injection...Potash ponds near Moab have never caused bird problems.

Ponds would adversely affect scenic beauty of the area as well as adversely affect property values and the quality of life.

Deep well injection: Concerned with effects of increased seismic activity on springs and wells used for domestic or agricultural purposes. There are examples of wells harmed by seismic activity induced by existing deep well injection.

Locating a new well near private lands would adversely affect land values and would be very disturbing to residents during both construction and operation.

Consider horizontal drilling from the existing well site.

5. Cooperating Agencies

Two agencies requested to be cooperating agencies during the scoping process: Montrose County and the State of Colorado. Reclamation will discuss cooperating agency status with other agencies.

6. Discussion and Summary of Scoping Results

A public scoping process was conducted on the PVU EIS. Information collected will assist Reclamation in the development and analysis of alternatives and the identification of significant issues. Issues were identified that need to be considered early in the process. Ideas for alternatives were also presented.

Scoping activities showed widespread support for controlling salinity in the Colorado River Basin, and the Paradox Unit was recognized as an important element in basin salinity control. Continued operation of the PVU is important economically to the upper and lower Colorado River Basins.

There were suggestions to expand the analysis beyond disposal of naturally-occurring brines in the Paradox Valley to giving priority to addressing man-induced salinity sources throughout the basin, such as agricultural practices and water management.

There are many concerns that the type and/or location of an alternative selected could have significant adverse impacts on private lands and residences—for example property values, scenery, quality of life---if the selected alternative is planned near private lands. This was particularly true for evaporation pond alternatives. However, concerns were

also expressed about the construction impacts and increased seismic activity impacts of a new injection well.

Effects on public lands and associated recreation and tourism were also brought up to be considered.

Appendix B contains the scoping report developed for the concept of a test evaporation pond and much of the input is relevant to a full scale evaporation pond alternative. Input from that scoping exercise was summarized as follows:

“Local landowners’ comments and concerns focused primarily on potential impacts to lands adjacent to the proposed site including noise, odor, wildlife, and property values. Local residents also had concerns with potential evaporation ponds sites adjacent to the Dolores River and on the west-end of the Paradox Valley (residence, farming and grazing, minimize visual impacts).

Many Paradox Valley locals also supported continued salinity control activities for the economic benefits (jobs opportunities). Locals also strongly supported investigating a second deep well injection site, subject to additional geologic and seismic studies.

Environmental groups and others requested that Reclamation prepare an Environmental Impact Statement prior to implementing the evaporation pond pilot study. These groups also questioned the scope of the proposed environmental assessment and recommended an evaluation of the entire Colorado River Basin.

Members of the Salinity Control Forum support the implementation of the evaporation pond pilot study as a viable method to gather information to be used in evaluating a range of alternatives for PVU brine disposal. Forum members also expressed a desire to explore brine disposal with lower operation and maintenance costs when compared to deep well injection.

The U.S. Fish and Wildlife Service expressed concerns with potential leaking evaporation ponds impacting the Dolores River. The Service also expressed doubts that the pilot study could successfully address impacts to waterfowl and reiterated that the Migratory Bird Treaty Act has stiff penalties for actions that take migratory birds.

Regulatory agencies indicated need for the pilot study to be designed to comply with federal, state and local laws and regulations.”

Attachment A-Scoping Letters

Agencies and Organizations



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8

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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

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.

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.

Future Underground Injection Control Permit (UIC)

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:
 - 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.
 - 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.

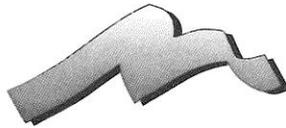
The EPA appreciates the opportunity to provide scoping comments at this stage of the EIS process. If we may provide further explanation of our comments during this phase of your planning process, please contact Dana Allen at 303-312-6870 (allen.dana@epa.gov) or me at 303-312-6925. Craig Boomgaard is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

Sincerely,



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

cc: TStroh@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:

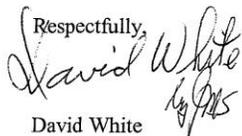
As the elected County Commissioners for Montrose County, Colorado we are hereby submitting comments in regard to the above referenced action.

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.

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.

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

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

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November 19, 2012

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

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

Dear Terry:

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.

Sincerely,

Larry R. Dozier
Chairman



PO Box 466 • Moab, UT 84532 • 435.259.1063 • livingrivers.org

November 26, 2012

Mr. Terry Stroh
Bureau of Reclamation
Western Colorado Area Office
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Grand Junction, Colorado 81506
telephone (970) 248-0808
facsimile (970) 248-0801
email at paradoxeis@usbr.gov

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.

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. 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.

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

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

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

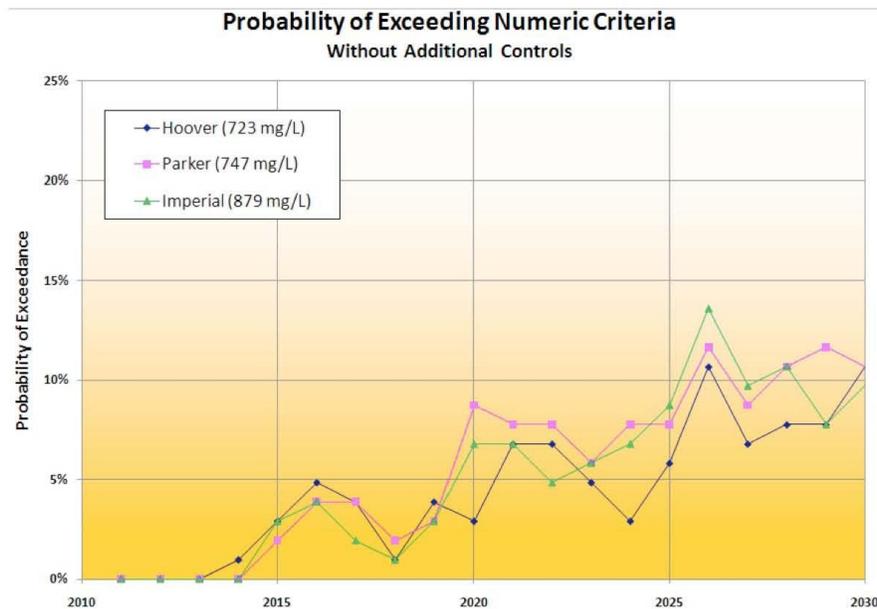
UNDERSTAND THE FUTURE

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.

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.

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.

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

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.

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

The other places where deep well injection of brines into the Paradox Formation that 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 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 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 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 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-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

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

Laurel Hagen
Canyonlands Watershed Council
Executive Director

/s/ Taylor McKinnon

Taylor McKinnon
Center for Biological Diversity
Wildlands Campaigns Director

/s/ Laura Kamala

Laura Kamala
Grand Canyon Trust
Utah Program Director

November 26, 2012

Mr. Ed Warner
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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 Country 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

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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.

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 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.

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

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 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.

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.¹ 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

¹RM Potash Exploration Project, Environmental Assessment DOI-BLM-CO-S010-2009-0076.: blm.gov/pgdata/etc/medialib/blm/co/information/nepa/san_juan_public_lands/trfo_nepa_docs.Par.1940.File.dat/09-76%20RM_Potash_Final_EA_2012-1018.pdf

of a reduction of flows to native fish populations, in light of the most recent scientific research² finding evidence of deteriorating viability of native fish populations in the Dolores River below McPhee Dam.³ If additional augmentation water is needed, an assessment of that need should be described under the appropriate alternatives.

No Action Alternative

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 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.

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 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 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 the analysis, as these qualities hold economic value for tourism and recreation, and social value for preservation of intact rural culture.

Use of Evaporation Ponds

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 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

² 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>

³ 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.

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 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 vegetation. Further, all alternatives should specify the best available technology for preventing leakage of evaporative ponds, and detail the expected materials and construction methods.

Other Aspects for Consideration in Multiple Alternatives

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.

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.

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 desalinization pilot project at the Brackish Groundwater Research Facility in Alamogordo, N.M. In other instances, the BOR 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.

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

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. Potential impacts on fish species protected by the Endangered Species Act should be addressed in consultation with the U.S. Fish and Wildlife Service.

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

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.

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.

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

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.

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. 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.

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.

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.

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.

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

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

25. 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. 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,

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**Attachment B-April 2012 Scoping Report-Paradox
Evaporation Pond Pilot Study**

RECLAMATION

Managing Water in the West

Final Scoping Report- Paradox Evaporation Pond Pilot Study

April 2012



Paradox Valley, Colorado.

Bureau of Reclamation
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1. Introduction and Background

The Bureau of Reclamation (Reclamation) is preparing an environmental assessment (EA) to describe potential effects related to the construction and operation of a proposed evaporation pond pilot study for the Paradox Valley Unit (PVU) of the Colorado River Basin Salinity Control Program. Public involvement will be an important activity in the development of the EA and pilot study. The first phase of the public involvement process is “scoping” and is designed to help determine issues and alternatives to be addressed in the pilot study plan and EA. Scoping is defined as “an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to the proposed action.” This report summarizes the findings of the scoping period.

A draft and final EA 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 proposed action and need, analysis of issues in the EA, and selection of a recommended plan. If, based on this analysis, Reclamation concludes the proposed action would have no significant impact on the human environment; preparation of an Environmental Impact Statement would not be required before the action could be implemented. If appropriate, a Finding of No Significant Impacts (FONSI) will be the final product prepared under this EA. Periodic meetings and mailings will be used to keep the public updated on the process.

The Paradox Valley was formed from the collapse of a salt anticline (dome) located in southwestern Colorado. The Dolores River, as it passes through the valley, historically picked up an estimated 205,000 tons of salt annually. The Colorado River Basin Salinity Control Act (Public Law 93-320) of 1974 authorized the Reclamation to investigate and construct the PVU. The PVU currently intercepts brine groundwater and disposes of it by deep well injection. Approximately 110,000 tons of salt that would have otherwise entered the Dolores River annually is injected into a 15,932 foot deep well located south of Bedrock, Colorado. The PVU is designed to prevent this natural salt load from entering the river and degrading the water quality of the main stem of the Colorado River.

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. A new injection well alternative and an evaporation pond alternative, as well as other alternatives are being considered for future brine disposal. Reclamation intends to conduct a study to develop and evaluate alternatives for the continued operations of the PVU.

As part of this study, the Colorado River Basin Salinity Control Forum (Forum) has requested that Reclamation develop a pilot study to gather information to evaluate the use of evaporation ponds as an alternative to deep well injection to control brine from

entering the Dolores River. The Forum is comprised of representatives appointed by the governors from the respective states in the Colorado River Basin (Colorado, Wyoming, Utah, New Mexico, Arizona, Nevada, and California) and was created for interstate cooperation and to provide the states with the information necessary to reduce salinity concentrations in the Colorado River and to comply with Section 303 (a) and (b) of the Clean Water Act.

2. Paradox Evaporation Pond Pilot Study

The proposed Paradox Evaporation Pond Pilot study (pilot study) would include the construction and operation of one or more evaporation ponds (between 1 and 15 acres in size) within the Paradox Valley to evaluate the feasibility of evaporation ponds as a method for long-term salt disposal. Brine collected at the existing PVU Well Field would be piped to the evaporation pond(s). The pilot study would be operated for a period of three to five years to gather information on evaporation rates, enhanced evaporation techniques and operational costs.

The pilot study would also monitor and evaluate other environmental factors, such as potential impacts on migratory birds and other wildlife, hydrogen sulfide removal techniques, and methods for disposal of brine evaporate. The pilot study would test strategies aimed at preventing harm to migratory birds (as outlined in the federal Migratory Bird Treaty Act of 1918). The U.S. Fish and Wildlife Service indicated during a recent Forum meeting that pond netting must be incorporated into the pond designs. Net supports would be in place and netting available onsite, ready to install, if impacts occur and other mitigation techniques are not effective. Reclamation is considering using both active and passive deterrents (coloring the brine, noise cannons, flashing lights, and bioacoustics, as well as other methods with potential to deter birds from using the evaporation pond(s).

Reclamation has initially identified three potential sites for the pilot study, although additional sites may be considered (See attached map). It is anticipated that the total area of the pilot study will not exceed 40 acres in size. Reclamation proposes to enclose and stabilize (cover) the brine evaporate in place following the study, subject to local, state and federal laws and regulations. The long-term storage of the salt brine evaporate accumulated during the pilot study may also require additional permitting as a landfill. Removal and disposal of brine evaporate at an existing permitted landfill locations will also be explored.

3. Public Scoping Activities

Several methods were used to inform the public and solicit comments on preparation of an environmental assessment. These methods included press releases, preparation and mailings of information packets, meetings with interested parties, scoping announcements, and public scoping meetings.

The scoping period began on November 22, 2011, with press releases and scoping letters mailed to landowners in the Paradox Valley, and various organizations and agencies. The scoping letter described Reclamation's intent to prepare an EA, announced scoping public meeting dates, and solicited public comments. Scoping comments were requested by January 30, 2012.

Reclamation distributed an announcement of the scoping meetings along with background information to an initial EA mailing list of approximately 240 individuals, organizations, and agencies. The announcement requested written comments as well as attendance at the scoping meetings. Personal contacts were also used to notify people of the scoping meetings.

Public scoping meetings were held December 6 and 8, 2011, in Paradox and Montrose, Colorado, respectively. Representatives from federal, state, and local agencies attended the meetings, as well as members of the public. At the meetings, Reclamation presented background information and listened to public comment and questions. Forms were also provided for written comments. At the meetings, Reclamation offered to meet individually with groups or organizations to discuss the EA process.

Additional meetings were held with the Bureau of Land Management and Colorado Department of Public Health and Environment.

4. General Scoping Results

Nineteen people, representing local landowner interests, organizations, agencies and other interested parties, attended the scoping meeting in Paradox and twenty people attended the scoping meeting in Montrose. Notes from the scoping meetings are available for review at Reclamation's office in Grand Junction. In addition, written input received from agencies, organizations and individuals is also available for review. Approximately 68 agencies, organizations and individuals that participated in the public scoping are as follows:

- Montrose County
- Environmental Protection Agency
- Colorado Parks and Wildlife
- Bureau of Land Management
- Trout Unlimited
- Energy Fuels
- Living Rivers and Riverkeepers
- The Wilderness Society
- Center for Biological Diversity
- Canyonlands Watershed Council
- High Country Citizens' Alliance
- Western Colorado Congress
- Biodiversity Conservation Alliance
- Colorado Environmental Coalition
- Montrose County West End Planning Advisory Committee
- Colorado Department of Water Resource
- Colorado River Water Conservation District
- Congressman Tipton's Office
- Sheep Mountain Alliance
- Dolores River Dialog
- San Juan Citizens Alliance Colorado
- Rocky Mountain Chapter of the Sierra Club -
- Rocky Mountain Recreation
- InitiativeDvorak Raft, Kayak & Fishing Expeditions
- Grand Canyon Trust
- Colorado River Basin Salinity Control Forum

The following section of this report summarizes comments and concerns associated with specific topics. The information is a compilation of information presented and no attempt is made to analyze/support/or refute the comments.

BLM Areas of Critical Environmental Concern (ACEC)

1. What effect does an ACEC have on the project? Are they deal breakers? What effect does a proposed ACEC have?
2. If a proposed pond site was in a proposed ACEC, what would happen?
3. Can you do anything in an ACEC before the BLM finishes their Resource Management Plan (RMP)?

Coordination with other Agencies

1. There will likely be a need for Reclamation and Montrose County to coordinate the development of these sites.
2. Montrose County requests updates be provided so that staff and elected officials may remain aware of the status of this locally important project.

Economics

1. Need to maintain or increase employment related to the Unit.
2. Want to see a chart comparing costs of alternatives; what is cost of the study?
3. Considering the cost of the pilot study, this is a no-brainer. Should develop new well.
4. How much will the pilot study cost?

Evaporation Ponds

1. The idea of building evaporation ponds to collect the salt in Bedrock is totally the correct solution. I worked on heavy construction projects during my career and one of the projects was the Truscott Brine Lake Dam in Truscott, Texas in 1980. The Brasos River was receiving high salt concentrations because of large springs that contained salt. The Corps of Engineers tried to seal the salt springs with concrete but it was not effective. The company I worked for simply built a dam one mile long and 70 feet high. I visited the dam in 2002 and it was working quite well. I was never in favor of the costly deep well injection system, but evaporation ponds will work.

Flooding and Storm Events

1. It looks like it would be hard to protect the evaporation ponds from

- unusual weather events such as cloud burst or rain and snow flooding. As an example, you need to look up the San Miguel River a few miles.
2. Flood impacts need to be considered when identifying and evaluating pond sites.

Landfill and Solid Waste Regulations

1. The brine is classified by the EPA as a non-hazardous waste.
2. The Colorado Department of Public Health considers the brine evaporate as a solid waste, requiring permitting for long-term storage (landfill).
3. Reclamation and BLM policies restrict construction of new landfills on federal lands.
4. The County issues the Certificate of Designation (approval) for landfills that comply with State regulations.

Land Value Impacts

1. I am very concerned about the detrimental effect that the ponds and operations thereof would have on the human environment and on the value of my property immediately adjacent to the proposed pond.
2. 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 Bedrock Store, and I believe that the proposed operations would reduce the value of this property considerably.

Noise and Disturbances

1. It is peaceful and quiet in the Paradox Valley. I would be concerned about how you would keep animals away from the evaporation ponds with sound bursts.
2. Canon noise should not be used to scare wildlife.
3. Bird deterrents such as flashing lights and especially noise cannons may have a negative impact on the area, especially our resort which could possibly become somewhat 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.
4. I really don't like the idea of using noise cannons to deter migratory birds from landing on ponds. Noise cannons would definitely have an impact on the human environment, and I live fairly close to the site, I think I would be able to hear the cannons. Noise cannons might also affect chickens that are laying, or other undomesticated animals.
5. The use of noise cannons, flashing lights and possible other methods would have a severe detrimental effect on the normal living conditions of local residents.

Odor

1. With regard to the evaporation ponds we have also heard that the smell of sulfur would be terrible. Would this be true?
2. Possible odors are also of concern. 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. A large scale pond may have a similar affect.

Pilot and Alternative Studies

1. How long will the pilot study last?
2. Have you investigated lining the river?
3. You should use the results of the ongoing USGS hydro study.
4. What are we scoping—the pilot study or the overall study for the Unit?
5. If you did similar studies in the 1970's, why do need another study now?
6. Is there a way to stop the salt at the source? Can you cut the water supply that supplies the brine?
7. Time frames being presented are confusing? Chicken and egg situation.
8. Can you control recharge?
9. Who decides if the pilot study is feasible?
10. You should put the pilot study money towards building a new well.
11. Are there commercial opportunities to use brine?
12. 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.
13. Reclamation should pursue the evaporation pond pilot study as quickly as possible.
14. Closing the salt injection facility would have a positive effect on our future plans (Resort and RV Park) as it would greatly reduce traffic to and from the plant since the access road crosses our property and would 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.
15. We would like to see other alternatives used, such as drilling another deep injection well or possibly 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.
16. Implore you to conduct a full Environmental Impact Statement (EIS) for salinity control in the Paradox Valley before allowing an evaporation pond to be built. Although 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 dump 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 (5 comments).

17. Please don't fix one problem by creating another problem. Please conduct a full environmental impact statement EIS before moving forward with anything in Paradox Valley.
18. It has come to my attention that the Bureau of Reclamation is considering building an 800 acre pond complex to replace the current injection system with a large scale evaporation 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.
19. I would like very much to see the Bureau of Reclamation conduct a full Environmental Impact Statement (EIS) for salinity control in Paradox Valley.
20. 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 examined.
21. 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.
22. In the past I have seen various projects touted as "a simple impact assessment is enough". It is not enough for this possibly large future project, impact on wildlife, recreation and tourism dollar! Therefore I say Full Environmental Impact Study is quite justified.

Pond Liners

1. How do you encapsulate the salt pile? How long will the pile last?
2. Liners all eventually leak, what happens then? Will this cause a bigger problem?
3. Could the pond liner leak?
4. What if the salt leeches into the river?

Pond Location

1. Will private lands be considered for ponds?
2. Long Park has flat area you could pump to.
3. Will you consider using private lands?
4. Are their sites on the west side of the river?
5. Reclamation should investigate using private land purchase as way to get the best site and obtain local support.
6. 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 wondered many times how the

site could be left like that.

7. How will the pilot study results relate to a large scale site if at a different location?

Roads

1. County Road Y11 may be impacted by construction and monitoring activities.

Salinity

1. How has the conductivity of the Dolores River changed?
2. Is the goal to reduce concentration of salt in the river or tons of salt?
3. The Paradox Valley is a major source of salt to the Colorado River and control is very important.
4. 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.

Uranium Mill

1. Use brine from uranium processing; used to be piped to Uravan for that purpose.
2. Is Reclamation working with Pinon Ridge Uranium Mill? How will the Pinon Ridge well pumping affect the salt issue?

Visual Impacts

1. Roads in area are part of scenic route, ponds might conflict with this.

Injection Well

1. Concerns with causing earthquakes
2. What is wrong with another deep well?
3. What was cost of old well? Was it fracked?
4. Will there be parallel studies going on about deep well injection?
5. How far away would you have to drill a new well?
6. How much would it cost to decide where to drill?
7. We have heard through the grapevine that consideration is being given to drilling a new well off X Road and also Monogram Mesa. The location by X Road is only 200 yards from our house. The location would be a terrible installation for us and our quiet way of life. X Road would be destroyed and it already lacks maintenance. We hope you would consider Monogram Mesa where the impact would be minimal.

Wildlife

1. Birds—during migration, can have lots of birds in the area.
2. Do you have information on the effects of similar ponds on wildlife?
3. Loss of habitat for wintering animals.
4. Loss of nesting habitat for spring nesting and birthing.
5. Would the ponds be fence to protect wildlife?

4. Input from agencies and organizations

Agencies and organizations provided comments and are summarized in the following paragraphs.

U.S Fish and Wildlife Service:

Migratory Bird Concerns:

“The Service’s concerns for impacts to migratory birds have 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, Reclamation will be held responsible for their death. The Act provides stiff penalties for actions that take migratory birds.”

“We have stated that to protect migratory birds the pond 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 meeting 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.”

Pond Placement

“One site 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 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.”

Deep Well Injection

“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.”

Montrose County:

Coordination

“...it appears that all 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... 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”.

County Road Impacts

“...County Road Y11 may be impacted by construction and monitoring activities.

Colorado Department of Public Health and Environment:

The Colorado Department of Public Health and Environment provided Reclamation with draft solid waste impoundment regulations for review and consideration. These regulations are currently in the process of being revised. Disposal of the brine evaporate would fall under these regulations and require a “certificate of designation as a landfill” from the appropriate county.

Bureau of Land Management:

Pond Locations

“The BLM has concerns with both (BLM) sites due to their close proximity to the Dolores River. BLM believes a more suitable site might be found either on private land or BLM-managed lands. As appropriate, BLM will assist BOR (Reclamation) in locating a more suitable site.”

”The 80 acre parcel (Site 2 in the scoping document) ranges in elevation from approximately 4944’ to 4963’. The approximate elevation of the Dolores River is 4940’. Only 4’ of elevation difference, flood hazard is a concern at the site. Placing an evaporation pond designed to remove salts from the Dolores River in a location where it could be flooded and wash salt and other heavy metals and contaminants into the river, seems counterproductive...the site appears to be a former river oxbow. The mapped soils confirm the probability of an oxbow by indicating the site is composed of fluvaquents, a type of frequently flooded soils.”

“Elevation differences at this site (Site 3 in the scoping document) seems to be more protective from a flooding event. However, the location is only approximately 100 feet from the mainstem of the Dolores River, and the potential for spilling of salt brine, evaporates and associated contaminants directly into the river seems possible. Bank erosion is already evident in the area and a large storm event could quickly erode through the existing dam. The soils at this site are typical on the floor of the Paradox Valley, a fine sandy loam. Any ponds in this area would need a substantial liner to prevent deep percolation of the pond contents.”

Landfill Regulations

“Regulations prohibit landfills on BLM-managed public lands. Assuming the brine evaporate is classified as a solid waste, BOR (Reclamation) would be required to remove the evaporate to a permitted/approved landfill.”

Land Withdrawal

“A long-term evaporative pond might best be managed through a Withdrawal Order, wherein BLM would transfer jurisdiction of public land to BOR (Reclamation)”.

Wildlife

“How would these (effects on wildlife) be assessed? If the pond’s location is close to the river, will all future evaporation ponds be similarly located? If not, how would these evaluate wildlife uses given different attractions in the vicinity?”

“What is the plan if crystals from the brine appear on birds? “At what level would mitigation be implemented to prevent death to migratory birds?”

“What will the migratory bird monitoring/management plan document? “Presence of birds? Adjacent to pond? Species? Condition?” Need to define unacceptable impact on migratory birds.”

Artificial Lighting

“How about a statement that artificial lighting will not be used, or if needed, (used only) for safety purposes. What is the maximum that would be appropriate that would not attract birds? Shielded lighting to protect the night skies?”

The Wilderness Society and San Juan Citizens Alliance; Sheep Mountain Alliance, Living Rivers and Colorado Riverkeepers, Rocky Mountain Chapter of the Sierra Club, Rocky Mountain Recreation Initiative, Dvorak Raft, Kayak & Fishing Expeditions, Center for Biological Diversity, Canyonlands Watershed Council, High Country Citizens’ Alliance, Western Colorado Congress, Biodiversity Conservation Alliance, Grand Canyon Trust, and Colorado Environmental Coalition:

Two letters were received representing comments from 14 groups. A summary of those comments are presented as follows.

Scope of Analysis

“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.”

“...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 evaporation complex. Currently, the deep-well injection system poses concerns for its seismic impacts which will require a carefully considered approach to identify appropriate alternatives for its extension or replacement.”

Environmental Impact Statement

“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. The need for more extensive analysis is underscored in the Bureau of Reclamation Scoping Notice...”

“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 and 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.”

Native and Endangered Fish

“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.”

Colorado River Basin Salinity Control

“Not only is the pilot project significant in terms of footprint and specific impacts to the 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.”

“Salinity control projects have been implemented over the past several decades...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.”

Energy and Mining Activities

“The Dolores River watershed and its sensitive ecosystems and habitats are experiencing increased pressure 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...”

Collaboration

“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.”

Landfill

”Given associated problems with the three Pond Pilot Study must be analyzed...”
“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 provisions for monitoring for groundwater contamination, surface run-off, and impacts to wildlife and vegetation...”

Injection Well

“The 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 seismic events caused by pressure injections in light of existing and future development within Paradox Valley, including the proposed Pinyon Ridge Uranium Mill to the east...”

Renewable Energy

“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 is another possibility in Paradox Valley, which has the benefit of returning a freshwater supply to the river.”

McPhee Reservoir Operations

“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.”

Resource Impacts

Additionally, issues and/or concerns were listed for: water quality and quantity, riparian zone and wetlands, groundwater depletion, brine character, air quality and odors, soil quality and impacts to soil crusts, birds, bats, rare plant and plant communities, wildlife habitat, fish, livestock, nuisances, scenic viewshed, cultural resources, recreation, research and natural history activities, land management and designations and public land planning processes, emergency preparedness, economic development, area development, waste, energy, and alternative technologies.

Colorado River Conservation District

“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.”

Cost Effective Replacement

“In fact, it is now imperative to develop a cost effective replacement or even an augmentation, to the currently very effective deep injection well...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 inter-compare potential alternatives such as 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.”

Impacts to Mainstem Colorado

“...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:

- 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;
- 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;
- 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”

Colorado River Water Conservation Board

“This comment is submitted by the Colorado Water Conservation Board (“CWCB”) on behalf of Colorado’s three members of the Colorado River Basin Salinity Control Program’s Forum: Jennifer Gimbel, Steve Gunderson, and David Robbins. Ms. Gimbel is the Director of the CWCB and Mr. Gunderson is Director of the Colorado Water Quality Control Division of the Colorado Department of Public Health and Environment (“CDPHE”).”

“As alternatives are being considered to extend the life of the unit the Forum, representing the seven basin states, has recommended that an evaporation pond pilot study be conducted in order to better evaluate the potential for future large scale evaporation ponds as a possible alternative or part of the future plan for saline brine disposal at the Paradox Unit.”

“The Forum further believes that time is of the essence in implementing the pilot evaporation project since there is currently no backup plan to handle the continuous brine inflow to the Dolores River that would occur if the existing injection well was to experience a catastrophic failure. In this regard, we observe that operation of the unit provides demonstrable water quality benefits to downstream water users and wildlife in and along the Dolores River in Colorado, as well as to the millions of water users in the Lower Colorado River Basin.”

“We encourage you to expeditiously complete the required Environmental Assessment of the pilot project and begin implementation as soon as possible. The pilot is necessary to answer some of the technical questions that will arise in the future NEPA evaluation of a full scale project, and thus must be well underway before a more thorough alternatives study and a full environmental evaluation of the Paradox Unit can be initiated.”

“...a key aspect of the pilot project will be to assess any adverse wildlife impacts if they occur and to test the effectiveness of several potential mitigation strategies that may be necessary to prevent any impacts if a full scale evaporation project is eventually recommended.”

Colorado Parks and Wildlife

“The location of the proposed Paradox Pilot Evaporation Pond Study and the three potential ponds lie within mapped severe winter range for Mule deer and elk. Mule deer and a small number of elk are in the area throughout the year.”

There are several existing roads in the area, and CPW recommends improving existing roads and using those to access the pond sites versus creating new roads. This will help to minimize habitat fragmentation as well as disturbances to existing wildlife.”

“With the increased human activity..., the spread and control of noxious weeds becomes a concern for wildlife...”

“The Dolores River contains three BLM-designated Sensitive Species of fish that are also of great concern to CPW...these species are declining and are sensitive to any additional water depletions or changes in water quality in the Dolores River Basin.”

“Riparian areas and floodplains are important for stream bank stabilization, maintaining the plant community, trapping sediment, recycling nutrients and flood control...Protecting riparian habitat will improve water quality and fish habitat.”

CPW also suggests fencing the ponds to exclude most wildlife. CPW recommends a minimum of an eight foot tall woven wire fence around the perimeter of each pond. The CPW supports the U.S. Fish and Wildlife pond netting requirements for avian species. CPW also supports the use of active and passive deterrents as mentioned in the Paradox Pilot Evaporation Pond Study.”

Colorado River Basin Salinity Control Forum

“The proposed Paradox Evaporation Pond Pilot Study is an integral part of the overall environmental process which will be required for the PVU brine disposal alternatives EIS. Without information gained from the Paradox Evaporation Pond Pilot Study, Reclamation will not have the scientific information required to make appropriate decisions in the EIS process.”

“ The Forum believes that the scientifically based and environmentally responsible path to move ahead with the overall PVU brine disposal alternatives study is to quickly implement a pilot evaporation pond study effort as a piece of the overall EIS. The Forum believes that the responsible approach in the EIS to determine whether or not an evaporation pond is a viable and environmentally acceptable replacement alternative is to test it through a pilot study.”

5. Summary

A public scoping process was conducted on the Paradox Evaporation Pond Pilot Study. Information collected will assist Reclamation in the development and analysis of alternatives and the identification of significant issues. Issues were identified that need to be resolved early in the process. Ideas for alternatives were also presented. There is strong public and agency interest in the operation of the PVU because of its economic importance to the local community and as well it regional economic and environmental benefits.

Local landowners’ comments and concerns focused primarily on potential impacts to lands adjacent to the proposed site including noise, odor, wildlife, and property values. Local residents also had concerned with potential evaporation ponds sites adjacent to the Dolores River and on the west-end of the Paradox Valley (residence, farming and grazing, minimize visual impacts).

Many Paradox Valley locals also supported continued salinity control activities for the economic benefits (jobs opportunities). Locals also strongly supported investigating a second deep well injection site, subject to additional geologic and seismic studies.

Environmental groups and others requested that Reclamation prepare an Environmental Impact Statement prior to implementing the evaporation pond pilot study. These groups also questioned the scope of the proposed environmental assessment and recommended an evaluation of the entire Colorado River Basin.

Members of the Salinity Control Forum support the implementation of the evaporation pond pilot study as a viable method to gather information to be used in evaluating a range of alternatives for PVU brine disposal. Forum members also expressed a desire to explore brine disposal with lower operation and maintenance costs when compared to deep well injection.

The U.S. Fish and Wildlife Service expressed concerns with potential leaking evaporation ponds impacting the Dolores River. The Service also expressed doubts that

the pilot study could successfully addressing impacts to waterfowl and reiterated that the Migratory Bird Treaty Act has stiff penalties for actions that take migratory birds.

Regulatory agencies indicated need for the pilot study to be designed to comply with federal, state and local laws and regulations.

Scoping Documents

Paradox Evaporation Pond Pilot Study

Background: The Paradox Valley was formed from the collapse of a salt anticline (dome) located in southwestern Colorado. The Dolores River, as it passes through the valley, historically picked up an estimated 205,000 tons of salt annually. The Colorado River Basin Salinity Control Act (Public Law 93-320) of 1974 authorized the Bureau of Reclamation (Reclamation) to investigate and construct the Paradox Valley Unit (PVU). The PVU currently intercepts brine groundwater and disposes it by deep well injection. Approximately 110,000 tons of salt that would have otherwise entered the Dolores River annually is injected into a 15,932 foot deep well located south of Bedrock, Colorado. The PVU is designed to prevent this natural salt load from entering the river and degrading the water quality of the main stem of the Colorado River. 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. A new injection well alternative and an evaporation pond alternative, as well as other alternatives are being considered for future brine disposal. Reclamation intends to conduct a study/Environmental Impact Statement to develop and evaluate alternatives for the continued operations of the Paradox Unit. As part of this study, the Colorado River Basin Salinity Control Forum (Forum) has requested that Reclamation develop a pilot study to gather information to evaluate the use of evaporation ponds as an alternative to deep well injection to control salt brine from entering the Dolores River near Bedrock, Colorado. The Forum is comprised of representatives appointed by the governors from the respective states in the Colorado River Basin (Colorado, Wyoming, Utah, New Mexico, Arizona, Nevada, and California) and was created for interstate cooperation and to provide the states with the information necessary to reduce salinity concentrations in the Colorado River and to comply with Section 303 (a) and (b) of the Clean Water Act.

Paradox Evaporation Pond Pilot Study: The proposed pilot study would include the construction and operation of one or more evaporation ponds (between 1 and 15 acres in size) within the Paradox Valley to evaluate the feasibility of evaporation ponds as a method for long-term salt removal. Salt brine collected at the existing PVU Well Field would be piped to the evaporation pond(s). The pilot study would be operated for a period of three to five years to gather information on evaporation rates, advanced evaporation techniques and operational costs.

The pilot study would also monitor and evaluate other environmental factors, such as potential impacts on migratory birds and other wildlife, hydrogen sulfide removal techniques, and methods for disposal of brine evaporate. The pilot study would test strategies aimed at preventing harm to migratory birds (as outlined in the federal Migratory Bird Treaty Act of 1918). The U.S. Fish and Wildlife Service indicated during a recent Forum meeting that pond netting must be incorporated into the pond designs. Net supports would be in place and netting available onsite, ready to install, if impacts occur and other mitigation techniques are not effective. Reclamation is considering using both active and passive deterrents (coloring the brine, noise cannons, flashing lights, and bioacoustics, as well as other methods with potential to deter birds from using the evaporation pond(s)).

Environmental Assessment: Reclamation has identified three potential sites for the pilot study, although additional sites may be considered during the National

Environmental Policy Act (NEPA) process (see attached map). It is anticipated that the footprint of the pilot study will not exceed 40 acres in size. Reclamation proposes to enclose and stabilize (cover) the salt brine evaporate in place following the study, subject to local, state and federal laws and regulations. The long-term storage of the salt brine evaporate accumulated during the pilot study may also require additional permitting as a landfill. Removal and disposal of salt brine evaporate at an existing permitted landfill locations will also be explored.

Reclamation is conducting public scoping to identify issues and concerns to assist in the preparation of an environmental assessment (EA). The EA will evaluate the effects on the human environment from the construction and operation of the proposed Paradox Evaporation Pond Pilot Study. If, based on the analysis completed during development of the EA, Reclamation concludes the proposed action would have no significant impact on the human environment; preparation of an Environmental Impact Statement would not be required before the pilot study could be implemented.

Public Scoping Meeting: Public scoping meetings on the pilot evaporation proposal are scheduled on the dates and locations provided below:

Paradox, Colorado- Paradox Community Center, 21665 6.00 Road (basement of the red church in Paradox Valley) on Tuesday, **December 6, presentation at 6 PM, with an open house from 5-7 PM**

Montrose, Colorado- Holiday Inn Express, 1391 S Townsend Ave. on Thursday, **December 8, presentation at 6 PM, followed by a questions an answer session**

Public Comments: Reclamation requests written comments on the proposed pilot study are received by January 30, 2012. Comments may be provided at a public scoping meetings listed above, emailed to TStroh@usbr.gov, or mailed to:

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

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