



# NEW WADDELL DAM





## History

In the early 1900s, the seven states that share the Colorado River Basin – Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming – negotiated for shares of its water. As a result, the Colorado River is shared by seven states and Mexico. Both the Upper Basin (Colorado, New Mexico, Utah and Wyoming) and the Lower Basin (Arizona, California and Nevada) have an annual allocation of 7.5 million acre-feet (MAF) and an additional 1.5 MAF in annual flows is made available to the Republic of Mexico. One acre-foot is approximately 326,000 gallons and equates to a yearly supply for three Arizona families.

In 1968, President Lyndon B. Johnson signed the Colorado River Basin Project Act, which authorized construction of Central Arizona Project (CAP) by the U.S. Department of the Interior's Bureau of Reclamation. The system would provide a way for Arizona to fully use its 2.8 MAF allotment through the delivery of Colorado River to the most populous areas of the state. In 1971, the Central Arizona Water Conservation District (CAWCD) was created to provide Arizona with a means to repay the federal government for the reimbursable costs of construction and to manage and operate the physical system. CAWCD, commonly referred to as CAP, supplies Colorado River water to central and southern Arizona, and delivers more tribal water than any other organization in the United States.

## The CAP System

Construction of the CAP system began at Lake Havasu in 1973 and was completed 20 years later south of Tucson at a cost of more than \$4 billion. The canal stretches 336 miles, lifts the water approximately 3,000 feet in elevation over the course of the system and includes 14 pumping plants, one hydroelectric pump/generating plant at New Waddell Dam, Lake Pleasant storage reservoir, 39 radial gate structures to control the flow of water and more than 50 turnouts to deliver water.



# Managing and Delivering Colorado River Water

CAP is governed by a 15-member popularly elected Board of Directors. CAWCD Board members are elected from Maricopa (10), Pima (4), and Pinal (1) counties, serving staggered six-year terms. The Board regularly meets twice per month and adheres to all open meeting laws.

CAP's daily operations are managed by nearly 500 professionals who are responsible for system maintenance and operations, repayment obligations, public outreach, and water resource management programs.



## Quality of Life

Few natural resources are as precious as water, and by CAP providing Colorado River water, the Arizona economy is stronger, and residents enjoy a higher quality of life.



Waddell Dam (original)



New Waddell Dam



## Lake Pleasant: A Lake With Two Purposes

Lake Pleasant has a surface area of approximately 15.5 square miles and is a great recreational spot that is visited by more than 1 million people each year. However, its primary purpose is to store Colorado River water for Central Arizona Project (CAP), providing flexibility to balance Colorado River water supply diversions and water user deliveries, and maintaining the CAP system and energy costs.

### NEW WADDELL DAM AND LAKE PLEASANT

When the original dam was completed in 1927, it was the world's largest concrete, multiple-arch dam and its purpose was to store Agua Fria River water that was used to irrigate desert land in the Maricopa Water District's service area. In 1984, federal legislation associated with CAP authorized construction of New Waddell Dam and expansion of Lake Pleasant. Maricopa Water District retained rights to store Agua Fria River water in Lake Pleasant up to the capacity of the original system and maintained operation of its water diversion facilities at Hank Raymond Lake, located just south of Lake Pleasant. In addition, it acquired 225 acres of land on the southeastern shore of Lake Pleasant.

Construction of the \$625 million New Waddell Dam started in 1985 and was completed in 1992. It is a zoned earthfill dam with a structural height of 440 feet, crest length of 4,700 feet and top width of 35 feet. It was constructed with an impervious core, internal filter and drainage zones, and hardened with a shell of gravel cobblefill.

Today, the dam is critical to the CAP system. It stores Colorado River water and runoff from the Agua Fria River and provides hydroelectric generation, flood protection and increased recreational opportunities at Lake Pleasant.

The original Waddell Dam wasn't destroyed. In fact, it is located approximately a half mile upstream from the new dam and is beneath the water surface of Lake Pleasant most of the year.

Lake Pleasant is one of the most prominent and popular features of the CAP system, and with an operational storage capacity of 811,784 AF, it can hold approximately five times the amount of water it held before New Waddell Dam was constructed. Its size and location provide critical system reliability for CAP and its water users.

To connect Lake Pleasant with the main CAP canal, Waddell Canal was constructed. It intersects the CAP canal near the Arizona State Route 303 and extends 4.9 miles north to Lake Pleasant. Water in

this small section of canal can flow both ways, depending on if CAP Operations is filling the lake or discharging from the lake. Waddell Canal is slightly sloped towards Lake Pleasant to allow for gravity flow before being pumped into the lake.

To help manage power costs, water is pumped into the lake during the spring and winter when water demand and power costs are lower. In the summer, when water demand and power costs are higher, water is released for downstream deliveries. This release through Waddell Pump/Generating Plant generates up to 42 megawatts, enough electricity to provide energy to more than 2,500 residential homes. This operation of Lake Pleasant causes the water level in the reservoir to rise and fall an average of 65 feet per year.

This operational strategy also allows for preventive maintenance on the west end of the CAP system between Lake Havasu and Lake Pleasant without any service interruption.

Without New Waddell Dam and Lake Pleasant, CAP would be restricted to importing Colorado River water into the state only when there was demand for the water, severely limiting CAP's ability to manage its energy resources and dramatically increasing the cost of CAP water.

# Water Quality Testing

Lake Pleasant is CAP's storage reservoir. CAP takes frequent water samples, collecting and analyzing them for general water chemistry, including basic analytes (e.g. conductivity, pH, dissolved oxygen), nutrients, metals, and various inorganic compounds (minerals). More comprehensive analyses are performed less frequently, as the samples are screened for more than 250 pollutants (e.g. pesticides, PCBs, VOCs, and PFAS). CAP also monitors thermal stratification by measuring water quality at multiple depths (i.e. vertical profiling) throughout the lake. Chlorophyll concentrations are included in the vertical profiles and serve as a key indicator of primary productivity and potential algal blooms that could lead to taste and odor issues in the canal. Municipalities treat all CAP water, including water from Lake Pleasant, before providing it for residential use to ensure that it meets all drinking water standards.



## FOR MORE INFORMATION

CAP has created a portal with maps and data related to water quality for water users. Visit the AquaPortal at [aquaportal.cap-az.com](http://aquaportal.cap-az.com).

## Lake Pleasant: The Recreational Destination

Although CAP stores water in Lake Pleasant, the land is owned by the Bureau of Reclamation and the recreational opportunities are managed by Maricopa County Parks and Recreation Department (MCPRD) and the Maricopa Water District including camping, boating, fishing, swimming, hiking, picnicking and wildlife viewing.

Lake Pleasant Regional Park, operated by MCPRD, has ten- and four-lane boat ramps where park visitors may launch their watercraft. Individuals looking to dock their boats on the western shoreline of the lake may also do so at the Scorpion Bay Marina, which includes a floating restaurant, convenience store and watercraft rentals. The park offers more than 140 developed and semi-developed campsites for RV and tent camping in the Desert Tortoise and Roadrunner campgrounds, and three group campgrounds with showers, restrooms and ramadas. There are 14 primitive campsites available in the Primitive Dirt Spillway Campground with access to shoreline for visitors seeking a more rustic experience. Primitive campsites do not have facilities within the campground but offer an outhouse and dumpster.

The Desert Outdoor Center, located on the eastern side of Lake Pleasant and operated by MCPRD, is an ideal setting for environmental education field

trips, and includes classrooms, a science lab, open-air amphitheater and more than 30 ranger-led programs ranging from natural history to desert survival to alternative energy. The 26,000-square foot facility also provides a beautiful backdrop for weddings, retreats and other group functions. Note that the center is available by reservation only.

There also is an interpretative trail that includes information about the New Waddell Dam and CAP operations, although it is also only open upon reservation for special events.

To verify the center is open, be sure to call MCPRD at (602) 372-7470 or [visitmaricopacountyparks.net](http://visitmaricopacountyparks.net).

Pleasant Harbor, managed by the Maricopa Water District, is located on the southeastern shore of Lake Pleasant and is open to the public 365 days a year. The full-service marina features Dillon's Restaurant, boat and slip rentals, as well as jet ski, kayak, paddle boards, pontoon, and sailboat rentals. Pleasant Harbor includes H2-Whoa!, the world's largest floating water slide and is home to The Phoenix, a 150-passenger boat cruise providing daily tours of Lake Pleasant. Pleasant Harbor RV Resort includes 253 full hookup sites, 60 partial hookup sites and unlimited dry camping with amenities including 24-hour security, club house, pool and spa, bocce ball, basketball, shuffleboard, horseshoes, laundry facilities, showers, convenience store, free Wi-Fi, and picnic grounds. For more information about Pleasant Harbor RV Resort and Marina, visit [pleasantharbor.com](http://pleasantharbor.com) or call the Pleasant Harbor RV Resort at 623-235-6140 or the Pleasant Harbor Marina at 623-235-6130.





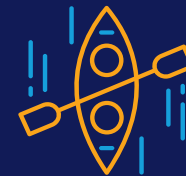
## NEW WADDELL DAM

**TYPE** // Zoned earthfill  
**HEIGHT** // 440 ft above streambed  
**CREST ELEVATION/LENGTH** // 1,728 ft/4,700 ft  
**VOLUME** // 16,200,000 cubic yds of material



## WADDELL PUMP / GENERATING PLANT

**STARTED OPERATIONS** // December 7, 1992  
**TOTAL NUMBER OF UNITS** // 8  
**TOTAL NUMBER OF PUMPS** // 4 variable speed pumps  
**NUMBER OF PUMP/GENERATORS** // 4 units  
**PUMPING CAPACITY** // 3,000 cubic ft per second  
**MAXIMUM POWER GENERATION** // 42 megawatts  
**MAXIMUM LIFT TO LAKE** // 185 feet



## LAKE PLEASANT

**MAXIMUM OPERATING STORAGE CAPACITY** // 811,784 acre-feet  
**MAXIMUM OPERATING SURFACE ELEVATION** // 1,702 feet  
**MAXIMUM OPERATING SURFACE ACRES** // 9,957 acres

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[CentralArizonaProject.com](http://CentralArizonaProject.com)

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