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Emerging Trends and Future Issues

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Introduction

Previous papers concerning "Changing Management of the Colorado River" have provided an overview of the Colorado River Basin, its development for flood control, water supply and power generation, the legal framework or "Law of the River" that guides operations and use of the Colorado River, discussed river operations and the processes such as the annual operating plan and long-term operating criteria, and identified more recent issues and needs voiced by environmental, Native American, and other public interests that relate to use and management of the Colorado River. This paper will describe and discuss some of the key emerging and future management challenges facing the U.S. Bureau of Reclamation (Reclamation) as a prominent player in the resolution of water management issues on the Colorado and offer possible ways to meet these challenges.

Development and management of the Colorado River during this century has been based primarily on activities that would help meet beneficial consumptive use needs by implementing actions associated with taming the Colorado River and providing reliable and adequate water supplies for large irrigation and municipal and industrial projects in the arid West. As a result, the Colorado

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River Basin is dotted with large dams and associated reservoirs, diversion dams, and distribution systems and is often described as the most closely regulated and controlled river in the United States. Likewise, development of the legal framework or "Law of the River" that divided and established water apportionments among the Basin States, and determined the kinds and priorities of use, was also based on beneficial consumptive use. The results of actions to complete extensive water development projects and a legal framework for operating the Colorado were extremely successful in meeting the needs of a developing West. Power generation, while typically being given a priority of "incidental to other uses" has none the less been a major factor in Colorado River management because of its role in providing revenues for funding the construction and operation of dams and because of its direct effect on downstream river flows. The integration of these uses have been refined over many years by working with public needs toward acceptable solutions. So why is the management of the Colorado River System faced with a need to change? ~~Two reasons: increasing consumptive uses such as municipal and industrial are competing with irrigated agriculture; and nonconsumptive environmental and recreational uses are competing with existing and new consumptive uses.~~ While the Colorado River is over-allocated by some accounts, there exist many unused entitlements such as the under-developed Upper Basin and partially quantified Native American water rights. One of the key conflicts of the river is that all of the "allocation amounts" depend on consumptive uses and many of the more contemporary needs are in-stream flows for the Endangered Species Act (ESA) compliance, other fish, recreation, or esthetic uses. At the heart of the current debate is the hope that there are additional water supplies to meet future consumptive uses and some parties may be willing to tes

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to see if those supplies can be delivered for their use within the existing law.
Further, in 1922, Compact negotiators divided the Colorado River based on an estimated water supply of 18 MAF/yr, while current estimates of average annual flow are closer to 15 MAF/yr. This in itself will continue to present a greater challenge to meet all demands as the Upper Colorado River Basin develops its consumptive use allocation.
The concerns and requests to manage the Colorado River to protect and/or benefit these numerous uses cause the setting to become more complex, contentious, and make "business as usual" a thing of the past. The following sections focus on specific and key issues that characterize the nature and magnitude of the challenge facing agencies and managers of the Colorado River and its resources.
Water Marketing and Water Exchanges
As previously mentioned, the waters of the Colorado River are fully-allocated and, in fact, the Colorado River is over-allocated based on estimates of the average annual water supply. The demand for water for beneficial consumptive use is rapidly reaching the annual apportioned supply in the Lower Colorado River Basin.
To further complicate this, use within the three Lower Basin states differs significantly. Consumptive use within California has exceeded its apportionment for several years because of under utilization in Arizona and Nevada. Nevada, which was apportioned much less water (0.3 MAF) than either Arizona (2.8 MAF) or California (4.4 MAF), projects that it will run out of Colorado River water soon after the turn of the century because of explosive growth in southern Nevada.
Arizona, on the other hand, currently has a significant unused apportionment because of less than expected agricultural use of water from the Central Arizona

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Project.

To satisfy the Lower Basin needs, some have been focusing on the unused allocation in the Upper Basin. The Upper Basin has developed the use of its water supplies much more slowly. In fact, current projections don't show full utilization until at least the year 2060. Only New Mexico is near its entitled use. Future population growth in Western Colorado and Utah is the likely source of increased use in these two states, while Wyoming has limited potential for additional use.

One state, Utah, has been entertaining the thought of leasing some of their unused entitlement, but many are concerned that this approach could someday result in the loss of its water right under the traditional western water law theory of "use it or lose it." This type of water marketing has been termed by some as "water flowing toward money." Water is truly as valuable as gold to these Western states.

So what does the future hold in terms of marketing and exchanges? The current and likely future federal position is to encourage voluntary water marketing through transfers on both an inter- and intra-state basis. Needs of the more populous states are now forcing the Secretary of the Interior to consider creative marketing and exchanges to meet contemporary needs.

Intra-state transfers offer good potential to meet changing demands for use such as exist in California. For example, Southern California (including the greater Los Angeles and San Diego areas) depends on water from Northern California through the State Water Project, Owens Valley, and the Colorado River.

Likewise, exports out of the Colorado Basin furnish major areas in Colorado and Utah with municipal and irrigation supplies.

Agricultural use dominates current use of Colorado River water and accounts for more than 80 percent of consumptive use. Discussions and proposals hav

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periodically surfaced and likely will continue in the future to transfer high priority water allocated to California agricultural areas such as the Imperial Valley to Southern California urban areas through existing or new aqueducts by changing the point of diversion of Colorado River water. The urban areas would, in turn, fund water conservation improvements that would result in water savings and more efficient use in the Imperial Valley and possibly sustain current agricultural uses.

Another challenge in doing this is to assess and protect environmental values and needs such as wetlands and river habitats along the Colorado that might be impacted because of changes in points of diversions. Environmental groups are keenly interested in this aspect of any exchange.

In summary, many believe the goal of successful intra-state water marketing or transfers is to keep traditional consumptive uses whole while providing additional supplies for urban purposes. However, it is more likely that some existing uses will be reduced in the future as demands for new uses increase.

Public demands and opinion play an important role in shaping policies which govern such transfers of water. Each of the states will face this issue as urbanization continues.

Inter-state marketing between the basins has been a controversial issue for many years. Many view it as being prohibited by the 1922 Colorado River Compact. Federal approval of such proposals would likely depend on unanimous support by the Basin States.

Inter-state marketing or transfer of unused apportionments presents a more difficult challenge because of the fear by all Basin States that such arrangements may lead to a permanent loss of their entitlements to use Colorado River water. One approach that may work and is looked favorably upon by

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Reclamation in the Lower Basin is to bank unused annual apportionments in reservoirs such as Lake Mead and then market this water to other Basin States on an interim basis. The details under which such arrangements would be governed are very contentious and presently not resolved.

Modification of Dam and River Operations to Meet Environmental and Other

Nontraditional Uses

The emergence of demands to modify or reoperate and manage the major facilities

such as the Glen Canyon and Hoover Dam and powerplants to meet "public good"

uses, such as environmental and recreational uses, is likely to continue to grow

in significance in future actions along the Colorado River. The previous papers

have discussed processes that involve consideration of endangered species and

associated critical habitat in planning for future management of the Colorado

River.

Unless significant future changes occur in the "Law of the River," the most

typical approach will be to refine operations to better meet these needs. For

example, the annual operating plan is generally based on projected water needs

from downstream uses, existing water supply in reservoirs, and projected runoffs

from basin snowpack. Actual monthly schedules are developed by seeking a balance

of the benefits to the various authorized project uses. Dams and hydroelectric

facilities in turn are operated to meet water orders and integrate power

generation and marketing potential. The actual schedules for release through

Colorado River dams has been, or could be, modified; however, this will impact

power generation and marketing.

Tradeoffs such as these have already occurred for specific reasons such as beach

building, recovery of endangered species, special recreation events, or

emergency needs below Flaming Gorge, Aspinall, Navajo, Glen Canyon, and Hoover

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Dams. The major impact of such tradeoffs has been to power uses, although this could also impact the water users because of the use of power revenues to fund, construct, and operate the dams on the Colorado River. The ESA has played a major role in changing historic operational practices. It has forced the evaluation of the operation of virtually every reservoir in the Basin, which is having potential impacts on most of the other project functions for which those reservoirs were built. Conflicts are rapidly rising among those wishing to store and release water for consumptive use, those interested in flood control and the operation of reservoirs for the benefit of endangered species. The most prominent philosophy seems to be that of restoring "natural hydrographs," the elimination of which was one of the purposes and outcomes of the building and operation of reservoirs. Some fear that the strong language of the ESA could overrule any attempt to achieve a balance between uses. Despite this possibility, Reclamation has sought solutions which attempt to achieve the purposes of the ESA while continuing to meet the needs of the other uses. Recovery implementation programs serve as a mechanism to bring all parties to the table for discussions and planning to achieve this goal. Sound biological determinations and trust to find long-term solutions seem to be the key methods for best implementing the ESA as currently written.

Native American Resources and Water Rights

The issue of the Native Americans pursuing and utilizing their water rights could be an exciting one in the future. The Native Americans living in the basin have long contended that their ancestors were not at the bargaining table when such important agreements as the upper and lower basin compacts were negotiated. As such they do not feel as compelled to abide by their outcomes. Some suggest

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that all of their entitlements are outside the agreements. In contrast, many non-Indian parties feel that the interests of the Indians were represented by the federal government under the trust responsibilities outlined in treaties. For example a scenario could develop where a tribe and a water entity within a basin state agree the tribe will deliver a quantity of water to them for or a fee and the only way the tribe has of conveying the water is through federal facilities. The tribe in turn requests the Secretary of the Interior to help deliver the water. The Department of the Interior would feel compelled to assist the tribes through trust responsibilities and their sovereign status. The outcome may be a "protracted litigation process." Many positive strides have been made by including Native Americans in discussions on Colorado River issues in the basin. They have become full partners in decision-making processes as evidenced by efforts like Glen Canyon EIS. A very large part of the solution and a challenge in the future will be to increase participation, to the extent possible, by Native Americans in all process so all parties can continue to understand each others needs. It will only be through dialogue that barriers and misconceptions can be removed to allow meaningful compromise.