The California Water-Management System: Acting on the Future

by Patrick Ruckert

The articles in this section are adapted from a class series and report by the author, in Los Angeles, Summer 2013.

Sept. 19—From 1935 to 1973, one of the most complex water and land systems envisioned by man was accomplished in California. Today, the interconnected California water-management system provides water to more than 30 million people, and irrigates over 9 million acres of farmland. As an hydraulic unit, the California Water System is the world's largest and most complex public works project ever built, to be outranked only when China completes its giant South-to-North Water Diversion plan. In fact, California has been called, "the most hydrologically altered landmass on the planet" (**Figure 1**).

FIGURE 1
Major Projects of the California Water Management System

The comprehensive water system in California was built during the years when, nationally, the commitment was to upshift to nuclear power as the new mode of energy for modern economic actitivity. The Atoms for Peace efforts were furthering research and applications of the new atomic science to all areas of life, from medicine and plant-breeding, to metal-working and construction. The scientific commitment of the Atoms for Peace program was seen as the basis for a foreign policy of peace and mutual betterment among nations.

The principal figures leading the construction of the California water program were explicitly committed to this viewpoint—President Franklin Delano Roosevelt, California Gov. Edmund G. "Pat" Brown, and Presi-

dent John F. Kennedy (see box, "The Way We Used To Think").

Moreover, the California hydrological engineers in the 1950s foresaw that, despite their provision of upgraded water supplies from the state program, by 2000, still more water would be required in the state and the dry lands of the West. Their vision initiated what became the 1964 proposal by the California-based Parsons Company for NAWAPA—the North American Water and Power Alliance.

Their vantage point was *to act on the future*. In support of what we must do today, with the "Nuclear NAWAPA XXI: Gateway to the Fusion Economy," we here provide a short review of the main components of the California water system.

But first, consider the precursors to the build-out of the statewide system, and keep in mind the character of the nation-serving institutions involved in the process.

The story begins over 100 years ago, when the Federal Government, ironically, under environmentalist President Theodore Roosevelt, created the U.S. Reclamation Bureau, renamed the Bureau of Reclamation in 1925. The sole task of the Bureau was to build irrigation and hydroelectric projects in the West. That it did. Even though the last of the projects of the Bureau was authorized in the 1960s, its projects today provide water to about one-third of the entire U.S. population.

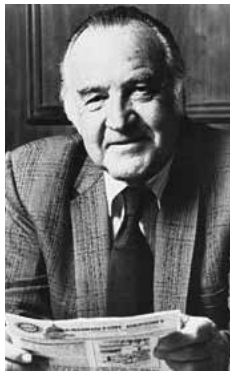
The California water-management system was *built by government*—elements of it by the Bureau of Reclamation, the State of California, and the City of Los Angeles. It was built by leaders who could see the future, and what that future required of them. The system was essentially completed in 1973, and there has been only one major project built since, despite the state's population having increased by more than 15 million. Of note, is that both FDR and Brown knew, and said, that the completion of the projects would be the time to begin planning the next ones.

They embodied the spirit expressed in a speech President Kennedy gave on Aug. 17, 1962, inaugurating a water project in Pueblo, Colo. "Every Member of Congress," he said, "everyone in the Executive branch from the President on, in the field of national resources, has to plan during their period of administration or office, for the next generation, because no project that we plan today will be beneficial to us.

The Way We Used To Think

President Franklin D. Roosevelt

From the 1930s through the early 1970s, using American System methods, President Franklin D. Roosevelt (in office 1933-45) and California Gov. Edmund G. "Pat" Brown (in office 1959-67), built California's amazing water-management system. It was a near 40-year building program, centered on great water projects, begun in 1935 by FDR, and completed in 1972. These projects contributed to the economic platform which transformed California from a relative backwater of the nation, into the seventh-largest economy in the world, and a powerhouse of scientific and technological progress for humanity.



Gov. Edmund G. "Pat" Brown

On Aug. 18, 1962, President Kennedy joined Governor Brown at the groundbreaking ceremony for the construction of the San Luis Dam. In his remarks, in addition to addressing the necessity of water conveyance, Kennedy raised the concept of desalination, for which he backed large-scale nuclear power usage. "We must step up our program to convert cheap fresh water from salt water. There is no scientific breakthrough, including the trip to the Moon, that will mean more to the country which first is able to bring fresh water from salt water at a competitive rate."[1]—*Patrick Ruckert*

1. See larouchepac.com for six speeches by Kennedy in 1962-63, inaugurating water projects in the West.

FIGURE 2
The Los Angeles Aqueduct

Anything we begin today is for those who come after us. And just as those who began something years ago make it possible for us to be here, I hope we'll fulfill our responsibility to the next generation that's going to follow us."

The next day, Kennedy was in California, inaugurating the construction of the San Luis Dam in the San Joaquin Valley.

The California System

The California system includes 1,200 major dams, the two biggest irrigation projects in the world, the longest aqueduct in the world, and more than 1,000 reservoirs, including some of the largest in the country.

There are six main projects of dams, aqueducts, and associated infrastructure that gather, transport, and distribute water in California. While they are separate projects, they are an interconnected whole—a statewide system.

They are: the Los Angeles Aqueduct, the Central Valley Project, the State Water Project, the Colorado River Projects, the Tuolumne River/Hetch Hetchy system, and the Mokelumne Aqueduct.

For Southern California, 90% of its water supply comes from three of these projects, hundreds of miles away: the Los Angeles Aqueduct, the Colorado River Aqueduct, and the State Water Project.

I will cover four of these projects in this article: the Los Angeles Aqueduct, the Central Valley Project, the State Water Project, and the Colorado River Projects.

1. The Los Angeles Aqueduct. The only one of the major water projects in the state not built by FDR or Pat Brown is the Los Angeles Aqueduct (**Figure 2**), which was built by the City of Los Angeles, with construction completed in 1913, and expanded in 1970. When completed, it was called the "greatest engineering project in the world." The project was initiated and supervised by William Mulholland, the head of the L.A. Department of Water and Power (see box).

The aqueduct carries water 233 miles from the

The Los Angeles Aqueduct: 100th Anniversary

Crowds watch as the gates are opened and the Los Angeles Aqueduct water begins to flow down into the San Fernando Valley, Nov. 5, 1913.

One hundred years ago, on Nov. 5, 1913, the first water flowed into Los Angeles from the new aqueduct. A celebration was held near Sylmar, where crowds gathered to watch as the channel gates were opened and the water started to flow down into the San Fernando Valley.

The Los Angeles Aqueduct is the first of the major water projects built in California. It is the only one of those projects in the state not built by Franklin Roosevelt or Gov. Pat Brown. Construction began in 1906 and was completed in 1913. Led by William Mulholland, the head of the Los Angeles Department of Water and Power, the City of Los Angeles built what was called at the time, the greatest engineering project in the World.

The aqueduct carries water 233 miles from the Owens Valley, and 338 miles from the Mono Lake Basin, by gravity, to the City of Los Angeles. In 1970, a parallel aqueduct was completed, which added another 50% capacity to the system. The two aqueducts deliver an average of 430 million gallons a day to the city. That is about 400,000 acre feet of water per year.—*Pat Ruckert*

Owens Valley, and 338 miles from the Mono Lake Basin, by gravity—no pumping—to the city of Los Angeles. The two aqueducts deliver an average of 430 million gallons a day to the city. That is about 400,000 acre feet per year (AFY).

2. The Central Valley Project. The state initiated the project in 1933, and the Federal Government, at the state's request, took it over and built it beginning in 1935. At President Roosevelt's insistence, the project required that all hydroelectric power generated by the project would be owned by the government. That is, *public not private power*, which was a major fighting issue in the 1920s and 1930s.

The Central Valley Project provides water to 3.1 million people and irrigates over 3 million acres in the San Joaquin Valley, by delivering over 7 million acre feet per year (MAFY).

The project consists of more than 40 dams and reservoirs, 25 canals that cover more than 2,000 miles, and 28 hydroelectric plants. The main elements of the project were completed in 1951 (**Figure 3**).

The project begins in the north Sierra Mountains, with dams and reservoirs on the Sacramento River and its tributaries. A principal installation is the Shasta Dam and Reservoir. Construction started on this in 1937; it was completed in 1945, 26 weeks ahead of schedule, despite the war mobilization at the same time. At the time of completion, it ranked as second-tallest dam in the United States, after the Hoover Dam.[1]

The water then flows to the Delta—the large confluence area of the Sacramento and San Joaquin rivers—and thence seaward through the San Francisco Bay.

From the Delta, the water is then pumped into the Delta-Mendota Canal and travels south to the San Luis Reservoir, from which it is distributed by canals and pipelines to the various irrigation districts in the San Joaquin Valley.

1. The crucial role of Lake Shasta is discussed in a box in the previous article, "The California Distribution System."

The Central Valley Project: The Delta

Below: The Shasta Dam and Reservoir: Construction began in 1937, and was completed in 1945—26 weeks ahead of schedule, despite the war effort. At the time of completion, it ranked as second-tallest in the United States, after the Hoover Dam.

There are several more systems of dams, reservoirs, and canals in the Central Valley Project.

3. The State Water Project. This is the largest state-built project in the country; in fact it is the largest single public works project in the world. The project is the particular accomplishment of Gov. Pat Brown, who, unlike his son Jerry, was an FDR Democrat, committed to progress, which he defined as providing the infrastructure that future generations would require.

Construction of the project began in 1961, and was completed in 1972.

The system consists of 22 dams, 34 lakes and reservoirs, 20 pumping plants, 5 hydroelectric power plants, and more than 700 miles of canals and pipelines, including the 444-mile-long California Aqueduct—the longest in the world—and the Oroville Dam, at 770 feet, the highest in the nation.

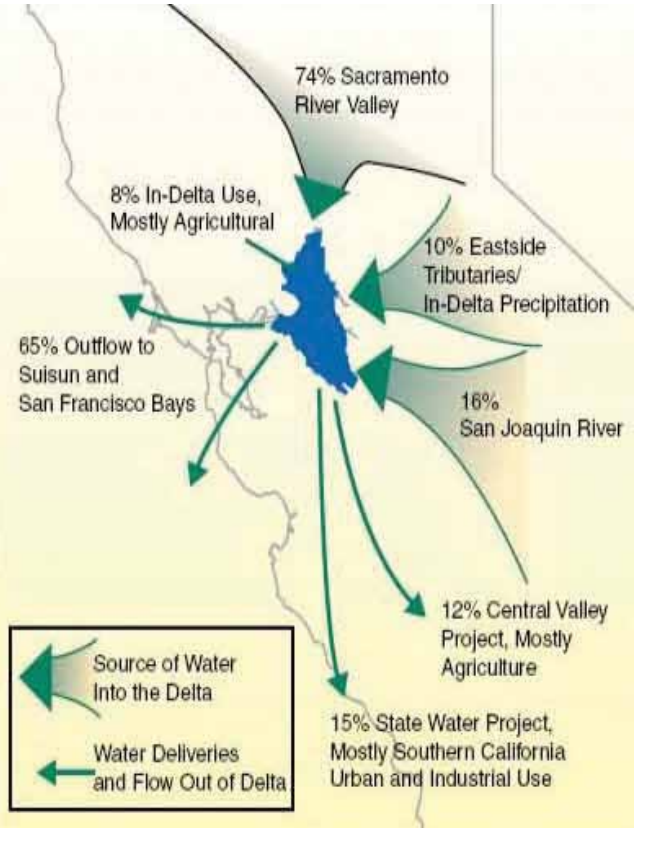
The California Aqueduct carries water from north of Redding, from dams on the Feather River, to the Sacramento River, to the Delta, through the San Joaquin Valley, over the Tehachapi Mountains, to Los Angeles and Riverside in Southern California. On the average, the State Water Project delivers 2.3 MAFY. It provides water for 23 million people, and irrigates 755,000 acres of land.

For Southern California, this system pours enough water into the Los Angeles area to be able to fill the Rose Bowl every hour and a half.

The project's hydroelectric plants produce enough electricity to supply the power for all the pumping re-

FIGURE 3

Schematic of Water Flow in the Delta



Creative Commons/lkluft

An aerial photo of the California Aqueduct and the Central Valley Aqueduct running side by side through the San Joaquin Valley.

quirements for lifting the water the 3,000 feet that the system requires, including the 2,000 feet over the Tehachapis.

4. The Colorado River Management System. The System provides 4.4 MAFY to California, and is the only one of the six major projects in California that also involves other states. Wyoming, Nevada, Utah, Colorado, New Mexico and Arizona, plus the nation of Mexico, share allocated portions of the river's water.

The heart of the Colorado River flow-control system is the Hoover Dam, completed in 1935, after FDR sped up its construction by the allocation of additional funds through the Reconstruction Finance Corporation. At the time it was the largest dam in the world.

There are two main components of the Colorado Management System serving southern California: the Colorado River Aqueduct and the All-American Canal.

The Colorado River Aqueduct. 155 miles south of the Hoover Dam is Parker Dam, built by the Bureau of Reclamation, and Lake Havasu, which is the starting point for the Colorado River Aqueduct. Work began on the aqueduct in 1933, and the first water flowed through it in 1939. During the 1930s Depression, the aqueduct was the largest public-works project in the state, with 10,000 men working at one time.

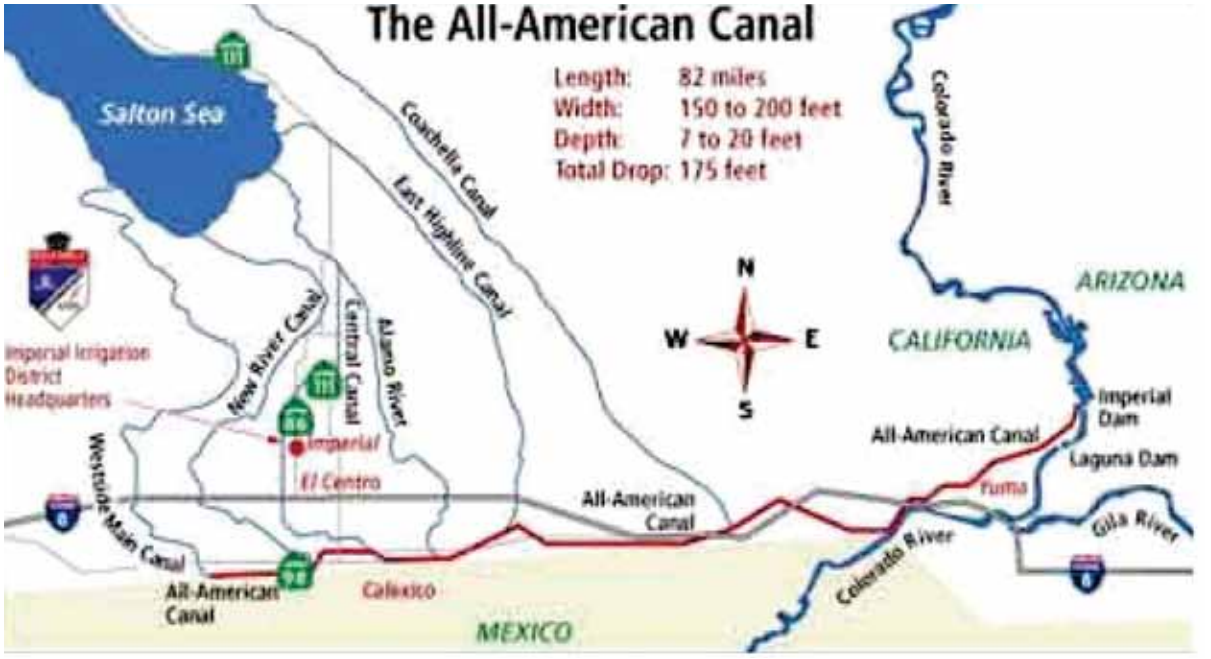
This aqueduct transports 1.2 MAFY of water from Lake Havasu 242 miles away. That is 1 billion gallons per day. It has 2 reservoirs, 5 pumping plants, 63 miles of canals, 92 miles of tunnels, and 84 miles of conduits and siphons. It delivers an average of 1.7 billion gallons of water per day to a 5,200-square-mile service area encompassing 26 cities and water districts, and nearly 19 million people in Southern California.

In 1955, the aqueduct was recognized by the American Society of Civil Engineers as one of the Seven Engineering Wonders of American Engineering.

The All-American Canal. The Canal is an 80-mile-long aqueduct which conveys 3.1 MAFY of water from the Colorado River into the Imperial Valley and to nine cities. It is the Valley's only water source, which has turned a desert into one of the most productive agricultural areas of the world. It begins at the Imperial Dam on the Colorado River, and irrigates 630,000 acres (**Figure 4**). Built by the Bureau of Reclamation and funded by

The Colorado River Aqueduct

FIGURE 4



FDR's Public Works Administration, construction began in the 1930s and was completed in 1942.

The Future

Forty years ago, California was the most productive economy in the world. That productivity relied on the economic platform mainly built over the prior 40-year period, beginning in the 1930s. As the major water projects were being built, millions of people were moving to California, which was seen as the land of opportunity and production. In the World War II years, Los Angeles became the second-most-industrialized city in the country. California became a center for the auto, steel, rubber, and aerospace industries. In those same years, in California, machine-tool production increased by 1,000%. The higher education system of the state was vastly expanded to produce the trained and skilled workers who were employed in industrial production. And any state resident could go to college for just a few dollars a year.

Today that is all gone. The last 40 years of increasing deregulation, environmentalism, and the insane idea that "government is the problem," have produced the disaster the state and the nation are in today. California relies for its tax base on a shrinking productive work force at low-wage jobs. Why does the state have a perpetual budget crisis, despite cutting $102 billion from the state budget since 2002? One reason is that between 2000 and 2009, the state lost 471,000 manufacturing jobs.

This can all be reversed, by "returning to the future." Beyond the specifics of the story and scope of the California Water Management System, is the point that it represents the American System at work. This is the system that those who, then, lived "in the future," used their imagination to create, in their minds, that which did not exist before. They then went to work and made that creation of their minds a reality.

Or, as Lyndon LaRouche stressed this Summer, "You only know truth by the imagination. But you have to know what the imagination should be: It's creativity. You make something that had not yet existed! You make it in the imagination. You then demonstrate that what you made in the imagination is the real thing."

There is no short-term solution to the present severe water crisis in California. There are actions that can alleviate it somewhat, like crushing the environmentalist menace, but the crisis will only be truly solved by a full return to the principles of the American System. That begins with the removal of Obama from the Presidency, and the reinstatement of the Glass-Steagall banking law. Then, like President Franklin D. Roosevelt and Gov. Pat Brown did in their time, we, in our time, can rebuild the country, and the world with projects like the Nuclear NAWAPA XXI.

patruckert@hotmail.com