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Working to protect and restore Western Watersheds and Wildlife

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Reclamation 2007 Interim Guidelines SEIS Project Manager
Upper Colorado Basin Region
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Submitted via email to CRinterimops@usbr.gov.

Dear Responsible Officials,

The following are the scoping comments of Western Watersheds Project on the Bureau of Reclamation Colorado River Interim Guidelines Supplemental Environmental Impact Statement ("SEIS"). It is long past time for a fundamental recalibration of water use and dam infrastructure in the Colorado River Basin. Water withdrawals from rivers and streams in the Colorado River Basin averaged 17 million acre-feet of water between 1985 and 2010 (Maupin et al. 2018). Prior to the era of dams and diversions, the river release 16.3 million acre-feet per year to the Sea of Cortez, but system losses (primarily evaporative) mean that the river is presently overallocated and operates at a water deficit (Nowak 2011). Oscillations in precipitation patterns due to el niño and la niña events render river flows inconsistent from year to year (Erkyihun 2015). Overlaid over this variability is the long-term reduction in overall flows as a result of climate change (Stern and Sheikh 2019), which is resulting in smaller snowpack levels in Upper Basin states, as well as the permanent disappearance of glaciers. For 2000-2010, Upper Basin streamflows were less than half 1985 levels (Maupin et al. 2018). The water simply dos not exist to sustain business-as-usual uses, withdrawals, and operations. Fundamental changes must be put in place.

The Purpose and Need Statement is Impermissibly Narrow

Drought and climate adaptation on the Colorado River system demand a comprehensive, hard look at all options to maintain the optimal delivery of water and electrical power, as well as restoring healthy ecosystems and optimizing public recreation opportunities. It is unrealistic to expect that modifying operations for Glen Canyon and Hoover Dams will meaningfully address the issues faced by the Bureau and by water users in the Colorado River Basin. The Purpose and Need must be expanded to encompass real solutions to emerging problems, rather than simply applying band-aids or window-dressing to cover up the issues.

Glen Canyon Dam Should be Removed

It is long past time to decommission and remove Glen Canyon Dam, and restore the Colorado River's natural flow through the affected canyons. There simply isn't enough water in the system to keep hydropower going for both Glen Canyon and downstream dams, and Glen Canyon makes the most compelling case for dam removal. When Glen Canyon Dam was constructed, and Lake Powell flooded the canyons upstream, many valuable resources were entombed under vast quantities of water and mud. These included geologic wonders (canyons, arches, natural bridges, waterfalls, alcoves), Indigenous cultural sites such as cliff dwellings and petroglyphs, and riparian plant communities (the oases of the desert and hotspots for biodiversity). This was habitat for the imperiled Southwest willow flycatcher and myriad other species. This was a landscape of priceless recreational and aesthetic value, much of which was lost to the water. Lake Powell's chief utility over the years has been the storage of excess water; now that drought and climate change have depleted flows in the Colorado River watershed, the excess water no longer exists in sufficient quantity to fill both Lake Powell and Lake Mead. The obvious solution is to decommission and remove Glen Canyon Dam, and allow remaining stored water to move downstream to maintain water levels in Lake Mead.

System-wide, reservoir evaporation accounts for 1.4 million acre-feet of water loss from the Colorado River system each year (Nowak 2011). Based on calculations from Myers (2013), each year Lake Powell has a net loss of 500,210 acre-feet (0.617 Gm^3) of water to evaporation more than the river in a free-flowing state. With dam removal, this half a million acre-feet would remain in the river for other uses, including instream flow and its ecological benefits. In addition, loss of water into the banks from the Lake Powell reservoir have been calculated at 14.8 Gm^3 (11.6 million acre-feet) of water since 1963 (Myers 2013), and while some of this water has slipped away due to dips in the bedrock, a proportion of this would be returned to the river once dam removal and reservoir decommissioning are complete. While Lake Powell has a lower evaporative potential than downstream reservoirs (Nowak 2011), the elimination of this reservoir would result in a major net savings in water by reducing evaporative water loss through radically smaller surface area and rapid transit of water through the river reaches overlapping what would then be the former reservoir.

Removing Glen Canyon dam will help with the recovery of endangered fishes as well as the restoration of riparian ecosystems in the Grand Canyon. Releases of cold hypolimnetic water from Glen Canyon Dam interfere with the spawning of endangered Colorado River fishes (Valdez 1990).

Cohn (2011) weighed the hydrological, ecological, recreational, and hydropower pros and cons of removing Glen Canyon Dam, and came down in favor of dam removal. We agree. At this point, given the apparent inevitability of the loss of sufficient water to sustain hydropower capability at both Glen Canyon Dam and Hoover Dam, and given the relative inaccessibility of water in Lake Powell for withdrawal for human use, decommissioning and removing Glen Canyon Dam, and allowing waters previously stored in Lake Powell to instead be stored in Lake Mead and downstream reservoirs, appears a logical and prudent near-term solution. In addition, the EIS should also weigh whether Parker and Palo Verde dams should be retained or removed.

Effects on downstream sediment deposition

The Bureau mus take a hard look at the impacts of dams on downstream sedimentation, and the possible benefits of dam removal in mitigating or reversing these impacts. The damming of the Colorado River has interfered with sediment transport and deposition, causing major ecological impacts, particularly in the Grand Canyon (Tecle 2017).

Salinity Should be Examined as a Key Variable in the Impact Analysis for Each Alternative

The Bureau must examine the impacts of dam operations and reservoir retention on salinity in the Colorado River system. Unnatural levels of salinity in the Colorado River have ecological and agricultural effects. Increases in salinity in the early 1960s had major impacts on irrigated agriculture in Mexico (Oyarzabal-Tamargo and Young 1978). The Colorado River Basin Salinity Control Forum is intended to minimize the inputs of salts into the Colorado River. Mineral concentrations reach 800-900 parts per million in the lower basin, and higher levels in Mexico; salinity levels of up to 6,000 ppm have been recorded in discharge wells at Lower Basin irrigation projects (Oyarzabal-Tamargo and Young 1978). Approximately 37% of all salinity in the system derives from drainage from irrigation onto saline aquifers in the Upper Basin states, while the concentrating effects of reservoir evaporation accounts for most of the balance (Gardner and Young 1988). Dams and reservoirs also increase salinity by concentrating salts during evaporation from the reservoir surface and by leaching salts from soils inundated by the reservoir (Dregne 1975).

Accumulation of toxic chemicals should be evaluated under each alternative

The Bureau must take a hard look at the effects of dam operations and reservoir retention on the concentration of toxic compounds. Sanchez et al. (2005) documented low levels of chronic contamination of Colorado River waters with perchlorate, a toxin that affects thyroid function in humans, and its bioaccumulation in irrigated lettuce. Similarly, evaporation of water from reservoir surfaces is likely to concentrate selenium. It is likely that many other harmful compounds or elements are being concentrated in the Colorado River system, and the role of dams and reservoirs, as well as irrigation withdrawals, in accelerating this process should be studied in detail and disclosed.

The Requirements of Native Species Should have Foremost Consideration

Native species, including rare and imperiled species (a subset of which are listed under the Endangered Species Act), should receive foremost consideration in reallocating water through this management program. Key species include, in the mainstem Colorado River, the Colorado pikeminnow, humpback chub, razorback sucker, and bonytail. During the pre-dam era, extreme fluctuations in river level benefitted Colorado River endangered fish species (Tecla 2017). In-stream flows should be guaranteed at a level that will sustain and recover listed species. The current arrangement through the RIPRAP program allows additional water withdrawals, and instead of mitigating losses by increasing inflows elsewhere, water withdrawals simply require a fee to be paid into a recovery program account.

Colorado River endangered fishes, as well as other sensitive species (like the flannelmouth sucker, Colorado River cutthroat trout, and roundtail chub), are becoming increasingly rare. The role of dams and reservoirs in impacting these species must be considered in detail in the forthcoming SEIS. Razorback suckers are seldom documented below Davis Dam in the lower Colorado River (Marsh and Minckley 1989), indicating poor habitat conditions as a result of dams and diversions.

The Ecological Requirements of Delta Estuaries should be Provided For

The Colorado River delta was one home to rich, biodiverse wetlands that spanned more than 1.9 million acres, but were reduced to about 150,000 acres due to dewatering of the river (Pitt et al. 2000). During some years, the flow of the Colorado River is appropriated and withdrawn from the river to such an extent that no water reaches the Sea of Cortez in many years (Glenn et al. 1996, Tecle 2017). Marine estuaries are critically important wetlands that offer rearing habitat for many species of marine life. The impact of water withdrawals for irrigation, dam interruptions of flow, and evaporation from reservoirs on water flow deliveries to the Mexico border should be examined and disclosed, as should the cumulative effects of these impacts together with Mexican water withdrawals, to evaluate the potential impacts on estuarine ecosystems in Mexico.

The Costs and Benefits of Diversion Uses Should be Fully Disclosed

The forthcoming SEIS should include a full analysis of the economic ramifications of various water uses. At present, a large plurality (if not majority) of withdrawn water is used for irrigation of agricultural crops, chiefly fodder for domestic livestock. Some of this irrigated agriculture even produces products exported outside the United States. The SEIS must fully assess the environmental impacts of all irrigation diversions, collectively and cumulatively, on the river system, its operation, and its ecosystems.

In the arid West, approximately 1 million cattle are pastured for part of the year on federal public lands. While the Taylor Grazing Act requires public land grazers to own a base property sufficient to carry their livestock through the non-grazing season, many (if not most) of these base properties are incapable of producing sufficient forage to sustain livestock over the non-federal period, and the use of "feedlines" where such livestock are fed hay or alfalfa produced on pastures that are flood- or drip-irrigated using waters diverted from the Colorado River system is quite prevalent. In addition, diverted water also is commonly used to water livestock themselves. An adult cow can consume up to 30 gallons of water each day, depending on the season, humidity, and thermal regimes. Cattle are ecologically unsuited to the Intermountain West, which is characterized by thin soils in the uplands, scant precipitation, poor forage production, and lack of availability of natural surface water.

It is not in the public interest to withdraw water to the point where fluvial ecosystems cease to function, and it is certainly not in the public interest to do this to provide forage subsidies for livestock that otherwise cannot survive in the arid ecosystems of the Intermountain West. In cases where water withdrawals are being used to subsidize crops that are then exported overseas, the withdrawals become even more difficult to justify based on the public interest.

States typically regulate water withdrawals on a "first in time, first in right" basis, under which the most senior water rights file can withdraw the full measure of their annual allocation, then the second-oldest takes their cut, and so forth until all the water rights withdrawals are fulfilled. This system incentivizes the complete dewatering of rivers and streams (primarily for irrigation, as irrigators tend to hold the most senior water rights). Most states penalize water rights holders who do not withdraw their full allocation by allowing more junior water users to seize and use a portion not withdrawn from the waterway. In many states, leaving water in the stream for in-stream flow (to support fish survival, for example) is not defined in law as a beneficial use, and therefore water rights holders lack even the option of using less than their full share each year.

For example, the staff member signing on behalf of WWP was in the past a Laramie city councilman serving on the Monolith Ranch Committee, tasked with managing the surface uses and water allocations of a private ranch bought by the city for its water rights. In order to convert the water use from agricultural to municipal use (which, under Wyoming state law, allowed only half the water used for agricultural purposes to be converted to municipal use), the City was compelled to maximize its use of water lest the full measure of the Monolith Ranch water right not become available for conversion. Hence, the City maximized its use of flood-irrigation withdrawals from the Big Laramie River, and also installed a center-pivot irrigation system to commence growing alfalfa, a water-hogging forage crop for cattle, to maximize the use of its allocation. The City would have been just as content (and indeed, it would have cost the City less) to leave the water in the stream in the interim, pending conversion to municipal use. However, state law was written in such a way that the City would have forfeited its water right by leaving allocated water in the river, leaving no water to be converted for the use of city residents.

This archaic system of state water law creates many absurd outcomes – a "use it or lose it" mentality among irrigators, giving priority to agricultural uses of marginal economic and social value while shunting the water demand from municipalities (which dwarf the economic potential of rural agriculture, and which support far more residents) to the back of the line. Effectively, it incentivizes water diverters to waste water, when water is an increasingly scarce and valuable resource. It is high time for the Bureau of Reclamation and the states to update water allocation methods to even out the senseless inequities that occur today. This might include allocating proportions of basin water to various sectors of water users at the federal level, then allow states to partition each sector's water allocation on the traditional "first in time, first in right" pecking order, with an additional partition of river water set aside to guarantee in-stream flows adequate to support thriving aquatic ecosystems. After all, the native species inhabiting the waterways of the Colorado River Basin were "first in time," so they should be "first in right." Federal primacy (and the Interstate Commerce Clause) support the federal government's ability to set up such a system of water allocation. This option should be considered in detail, and its environmental impacts fully analyzed and disclosed, in the forthcoming EIS.

Irrigation Should be Curtailed

A comprehensive Basin-wide reform of water uses should be incorporated into this SEIS. Irrigation withdrawals account for 85% of all Colorado River withdrawals, and this percentage reached 98% for the Upper Colorado Basin (Maupin et al. 2018). Alfalfa is the crop that has the greatest water use (evapotranspirative loss) per acre (Senay et al. 2016). In the Mexicali Valley of Mexico, Carillo-Guerrero et al. (2013) found that 90% of water withdrawals were lost to evapotranspiration, while 60% was lost in a comparable U.S. irrigation district. It simply makes no sense to grow water-hogging livestock fodder in arid desert regions, at the expense of native ecosystems and more valuable human uses of water.

The SEIS should consider at least one alternative under which federal primacy is asserted regarding allocation of water. Water should first be apportioned between municipal uses (the most economically beneficial), ecosystem maintenance, agricultural uses (food crops for humans versus livestock and fodder crop production, and domestic use versus export use). Domestic end-uses of water should be prioritized over export uses of water (e.g., growing alfalfa for overseas export), and human uses should be prioritized over farming for human foods, which should be prioritized over livestock and livestock forage crops. Once an allocation is made between classes of water use, states can allocate water based on first-in-time, first-in-right state water law.

Hyporheic Flows – and Withdrawals from Aquifers from Water Wells – Must Also be Considered

The SEIS must examine in detail the implications of withdrawals and dam/reservoir operations on hyporheic flows. A river can properly be seen as the surface expression of a near-surface floodplain aquifer. Withdrawals of water from near-surface aquifers in floodplains also should be counted as withdrawals from the rivers and streams on the surface. In desert environments, the availability of surface- and groundwater is perhaps the linchpin holding the entire ecosystem together. Hyporheic, or groundwater, systems have their own unique faunas and nutrient dynamics. Hyporheic communities include both detritovores and predators, all living in the waters that flow far underground. Boulton et al. (1991) reported that hyporheic communities include both detritovores and predators; during this study, copepods, ceratopoginid larvae, nematodes, water mites, and oligochaete worms were collected within 2 days of rehydration in previously dry hyporheic sediments.

Groundwater and surface streams are intimately interconnected from a hydrologic standpoint; groundwater in the upper layers upwells directly into stream and river channels or into floodplain springbrooks (Brunke and Gonser 1997). Groeneveld and Griepentrog (1985) found that the depletion of subsurface aquifers led to the decline of riparian vegetation, which in turn in turn led to increased bank erosion. These researchers concluded, "The slow drainage by aquifers which intersect streamcourses serves to maintain channel flow during dry periods and to support the plant species which structure the productivity and character of the riparian ecosystem. This balance may be particularly sensitive to alteration" (p. 44). Benson (1953) found that water inputs to the Pigeon River, Michigan through groundwater upwelling actually controls populations of brook and brown trout by determining the location of spawning habitats. Boulton et al. (1991) recommended that analysis of hyporheic communities should be included in analyses of stream ecosystems.

Groundwater supports its own unique biological component of microorganisms and detritus which contributes important nutrient inputs into streams and rivers at upwelling zones, sustaining high levels of aquatic biodiversity (Brunke and Gonser 1997). Ford and Naiman

(1989) found that nutrients, particularly carbon and nitrogen, carried by groundwater are important inputs to stream systems, and that these nutrients are rapidly utilized within the hyporheal zone (sub-sediment) or at the sediment/water interface. Hyporheic fungi and bacteria are an important food source for aquatic invertebrates, some of which may also inhabit the hyporheic zone (Barlocher and Murdoch 1989). Dissolved organic carbon in groundwater is rapidly immobilized upon reaching the hyporheic zone of streams. According to Fiebig and Lock (1991), "We conclude that groundwater can contribute substantial amounts of DOC [dissolved organic carbon], both high and low molecular weight, to a stream ecosystem. The stream bed is the site at which much of this material could be initially immobilized and made available to the stream trophic structure" (p.45).

Some groundwater aquifers may be as much as 35,000 years old, with negligible modern recharge (e.g., Phillips et al. 1986). If such aquifers are the source of well water, springs, or surface streams, then their depletion through activities such as coalbed methane extraction will potentially have long-term effects including (but not limited to) the desertification of entire watersheds, the loss of wildlife populations dependent on water sources, and the long-term degradation of downstream rivers and streams in communication with the depleted aquifer.

In order to fulfill NEPA's hard look requirements, the BLM should map groundwater flows in the various aquifers in the Colorado Basin, and provide analysis on the impacts of permitted activities on these groundwaters, with at minimum specific reference to quantity and forseeable location of groundwater withdrawals for coalbed methane, agriculture, and other projects that have already been announced, as well as impacts to groundwaters resulting from hydraulic fracturing and other activities associated with conventional oil and gas development.

Indigenous Water Rights must be Respected

Tribes possess rights to approximately 2.9 million acre-feet of water per year from the Colorado River system, but presently are using just over half of this total (Stern and Sheikh 2019). All SEIS analyses must account for full appropriation of tribal water rights as a prerequisite to additional water withdrawals. Indigenous reserved water rights are always first-in-time, and the sovereign nature of tribal water rights renders them superior to all claims made under state water laws.

Conclusions

Thank you for considering and addressing the issues raised in these scoping comments. In light of inevitable and inexorable changes in water flows due to climate change, it has become necessary for the Bureau of Reclamation t institute fundamental changes to the way that water iss allocated, and the way that dams and reservoirs are managed, in the Colorado Basin. The scope of this SEIS must therefore stretch well beyond the operations fo two dams, and consider the systemic problems in water overallocation and overuse throughout the basin. We look forward to providing additional input as the SEIS evolves into a more formal document.

Respectfully yours,

Erik Molvar
Executive Director

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