



Annual Review 2003
Coachella Valley Water District

Includes:

- Water quality report*
- Water management issues*
- Colorado River update*



LEGEND

- SOUTHERN PACIFIC RAILROAD
- CRUISE BOAT
- CITY BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY
- INTERSTATE
- MOUNTAINS

District service...by the numbers *(As of Dec. 31, 2003)*

General information

Local government agency formed — 1918, stormwater unit, 1915.

Governing board — 5 directors elected to 4-year terms.

Fields of service — Importation and distribution of domestic water; wastewater collection, reclamation and redistribution; regional flood protection; importation and distribution of irrigation water; irrigation drainage collection, groundwater management and water conservation.

Service area — 639,857 acres, 377,776 acres in stormwater unit, lying mainly in Riverside County with territory in Imperial County and a small portion of San Diego County.

Property valuation — Properties within CVWD had a total combined full value in 2003 of \$30,958,377,409 as fixed by Riverside and Imperial County assessors and state officials in charge of utility properties.

Irrigation water service

Colorado River water use in acre-feet

Total irrigable area, acres	78,553
Active accounts	1,150
Total sales	243,742
Average daily consumption	668
Maximum daily demand	1,124
Avg. use/crop-acre (multiple crops)	3.54

System

Reservoirs	2
Storage capacity, acre-feet	1,301
Distribution system, miles	485
Pumping plants	19
Canal, miles	122

Domestic water service

Water use in gallons

Population served	229,065
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Water jargon

Acre-Foot: 325,851 gallons, enough water to cover one acre of land (about the size of a football field) one foot deep. In the Coachella Valley an acre of developed land (houses, agriculture, golf courses, lakes, etc.) typically uses an estimated six acre-feet per year.

Parts Per Billion (ppb): A measurement used by water quality professionals to determine the level of a constituent in drinking water. A reading of 1 ppb is equivalent to one teaspoon of sugar dissolved in 1,297,000 gallons—enough water for a typical Coachella Valley family for six years.

Active meter services	91,626
Average <i>home</i> use, per person/day	245
Summer, per person/day	314
Sales, billion gallons	38
Sales, acre-feet	118,839

System

Active wells	103
Reservoirs	59
Storage, million gallons	105.8
Distribution lines, miles	1,782
Fire hydrants	12,530

Urban conservation in acre-feet

Reclaimed from sewage	14,293
Imported supply since 1973	1,756,580

Water reclamation (sanitation)

Wastewater reclamation plants	6
Daily capacity, million gallons	31.8
Collector system, miles	1,040
Active services	82,429
Average population served	206,073
Average daily flow, million gallons	16.7
Annual flow, billion gallons	6.11
Annual flow, acre-feet	18,759

Regional stormwater protection, miles

Whitewater River Channel	24
Coachella Valley Channel	24.5
Eastside Dike	25.5
Detention Channel 1	3.25
Detention Channel 2	2.25
Detention Channel 3	1.75
Westside Dike	4.5
Avenue 64 Evacuation Channel	6.75
La Quinta Evacuation Channel	4.5
Bear Creek Channel	3.5
La Quinta Channel	1.75
Deep Canyon facilities	6
Dead Indian Canyon facilities	2.75
Palm Valley Channel	6
East Magnesia Canyon Channel	1.75
West Magnesia Canyon Channel	1.25
Thunderbird Channel	1
Villas Stormwater Channel	.75
Peterson Stormwater Channel	.5
Sky Mountain Channels	1.75
Rancho Mirage Drain system	3
Portola Avenue Drain system	5
North Portola Avenue Storm Drain	1.3

Agricultural drainage

On-farm lines added, miles	0
Total on-farm drains, miles	2,298
District open drains, miles	21
District pipe drains, miles	166
Acreage with farm drains	37,425



Securing Colorado River supply—Steve Robbins, general manager-chief engineer, flanked by then California Governor Gray Davis and Gayle Norton, Secretary of the Interior, participates in the historic signing of an agreement quantifying California's Colorado River water supply. The ceremony took place atop Hoover Dam.

This Annual Review of district activities is sent to households and property owners within the boundaries of the Coachella Valley Water District to help keep service users aware of recent and future activities on the federal, state and local levels which could affect

Message from the general manager-chief engineer

them. This knowledge can help you make informed decisions about your water supply.

Highlighting last year's activities was news about the Colorado River water supply.

California had historically used far more Colorado River water than its legal entitlement because other states weren't using their full allotments. This changed a few years ago with the completion of the Central Arizona Project and California was facing a forced significant reduction in its river use.

Realizing this, Colorado River water purveyors within the state were able to secure an agreement from the federal government and other Colorado River basin states to allow the continued use at current levels for 15 years until conservation measures could be implemented and replacement water sources could be developed. The 15-year soft landing was conditioned on California water users meeting certain milestone deadlines.

A major deadline was the development of a Quantification Settlement Agreement between Coachella Valley Water District, Imperial Irrigation District and Metropolitan Water District of Southern California. We negotiated for nearly a decade, involving state and federal agencies and, ultimately, San Diego County Water Authority. But we were unable to come up with an agreement by the end of 2002 and CVWD water users suffered for it.

When the Department of the Interior failed in court in an effort to reduce Imperial Irrigation District's water supply, CVWD, with the lowest priority to the river's water for agriculture, took the hit. Immediately we had to stop the use of the remaining water available to us by golf courses and other non-agricultural users. We then negotiated a deal with farmers in the Palo Verde Irrigation District to pay them to fallow land, making that costly water available to Coachella Valley farmers.

Finally, however, the Quantification Settlement Agreement was signed and, as a result, Coachella Valley water users have more water available to them, both for agricultural and urban purposes, than they did before the cutback.

Also, while we have an agreement for a secure supply of Colorado River water, nature hasn't been very cooperative.

Facing the most severe and longest lasting drought since the development of water storage facilities on the Colorado River, both Lake Powell and Lake Mead

are at record lows. While storms this year left a good snow pack in Northern California, increasing the amount of water available through the State Water Project, the drought continues in the Rockies—Colorado River’s primary watershed.

A side affect of the Quantification Settlement Agreement was to allow us to acquired additional State Water Project rights from Metropolitan Water District. This is important as an additional water source, but it is also important as an increased urban water supply because Colorado River water available through our contract with the federal government is limited to use within the valley’s historic agricultural area.

In addition, we recently purchased State Water Project rights from a Central Valley agricultural agency which no longer needed them and we are constantly seeking opportunities for similar acquisitions.

Currently, we have no plumbing to deliver State Water Project water directly to the valley. Instead, we exchange it with Metropolitan Water District for Colorado River water from that agency’s aqueduct which crosses through the valley. With the additional state project water being made available to us, we are developing a plan to extend a branch of the California Aqueduct to the vallley.

To reduce demand on the valley’s water supplies, the district has had an ongoing water conservation program for all users and has been a leader in reclaiming water from sewage for reuse. Most of our urban water conservation efforts have been outside the home because 70-80

percent of the water used by Coachella Valley households is for landscaping.

During the last couple of years CVWD has adopted a valley-wide water management plan and a landscape water conservation ordinance which reduces the amount of water available for irrigation of new developments by 25 percent.

To make this as painless as possible, the district has water management specialists available to work with major water users, has published a landscape book geared specifically to the Coachella Valley homeowner, conducts annual landscape workshops for homeowners and has demonstration gardens available at both its Palm Desert and Coachella offices. The Coachella garden was renovated and enlarged this year. Both are open, generally, during regular office hours.

At the beginning of 2003 I was promoted from assistant general manager to lead this organization. As a result, the position of assistant general manager became vacant. I was extremely fortunate that the district was able to attract Mark Beuhler from the senior management staff of Metropolitan Water District to serve in that role. Mark’s engineering and water quality background with the largest water agency in the state will serve the people of Coachella Valley well.

This year we were saddened to lose two of the water pioneers who made Coachella Valley what it is today. Both former General Manager-Chief Engineer Lowell O. Weeks and Keith Ainsworth, his assistant

Cutting edge system management—Scott Coulson, right, service department director, explains to Mark Beuhler, assistant general manager, some of the equipment necessary to maintain nearly instantaneous control of the valley’s water supplies.





Blackout power—From left, Dan Farris, director of operations, and Cliff Larson, trades and support superintendent, survey a generator at a new well site. All new wells will have similar backup power to assure water availability during a massive power failure. The district also maintains several large generators on trailers to handle sites where permanent backup power is not available.

general manager, passed away since our last Annual Review.

You can read about some of these issues in more detail in the pages of this publication and further information is available on our website, www.cvwd.org.

Remember, CVWD is a local government agency. You elect the board of directors and, except under specific circumstances, board meetings are open to the public. Meetings are held on the second and fourth Tuesdays of each month at 9 a.m. in the dis-

trict's board room, Forbes Auditorium, at the district's Coachella office at Avenue 52 and Highway 111.

Yours very truly,

Steve Robbins
general manager-chief engineer

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Cover photos: Front, A drip emitter supplies water to a lush and efficient bougainvillea which actually blooms more with less water.

Inside back cover, Aloe vera blossoms provide an attractive vertical accent in a lush and efficient garden. **Back**, A wastewater reclamation plant worker creates an abstract as he cleans a settling basin.

Although it's long-term *Water Management Plan* outlines specific goals for reduced demand by agriculture, golf courses and domestic consumers, Coachella Valley Water District personnel know it still will take more water to meet future needs.

Planning for the water requirements of a region where the population is expected to double in 35

Planning CV's water future

years is not possible without anticipating that additional sources of water will be needed, especially when seeking also to alleviate aquifer overdraft.

The plan calls for conservation that limits demand for water to half the growth rate of the population. Meeting new demand will require "new" sources of water. Conservation is one way to create new water because what is saved is available for use elsewhere.

If the more than 229,000 people who received domestic water from CVWD in 2003 reduced their demand by 10 percent—a goal of the plan by 2010—this would generate nearly 12,000 acre-feet of "new" water, enough to serve the annual needs of more than 9,100 homes and businesses.

Another method for creating new water centers on changing the source of the water. Slightly less than a third of the area's agricultural irrigation water, for example, comes from private wells. With a guaranteed, increasing supply of imported water from the Colorado River, farmers and others who pump well water are in a position to switch to imported water, delivered by the Coachella Canal.

In addition to the guaranteed entitlement to 330,000 acre-feet a year—and 20,000 acre-feet from the Metropolitan Water District (MWD) of Southern California, the Quantification Settlement Agreement provides CVWD with the opportunity eventually to purchase up to 103,000 acre-feet annually from Imperial Irrigation District.

Because this is more than what is being pumped out of the ground for agriculture, additional water will be available for aquifer recharge.

Groundwater no longer used for agriculture becomes available for homes, businesses and other domestic use. There also are plans to make greater use of canal water to irrigate golf courses, further reducing overall demand on the aquifer.

As Coachella Valley's population grows—and as the number of homes not hooked up to a sewer system decreases with a reduction in the use of septic tanks—a greater volume of recycled water will be available for golf course and other landscape irrigation.

Conservation by existing and future users and shifting water sources away from groundwater use will not, however, be enough to ensure there are adequate supplies in the future while also addressing overdraft of the aquifer.

Imported water from the Colorado River has been used to recharge the aquifer since 1973. CVWD and Desert Water Agency (DWA) have entitlements to State Water Project (SWP) water, which they exchange "bucket for bucket" for Colorado River water from MWD.

This arrangement is necessary because there are no facilities to deliver SWP water to Coachella

Lush & Efficient demonstration garden—
Dave Koller, right, water management specialist, is interviewed during the dedication of the Dave Harbison Lush & Efficient Demonstration Garden at CVWD's Coachella office. Another demonstration garden is at the district's Palm Desert facility.



Valley. The 444-mile California Aqueduct ends in Devil Canyon, northwest of San Bernardino. A 13-mile pipeline extends from a canyon afterbay into eastern San Bernardino and the San Gorgonio Pass area.

Building a pipeline to bring State Water Project water into Coachella Valley was ruled out when costs were estimated in the late 1960s and early 1970s in excess of \$163 million. Given the amount of water received, planners believed the costs to be excessive.

CVWD is in the process, however, of more than tripling the amount of State Water Project water it receives, with the region's entitlement expected to exceed 206,000 acre-feet. This is sufficient to meet the needs of more than 161,000 households.

In addition, there is an estimated 5 million acre-feet of groundwater storage capacity beneath the Coachella Valley. By partnering with other water districts or agencies with access to State Water Project or Colorado River water, Coachella Valley can serve as an efficient water bank. The creation of additional storage capacity is a crucial step in better managing water in the Southwest.

Associated with the quantification settlement agreement is a 100,000 acre-foot entitlement transfer from MWD to CVWD (88,100 acre-feet) and DWA (11,900 acre-feet). The accord carries with it a provision that the water is available to Coachella Valley during so-called "wet" years (along with all of the costs associated with a SWP allotment, an average of \$240 an acre-foot in recent years). MWD retains the

ability to buy back the water during so-called "dry" years by reimbursing the two water districts for related expenses.

Agreements finalized last year made CVWD the fourth largest contractor of the 29 water agencies across California that have SWP entitlements. CVWD's share previously was relatively modest, 23,100 acre-feet, placing it 16th. Accords last year increased this to 121,100 acre-feet. DWA had an entitlement to 38,100 acre-feet. This increased to 50,000 acre-feet.

CVWD also bought outright entitlement to an additional 9,900 acre-feet of SWP water from Tulare Lake Basin Water Storage District. The district is paying farmers and other landowners a little more than \$21 million for permanent rights to the SWP water.

A less-publicized element of the QSA enables CVWD to purchase up to 35,000 acre-feet of State Water Project water from MWD for \$60 an acre-foot.

All of these agreements increase CVWD's annual access to SWP water to 156,100 acre-feet. Only MWD (2,011,500 acre-feet) and Kern County Water Agency (1,000,949) will have access to more.

Until a pipeline is built, however, any State Water Project water obtained for Coachella Valley will have to be delivered through an exchange agreement with MWD for Colorado River water, which is provided from the Colorado Aqueduct to the Whitewater River, where it flows into recharge ponds at Windy Point, west of Palm Springs.

Protecting water serious business in post-9/11 era

CVWD recently completed its second vulnerability assessment, a procedure mandated by the federal government in the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (H.R. 3448).

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Replacing the valley's groundwater—Imported water, available because of the district's contract for State Water Project water, flows into the Whitewater River to flow into the valley where it is allowed to percolate into the earth to replenish groundwater supplies.

Keeping vigilant—Leslie Cohen, risk manager, and John Burrow, claims and safety supervisor, check some of the security equipment monitoring district facilities.



Among the act's requirements are that community water systems serving a population of greater than 3,300 conduct an assessment of the vulnerability of the water system to a terrorist attack, submit a written copy of the assessment to the government and revise, if necessary, emergency response plans to incorporate the results of the assessment.

In 2002, CVWD hired Virginia-based Telemus Solutions to assess the vulnerability of its largest water system, serving the Coachella Valley's Cove Communities. That assessment was completed and submitted to the federal government in 2003.

In conducting its assessment, Telemus looked at all the system's facilities and infrastructure, reviewed emergency response plans and provided vulnerability training. Due to security concerns, Telemus' assessment report was read by only a few high-ranking CVWD officials. Claims and Safety Supervisor John Burrow said that while details are confidential, the

overall evaluation was that CVWD's facilities are safe and the recommendations included minor upgrades to existing security features.

"Our water users have one of the safest water delivery systems in the United States thanks to the way we produce and handle water," Burrow said.

The second assessment, of the district's smaller water systems, was conducted by Risk Management Professionals Inc. of Mission Viejo. It had to be sent to the federal government by June 30. Burrow said he expected RMP's evaluation to similarly conclude that CVWD has a safe water delivery system.

H.R. 3448 specifically requires the assessments to review "methods and means by which terrorists or other individuals or groups could disrupt the supply of safe drinking water or take other actions against water collection, pretreatment, treatment, storage and distribution facilities which could render such water significantly less safe for human consumption, as specified."

Clean water, soil amendments byproducts of sewage

To help meet the needs of the growing population, the district is planning to expand three of its six wastewater reclamation plants. Residential sewage is processed and—at three of the plants— treated to produce recycled water for golf courses and other landscape uses. The amount of recycled water in 2003 totaled 14,293 acre-feet, almost a 5 percent increase over the previous year.

Another byproduct of sewage treatment is called biosolids, a nutrient-rich organic matter that is further treated to become fertilizer and soil amendment. Biosolids are treated at the Palm Desert regional plant, located adjacent to the district's Palm Desert office, and at another plant near Del Webb Sun City. Syna-

gro, a nationwide company that owns and operates the largest biosolids composting facility in the United States, hauls the biosolids away from these locations.

The U.S. Environmental Protection Agency regulates biosolids recycling to ensure environmental safety. Synagro produces high-grade products that are used by farmers, horticulturists, landscapers, nurseries, and blenders who distribute and market products in stores. When properly managed, biosolids provide essential plant nutrients, improve soil structure, enhance moisture retention and reduce soil erosion.

With Synagro's contract set to expire, CVWD recently sent out a request for proposals for a 10-year contract for transport, treatment and beneficial reuse

Sludge removal—From left, Fred Cariaga, wastewater reclamation plant chief operator, and Leon Holiday, sanitation superintendent, supervise the loading of a truckload of sludge being hauled away for conversion into fertilizer and soil amendments.

of biosolids from the three main reclamation plants.

At the Thermal plant, the expansion plan will help the district to meet the growing needs in the eastern Coachella Valley. The expansion, slated to be complete in 2006, includes the creation of pre-aeration ponds, basins, clarifiers and a belt press building which will bring the plant's treatment capacity from 7.0 million gallons per day (mgd) to 9.9 mgd. Currently, biosolids are hauled from this location to a landfill. With the expansion, the biosolids instead will be hauled away for recycling.

At the Palm Desert regional plant, construction to upgrade the plant's biosolids capabilities is scheduled to get underway at the end of the year. The \$16.85 million upgrade is needed to meet the plant's treatment capacity of 18.5 mgd. Currently the district's largest plant, it now processes an average of 12 mgd.

The plant that serves Sun City Palm Desert is also being expanded, with the next phase expected to be complete in 2006. The plant's sewage treatment



capacity recently was doubled from 2.5 mgd to 5.0 mgd. With the next phase, the amount of water that's reclaimed for golf course use will be increased.

High water quality remains top CVWD priority

Ensuring that every drop of the more than 40 billion gallons it provides annually meets all federal and state standards for drinking water is a top priority at Coachella Valley Water District. This annual water quality report is published to document that extremely high quality water that meets all government standards is served to all constituents of the Coachella Valley Water District.

Data summarized here come from CVWD's most recent monitoring, completed between 2001 and 2003. The state allows the monitoring for some contaminants less than once a year because their concentrations do not change frequently.

All domestic water served by the Coachella Valley Water District is obtained locally from wells drilled into the Coachella Valley's vast groundwater basin.

The Coachella Valley Water District is governed by a locally elected board of directors, who normally meet in public session at 9 a.m. on the second and fourth Tuesdays of each month at district headquarters, Avenue 52 & Highway 111, Coachella.

Most water quality testing is done in the district's state-certified laboratory. A few highly specialized tests must be sent to other laboratories, which have the very expensive equipment necessary to find minuscule amounts of some constituents.

In addition to the detected constituents listed in the table on the following pages, CVWD's water quality staff of biologists, chemists, engineers and technicians monitor for more than 100 other regulated and unregulated chemicals. All of these are below detection levels in CVWD's domestic water.

“Este informe contiene información muy importante sobre su agua potable. Tradúzcalo ó hable con alguien que lo entienda bien.” —CDHS

While all of CVWD’s domestic water supply meets current requirements for arsenic, drinking water supplied to some service areas does contain low levels of this constituent. The standard for arsenic balances the current understanding of the chemical’s possible health effects against the costs of removing the constituent from drinking water. The California Department of Health Services continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations, and is linked to other health effects such as skin damage and circulatory problems.

With respect to the presence of arsenic in drinking water in excess of 10 ug/L but less than 50 ug/L—which is the case for wells supplying the communities of Mecca, Bombay Beach, North Shore, Hot Mineral Spa and Valerie Jean—the state Department of Health Services warns that some people who drink water containing arsenic in excess of the maximum contaminant level (MCL) during many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.

Radon is a naturally occurring, radioactive gas—a byproduct of uranium—that originates underground but is found in the air. Radon moves from the ground into homes primarily through cracks and holes in their foundations. While most radon enters the home through soil, radon from tap water typically is less than two percent of the radon in indoor air.

“Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline 1-800-426-4791.”

—California Department of Health Services

The federal Environmental Protection Agency (EPA) has determined that breathing radon gas increases an individual’s chances of developing lung cancer, and has proposed a maximum contaminant level of 300 picoCuries per liter (pCi/L) for radon in drinking water. This proposed standard is far less than the 4,000 pCi/L in water that is equivalent to the radon level found in outdoor air. The radon level in district wells ranges from 80 to 360 pCi/L—significantly lower than that in the air you breathe.

Nitrate in drinking water at levels above 45 milligrams per liter (mg/L) is a health risk for infants younger than six months old. High nitrate levels in drinking water can interfere with the capacity of the infant’s blood to carry oxygen, resulting in serious illness; symptoms include shortness of breath and blueness of skin. Nitrate levels above 45 mg/L may

Available for reuse—
Robert Saenz, reclamation plant operator, checks reclaimed water before it is redistributed for greenbelt and golf course irrigation.



also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain enzyme deficiencies. If you are caring for an infant, or you are pregnant, you should ask advice from your health care provider. Groundwater nitrate is the most closely monitored chemical in drinking water and nitrate levels do not change quickly in the district's deep wells used to supply drinking water. If the nitrate level in a well begins to climb, CVWD increases its monitoring frequency and, if necessary, wells are taken out of service before they become unsafe.

As noted, all drinking water served by CVWD comes from wells. The California Department of Health Services requires water agencies to state, however, "the sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

"Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.*
- Inorganic contaminants, such as salts and metals, that can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.*

—*Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff and residential uses.*

—*Organic chemical contaminants, including synthetic and volatile organic chemicals, that are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff and septic systems.*

—*Radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.*

"In order to ensure that tap water is safe to drink, USEPA and the State Department of Health Services (Department) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Department regulations also establish limits for contaminants in bottled water that must provide the same protection for public health.

"Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (800-426-4791)."

The district has conducted source water assessments to provide information about the vulnerability of district wells to contamination. Those results are included here.

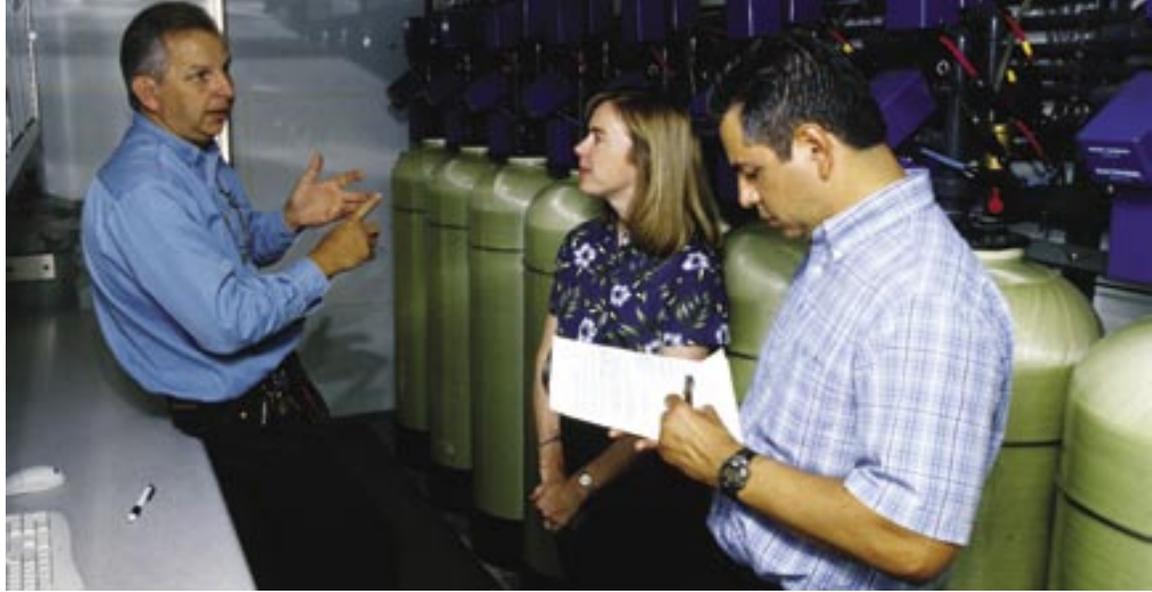
Cove communities

An assessment of the drinking water sources for this water system was completed in October 2003.



Checking quality—From left, laboratory technician Olivia Todd and water quality analyst Michelle Chaney are members of the CVWD water quality team constantly monitoring supplies going to the consumer.

Testing arsenic removal systems—Dan Zioli, left, research director for Basin Water, discusses preliminary results from an arsenic removal test lab in Mecca with Carrie Oliphant, CVWD senior domestic water engineer, and Will Gonzalez, CVWD water resources engineering technician.



Water from wells serving this area is considered most vulnerable to the following activities associated with detected contaminants: known contaminant plumes, dry cleaners and irrigated crops. In addition, water from wells serving this area is considered most vulnerable to the following activities not associated with any detected contaminants: known contaminant plumes, dry cleaners, underground storage tanks-confirmed leaking tanks, high density septic systems, automobile gas stations, historic gas stations, historic waste dumps/landfills, automobile repair shops, illegal activities/unauthorized dumping, sewer collection systems, pesticide/fertilizer/petroleum storage, transfer areas and utility stations' maintenance areas.

The Cove Community water system, consisting of 84 wells, is the district's largest system. It serves the communities of Rancho Mirage, Thousand Palms, Palm Desert, Indian Wells, La Quinta and portions of Bermuda Dunes, Cathedral City and Riverside County adjacent to these communities. The drinking water served to these communities complies with all drinking water standards.

Indio Hills, Sky Valley & areas adjacent to Desert Hot Springs

This assessment was completed in December 2002. Water from wells serving this area is considered most vulnerable to activities not associated with any detected contaminants. These are automobile repair shops, illegal activities/unauthorized dumping and low-density septic systems.

All four wells in the system are located in a rural area with a small amount of residential development. Although the possible contaminating activities listed exist, they occur in small numbers. The drinking water served to these communities complies with all drinking water standards.

Mecca, Bombay Beach, North Shore & Hot Mineral Spa

This assessment was completed in December 2002. Water from wells serving this area is considered most vulnerable to activities not associated with any detected contaminants. These are agricultural drainage and sewer collection systems.

These wells are located within agricultural and residential areas and draw from a confined aquifer where the thickness of confining sediments ranges from 100 feet to more than 400 feet. Drinking water served to these communities complies with all drinking water standards.

Desert Shores, Salton Sea Beach & Salton City

This assessment was completed in September 2002. Water from wells serving this area is considered most vulnerable to the running of the wells themselves, which is not associated with any detected contaminants.

All three wells are located in a remote area surrounded by desert with some agriculture in the outer zones. CVWD owns and maintains the wells. The drinking water served to these communities complies with all drinking water standards.

Valerie Jean

This assessment was completed in October 2003. Water from wells serving this area is considered most vulnerable to high density septic systems, which are not associated with any detected contaminants.

The wells are located in an agricultural area with some small residential areas. The number of septic systems is small. Future development in the area is expected to include centralized sewer collection which will replace existing on-site sewage disposal facilities. The drinking water served to these communities complies with all drinking water standards.

(Continued on page 14.)

Definitions, abbreviations & footnotes

AI—Agressive Index — This

is a measurement of corrosivity. Sources with AI values of 12 or greater are non-corrosive. AI values between 10 and 12 are moderately corrosive and AI values less than 10 are corrosive.

AL—Regulatory Action

Level — The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

MCL—Maximum Contaminant Level — The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to public health goals or maximum contaminant level goals as economically and technologically feasible. Secondary MCLs are set to protect the odor, taste and appearance of drinking water.

MCLG—Maximum Contaminant Level Goal — Level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the federal EPA.

mg/L — Milligrams per liter (parts per million).

MRDL—Maximum Residual Disinfectant Level — The level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap.

MRDLG—Maximum Residual Disinfectant Level Goal — The level of a disinfectant added for water treatment below which there is no known or expected risk to health. MRDLs are set by the U.S. Environmental Protection Agency.

NA — Not analyzed.

ND — None detected.

ng/L — Nanograms per liter (parts per trillion).

NTU — Nephelometric turbidity units (measurement of suspended material).

pCi/L — picoCuries per liter.

PHG—Public Health Goal — Level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California EPA.

Primary Drinking Water Standard — Primary maximum contaminant levels and maximum residual disinfectant levels for

Detected parameter, units	PHG or (MCLG)	Primary or (secondary) MCL	Cove Communities ⁽¹⁾ Range (Average)	Indio Hills, Sky Valley & areas adjacent to Desert Hot Springs Range (Average)
Aluminum, mg/L	0.6	1.0, (0.2)	ND-0.08 (ND)	ND
Arsenic, ug/L	None	50	ND-2.9 (ND)	ND
Boron, mg/L ⁽²⁾	None	None	ND-0.1 (ND)	ND
Chloride, mg/L	None	(500)	5.2-39 (13)	14-21 (17)
Chlorine (as CL ₂), mg/L	MRDLG 4.0	MRDL 4.0	ND-2.0 (0.3)	0.1-0.6 (0.3)
Chromium, ug/L	(100)	50	ND-20 (ND)	11-18 (15)
Chromium VI, ug/L ⁽²⁾	None	None	1.5-19 (7.8)	9.1-19 (15)
Color, units	None	(15)	ND	ND-3 (ND)
Copper, mg/L ⁽³⁾ [homes tested/ sites exceeding AL]	0.17	AL=1.3	0.14 [50/ 0]	0.12 [11/ 0]
Copper, mg/L	None	(1.0)	ND-0.05 (ND)	ND
Corrosivity, AI	None	(Non-corrosive)	11-13 (12)	12
DCPA mono & diacid degrade, ug/L ⁽²⁾	None	None	ND-1.1 (ND)	NA
Electrical conductance, umhos/cm	None	(1,600)	220-660 (350)	570-730 (640)
Fluoride, mg/L	1	2	0.2-0.9 (0.6)	0.5-0.7 (0.6)
Foaming agents (MBAS), mg/L	None	(500)	ND	ND
Gross alpha particle activity, pCi/L	(Zero)	15	ND-12 (ND)	ND-8.0 (4.8)
Hardness (as CaCO ₃), mg/L	None	None	23-280 (110)	120-180 (160)
Iron, ug/L	None	(300)	ND-160 (ND)	ND
Nitrate (as NO ₃), mg/L	45	45	ND-32 (6.1)	ND-7.0 (3.9)
Odor threshold, units	None	(3)	ND-3 (ND)	ND-1 (ND)
pH, units	None	None	7.2-8.6 (7.9)	7.7-8.3 (7.9)
Selenium, ug/L	(50)	50	ND	ND
Sodium, mg/L	None	None	6.1-45 (26)	56-77 (67)
Sulfate, mg/L	None	(500)	13-140 (33)	140-200 (160)
Tetrachloroethylene (PCE), ug/L	0.06	5	ND-0.7 (ND)	ND
Total dissolved solids, mg/L	None	(1,000)	120-440 (210)	350-500 (420)
Total trihalomethanes, ug/L ⁽⁴⁾	None	80	ND-2.2 (1.6)	NA
Trichloropropane (1,2,3-TCP), ng/L ⁽²⁾	None	None	ND-6.0 (ND)	ND
Turbidity, NTU	None	(5)	ND-0.9 (ND)	ND-1.3 (0.4)
Uranium, pCi/L	0.43	20	ND-12 (3.2)	ND-12 (5.7)
Vanadium, ug/L ⁽²⁾	None	None	4.3-34 (12)	5.8-24 (13)

contaminants that affect health, along with monitoring and reporting requirements.

Secondary Drinking Water Standard — Based on aesthetics, these secondary maximum contaminant levels have monitoring and reporting requirements specified in regulations.

ug/L—Micrograms per liter (parts per billion).

umhos/cm — Micromhos per centimeter.

domestic water quality summary

Mecca, Bombay Beach, North Shore & Hot Mineral Spa <i>Range (Average)</i>	Desert Shores, Salton Sea Beach & Salton City <i>Range (Average)</i>	Valerie Jean <i>Range (Average)</i>	Thermal <i>Range (Average)</i>	Major Source(s)
ND	ND	ND-0.06 (ND)	ND	Erosion of natural deposits
7.6-36 (18)	ND	12-16 (13)	ND-4.5 (ND)	Erosion of natural deposits
ND	0.4	ND	ND	Erosion of natural deposits
8.7-9.4 (9.0)	200-220 (200)	8.6-10 (9.3)	8.8-14 (11)	Leaching from natural deposits
ND-0.5 (0.2)	0.2-0.7 (0.3)	0.1-1.1 (0.4)	0.2-0.5 (0.3)	Result of drinking water chlorination
ND	ND	12-17 (15)	22-23 (22)	Erosion of natural deposits
ND-6.7 (2.2)	ND	13-18 (16)	21-22 (22)	Erosion of natural deposits
ND	ND	ND	ND	Naturally occurring organic materials
ND [20/ 0]	0.23 [11/ 0]	ND [5/ 0]	ND [10/ 0]	Internal corrosion of household plumbing
ND	ND	ND	ND	Leaching from natural deposits
11	12	12	11-12 (12)	Natural balance of hydrogen, carbon and oxygen
NA	NA	NA	NA	Leaching of herbicide used on grasses and weeds
220-250 (230)	1,300-1,510 (1,380)	220-240 (220)	250-290 (270)	Substances that form ions when in water
0.9-1.1 (1.0)	0.4-1.8 (1.2)	0.8	0.6-0.7 (0.7)	Erosion of natural deposits
ND	ND-100 (ND)	ND	ND	Municipal and industrial waste discharges
ND-3.8 (ND)	ND-8.6 (3.1)	ND-4.2 (ND)	ND-9.6 (ND)	Erosion of natural deposits
14-22 (18)	160-220 (180)	8.9-11 (10)	34-47 (41)	Erosion of natural deposits
ND	ND-118 (ND)	ND	ND	Leaching from natural deposits
ND	6.2-7.3 (6.9)	ND-2.3 (ND)	ND-3.0 (ND)	Leaching of fertilizer, animal wastes or natural deposits
ND	ND-1.4 (ND)	ND	ND	Naturally occurring organic materials
8.1-9.0 (8.6)	7.4-8.0 (7.6)	8.6-9.0 (8.8)	7.8-8.2 (8.0)	Physical characteristic
ND	ND-9.9 (ND)	ND	ND	Erosion of natural deposits
38-46 (43)	200-240 (210)	46-47 (47)	35-40 (38)	Erosion of natural deposits
29-35 (32)	180-300 (220)	22	23-30 (27)	Leaching from natural deposits
ND	ND	ND	ND	Discharge from dry cleaners and auto shops
120-140 (130)	760-910 (820)	120-140 (130)	140-170 (160)	Leaching from natural deposits
NA	NA	NA	NA	By-product of drinking water chlorination
ND	ND	ND	ND	Leaching of solvents used for cleaning
ND	ND-1.4 (0.7)	ND-0.3 (0.2)	ND	Leaching from natural deposits
ND-2.6 (ND)	ND-5.2 (2.5)	ND-2.6 (ND)	3.0-3.1 (3.1)	Erosion of natural deposits
3.4-29 (12)	22-28 (24)	33-46 (40)	26-31 (29)	Erosion of natural deposits

⁽¹⁾ Includes the communities of Rancho Mirage, Thousand Palms, Palm Desert, Indian Wells, La Quinta and portions of Bermuda Dunes, Cathedral City and Riverside County.

⁽²⁾ Unregulated contaminants are those for which EPA and the California Department of Health Services have not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist both regulatory agencies in determining the

occurrence of unregulated contaminants in drinking water and whether future regulation is warranted.

⁽³⁾ Reported values are 90th percentile levels for samples collected from faucets in water user homes. No sample exceeded the regulatory action level.

⁽⁴⁾ The reported average represents the highest running annual average based on distribution system monitoring.



Budgeting for growth—
Human resources director Heidi Keeran and finance director Tom O'Reilly check to make sure funds and personnel are available to meet the water needs of a growing population in Coachella Valley.

(Continued from page 11.)

Thermal

This assessment was completed in December 2002. Water from wells serving this area is considered most vulnerable to activities not associated with any detected contaminants. These are airport maintenance and fueling areas, agricultural drainage, illegal activities/unauthorized dumping, low density septic systems and irrigation wells.

The two wells in this system draw from a confined aquifer where the thickness of confining sediments

is more than 170 feet. The drinking water served to these communities complies with all drinking water standards.

To receive a summary of the assessments or for additional water quality data or clarification, readers are encouraged to call the district's water quality specialist, Steve Bigley, at (760) 398-2651, extension 2286. Complete copies of these assessments may be viewed at Coachella Valley Water District, Highway 111 & Avenue 52, Coachella, CA 92236.

Farmers increase conservation efforts

Reputation alone was not enough to get local farmers through the dramatic reduction last year in the availability of Colorado River water. Many growers found themselves going back to school to learn more about a subject which they already knew a great deal—water-efficient irrigation.

The collapse in late 2002 of the negotiations associated with the Quantification Settlement Agreement (See related article), followed by unfavorable court rulings, left the federal Bureau of Reclamation with what its officials said was no choice but to reduce Coachella Valley Water District's order of imported water by 31 percent.

This was a cut of 109,000 acre-feet, and because it occurred in April, the percentage of lost water was higher than had the reductions started at the begin-

ning of the year.

CVWD acted immediately, restricting Colorado River water use to agricultural irrigation, arranging to purchase additional water by paying farmers to fallow land near Blythe, adding personnel, fine-tuning scheduling and adjusting rates and fees.

Additional measures were deemed necessary, however; among them the hiring of the Fresno-based irrigation and farming efficiency consulting firm, JMLord, Inc., to conduct classes, and on-site seminars and other services to assist local growers in improving how and when they watered their crops.

Coachella Valley's agricultural industry already has a well-deserved reputation for being among the most water efficient in the United States. A significant portion of local farmland features drip and other forms of

(Continued on page 16.)

Comparative condensed balance sheet

<i>Assets</i>	<i>June 30, 2002</i>	<i>June 30, 2003</i>
<i>Current assets</i>		
Cash in bank.....	\$ 3,316,251	\$ 6,942,030
Accounts receivable, inventory & prepaid expenses.....	13,929,574	13,036,292
	17,245,825	19,978,322
<i>Deposits & other assets</i>	3,198,345	3,053,099
<i>Property, plant & equipment</i>		
All American Canal & distribution system (participating equity).....	\$ 34,874,502	\$ 34,874,502
State Water Plan (participating equity).....	85,444,896	90,780,196
Land, facilities and equipment.....	668,345,308	700,594,786
	788,664,706	826,249,484
Less accumulated amortization & depreciation.....	(225,851,939)	(244,054,981)
	562,812,767	582,194,503
Construction work in progress.....	55,964,402	75,176,144
	618,777,169	657,370,647
<i>Investments & other long-term assets</i>		
Assets restricted for development & other purposes.....	\$ 266,179,548	\$ 303,327,306
Notes & contracts receivable unrestricted.....	4,006	5,678,267
	266,183,554	309,005,573
Total assets	\$905,404,893	\$989,407,641
<i>Liabilities & equities</i>		
<i>Current liabilities</i>		
Accounts payable.....	\$ 4,778,645	\$ 4,628,609
Customers' advances & deposits.....	14,540,926	18,804,926
Accrued salaries, interest, other expenses, & deferrals.....	4,707,762	4,690,714
	24,027,333	28,124,249
<i>Long-term liabilities</i>		
Notes payable.....	\$ 0	\$ 5,677,667
Water & sanitation systems acquired.....	1,867,816	1,677,988
Refunding agreements (construction costs advanced).....	96,610	88,401
State Water Plan.....	8,408,356	8,274,104
	10,372,782	15,718,160
Bonds payable and certificates of participation.....	36,365,000	32,435,000
	46,737,782	48,153,160
Total liabilities	\$ 70,765,115	\$ 76,277,409
Taxpayers' equity in assets*	\$834,639,778	\$913,130,232
Total liabilities and taxpayer equity	\$905,404,893	\$989,407,641

*Includes the taxpayers' equity in canal and irrigation distribution facilities, wells and reservoirs, treatment plants and stormwater facilities. This value includes facilities paid for by others and donated to the district. The value has been reduced by any outstanding debt (liabilities).

Condensed statement of revenues & expenditures

	Fiscal year ended June 30, 2003					
	Irrigation	Domestic	Sanitation	Stormwater	General	Total
<i>Revenues</i>						
Service charges.....	979,684	2,052,498	16,418,685	0	0	19,450,867
Availability charges.....	564,457	784,922	111,670	0	0	1,461,049
Taxes.....	688,072	100,144	4,341,715	6,505,405	11,777,980	23,413,316
Interest.....	201,122	1,834,392	1,322,365	543,245	715,977	4,617,101
Other revenues.....	562	74,313	674,644	843,880	12,088,279 ⁽¹⁾	13,681,678
Water sales.....	\$4,624,725	\$41,841,232	\$ 0	\$ 0	\$ 0	\$ 46,465,957
Total	\$7,058,622	\$46,687,501	\$22,869,079	\$7,892,530	\$24,582,236	\$109,089,968
<i>Expenditures</i>						
Operation & maintenance.....	\$3,739,618	\$24,240,688	\$ 9,721,699	\$ 965,130	\$ 0	\$ 38,667,135
Engineering, administration & general.....	4,063,497	12,558,601	5,004,482	5,011,967	19,296,070	45,934,617
Contract & bond payments.....	0	150,033	3,976,387	1,434,402	3,694,730	9,255,552
New construction.....	698,912	7,460,754	5,877,574	709	1,591,436	15,629,385
Reserves.....	(1,443,405)	2,277,425	(1,711,063)	480,322	0	(396,721)
Total	\$7,058,622	\$46,687,501	\$22,869,079	\$7,892,530	\$24,582,236	\$109,089,968

⁽¹⁾Most is groundwater replenishment assessment fees—well owners' proportionate shares of the cost of importing water to replenish the groundwater basin.

(Continued from page 14.)

micro irrigation. Such systems are much more efficient than traditional row irrigation, which floods the fields with water. Drip systems deliver water exactly where it is needed, and make the application of fertilizers and pesticides/herbicides more precise.

Underground systems also eliminate evaporation. Crop production increases significantly with drip and micro irrigation, too.

CVWD and JMLord personnel had worked together in the past to address a variety of issues, including careful examinations of irrigation practices in Coachella and Imperial counties.

Farmers responsible for at least 10,000 acres and perhaps as many as 25,000 acres signed up for the free classes, conducted during lunch hours and during late spring and summer to minimize lost work time.

CVWD paid JMLord a little more than \$500,000 for instruction and other consulting services. Temporary surcharges for agricultural water helped fund the cost of the seven-month program.

Instruction during the 20 classes (two in Spanish) included effective ways to identify soil types and the watering needs for specific crops based on this information and other factors. Certain soil types retain water longer, requiring less frequent irrigations.

In addition to saving water, benefits include increased disease and salinity control, savings through reduced fertilizer use and increased crop production.

Those who attended the classes and other sessions included farm owners, managers, irrigators and

other workers who might benefit from the information. More than 20 people attended each session. Certificates were awarded to 17 individuals who attended five or more sessions. Many CVWD employees also attended so they can be more effective when working with growers and others in the farming community.

Water savings were documented for 10,000 acres at 14 percent, 0.7 acre-feet per acre, for total savings of 7,000 acre-feet. But because the growers can apply what they learned to the 25,000 acres they are responsible for as owners, managers or workers, there is the potential for total savings of 17,500 acre-feet.

Conservation was among the three factors that led use of Colorado River water in Coachella Valley to drop to the lowest diversions since it began arriving through the 122-mile Coachella Canal in 1949.

In 2004 CVWD's board of directors approved the contract with JMLord for a 12-month period. There are plans for a course catalog, more presentations by expert guest speakers, increased focus on salinity control and more sophisticated field inspections and services.

Growers responsible for 80 percent of the land farmed in Coachella Valley, about 50,000 acres, are expected to participate.

There also will be water savings documentation, which enhances Coachella Valley's water rights.



Demonstrating conservation—Bob Keeran, center, CVWD multimedia specialist, stops at a bell pepper greenhouse in Coachella Valley with a lower Colorado River tour group sponsored by the Water Education Foundation. Many water leaders from throughout the world visit the district each year to see the water conservation techniques used here.

Maintaining the system—Workers have water down in this Coachella Canal section to repair a gate—where water is released into pipes serving the valley’s farmland.



Although Coachella Valley’s rights to Colorado River water were established in 1931 with the Seven

Water District of Southern California (MWD) and Imperial Irrigation District (IID).

Agreement gives secure Colorado River water supply

Party Agreement, there has been varying degrees of uncertainty about its availability during the seven decades since.

Only with the signing of the Quantification Settlement Agreement (QSA) in 2003 has the amount of Colorado River water to which the Coachella Valley is entitled been ensured.

The QSA quantifies Coachella Valley Water District’s annual allotment of this important source of water at 330,000 acre-feet. This is the yearly average of deliveries to CVWD between 1990 and 1999.

The Colorado River provides more than two-thirds of the water used by the Coachella Valley’s vibrant agricultural industry. In 2003 farmers produced \$550,737,410 worth of fruits, vegetables and other crops. This is an average of \$8,001 per acre.

While the annual entitlement is a guarantee previously unavailable, the allotment actually is a cap. There are, however, additional provisions in the QSA to ensure that CVWD gets its full entitlement, regardless of the water-use practices by other agencies in California that are recipients of Colorado River water.

Another condition of the QSA is that CVWD receives an additional 20,000 acre-feet of water, stemming from the 1988 agreement between Metropolitan

MWD is financing IID delivery system upgrades in exchange for as much as 106,000 acre-feet annually of conserved water that has been generated by these improvements.

The transfer of agricultural irrigation water to urban consumption is the backbone of efforts to limit California’s use of Colorado River water and a prime contributor to uncertainty locally about the availability of imported water.

There were genuine concerns that “conserved” water in actuality was water that rightfully belonged to CVWD water users, and that the Coachella Valley would be short-changed.

Previously established water rights by several Indian tribes and others will cause 3,000 acre-feet to be subtracted from CVWD’s annual entitlement. The water district’s diversions will be reduced by an additional 26,000 acre-feet within the next two or three years, depending upon when work has been completed on lining with concrete the still-earthen portions of the Coachella Canal.

This project will conserve water that previously was lost to seepage, so the net effect will be a break-even for the Coachella Valley. The canal lining means, however, that additional water will be available elsewhere in the state to help meet the urban needs of the San Diego County Water Authority, which serves a fast growing region, and to satisfy federal treaty agreements with several Indian tribes.

When Colorado River water first flowed into the Coachella Valley in 1949—the year construction on



Bringing life to the desert—The Coachella Branch of the All-American Canal carries Colorado River water to Coachella Valley farmland.

the 122-mile canal was completed—supplies were plentiful. Lower Basin states (California, Nevada and Arizona) were using only 55.6 percent of the 7.5 million acre-feet annually to which they legally were entitled—8.5 million acre-feet if the additional water was available.

The distribution of Colorado River water between Lower Basin and Upper Basin (Wyoming, Utah, Colorado and New Mexico) states was accomplished in 1922 with the Colorado River Compact. The Lower Basin states' entitlements were established in the 1928 Boulder Canyon Project Act, which also authorized construction of what later would be known as Hoover Dam and Lake Mead. The All-American Canal, of which the Coachella Canal is a branch, also was approved in this Congressional action.

In 1948 the Upper Basin states divided their 7.5 million acre-foot annual entitlement by percentage instead of volume.

While California in 1949 was using nearly 83 percent of its yearly 4.4 million acre-foot allotment, there was still a significant surplus, water available because Arizona (19 percent) and Nevada (1.5 percent) were not anywhere near to using their entitlements to 2.8 million acre-feet and 300,000 acre-feet, respectively.

The Seven Party accord went so far as to anticipate the need to distribute within California 962,000 acre-feet (perhaps more, any amount beyond that was assigned to agricultural use) of surplus water not used by the two other states.

Thus, when Coachella Valley was given an allotment of Colorado River water in the 1931 agreement, there was no mention of how much to which the area was entitled. At that time California had not used more than 3.1 million acre-feet in any given year. In 1931 all of Arizona used only 265,296 acre-feet, Nevada none; it wouldn't begin tapping into the river until 1942.

Seven decades ago there also was some uncertainty regarding which water agency was responsible for delivering this water, a dilemma that created a firestorm of controversy in the Coachella Valley; an issue that would not be resolved until three years later, with less than ideal results for the area.

Because of how the 1931 agreement was written, there always existed a possibility that part or all of Coachella Valley's supply of Colorado River water could be threatened by increased demand by other states or other California water agencies; or because of inefficient irrigation practices elsewhere.

The threat to local water rights intensified as water became a valuable commodity, with some water districts willing to pay millions of dollars to buy water from others, even though the laws governing this water clearly stated it wasn't theirs to sell. What couldn't be used "reasonably and beneficially" was, by law, supposed to stay in the river so the district or agency next in line had full access to its entitlement.

California began tapping into the Lower Basin's surplus in 1953, going so far as to use more than one million acre-feet in excess of its legal entitlement in 1974. Arizona, which sued California in a case that garnered it a favorable United States Supreme Court ruling in 1964, reached its full entitlement in 1997 and has exceeded it the past three years; as has Nevada. In 2002 Colorado River water consumption in the Lower Basin exceeded 8.6 million acre-feet

Mexico, meanwhile, has been legally entitled to 1.5 million acre-feet since it signed a treaty with the United States in 1944. As much as 15.5 million acre-feet has flowed "South of the Border," since any water not used in the United States ends up in Mexico.

The Upper Basin states (Colorado, New Mexico, Wyoming and Utah) still use well below the 7.5 million acre feet to which they are entitled, exceeding four million acre-feet for the first time in 2002.

Other Lower Basin states and the Upper Basin states joined together, however, to pressure the federal government to ensure that California live within its 4.4 million entitlement. There was growing concern that the surplus water it used legally would become a part of its permanent entitlement.

They were willing to give California 15 years to wean itself from the surplus, but only if agencies within the state adopted a plan to curtail water use by the end of 2002.

Efforts to develop such a plan evolved into the QSA, but the surplus was eliminated at the beginning of 2003 when a mutually-agreeable accord was not approved by all of the participating water agencies by Dec. 31.

Thus, decades-long concerns became a reality in 2003 when Coachella Valley's supply of Colorado River water was cut 31 percent. CVWD acted quickly, spending in excess of \$15 million to avert a crisis.

Many farmers decided to rely more on private well water, adding to the overdraft of the area's aquifer. Non-agricultural canal water users, including several golf courses and homeowners associations, had to

find alternative sources for irrigation water. As a result, diversions of Colorado River water were at their lowest since 1949.

Signing of the Quantification Settlement Agreement provided assurances never previously available. The QSA itself, however, does not guarantee that sufficient Colorado River water will be available to meet everyone's needs, only that when it is available, Coachella Valley gets its fair share of this water, regardless of the practices of other districts or agencies.

In mid-May 2004 Lake Mead, the largest man-made reservoir in the United States, was at 58 percent capacity; at 1,132.6 feet its lowest elevation since February 1968. The level of the lake behind Hoover Dam has been dropping since December 1997.

A distinctive "bathtub ring" at the receding shoreline of Lake Mead was a somber reminder of current conditions during ceremonies celebrating the signing of the QSA. Enthusiasm for the impact of the QSA locally remains high, however, because of assurances that Coachella Valley receives adequate water for at least 35 years, more likely 45.

Well field grows to serve growing population

In addition to ensuring high quality drinking water, the district's domestic water responsibilities include

New well added to system—From left, Mike Seems, domestic water superintendent for operations, and Javier Miranda, domestic water

making sure there's an adequate supply of emergency

superintendent for construction, check the plumbing during construction of a new district well.



storage and an efficient delivery system for the growing population.

The district served domestic water to an estimated 229,065 people in 2003, up from an estimated 219,793 in 2002. The population increase required a subsequent increase in wells from 87 to 103.

To increase the amount of water in storage, construction started last year on a long-awaited 10 million gallon, above ground water storage reservoir in La Quinta. The reservoir also will help improve fire protection and system pressure in the area.

Because the reservoir is located adjacent to a

peninsular bighorn sheep habitat area, construction had to be halted during the December to July lambing season. The \$3.8 million project is expected to be completed by the end of 2004. It is being constructed near the district's existing 5 million gallon reservoir in the city of La Quinta.

Beginning in 2004, most new wells will be equipped with emergency standby generators to assure the continued delivery of water in case of a massive power failure. The district also has several standby generators on trailers to move to areas where needed in case of large power outages.

Flood control activities include identifying areas

CVWD works with other agencies—and many community and business leaders—to ensure its constituents affordably receive the highest quality service.

Cooperative efforts are especially prevalent in stormwater protection. Flooding respects few if any boundaries, geographic or otherwise, so collaborations with other agencies and the community are beneficial, and often mandatory, for success.

Many benefits provided by stormwater go unnoticed except among those who receive them directly. Since serious storms are rare in Coachella Valley, this service often goes unnoticed until there is actual flooding. By then it is too late for planning, and without adequate protection the results are devastating.

Identifying through accurate mapping and other information an area's stormwater history helps establish the potential for flooding in the future, which

enhances CVWD's ability to construct protective facilities. These maps also enable property owners to obtain flood insurance at rates that accurately reflect the actual level of risk.

CVWD is working closely with other agencies and the community to improve the availability of these maps in two areas—Salton City and Oasis.

Salton City is included in the Federal Emergency Management Agency's (FEMA) update to its Flood Insurance Study and Flood Insurance Rate Map (FIRM) for Imperial County. CVWD is serving as a Cooperating Technical Partner with FEMA. The CTP, as it is known, seeks to ensure that objectives of participating

Spanish language weather reports to be available

In cooperation with the National Oceanic and Atmospheric Administration (NOAA) and National Weather Service (NWS), CVWD this summer will provide what will be the nation's second Spanish-language weather radio broadcast system.

The district already operates a full-service English broadcast weather radio system which reports weather forecasts, watches and warnings available to the public via telephone, internet and radio frequency 24 hours a day. However, district officials want to expand these services to benefit the large Spanish-speaking population that lives within CVWD's boundaries.

The Spanish broadcast system will operate on a dedicated NOAA radio frequency and originate from the NWS office in San Diego. It will broadcast the same forecasts, warnings and watches, which is expected to be especially helpful to Spanish speaking residents of Oasis and Mecca, where flooding is prominent during heavy rainfall. Hearing the information requires a special radio receiver or scanner capable of picking up the signal.

In conjunction with this project, the district's weather telephone hotline also will be available in Spanish. And, the district's web site will host a link to the NOAA's Spanish language weather web site. District personnel expected to have all three programs in place by July. In the Coachella Valley, August and September are typically two of the rainiest months of the year.

Under the agreement with the NWS, the district will purchase, install and maintain the radio system upgrades and additional microwave radio links. The board of directors allocated \$30,000 for the project.

Keeping channels clear—Constant maintenance is necessary to assure that drainage and flood waters flow smoothly to the Salton Sea.



agencies are compatible and that limited funding is utilized effectively.

In the Oasis area, where preliminary FEMA mapping is expected by next year, CVWD is pursuing funding through the Small Watershed Program, which is administered by the Natural Resource Conservation Service. Stormwater engineers are seeking to finance protection in an area where local funding is limited. Participation in a federal grant program continues. Meanwhile, a Spanish-language weather alert program for the area is being implemented (see separate story).

Progress also continues to be made in the Thousand Palms area, where more than 5,000 residents and 2,800 acres will benefit from regional stormwater protection. The project for this area also protects a 550-acre corridor to ensure a long-term supply of wind-blown sand for the Coachella Valley Preserve.

Initially, plans for Thousand Palms focused on a system of levees, but new designs also use flood

control channels to reduce the project's impact on the community since less property will be needed.

Completion on the design of flood control facilities for Thousand Palms is expected in 2004. CVWD is working with the Army Corps of Engineers on this \$30 million project, which has 65 percent federal funding and nearly a quarter of the expense covered by the state.

North Indio, north of Interstate 10, also has regional flood control concerns, stemming from the potential for stormwater to flow out of Thousand Palms Canyon. CVWD has initiated steps, including the hiring of a consultant to complete a Master Plan for the area to address the flooding potential.

In Mecca flooding concerns are more local in nature because of inadequate drainage. During a storm, water "pools" on the surface, creating flooding hazards. A master plan to address the problem also is in the works for the Mecca area.

Water audits help improve irrigation efficiency

Recently a homeowners association in Rancho Mirage asked to have its landscape irrigation audited to determine water efficiency. Although an area only slightly greater than three acres was involved, the group discovered it was losing nearly \$4,400 a year because its sprinkler system was inefficient.

Factors such as evaporation and spray loss are hard to control completely, especially in arid desert climates, so no sprinkler system is 100 percent efficient. Yet in Coachella Valley an efficiency of 75-85 percent is attainable. The amount of turf involved in this case should require about 83 inches of water. Instead, the association was using more than twice



Checking sprinkler efficiency—From left, Don Ackley, water management supervisor, and Robert White, golf course superintendent at Heritage Palms, measure water samples collected in a sprinkler test to determine if water is being evenly applied.

that amount—177.3 inches—resulting in efficiency of only 38 percent.

By repairing, improving and maintaining the sprinkler system, the organization’s annual bill of more than \$7,000 for irrigation could be reduced by nearly \$2,500. The association was provided with a 23-page report, outlining problems and remedies.

These audits are free, contracted out by Coachella Valley Water District to the Coachella Valley Resource Conservation District or, in a few instances, provided by CVWD staff. Participation is voluntary, and those who receive audits are under no obligation to enact the recommendations. Similar audits are provided to golf courses, where the savings can be even more significant, and local growers.

Audits of water use are effective ways to improve irrigation efficiency on local farms and golf courses. Those for homeowners’ groups and at golf courses deal primarily with the efficiency of sprinklers used to irrigate turf areas. Often, audits at farms focus on the efficiency of drip or other micro irrigation systems.

The goal of both, however, is the uniform delivery of water to ensure that the irrigation needs of the plants or grass are met without using more water than necessary. When a portion of crops or turf is not getting enough water, often there is a tendency to increase irrigation, making up the deficit while over watering everywhere else.

A wide variety of factors can negatively impact a farm irrigation system. Emitters in a drip system that become clogged with silt do not deliver the amount of water for which they are designed. Those damaged by gravel might deliver too much water. Water pressure might be too low for a particular system, or too high.

Or the grower may have a well-designed, properly maintained delivery system, but still waters too much by irrigating for too long a period of time. There are

environmental factors, too, such as salinity levels, soil type or weather conditions such as wind.

When an audit is conducted, the irrigation system is examined carefully and other factors such as soil types, crops grown, water use history and evapotranspiration (ET) are considered. The result is an audit that gives him a uniformity level “as measured.”

For a variety of reasons, for example, a farmer may have an irrigation system with only 75 percent uniformity. A reasonable objective is 90 percent uniformity. If a system is delivering the same amount of water uniformly to every location where irrigation is sought, it is much easier to reduce over watering.

In addition, a few water user-funded audits are conducted to ensure that farms located on certain types of soil are fulfilling their obligations to be eligible to receive canal water.

Farmland designated as Class 6, which predominately is gravel and sand, is deemed unacceptable for traditional flood (row) irrigation because water soaks through the soil too quickly. To have access to imported water, growers with Class 6 land who have a contract with CVWD to receive canal water must irrigate with drip, other micro irrigation or sprinklers.

These audits are conducted to ensure such systems are in use, at least partially in some cases, since farmers have different irrigation systems and different sources. A grower who has half of his land on drip irrigation and half on row is in compliance if at least half of his water comes from sources other than the Coachella Canal, such as private wells. There also are instances when a portion of a farm is within the boundaries of land eligible to receive canal water, but some acreage is outside of the area eligible for canal water. Again, the percentage of eligible land must match the percentage of land within the irrigation service area boundaries.

This past year there was a greater emphasis on these audits because CVWD's order of Colorado

River water was cut significantly. This ensured that canal water was going to land eligible to receive it.

Workshops, demonstration gardens aid conservation

Since its inception, thousands of people have benefited from CVWD's Landscape Workshop, held annually at The Living Desert.

Catered specifically for homeowners, the workshop varies each year and has included education sessions on topics such as choosing the right water-efficient plants, rockscape designs, how to convert your landscape, irrigation maintenance and more. Speakers have included CVWD employees, landscape designers and experts from College of the Desert and Living Desert.

For a nominal fee, participants walk away with valuable information and a copy of "Lush and Efficient Gardening in the Coachella Valley," a 160-page guide to desert landscaping and irrigation. Copies of the book are still available. (See document insert for details.)

As recent interest in the workshop has increased, so have the number of sessions. The district started by hosting one per year, but in 2000 hosted two sessions and in 2001 increased it to three sessions per year. Each session can accommodate about 100 people and is almost always sold out. Water users will be notified of upcoming workshops through a flier with their monthly bill.

Reducing the district's overall domestic water demand by at least 10 percent is among the long-term goals established by CVWD's 35-year Water Management Plan, which the board of directors approved in 2002. As an extension of that plan, in 2003, the board adopted a landscape model ordinance that called for

new and refurbished landscaping to feature vegetation that used 25 percent less water.

Because 70-80 percent of all domestic water use occurs outside of the home, the district considers water-efficient landscape a logical starting point for water conservation efforts. But hosting the workshop is just one way in which the district is helping its approximately 92,000 domestic water users conserve water. Other awareness and education efforts include newsletters, brochures, a public display at the Riverside County Fair and National Date Festival, a loan program—which is being revamped for future use—and demonstration gardens at the district's Coachella and Palm Desert offices.

The Coachella office demonstration garden celebrated a grand re-opening in March 2004. More than 100 people, including city and planning officials, attended the event to learn about the importance of desert landscaping in helping to conserve water and view examples of water-efficient plants first-hand.

The colorful garden features about 46 types of plants, labeled with placards for easy identification, as well as a cobble streambed and benches. Along with the demonstration garden at the Palm Desert office, the two will be important tools in educating the Coachella Valley on the benefits and beauty of water-efficient landscaping. Both are open to the public weekdays from 7:30 a.m. to 4:30 p.m.

The Coachella garden is dedicated to the memory of the late David Harbison, a 14-year CVWD employee who was renowned for his work in water management and water-efficient landscaping.

Water-efficient demonstration garden—From left, Dan Parks, assistant to the general manager; Dennis Mahr, communications and legislative director and Julia Fernandez, board secretary, check out the new demonstration garden at CVWD's Coachella office.



2003 farm production totals

Calendar year figures for Coachella Valley land irrigated with Colorado River water

Value of year's production \$550,737,410

Total acreage irrigated (includes double cropping) 68,834

Average gross value per acre \$8,001

Crop	Acreage	Yield in tons	Value per acre ¹	Total value
Fruit	30,934	221,773.9	\$7,330	\$226,741,828
Cantaloupes	781	7,403.9	2,641	2,062,721
Dates	6,926	28,673.6	10,901	75,497,694
Figs	126	239.4	2,975	374,845
Grapes (table)	11,270	68,747.0	8,046	90,677,293
Grapefruit	1,532	18,133.5	4,455	6,825,456
Honeydew melons	69	660.0	3,114	214,891
Lemons and limes	4,643	37,780.1	4,446	20,643,042
Mangos	54	102.6	2,975	160,648
Olives	94	178.6	2,975	279,647
Oranges and tangerines	3,534	24,692.1	3,847	13,595,447
Peaches	45	110.3	2,296	103,335
Tomatoes	354	5,161.3	8,194	2,900,662
Strawberries	418	189.1	15,430	6,449,845
Watermelons	1,088	29,702.4	6,394	6,956,302
Vegetables	23,735	313,188.7	\$7,858	\$186,507,969
Artichokes	736	5,025.0	5,732	4,219,024
Asparagus	10	15.3	4,080	40,799
Bell peppers	3,800	71,949.2	12,572	47,774,269
Bok choy	152	1,234.7	5,150	782,797
Broccoli	2,195	13,749.5	5,024	11,027,083
Cabbage	67	916.2	2,565	171,884
Carrots	1,845	46,923.0	5,778	10,660,897
Cauliflower	836	7,975.4	7,735	6,466,487
Celery	375	13,742.4	8,971	3,364,149
Chili peppers	41	344.6	3,782	155,072
Corn (sweet)	2,267	16,594.4	2,216	5,024,796
Cucumbers	59	479.2	5,150	303,849
Eggplant	284	2,984.8	8,713	2,474,432
Green beans	1,204	6,138.6	5,799	6,982,037
Lettuce	4,516	52,850.7	11,160	50,398,473
Okra	359	2,821.7	7,860	2,821,740
Onions (dry)	455	11,864.1	6,404	2,913,829
Oriental vegetables	902	13,466.9	10,030	9,047,037
Parsley	79	641.7	5,150	406,849
Potatoes	891	11,805.8	4,375	3,898,259
Radishes	383	3,111.1	5,150	1,972,443
Spices	861	6,993.9	5,150	4,434,135
Spinach	1,138	18,795.8	8,724	9,927,929
Squash	280	2,764.7	4,428	1,239,700
Forage	3,520	18,117.2	\$515	\$1,812,687
Alfalfa hay	1,719	15,127.2	807	1,387,921
Sudan hay	325	1,495.0	373	121,095
Pasture (irrigated)	1,175	13,277.5 animal units/ month	122	143,397
Wheat	301	1,495.0	532	160,274
Nuts	24	45.5	\$2,969	\$71,248
Pecans	24	45.5	\$2,969	\$71,248
Nursery	1,117	—	\$21,860	\$24,417,129
Fish Farms	1,288	3,979.9	\$13,163	\$16,954,459
Golf Courses	6,020	—	\$11,469	\$69,045,421
Polo Fields	421	—	\$11,469	\$4,828,592
Turf Grass	1,775	190,102.5	\$11,469	\$20,358,077

¹Rounded off to the nearest dollar.



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