

Defenders of Wildlife * Environmental Defense * Friends of Arizona Rivers
Grand Canyon Trust * National Wildlife Federation * Pacific Institute
Pronatura Noroeste * Sierra Club * Sonoran Institute * The Nature Conservancy

November 15, 2005

Mr. John Johnson
U.S. Bureau of Reclamation
P.O. Box 61740
Boulder City, NV 89006-1470

Via email: bypass@lc.usbr.gov

Dear Mr. Johnson:

This letter is submitted on behalf of Defenders of Wildlife, Environmental Defense, Friends of Arizona Rivers, the Grand Canyon Trust, National Wildlife Federation, the Pacific Institute, Pronatura Noroeste, the Sierra Club, the Sonoran Institute, and The Nature Conservancy to identify issues that should be addressed by the United States Bureau of Reclamation (Reclamation) in its consideration of “**methods to recover or replace the bypass flow, including the Yuma Desalting Plant,**” pursuant to Reclamation’s letter of September 22, 2005.

1. Reclamation should clarify the public process it intends to use in its decision about how to replace or recover the bypass flow. It is not clear from the letter of September 22, 2005 (letter), if Reclamation intends this gathering of comments to constitute a scoping process under the National Environmental Policy Act (NEPA), or some other process. Moreover, the letter did not specify a schedule for the review process. Reclamation should develop and make public a timetable for this process.
2. Reclamation must fully comply with the National Environmental Policy Act before it proceeds with replacing the bypass flow. NEPA requires all federal agencies to prepare an environmental impact statement for major federal actions that significantly affect the environment. Meaningful NEPA documentation will allow Reclamation and the public to explore alternative methods of recovering or replacing the bypass flow, including the Yuma Desalting Plant, and to learn about the environmental impacts of these alternatives.
3. Reclamation should consider all objectives, recommendations and information provided in “Balancing Water Needs on the Lower Colorado River: Recommendations of the Yuma Desalting Plant/Ciénega de Santa Clara Workgroup”¹

¹ This report is available at <http://www.cap-az.com/images/newfinaldocument.pdf>

(report) in determining a mechanism to replace or recover the bypass flow. The report, which contains a solution set that satisfies both water managers and conservation interests, documents a significant consensus that should be taken seriously in Reclamation's process. Many of the recommendations provided in the report will require further action and investigation on the part of Reclamation, including binational discussions with Mexico. We urge Reclamation to give full consideration to the Workgroup recommendations and explore means by which they might be implemented in the hopes of averting further conflict over this difficult issue – as well as supporting the results of this collaborative effort and encouraging similar efforts to resolve other challenging Colorado River issues.

The report was written by representatives of institutions with very different interests in the uses of Colorado River water, including two representatives each from Reclamation and from water users such as the Central Arizona Water Conservation District (which manages the Central Arizona Project), and the Arizona Department of Water Resources, and one representative each from the City of Yuma and environmental and conservation interests such as Environmental Defense, and The Nature Conservancy, the Pacific Institute and the Sonoran Institute.

4. In addition to complying with all applicable federal laws (including but not limited to the Endangered Species Act, the Clean Water Act, and the Migratory Bird Treaty Act), Reclamation should employ three primary criteria in selecting a mechanism to recover or replace the bypass flow: a) the mechanism results in no net adverse impacts to habitat quality and quantity at the Ciénega de Santa Clara and to environmental resources in general, b) the mechanism implemented is the most cost-effective alternative available that satisfies the first criterion,² and c) the mechanism either prevents U.S. water users from experiencing an increased risk of shortage as a result of the bypass flow from what they might otherwise experience, or reduces that risk.

5. The Ciénega de Santa Clara is a key component of the Colorado River delta, and must be protected for the people and wildlife who depend on it. One of the three fundamental objectives on which consensus was reached for the report was to maintain the wildlife habitat and ecosystem values of the Ciénega de Santa Clara. As Reclamation considers how to replace or recover the bypass flow, and whether or not (and if so, how) to operate the Yuma Desalting Plant, the agency must consider the environmental, economic, and social value of the Ciénega de Santa Clara. The Ciénega de Santa Clara is the largest remaining wetland in the Colorado River delta, with some 14,000 acres of emergent vegetation and another 25,000 acres of open water and mudflats. The Ciénega relies on water delivered through the Main Outlet Drain Extension (MODE) canal that originates as agricultural drain water in the Wellton-Mohawk Irrigation and Drainage District in Southern Arizona. The water in

² Note that the Colorado River Basin Salinity Control Act authorizes modifications to the project if at the lowest overall cost to the U.S. 43 U.S.C. § 1574.

the MODE canal is brackish (averaging 2800 ppm at the upstream end of the canal), but nevertheless sustains a very large expanse of wetlands vegetation at the Ciénega including phragmites and cattails.

Notable wildlife resources at the Ciénega de Santa Clara³ include significant populations of two species listed as endangered under the United States Endangered Species Act. The Yuma Clapper Rail (*Rallus longirostris yumanensis*) is a marshbird endangered from loss of habitat, primarily due to stream channelization and drying and flooding of marshes, as a consequence of water flow management on the lower Colorado River.⁴ Today 70% of the world's remaining population of Yuma Clapper Rails live at the Ciénega de Santa Clara. The desert pupfish (*Cyprinodon macularius*) is endangered due to a number of threats including habitat modification, channelization, water impoundment and diversion, and groundwater pumping. A number of other endangered species, listed either in the United States or Mexico, have been identified at the Ciénega de Santa Clara, including the snowy plover, reddish egret, bald eagle, peregrine falcon, California black rail, Virginia rail, yellow-footed gull, elegant tern, and least tern. In addition to endangered species, the Ciénega de Santa Clara sustains at least 95 different waterbird species.

Numerous institutions have recognized the significance of the Ciénega de Santa Clara. It is a federally protected natural resource in Mexico, located within the boundaries of the Biosphere Reserve of the Upper Gulf of California and Colorado River Delta that was established and managed by Mexico's Comisión Nacional de Áreas Naturales Protegidas (CONANP), the federal agency with jurisdiction over national parks.⁵ The Ciénega was concurrently designated as a UNESCO Biosphere Reserve.⁶ In 1994, the Ciénega was included in the Western Hemisphere Shorebird Reserve Network,⁷ and recognized as an internationally important wetland by the RAMSAR convention in 1996.⁸ In 2000, the United States and Mexico together signed a Minute to the 1944 US-Mexico water treaty that recognizes the importance to both countries of the Colorado River delta, including the Ciénega.⁹ Also in 2000, several conservation organizations identified the Ciénega's natural resources as a priority for conservation in the Sonoran Desert Ecoregion.¹⁰ Most recently, the Ciénega was named a conservation priority in "Conservation Priorities of the Colorado River Delta," a report published in 2005.¹¹

³ See attachment A: Checklist of the Waterbirds of the Ciénega de Santa Clara

⁴ http://ecos.fws.gov/docs/life_histories/B00P.html

⁵ http://www.semarnat.gob.mx/marco_juridico/emergentes/em-139-ecol-2002.shtml

⁶ <http://www.unesco.org/mab/BR-Ramsar.htm>

⁷ <http://www.manomet.org/WHSRN/viewsite.php?id=57>

⁸ http://www.wetlands.org/RDB/Ramsar_Dir/Mexico/MX005D02.htm

⁹ <http://www.ibwc.state.gov/files/minutes/min306.pdf>

¹⁰ Marshall, R.M., S. Anderson, M. Batcher, P. Comer, S. Cornelius, R. Cox, A. Gondor, D. Gori, J. Humke, R. Paredes Aguilar, I.E. Parra, S. Schwartz. 2000. An Ecological Analysis of Conservation Priorities in the Sonoran Desert Ecoregion. Prepared by The Nature Conservancy Arizona Chapter, Sonoran Institute, and Instituto del Medio Ambiente y el Desarrollo Sustentable del Estado de Sonora with support from Department of Defense Legacy Program, Agency and Institutional partners. 146 pp.

¹¹ Zamora-Arroyo, Francisco et al., 2005. Conservation Priorities in the Colorado River Delta, Mexico and the United States. Prepared by the Sonoran Institute, Environmental Defense, University of Arizona,

The Ciénega de Santa Clara also plays a key role in sustaining the small, poor, rural communities located nearby,¹² therefore any actions that impact the Ciénega de Santa Clara should be analyzed for their environmental justice impacts. With a full two-thirds of the local communities either directly or indirectly relying on the Ciénega to provide for their families, a decline in the Ciénega's health would bring significant impacts. Some 50% of local residents fish in the Ciénega to feed themselves and their families, and an additional 16% rely upon the resources of the Ciénega to supplement their income through fishing, hunting and tourism. Moreover, of those who rely on the Ciénega's resources as a source of income, a quarter derive their entire income from the wetland. In a region where fishermen make only \$154 a month, even the slightest change in the availability of resources holds the potential to create tremendous economic upheaval for those who rely upon it for sustenance.

The Ciénega de Santa Clara also plays a central role in a robust ecotourism business that brings \$47,000 to local residents annually. In Ejido Luis Encinas Johnson, as much as 20% of the residents' income comes from ecotourism. The residents' extensive knowledge of the wetland makes them ideal guides and resources for tourists interested in their heritage. Their livelihoods are connected to this ecosystem and degradation of the wetland would not only bring great economic loss but also the loss of a culture rich in history and tradition. Although the introduction of ecotourism is relatively new, there is evidence to suggest that it will continue to flourish in the years to come if the Ciénega persists in its present state of health or better; in a survey of people visiting the Ciénega, 88% of respondents stated that they would like to see it remain for future generations to enjoy.

6. Reclamation should give full consideration to the use of a market-based, compensated water conservation program as a mechanism to replace the bypass flow.

Compensated water conservation that results in augmented supply at Lake Mead, implemented appropriately, would be environmentally benign and the least expensive of available mechanisms to replace or recover the bypass flow. Specifically, compensated water conservation would entail a program implemented by Reclamation to purchase water from willing sellers with contract rights to Colorado River water, essentially paying contract holders to forbear use of Colorado River water. Reclamation would then store this water in Lake Mead for future system use, effectively replacing the bypass flow. This method of replacing the bypass flow, implemented correctly, should be politically feasible, economically sound, and environmentally preferable to other alternatives.

Politically feasible: As of 2005, agreement has been reached by water users in Arizona and environmental interests over how Reclamation should replace the bypass

Pronatura Noroeste Dirección de Conservación Sonora, Centro de Investigación en Alimentación y Desarrollo, and World Wildlife Fund – Gulf of California Program. 103 pp.

¹² See attachment B: Community Use of the Ciénega de Santa Clara by the Ejidos Owning It: Ejido La Flor Del Desierto, Ejido Mesa Rica, and Ejido Luis Encino Johnson.

flow (see discussion in #3, above). This agreement demonstrates support for a number of options, including the use of a compensated forbearance program, specifically calling for a “Basin-wide voluntary consumptive use reduction and forbearance program to reduce the potential for shortages.” Notably, the Board of the Central Arizona Water Conservancy District has endorsed this agreement.¹³

Economically sound: Environmental Defense analyzed the value of water used for select crops in the Lower Colorado River basin, and found that more than 1.5 million acre-feet of water is used to irrigate crops that net less than \$20/acre-foot.¹⁴ This suggests that Reclamation should be able to acquire water from willing sellers for considerably less than it would cost to produce water treated at the Yuma Desalting Plant, which is estimated to range from \$365-704 per acre-foot¹⁵ before environmental damage avoidance or mitigation costs are included.

Reclamation should consider that even a temporary forbearance program may have local economic impacts, and we suggest that Reclamation should develop a proposal to mitigate third party impacts that accompany a compensated, voluntary forbearance program to replace the bypass flow. In order to mitigate third-party impacts of fallowing agricultural lands temporarily, the federal government could establish a drought economic adjustment fund that would provide economic development grants to affected communities in the counties of origin. These funds preferentially would go to established county-based farm labor assistance programs to the extent that such programs exist, and could include lump sum payments to displaced workers based on a percentage of foregone annual income. We do not have an estimate of the costs of such a program, but we believe that even with the inclusion of a third-party impact mitigation program, the cost of a compensated water conservation program would remain lower than the cost of other mechanisms to replace or recover the bypass flow.

Environmentally benign: Land fallowing in the Lower Colorado River basin in volumes needed to replace the bypass flow is not expected to have a significant environmental impact.

7. Bypass flow replacement is most important to water users for its impact on Colorado River storage at Lake Mead and its role in delaying the onset of shortages, so Reclamation should give consideration to alternatives that prevent shortages but do not necessarily require bypass flow replacement every year. Specifically,

¹³ See attachment C: Resolution of the Board of Directors of the Central Arizona Water Conservation District Endorsing the White Paper Produced by the Yuma Desalting Plant Workgroup, June 23, 2005.

¹⁴ See attachment D: What is the Water Worth? Net Economic Returns for Colorado River Water Used to Grow Selected Crops in the Lower Basin

¹⁵ The cost of producing an acre-foot of water is derived from data provided by the Bureau of Reclamation for use in the report “Balancing Water Needs on the Lower Colorado River: Recommendations of the Yuma Desalting Plant/Ciénega de Santa Clara Workgroup” (see note 1). Ranges for cost are the result of variability in power cost, process recovery factor, on-stream factor, and amortization period, as well as the range of capacities at which the plant might be operated.

Reclamation should consider establishing a shortage trust fund that allows the federal government to prepare for and mitigate water supply disruption. A shortage trust fund could be expended to make much more significant contributions to the preservation of reservoir storage and mitigate drought impacts during periods of water scarcity (when the risk of shortage caused by the cumulative impacts of failure to replace bypass flows is most likely to impact water users). Funds from the shortage trust fund would be used to finance water conservation as described in point 6, above.

8. Reclamation should define clear guidelines specifying the conditions under which it will replace the bypass flow. For example, it would be wasteful to operate such a program when Lake Mead is likely to have flood control or space-building releases. It could also be considered wasteful to operate such a program solely to provide ‘surplus’ water to lower basin contractors.
9. It may be possible to operate the Yuma Desalting Plant without harming the environment and in a manner that makes it the most cost-effective alternative. As discussed in the report “Balancing Water Needs on the Lower Colorado River: Recommendations of the Yuma Desalting Plant/Ciénega de Santa Clara Workgroup,” there are a number of modifications to the authorized use of the Yuma Desalting Plant that would be necessary for the YDP to operate without causing massive ecosystem degradation at the Ciénega de Santa Clara. There may also be a way to create additional benefits of YDP operation such that where benefits beyond the national obligation to replace the bypass flow accrue to definite and identifiable beneficiaries, the costs of such additional benefits could be borne by these beneficiaries. This may have the effect of making the YDP a cost-effective alternative. These changes include:

An alternative water source for the YDP. The primary alternative source identified in the report is groundwater from the South Gila drainage wells and other Yuma area wells, which could be used as source water for the YDP while agricultural wastewater from the Wellton-Mohawk Irrigation and Drainage District is allowed to flow to the Ciénega de Santa Clara.

An alternative water source for the Ciénega de Santa Clara. If the agricultural wastewater from the Wellton-Mohawk Irrigation and Drainage District is used as a source for the YDP, then an alternative source of water should be delivered to the Ciénega de Santa Clara, and that water must be of sufficient quantity and quality that it does not degrade habitat at the Ciénega. The report identifies several alternative water supplies that might work, including groundwater from the protective and regulatory pumping unite (Minute 242 well-fields); drain water from agriculture in the San Luis Valley, or possibly the Mexicali Valley; and effluent from nearby municipalities, including Yuma. The report authors did not evaluate these flows for suitability as supply for the Ciénega de Santa Clara, so if

Reclamation pursues this option, assessments of water quality and quantity will be essential.

An alternative location for YDP brine waste disposal. Were the YDP to operate as presently configured, brine waste from the plant's process would be discharged into the canal that delivers water to the Ciénega de Santa Clara at its northern end, the Main Outlet Drain Extension (MODE) Canal. Were brine waste, which could have a salinity ranging from 3347-6206 ppm (measured at the international border), to flow into the Ciénega de Santa Clara, it would cause considerable degradation, if not complete destruction, of the emergent vegetation that grows there. However, because at present the salinity of water at the Ciénega de Santa Clara concentrates as it travels south towards the Gulf of California (due to evapotranspiration and evaporation), eventually reaching a salinity surpassing the tolerance of the emergent vegetation, it should be possible to extend the MODE canal to discharge YDP brine waste at a location sufficiently far south in the Ciénega de Santa Clara that it does not increase salinity locally, and consequently does no harm. The report authors did not evaluate actual salinities at the Ciénega de Santa Clara, so if Reclamation pursues this option, the agency should conduct salinity studies to determine an appropriate location for the new brine discharge site. Moreover, if Reclamation implements this option, the agency should establish a monitoring program to assess the actual impacts of salinity discharge on habitat quantity and quality at the Ciénega de Santa Clara, and should be prepared to make changes (such as additional extension of the canal) if the brine waste discharge causes habitat degradation. Finally, the report authors did not evaluate the potential cost of such an extension to the MODE canal, so if Reclamation pursues this option, a cost estimate will be essential.

An alternative disposition of YDP product water. The report authors, acknowledging that YDP product water will be expensive, suggest that there might be a more economically rational way to use it than is presently authorized. By Reclamation's account, an acre-foot of YDP treated water is estimated to cost \$365-704,¹⁶ a cost estimate that does not yet factor in the additional cost of mitigation for environmental damages or any of the alternatives discussed above. Reclamation should look for a way to use YDP product water that provides benefits commensurate with the cost to produce it. Moreover, if Reclamation operates the YDP to provide benefits beyond bypass flow recovery or replacement, Reclamation should ensure that the beneficiaries pay for any costs that exceed the least cost alternative to replace or recover the bypass flow.

As authorized, YDP product water would be discharged into the Colorado River, where it would mix with flows released from Imperial Dam for delivery to Mexico. Mexico's use of Colorado River water, similar to United States' use, is

¹⁶ Cost figured from YDP report, numbers provided by Reclamation. Ranges for annual cost are the result of variability in power cost, process recovery factor, on-stream factor, and amortization period.

about 80% in agriculture, much of it irrigating crops that yield relatively low net economic returns.¹⁷

The YDP was designed to produce water that is scrubbed clean of nearly all contaminants, including salts, but also including bacteria, viruses, and some pesticides and herbicides. Thus YDP product water may be attractive to nearby municipalities as a source of potable, or nearly-potable water. In considering this alternative, Reclamation should evaluate the cost of any additional infrastructure that would be required to deliver YDP product water to municipal users.

10. Reclamation should consider the impacts of energy use, including pollution, in its analysis of alternatives. Although the subject was not considered in the report, alternatives that are energy-intensive, such as operation of the Yuma Desalting Plant, may have impacts such as emissions of NO_x, SO_x, and carbon. Reclamation should quantify the energy use and related emissions for all bypass flow replacement or recovery alternatives.

11. If Reclamation intends to pursue operation of the YDP, the agency should analyze the potential for accidents and natural disasters at the site, and should ensure that safeguards are put in place to minimize risk. A recent large spill at the YDP of almost pure sulfuric acid (4100 gallons as reported to the Arizona Department of Environmental Quality¹⁸), an extremely hazardous substance, demonstrates the potential for operator error, equipment malfunction, or natural disaster to create an extremely dangerous condition that could impact human health and local shallow groundwater resources. Significantly, this spill occurred while the YDP is being maintained in ready-reserve. We are concerned that the potential for this kind of spill would increase dramatically were the YDP to be operated at anywhere from 1/3 to full capacity.

Reclamation's safety record at the YDP is far from perfect. In 2004, the Department of the Interior was fined by the Environmental Protection Agency because Reclamation failed to maintain records showing that its chlorine gas system at the YDP was operating properly, and that its employees were properly trained in handling any accidental chemical releases.¹⁹

If Reclamation intends to pursue YDP operation, the agency should assess the potential for accidents and natural disasters, and should ensure that specific measures are taken to eliminate risk. Moreover, Reclamation should review the suitability of

¹⁷ Net economic return information for Colorado River water used to grow crops in Mexico is not available. However, this report assumes that values in Mexico are equivalent to, or lower than, values for Colorado River water used to irrigate crops in the Lower Basin in the United States (see Attachment D).

¹⁸ Arizona Department of Environmental Quality Emergency Response Unit Incident Report Form ERU#05-083-J, NRC#757828. May 5, 2005.

¹⁹ U.S. EPA, 2005. FedFacs: an environmental bulletin for federal facilities. #18. "EPA Fines DOI Water Treatment Facility for Failing to Maintain Chemical Risk Plan" p. 11.

operating the YDP given that the agency has itself assessed a “high” risk of seismic hazard at the site. A serious spill of a hazardous substance occurred due to operator error or faulty equipment. Reclamation should also consider that an earthquake could cause such a spill, or worse. In its assessment of whether or not to operate the YDP, Reclamation should take these risks, and the cost of minimizing them, into consideration.

Thank you for the opportunity to provide comments to Reclamation as the agency considers how to replace the bypass flow. We request that you add all of us who have signed this letter to the list of people you keep informed about your progress on this planning effort. Please do not hesitate to contact Jennifer Pitt at 303-440-4901 if you have questions.

Sincerely,

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