

HYDR DYNAMICS

Engineering, environmental and political channels converge to deliver the Coachella Valley's abundant water. But their shifting courses may threaten the flow. **By Jan Silver Maguire**

A new home development in Indio boasts a 20-acre private lake. At a major resort in Palm Desert, gondolas navigate a decorative pond as they transport guests to dinner. A mall in Rancho Mirage is both named for, and derives its glamour from, an artificial river that runs through it. Private pools, largely unused other than for visual relief from the arid terrain, evaporate quietly in thousands of backyards. Many square miles of crops, vineyards and date groves suck moisture from mechanically moistened earth. And then there are the dozens of emerald golf courses—showered generously every day of the year.

The Coachella Valley flaunts its world-renowned status as a Desert oasis wherever one looks. So what is the main source from which this seemingly plentiful water springs?

We're walking on it.



THE DESERT'S WATER MUST BE GOVERNED BY A COMPREHENSIVE PLAN TO PREVENT SHORTAGES AND THEIR POTENTIALLY DEVASTATING RIPPLE EFFECTS.

Deep beneath the Coachella Valley lies a massive aquifer, a natural underground reservoir with a capacity estimated at nearly 40 million acre-feet. (An acre-foot of water is 325,851 gallons, so don't bother with your calculator—it will run out of digits.) Yet this aquifer is not full; it is, in fact, being depleted faster than it's being recharged, and new water is getting harder to find or buy. Media reports of a looming "water war" in the West have been appearing more frequently each year. And recent dire headlines about the Atlanta metropolitan area's down-to-a-trickle supplies have stirred unease nationwide.

In California, issues surrounding water—principally its acquisition, management and conservation—are among the most controversial and complex. Districts, states, farmers and developers increasingly are vying for precious resources like the Colorado River and the San Joaquin Bay Delta. As the competition churns, Sacramento has stagnated—locked in political debate as Governor Arnold Schwarzenegger attempts to



Colorado River gold is destined for Coachella Valley faucets.

push through a proposed \$5.9 billion comprehensive water infrastructure plan that includes restoration of the Delta, which supplies clean water to 25 million people in Southern California. Moreover, in a move designed to protect the declining population of a tiny fish called the Delta smelt, this past August a federal judge imposed temporary restrictions on the amount of water taken from the Delta. Many water officials believe this decision could portend rationing and greater restrictions on water use.

For the Coachella Valley, the near- and long-term implications of recent federal and state decisions remain to be seen. But from a macro-perspective, it is clear that the Desert's water issues are inextricably tied to the Delta, the State of California and neighboring states. The Delta "probably is the lynchpin to water supply in the state," says David Luker, general manager of the Desert Water Agency (DWA), one of two local water purveyors—the other is the Coachella Valley Water District (CVWD)—that contracts for state water. The consensus is that the Desert's water issues must be governed by a comprehensive plan encompassing effective management, recycling and conservation to prevent shortages and their potentially devastating ripple effects.

STILL WATERS RUN DEEP

Historically, significant use of the Coachella Valley's water began with an agricultural

bonanza at the turn of the twentieth century. Farmers took advantage of cheap land and bountiful sunshine, particularly in the eastern valley, to grow niche crops like dates, melons and citrus—tapping into the vast underground aquifer and artesian wells. But then an alarming decrease in local groundwater tables threatened the industry. A crisis was averted in 1949 when the US Bureau of Reclamation completed the Coachella Valley branch of the All-American Canal to import water from the Colorado River. Yet the Desert's subsequent evolution into a residential, resort and golfing destination began increasing the region's thirst anew. In fact, according to CVWD's 2002 Water Management Plan, valley water demand increased nearly seven-fold from 1936 to 1999.

Rodney Smith, Ph.D., senior vice president of Upland, California-based Stratecon, Inc., a strategic planning firm specializing in water and other natural resources, blames overdevelopment in the West—and in the Coachella Valley, particularly—for the stressed aquifer. "Groundwater was once the mother lode for this area," he notes. "But then agricultural development occurred, cities started springing up and it was very convenient to drill more wells and pump more water." As the region's critical water source, the Coachella Valley aquifer extends from Whitewater in the northwest to the Salton Sea in the southeast, encompassing four main sub-basins—Mission Creek, Garnet Hill, Whitewater



Millions of gallons go down the drain.

River and Desert Hot Springs. Due primarily to the ongoing drought and a burgeoning population, water experts believe areas of the aquifer to be in an extended period of overdraft. A 2003/04 CVWD engineering report concluded that the Whitewater River sub-basin is overdrawn at a rate of 70,132 acre-feet, or nearly 23 billion gallons, per year.

A key component of the valley's plan to offset groundwater use continues to be importing water via two main sources: the State Water Project and the Colorado River. In the 1970s, CVWD and DWA joined the State Water Project to access additional supplies from Northern California. Since a direct pipeline does not exist to bring state water into the Coachella Valley, CVWD and DWA trade their State Water Project entitlements in an arrangement with the Metropolitan Water District of Southern California (MWD). MWD releases the water from the immensely strategic Colorado River Aqueduct as it intersects the Whitewater River. The water then flows beneath I-10 and eventually percolates into recharge ponds near Windy Point, at the northwestern end of Palm Springs.

In recent years, CVWD and DWA have sought access to extra state water entitlements, including a \$20 million purchase of 9,900 acre-feet from the Tulare Basin Water Storage District in 2004—bringing the Coachella Valley's State Water Project entitlement total to 187,100 acre-feet per year. As *Dune* went to press, CVWD and DWA also were close to finalizing a deal with water districts in California's central valley region that will bring an additional 23,000 acre-feet of State Water Project entitlements to the Desert in

2010. According to CVWD general manager and chief engineer Steve Robbins, the two agencies also are evaluating the feasibility of piping water from Northern California directly to the Coachella Valley, "but high costs are associated with it," he says.

One increasingly divisive issue relates to California's historic dependence on Colorado River water in relation to neighboring states like Nevada and Arizona, which have recently sought their full entitlements to leverage explosive population growth and development. The Colorado River arguably is the most important source of regional groundwater recharge in the Coachella and Imperial valleys. Other recharge sources include surface runoff and subsurface inflow from the San Jacinto and Santa Rosa Mountains, the San Bernardino Mountains during wet years (creating the "natural" Whitewater River), and local precipitation—although it is important to note that the Coachella Valley's annual rainfall averages only three inches. Return flows from urban, golf course and agricultural irrigation also contribute to recharge.

In October 2003, a "peace treaty" known as the Quantification Settlement Agreement (QSA) was reached among the seven states that divvy the Colorado River. The agreement resulted in a 75-year plan for California's share. The QSA set Coachella Valley river water entitlement at 330,000 acre-feet per year, while directing significant water transfers from the Imperial Irrigation District to San Diego. It also served as a catalyst for



Placing the Mid-Valley Pipeline.

Salton Sea restoration and a \$200 million state-funded project to reline the earthen portions of the All-American and Coachella Canals to reduce loss of water from seepage.

NOT WATER UNDER THE BRIDGE

Water management in the Coachella Valley faces many challenges. One is the reliability of imported water from both the Colorado River and State Water Project—particularly in light of the August court decision to suspend water usage from the Delta. Says Robbins: "The 35 percent reduction in the amount of water moving south of the Delta is a tremendous hit to the water industry as a whole." An important corollary, Robbins adds, is that it's now difficult, if not impossible, to conduct water supply assessments mandated by law. This, he believes, will have a direct and negative impact on construction—a substantial part of California's economy.

"We all have a stake in this," says Fred Bell, executive director of the Desert chapter of the California Building Industry Association, adding that while the situation is serious, it is still manageable. Bell also stresses the need for conservation. "The building industry, residents... anyone who does business in California has to deal with water conservation in some fashion."

A 2004 report prepared by Terra Nova Planning & Research, Inc., for the Coachella Valley Multiple Species Habitat Conservation Plan, supports Bell's admonishment, warning that "serious social, environmental and economic consequences" could result from the groundwater basin's overdraft condition. Said consequences could include the loss of groundwater in storage, diminishing water quality, seawater intrusion, increased costs associated with drilling and installing deeper wells and larger pumps, and land subsidence—or sinking of the land surface, which can cause ground fissures, sinkholes and structural damage.

Borrowed water flows into the recharge ponds at Windy Point.



Another challenge, partially aggravated by the palm tree-filled promotions of resorts and developers, is our collective belief in a limitless water supply and our procrastination when it comes to fixing leaky sprinklers and faucets. "I'm amazed that as much as we try to get people to conserve and as much as we see written about it, we still see water waste," says Luker, noting that 70-80 percent of the valley's water supply is used for landscape and golf course applications. To this end, DWA has transformed its facility and grounds to demonstrate how to maximize conservation techniques. Grass has been replaced with artificial turf and desert landscape, and recycled water is used for irrigation. Customers, as a result, gradually are jumping on the conservation bandwagon: Palm Springs High School playing fields and five golf courses in Palm Springs irrigate with recycled water, while 12 golf courses located within the CVWD use at least some recycled water for the same purpose.

To offset the ongoing reliance on groundwater, CVWD is constructing the \$70 million Mid-Valley Pipeline. When completed by the end of 2010, it will route Colorado River water through the CVWD's Wastewater Reclamation Plant and help 50 golf courses in Indian Wells, Palm Desert and Rancho Mirage meet their irrigation needs with a mix of recycled and river water. A second advantage to using recycled water, DWA's Luker notes, is that it saves electricity: "Pumping all the water from below ground creates a higher power demand than if we use surface water from the wastewater recycling plant in Palm Springs."

While recycled or reclaimed wastewater is not suitable for human consumption, how safe is Colorado River water to drink? Expert opinions vary. Arden Wallum, general manager of Mission Springs Water District (MSWD)—

WATER MANAGEMENT IN THE VALLEY THE H₂O VERLORDS

COACHELLA VALLEY WATER DISTRICT (CVWD)

Coachella, CA

Established in 1918 to protect the valley's groundwater basin and seek supplemental sources of imported water, CVWD is a local government agency overseen by five directors elected to four year-terms by district voters. Its service area is approximately 1,000 square miles—mostly within the central and eastern Coachella Valley in Riverside County, although boundaries extend into Imperial County. CVWD services include providing drinking water to more than 100,000 homes and businesses, sanitation services and wastewater recycling.

www.cvwd.org

DESERT WATER AGENCY (DWA)

Palm Springs, CA

DWA, a nonprofit public agency, was formed in 1961 to qualify for receiving imported water through the California Water Plan. It is governed by a five-member board of directors and serves a 325-square-mile area covering all of Palm Springs, parts of Cathedral City, and some unincorporated areas of Riverside County. DWA provides a range of services including domestic water, water recycling, sewer, and engineering and planning.

www.dwa.org

MISSION SPRINGS WATER DISTRICT (MSWD)

Desert Hot Springs, CA

Formerly known as the Desert Hot Springs County Water District, MSWD was created in 1953 as a publicly owned water district to meet the critical need for fresh water in the Desert Hot Springs area. The district is managed by a five-member board of directors and spans 135 square miles, including the City of Desert Hot Springs, West Palm Springs, Palm Springs Crest and 10 small communities in Riverside County. Among its services are domestic water, sanitary sewage collection and treatment, and groundwater basin management.

www.mswd.org



which draws 100 percent of its water supply from groundwater—ranks the area's water quality level, from highest to lowest, as follows: groundwater, State Water Project water and Colorado River water. "They're bringing Colorado River into our recharge

ponds," say Wallum, "and replenishing our groundwater with this poor-quality water. We're concerned that our groundwater quality will deteriorate." To illustrate this, at least one geologist studying the issue has found total dissolved solids (TDS) to be approximately four times greater in Colorado River water than in average drinking water.

Eddie Rigdon, group manager of water systems operations for the Metropolitan Water District, acknowledges that while there is a high level of TDS in the Colorado River—now roughly at 700 milligrams per liter (versus an average of less than 300 in water pumped for domestic purposes from the valley's groundwater basin)—this is due to the natural particulate-gathering of water as it travels. MWD laboratory staff treats water

Colorado River Aqueduct water is diverted into Whitewater Canyon.



WHETHER OR NOT YOU
SUBSCRIBE TO GLOBAL
WARMING, SCIENTISTS
ARE PURPORTING MORE
EVIDENCE OF IT—LIKE THE
SHRINKING
SNOWPACK
IN THE ROCKIES AND
SIERRA NEVADAS.



PHOTOS (PAGES 41-44) COURTESY OF CVWD

from its source and throughout the distribution system and regularly conducting analyses to ensure a safe drinking supply. “The California Department of Health Sciences has some of the highest water quality standards in the United States, and we regularly meet or exceed requirements below national pollutant levels,” says Rigdon.

It is also important to take into account the forces of nature that contribute to water supply, demand and infrastructure, such as global warming, drought conditions and the valley’s seismic predisposition. Whether or not you subscribe to global warming, scientists increasingly are purporting evidence of this phenomenon—disappearing glaciers, higher atmospheric levels of methane and carbon dioxide, and, more significantly for California, the shrinking snowpack in the Rocky and

Sierra Nevada mountain ranges. A July 2007 report by the Natural Resources Defense Council assessing the effects of global warming on water supplies in the West states that current drought conditions are a taste of things to come.

IN THE PIPELINE

In 2002, the Coachella Valley Water District finalized a comprehensive blueprint called *The Coachella Valley Water Management Plan* to ensure that the region continues to meet its current and future demands for high-quality water. The plan’s overarching objective is to improve all areas of water management, such as controlling groundwater overdraft, searching for steady supplies of imported water, maximizing recycled water use for outdoor needs, and increasing water conservation measures. Since its inception, CVWD has launched a series of programs designed to meet plan requirements. One conservation-based program is designed to reduce dependence on groundwater by providing loans and assistance for the installation of water-saving irrigation and landscape systems.

Desert Water Agency has adopted much of the *Water Management Plan*. It implements many recycling and conservation projects of its own while participating in renewable energy initiatives. The agency currently has two hydroelectric plants—one in Whitewater and one in Snow Creek, at the foot of Mount San Jacinto. “We’re very active in power generation,” says DWA’s Luker. “We’re looking to expand that and also supply energy for our water reclamation project to offset operating costs. It’s a good thing for California because it takes demand off the grid and makes power available for other uses.”

Meanwhile, state water officials are forging ahead with plans to ensure that water supplies keep up with ongoing development locally. “What makes sense is to manage growth—meaning that you grow without depleting your resources,” says Dick Kelly, mayor of Palm Desert, a regional leader in the water conservation movement. Among many measures the city has undertaken are stringent landscape ordinances requiring the use of drip irrigation systems instead of sprinklers in public landscaping and requiring developers to use drought-tolerant

plants. Kelly also notes that his is the only city in California with a program to reduce energy consumption by 30 percent in the next five years.

The alarmingly low water levels at Lake Powell, at the Utah/Arizona border, and Nevada’s Lake Mead beg another question: How much do cyclical weather patterns affect our supply and storage capacities? “History is replete with cycles of wet-versus-dry periods,” explains Stratecon’s Rodney Smith. “Last century, when you had people devising expectations of water supplies, we were in a relatively wet period. A lot of these storage projects were developed when we were in the midst of very favorable conditions.”

And what about the consumer’s water costs? Coachella Valley residents are lucky at the moment—paying approximately 80 cents per 100 cubic feet (748 gallons), while residents in Pasadena about 90 miles to the west pay two to three times as much. Yet the majority of water experts agree that it’s only a matter of time before Desert residents see increases. MSWD’s Wallum says imported water will become very expensive. “We were buying water in the late 1990s at \$1,000 per acre-foot; the going price now is \$3,000.” MWD’s Rigdon foresees rate hikes due to growing associated costs, like maintenance and transport. “Energy is a big component of moving water,” he explains. “As energy prices go up, so will the cost of water.”

“The dynamics of water in California are changing, and we recognize that we have to change,” acknowledges CVWD’s Robbins. He and his colleagues agree that a major paradigm shift also is needed on the public’s part. “The cultural belief is that water is cheap and plentiful. But whether you have lived here for 30 years or 30 days, don’t take water for granted.” ◀

For more information, see the California Department of Water Resources (www.water.ca.gov) and “California’s Water: A Crisis We Can’t Ignore” (www.calwatercrisis.org), a public education program launched by the Association of California Water Agencies.

For simple everyday water conservation tips, visit www.watereitwisely.com.