THE SOLANO WATER STORY

A History of the
Solano Irrigation District
and the Solano Project

Solano Irrigation District
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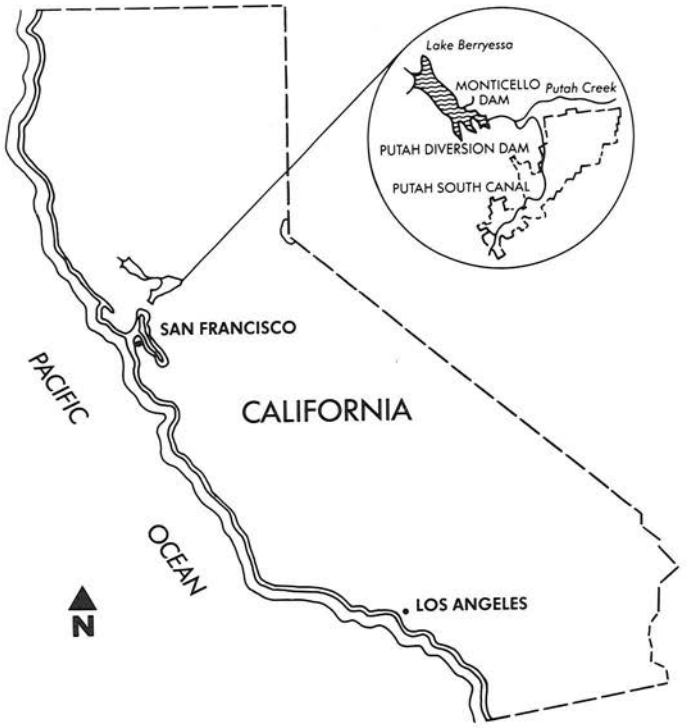
C O N T E N T S

Location Of Solano Project



General Location of the Solano Project

In February, 1988 the Solano Irrigation District reached its benchmark 40th anniversary. This book commemorates that event and the years leading up to it.

It preserves an important piece of California history that will help future generations understand how the essentially arid Central Valley became an agricultural cornucopia for the rest of the nation.

The story of water in Solano County is the story of the Solano Project, the Solano Irrigation District, the Solano Water Council, the Solano County Flood Control and Water Conservation District and its member units, and the people behind all the agencies involved. Against formidable odds, they prevailed.

The Solano Irrigation District salutes the hundreds of individuals who made the Solano Project a reality and regrets that there isn't enough space between these covers for detailed acknowledgments.

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P R E F A C E

This book is about courage — the courage to work for a vision of the future, and to carry that vision through to completion. Solano County would be a very different place today if it were not for those whose stories are told in this book.

The result of their efforts, the Monticello Dam, is an extraordinary achievement — especially in this state where great amounts of money and power are expended to move water across vast distances.

Monticello is unique in California for keeping a large water supply so close to its end users. As a federally-sponsored "local" dam, Monticello was a political coup for Solano County.

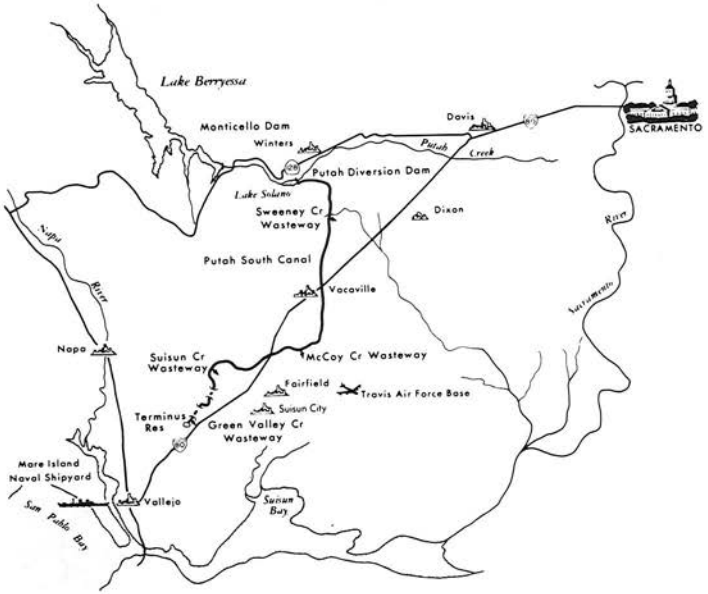
But we can no longer afford to take the Solano Project for granted. Despite Southern California's growing thirst, ours is the only major water project that remains independent, functioning outside the orbit of either the Central Valley Project or the State Water Project.

To fully appreciate the Solano Project, consider it in the context of California's extensive water system.

The Central Valley Project (built by the Bureau of Reclamation) and the State Water Project (built by the State of California) are the world's two largest irrigation projects. They have transformed the naturally arid Central Valley into our nation's leading agricultural area.

The Central Valley Project and State Water Project networks contain 42 reservoirs, 14 major canals, and 31 pumping stations that collect, store, and transport water southward from the Delta. About one-quarter of the state's land area and two-thirds of its population are served by the 76 water agencies which get their water from these systems. water from these systems.

Northern Californians fear that too much exportation of north state waters will have disastrous side effects. Herein lies the essence of the tension between Northern and South-



The Solano Project

ern California: moving water from where it is to where it isn't.

Solano County fortunately is removed from the fray — at least directly. But as this book details, this was not a mere coincidence. It was due to the foresight and dedication of a number of people.

Now that the era of big federal public water projects has passed, more courage will be needed. We must conserve more of our water resources — reducing consumption and reusing what we have. We must fight against the contamination of our water supplies and protect our irreplaceable Delta and marshlands.

We are nearing the time when Solano County may assume a greater responsibility for the Project which serves it so well. I hope the story told here will inspire the Solano community and help prepare it to maintain Monticello for future generations of citizens.

Vic Fazio
Member, U.S. Congress

CHAPTER 1

YELLOW GOLD VERSUS BLACK GOLD

Some astute farmers found more profit in agriculture than in the Mother Lode's streams.

Soldiers, trappers, and Spanish missionaries were the first Europeans in the Solano area. For all their activities, these pioneers made do with water from the numerous creeks.

By 1849, cattle ranches had been established on the Mexican land grants. Good pasture depended on nature's generosity with the winter rains.

But the discovery of gold at John Sutter's lumber mill in Coloma jarred California into a new era. Solano County, one of the state's original 27 counties, straddled the heavily traveled land route between San Francisco and the Mother Lode's mining camps.

Agriculture thrived. Some astute farmers found there was more profit in growing crops and raising livestock to feed the gold hunters than could be panned from placer deposits at places such as You Bet and Red Dog.

Rapidly, the Army post at Benicia, California's first

capital, became a major arsenal. In 1856, the U.S. Navy established a shipbuilding and ship repair base at Mare Island near Vallejo, giving Solano County another economic boost.

Farmers, cattlemen, and sheep ranchers got a taste of the unpredictable cycles of weather. In the 1860's they saw years of heavy rainfall, followed by periods of severe drought.

Large-scale grain raising began, and more diversified crops became popular as farmers learned how to irrigate with groundwater that in some areas was readily accessible, if not overly plentiful.

These earlier settlers found a mild, two-season climate in Solano County. Temperatures seldom fall below freezing, and snow is rare on the valley floor. Farmers could count on a good growing season — generally extending over 240 days.

But while the growing season was long, the rains came and went: 90 percent of the rains fell in December, January, and February. The growing season seldom got even a brief sprinkle.

By irrigating with groundwater in the summer, some farmers grew specialty crops for the expanding San Francisco Bay area. They discovered that much of the land they considered suitable only for dry farming was extremely fertile when water was applied. Fruit and nut crops, vegetables, and field crops increased farm income significantly.

John Reid Wolfskill was an early irrigator. He installed a pump in Putah Creek and dug ditches in the 1850's to carry the water to his fruit trees and vineyards. It was the first instance of surface water irrigation in the county.

By early in the next century, agricultural activity became more diversified, but most farmers still lacked adequate water for extensive irrigation. Groundwater was being rapidly depleted and becoming too expensive to pump. In some parts of the county the water table dropped beyond reach.

It had become evident that in California's Central Valley water was king. Farmers in Solano County and elsewhere knew they had to find new sources of inexpensive irrigation water. Urbanites were looking for more water too.

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CHAPTER 2

THE VISIONARIES AT DEVIL'S GATE

The dreams of the first generation become a reality in structures built by the second generation.

By the early 1900's, dam builders from the outside were already climbing around Devil's Gate, the gorge that opens into Berryessa Valley. A monumental dam at the junction of Solano, Yolo, and Napa counties was inevitable.

The question was not if a dam would be built but who would build and control it. Even that far back, people saw value in impounding Putah Creek.

In 1907, cities south of San Francisco hired three prominent engineers — Arthur Powell Davis, George Washington Goethals, and William Mulholland, to investigate the feasibility of tapping into Cache and Putah Creeks.

These were not run-of-the-mill water consultants. Goethals had just finished building the Panama Canal. Mulholland spearheaded the scheme to drain Owens Valley water into Los Angeles County. Davis was the nephew of John Wesley Powell, the first white man to navigate the Colorado River and who came up with the West's first reclamation plan.

The three prominent engineers came up with a suitably

ambitious project. They envisioned a water supply based on storage on the South Fork of the Eel River, a tunnel to Clear Lake on Cache Creek, and a tunnel to Putah Creek. From there water would be stored in the Berryessa Valley behind a dam at Devil's Gate.

A long tunnel would take the water to Cordelia. Another conduit would carry it to Benicia where a siphon would carry the well-travelled water under the Carquinez Strait to terminal storage on the south shore of the San Francisco Bay.

Perhaps the plan never left the drawing boards because it was beyond the means of its sponsors. Perhaps Mulholland and Goethals were lured away by more pressing challenges. Whatever the reason, the project was put on hold and left for future consideration.

A year later, in 1908, the fledgling U.S. Bureau of Reclamation began investigating possible water storage on Putah Creek, including a small reservoir at Monticello. The Bureau's Dixon Project, as it was known, would have delivered irrigation water to a service area of 50,000 acres around Dixon and Winters.

Not all of the early water seekers were outsiders. William Pierce of Willota Ranch in Suisun Valley was a homegrown visionary. Pierce was born in the valley in 1875. His son, Lewis, remembers hearing his father talk about a dam at Devil's Gate as early as 1916. (The gorge was the only break in the Blue Ridge between Vacaville and Knoxville.)

"Father said the city of Richmond was looking for a water supply and was eyeing Monticello because it was a perfect formation for a dam.

"He thought it would be awful if the Bay Area got the water that we could use. Father wanted the county to put in the dam at Monticello."

William Pierce could not interest enough people in surface water, so the idea was pushed aside. Among engineers there's an old saying that the dreams of the first generation became a reality in structures built by the second.

Looking back, Lewis Pierce says thoughtfully, "I always considered him the father of the whole thing. He was talking about damming Putah Creek before anybody else around here."

As California grew and the market for Solano County agricultural products increased, the search for new water sources continued. The prospective projects were usually on a considerably smaller scale than what Pierce had in mind.

Some efforts succeeded, some failed.

In 1916 a group of growers proposed an irrigated farm development southeast of Elmira, to be called Calhoun Irrigated Farms. The plan was to dredge a channel that would extend Lindsey Slough westward and construct a reservoir.

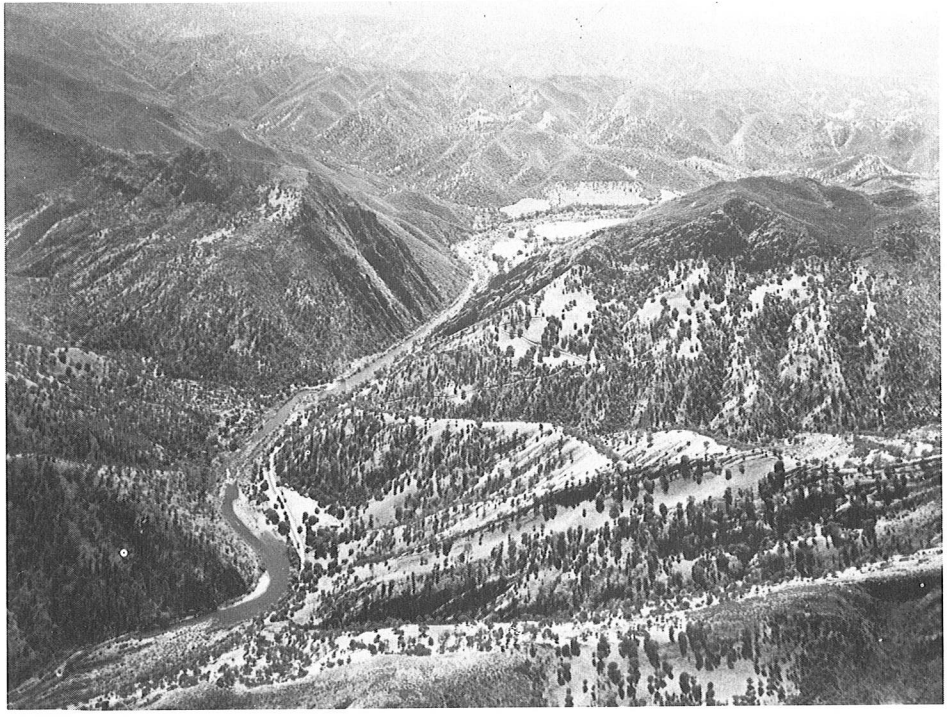
The reservoir, which would be filled by pumping from Lindsey Slough, would allow the irrigation of adjacent lands. A canal was included to bring the water to the Suisun Valley's fruit orchards.

Banking on the success of the project, growers formed the Suisun Irrigation District. Unfortunately, the project failed and the District was abandoned.

In the early 1920's, farmers southeast of Dixon came up with the East Dixon Irrigation District. Their plan was to irrigate with water pumped from Haas Slough. Then they learned that state law requires the directors of an irrigation district to be residents of the district. Lacking enough local landowners for a board of directors, they formed Reclamation District #2068 instead.

The Reclamation District installed a pumping plant near the head of Haas Slough and built a distribution system that today serves 13,000 acres.

But Pierce had not abandoned his vision. By the late 1930's and early 1940's his persistent message began to reach the right ears. The Solano County Board of Supervisors appointed a Water Council in 1940 to promote water development and to study local water needs. They asked Pierce to collect all the available water data and to investi-



Devil's Gate Prior to the Dam

gate possible sources of water. One of Pierce's staunch converts in that period was Luther Gibson, publisher of the *Vallejo Herald*, who later became a State Senator.

Pierce credited Gibson with starting the Water Council and persuading the Board of Supervisors to recognize and fund their efforts. The Council's first slate of officers included J.E. Freitas, Fairfield, Chairman; Guy Kennedy, Vallejo, Vice Chairman; Frank Bell, Vallejo, Secretary; Harvey J. Faber, Suisun, Treasurer; and William Pierce, Suisun, Water Advisor. Luther Gibson was nominated as chairman but declined because he believed an up-county man should head the committee.

Writing in his Vallejo newspaper on April 13, 1948, Luther Gibson recapped these events, commenting that he, Frank Bell, and William Pierce first joined forces in 1939.

"In 1940, upon our recommendation," he recalled, "the Solano County Board of Supervisors created the Solano County Water Council."

William Pierce filled in the details. "On February 16, 1939, the problem of water was discussed at a Farm Bureau conference on irrigation and drainage, and on August 3, the supervisors budgeted $750 to secure data on sources of water for the county. On September 26, 1939 the first meeting of a county-wide committee was held."

Pierce explained that the September conferees requested the supervisors to appoint him to collect all available data on water and report to them. The Board agreed.

An advisory committee was named, composed of William Weyand, Dixon; J. Crum, Winters; Frank Douglass, Vacaville; Hugh Wren, Fairfield; Tobias Kilkenny, Vallejo; Clyde Brann, Rio Vista; James Fulmer, Dixon; and Vern DeTar, Suisun, Secretary.

During this period, another meeting was called in Suisun and at that time the Solano Water Council was formed. The Council's stationery shows November 4 as the date of its origin.

The Water Council's mandate was the development of

water resources in the Central Valley, and particularly of course, in Solano County.

There were several pressing concerns. Construction of the Shasta Dam had reduced the natural water flow into the Delta, increasing salinity in the sloughs and allowing salt water to build up in the Sacramento River.

For Pierce the priority was still a dam at Devil's Gate. By now both the Bureau of Reclamation and the Army Corps of Engineers had put together specific plans for a project on Putah Creek. They called it the "Solano Project."

One of Pierce's associates on the Water Council and another prime mover was Frank Douglass of Vacaville. His recollection is that the Chamber of Commerce was concerned about the water situation. Douglass recommended to them that three people — Louis Vaile, an engineer; William Pierce, who had more statistics on Solano County than anybody; and E.C. Fisher, a local farmer who knew the surrounding hills like he knew the back of his hand — be delegated to check the local canyons in the Vaca Mountains for water possibilities.

Vaile reported back to the Chamber that they had found nothing of much interest. Douglass says he passed the news on to Luther Gibson and told him, "It looks like we're going to have to go big — go for the Monticello Dam."

The Water Council then set about winning support for the project that would require coordination between Yolo, Solano, Napa, and Lake counties.

"If they [neighboring counties] would come with us," Douglass said, "we were going to take Wilson and Indian valleys in and put lakes there too. We were going to put in separate dams, with Cache Creek as the supply for Yolo County."

Douglass did a lot of traveling through the four counties to drum up support from community leaders. He says Napa and Yolo counties both fought it.

"I couldn't budge Napa or Yolo. There was a guy in Napa County who owned the block brick business and was

buying up a lot of land. He didn't want the dam. The sheriff said if he caught me in town again he'd put me in jail.

"In Yolo County, a few influential people were the controlling factors in the Clear Lake Water Company. The last thing they wanted was competition from a federally subsidized dam."

At meetings to discuss the issue, Napa County insisted the water was to remain in their county. The Solano Water Council reminded them that "their" water actually came from Lake County, the headwater of Putah Creek, so they had no real claim.

Finally, when putting together a four-county coalition proved impossible, it was decided to concentrate instead on Monticello Dam and Solano County.

Ed Uhl was another member of the Water Council. At 93, Uhl still enjoys reminiscing about those hectic early years. Uhl's father left Ohio in 1889. Before he departed he was offered the gift of a horse. Rejecting the horse, he asked instead for its value in cash and received $75.

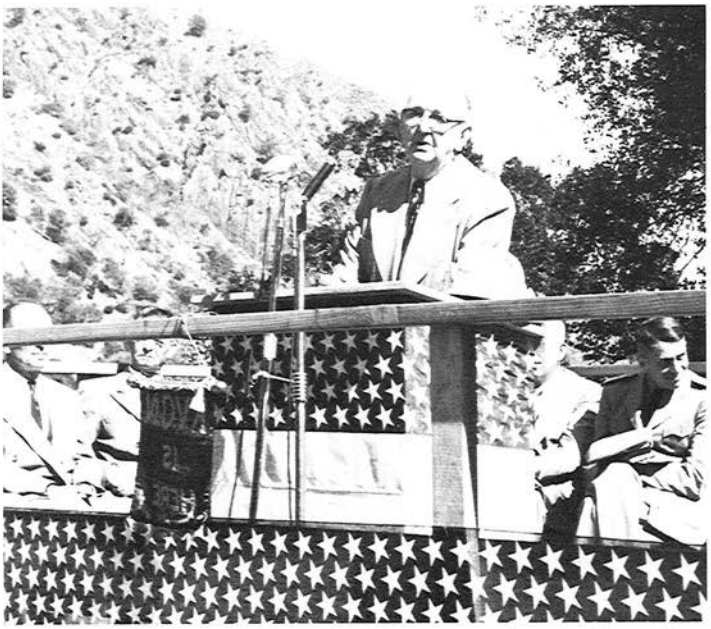
Uhl came to Solano County to live with a distant relative. Before long he parleyed what remained of his $75 into a 20-acre slice out of the Ulatis Ranch. Later he sold the acreage for $8,000. That first transaction was the start of the Uhl family's eventual widespread holdings in Solano and Yolo Counties.

Ed Uhl branched out from farming into the hay business and a dehydration plant. He found time to join Solano's Water Council because he recognized the need for a water supply.

He has vivid memories of the shortage of water at that time. "I was using groundwater where it was available, but it was only available in very small amounts. I could irrigate 20 acres properly, whereas we had 500 acres or more. Groundwater was a drop in the bucket, so I was dry farming like everybody else.

"In Elmira we had barley or oats. The orchards were doing pretty well for a few years because they were closer

William Pierce, Early Advocate of the Dam



William Weyand, Chairman of the Water Council Speaking at the Groundbreaking Ceremony in 1953

to the mountains where the rainfall is heavier. You had to have the weather breaks."

As the Solano Project's prospects began to look up, largely due to the Water Council's persistent efforts, the Bureau of Reclamation and various state agencies took on even more important roles.

For its part, the Bureau had made intensive studies of the original Yolo-Solano Project, which was based on both Putah and Cache Creeks, with a dam at Devil's Gate. But when Yolo and Napa counties proved less than enthusiastic, as Douglass learned, the State Engineer's Office recommended an independent project.

A scaled-down version would impound only Putah Creek and provide water for Solano County only. By so doing, less of Napa County's Berryessa Valley would be inundated.

The state engineer also requested the Bureau to make further studies of alternate dam sites on Putah Creek. Bureau engineers responded that they had already examined all the feasible sites.

By the Bureau's engineering and financial criteria, the Monticello site at Devil's Gate was far superior to any of the other upstream or downstream locations. Several decades and a mountain of feasibility and engineering studies later, they officially endorsed Pierce's original selection.

CHAPTER 3

MARSHALLING THE TROOPS

"If we don't get water, I'm pulling out so fast that all you will see is my dust."
Charles Knickerbocker

After a hiatus during World War II, the Board of Supervisors and the Water Council resumed their efforts in earnest. They felt a new sense of urgency because Solano County's participation in post-war prosperity depended upon an adequate and dependable source of water.

Without it, there would be no way to meet the water needs of the county's agricultural base and those of the rapidly growing cities. They also knew that if they didn't move quickly to put a claim on Devil's Gate, somebody else surely would.

A motorcade of more than 500 supporters of the Solano Water Council assembled at the site of the proposed Monticello Dam on Putah Creek in 1945. They signed a petition to the California Congressional delegation, requesting federal support for the Project.

After picnicking they listened to pep talks urging them to spread the word around the county. Among the speakers was Rear Admiral Mahlon S. Tisdale, commander of the Mare Island Navy Yard.

Admiral Tisdale stressed that Mare Island was vitally interested in the project because a plentiful water supply would enable the yard to maintain a heavy industrial load. Travis Air Force Base was equally in need of a reliable water supply.

After he retired, Tisdale went to Washington, D.C. to represent the county in its efforts to speed up Congressional action on the Project.

The first name on the petition to Congress was Charles Knickerbocker, who had moved to Solano County from San Jose.

Knickerbocker's acreage was planted in apricots, plums, olives, and other crops. "It is dry land that yields $300 to $400 per acre. If I had water the yield per acre would double."

He planned to try truck gardening as well as nut and fruit trees. His aim was to break into the post-war Bay Area market.

"I want to get some other fellows interested in a quick-freeze cooperative. Solano County sure looks good to me. If we don't get water, I'm pulling out so fast that all you'll see is my dust," Knickerbocker was quoted in a county newspaper in 1945.

Throughout this period the Water Council held public meetings in Vacaville, Fairfield, and elsewhere. The Grange, the Farm Bureau, and the local chambers of commerce joined the swelling list of supporters. Pierce's message had become Solano County's message. Now the job was to carry the word to legislators in Sacramento and Washington, D.C.

In addition to its grass roots activities, the Water Council negotiated with the Bureau of Reclamation to stretch the repayment of construction costs of the proposed Solano Project beyond the traditional 40 annual payments. They arranged for a ten-year extension, if that should prove necessary.

Council members chalked this up as a major step to-

ward reducing the economic hazards that ordinarily accompanied reclamation projects.

Another important victory was the amicable settlement of Yolo County's opposition to the Project. Supervisor Frank Bell later explained that Yolo officials weren't really aware that the Bureau had abandoned plans for the Yolo-Solano Project. Exercising considerable diplomacy, Bell was able to quiet fears on the Yolo side of the line.

CHAPTER 4

PUTAH CREEK AND THE WATER TABLE

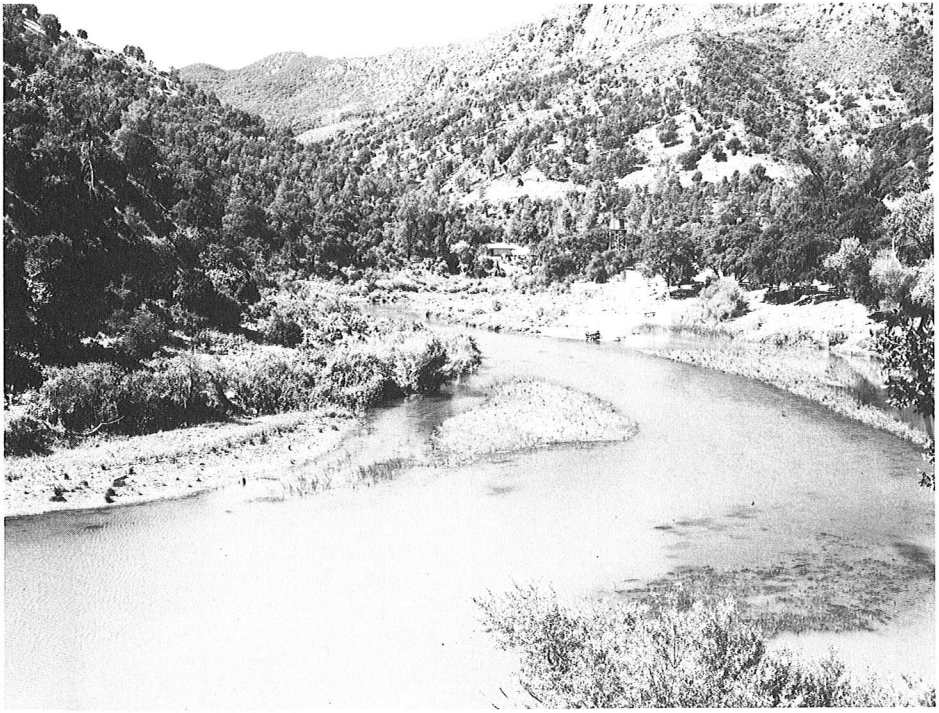
Groundwater was dwindling fast and the water table needed time to recharge.

Bureau engineers had made intensive studies of groundwater conditions to help verify the need for Monticello Dam. They found little uniformity throughout Solano County.

The land proposed to be served by the Project lies within a portion of two distinct groundwater basins, separated by a barrier of consolidated rocks that crops out near Vacaville and extends southeast to the Montezuma Hills. Northeast of this barrier is the Putah area, and to the southwest lies the Fairfield zone.

At one time good irrigation well yields had been readily obtained in the Putah area. Over time, the concentration of wells and the demand for water increased so drastically that deeper wells were drilled to maintain sufficient yields without excessive drawdown.

Approximately 80 percent (by volume) of the pumping was occurring in the northern third of the proposed service area. Bureau studies showed that the groundwater depres-



Putah Creek Prior to the Dam

sion near Dixon was increasing in size because the pumping was considerably in excess of the groundwater recharge.

From Vacaville southeastward through Elmira to the Yolo Bypass, most wells encountered hardpan and dense clays, so the yields were small. East of Fairfield good wells were also rare. A small local area west of Fairfield had better conditions for groundwater storage and recovery.

Putah Creek, the Bureau determined in its study, is one of the sources of groundwater recharge in a rather highly developed irrigated area, extending eastward from Winters on the south side of Putah Creek. At times, farmers used small collapsible dams across Putah Creek to increase percolation into the adjacent gravels.

Throughout most of the northern portion of Solano County in the Putah Creek fan area, the estimated perennial groundwater recharge was about 44,000 acre-feet per year for the period from 1934 to 1949. Groundwater pumping had increased rapidly since 1940.

By 1949, the rate of net groundwater use was 177 percent of the estimated perennial recharge for the period 1939-1949, and 112 percent of the recharge for 1941, the year of highest annual recharge on record up to that time.

The Bureau's study only proved again what the farmers already knew. Groundwater was dwindling fast and the water table desperately needed time to recharge. All of these factors were additional justification for the Solano Project.

The Bureau's information about Putah Creek should have quieted the fears of those who said the proposed dam would never fill. Putah Creek rises on the eastern slopes of the Coast Range in Lake County and flows southeastward through Napa, Solano and Yolo counties into the Yolo Bypass near Davis. The stream's total length is 80 miles.

The basin it drains is long and narrow, about 20 miles wide at the widest point. The adjoining terrain is generally mountainous, ranging in altitude from 4,700 feet above sea level at Cobb Mountain to about 125 feet above sea level where the stream emerges from the canyon near Winters.

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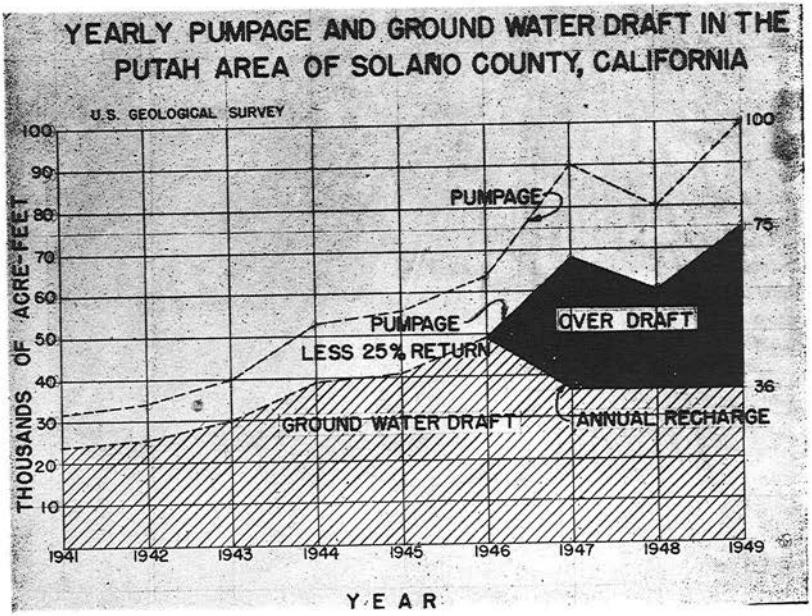
Does Your Irrigation Well Produce As Well As It Did Two Years Ago?

Most Putah Area (Dixon) District Wells Are Producing Less.



THE ABOVE GRAPH SHOWS WHY.

We are pumping 30 percent more water out of the ground in this district than is being replaced by rainfall. As long as we do this our irrigation water supply becomes smaller each year.

SUPPLEMENTAL IRRIGATION WATER FROM MONTICELLO RESERVOIRS IS THE BEST

and cheapest source of water to correct this overdraft for farmers in the Solano Irrigation District. This is also the best available source of gravity water for Solano County. It will insure you against future water shortage. It will make it possible to produce larger and more profitable crops on your land. It will make your land more valuable.

WE CANNOT AFFORD TO OVERLOOK THIS OPPORTUNITY TO OBTAIN THE GRAVITY WATER WHICH IS SO NECESSARY TO MAINTAIN OUR AGRICULTURE LAND.

VOTE ON JUNE 21st, TO APPROVE THE CONTRACT WITH THE SOLANO COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

Circular of Groundwater Graph to Gain Public Support for the Solano Project

Six other streams are tributaries to Putah Creek, all of which discharge heavily during the winter season, but are virtually dry in summer.

Putah Creek is typical of streams having their sources at low elevations and depending almost entirely on rainfall for their supplies. Before Monticello Dam was built, Putah Creek, like its tributaries, had little or no flow in summer.

In the winter months runoff occurs almost immediately after precipitation, due to the absence of snow pack and groundwater storage in the upper watershed. Total runoff varies greatly from year to year.

The average annual runoff for Putah Creek between 1902 and 1945 was 375,000 acre-feet. The maximum annual runoff of record for that period occurred in 1941, when it exceeded 1,000,000 acre-feet. Minimum flow of record was 35,000 acre-feet in 1931.

Between 1917 and 1937, runoff was below average in all but two years. Periods of heavy runoff have occurred in groups of about three years. In order to maintain a consistently adequate stream flow year round, the Bureau believed it would be necessary to have sufficient carryover storage from wet years to compensate for the lengthier periods of sparse rainfall. This was an important factor in planning for the size of the Project.

CHAPTER 5

FORMATION OF S.I.D.

Farmers voted for S.I.D. by an overwhelming majority.

Not unexpectedly, Napa County officials opposed the Solano Project to the very end. Representatives of both counties met in December, 1945 at Governor Earl Warren's California Water Conference in Sacramento.

The Solano delegation included Frank Bell, Dan Foley, Frank Douglass, William Pierce, John O'Grady, W.J. Weyand, and I.D. Kilkenny.

The Napa County spokesman charged that the dam proposed by the Bureau of Reclamation would inundate the town of Monticello and destroy 25,000 acres of land richer than the land it sought to irrigate. They also claimed there would be no power benefits from the Project.

Responding to those charges, Solano Supervisor Frank Bell of Vallejo said, "No mention was made of the overall benefits to a hundred thousand acres in Solano County."

Bell said the Napa interests were worried not so much about Berryessa Valley as they were in their own water project, the Conn Valley Plan.

No arguments from Napa County could sway Pierce. For him the priority was still Monticello Dam at Devil's

Gate Gorge. Both the Bureau and the Army Corps of Engineers steadfastly agreed.

The first step in moving the proposal off the drawing boards and into construction was to form the Solano Irrigation District. The new District's charge would be to obtain water from the Bureau's multi-purpose Solano Project.

Boundaries proposed for the new District were approved by state officials early in 1948. Next, Solano supervisors passed a resolution forming the Irrigation District. They set February 28, 1948 as the election date for the voters to approve or reject the idea and to elect the District's board if they approved the formation.

On the Board of Supervisors at the time were Frank O. Bell, Chairman; Charles Brown, J.M. Morrison, Delbert A. Mowers, and Richard Y. Rule.

An overwhelming majority (the margin was 11 to 1) voted for the formation of the District under authority contained in the California Water Code. The original area proposed for irrigation included about 80,000 acres. The District was divided into five geographic areas, ensuring that local representation on its Board of Directors would be maintained over time.

Directors elected to serve on the first board were Howard Vaughn, Division 1; J.M. Brazelton, Division 2; Homer Burrell, Division 3; W. Morris Dally, Division 4; and Fred Chadbourne, Division 5. Amasa Morse was named Assessor; Frank Sweeney, Collector, and Wood Young, Treasurer.

S.I.D. is a special-purpose agency similar to fire and school districts, but it has much broader authority. To finance its operations, the District can levy and collect water delivery fees, stand-by charges and ad valorem assessments. These revenues help the District meet its maintenance and operational costs as well as debt service payments.

It levies water-use charges for irrigation water and for municipal and industrial (M&I) water provided within its service area. The District is also authorized to construct and operate facilities for drainage and to generate and dis-

tribute hydroelectric power.

S.I.D. is accountable to the registered voters and landowners in the District. The voters select the Board of Directors. Any capital expenditure that necessitates borrowing money requires voter approval.

Because S.I.D. did not want to take on the role of water wholesaler, and the Bureau did not want to deal with a lot of individual member units, the county supervisors requested that the legislature create the Solano County Flood Control and Water Conservation District. This was done by special legislative act in 1951, and the new agency became the water wholesaler.

The Conservation District serves as the formal, master contractor for its member agencies. Wearing two hats, the county's supervisors make up its Board of Directors.

CHAPTER 6

MANY WANTED IN, SOME WANTED OUT

"I don't want Monticello water. The cost is going to be out of reason."
C.A. Carrington

W. Morris Dally, the grand old man of the Solano Irrigation District, has been a member of every board of directors since the District was formed in 1948.

His family can be traced back to the 1850's in Solano County. They were farmers who raised barley, wheat, and hay. Among the family's keepsakes is a document signed by Ulysses S. Grant that deeded 160 acres to Dally's grandfather. That piece of land is still in the family.

Dally says that sorting out the farmers who wanted to be included in the irrigation district from those who wanted to be dropped was a major problem for the directors.

S.I.D. circulated petitions around the county for the farmers to sign. "We tried to be careful not to pressure anybody to sign. Some people were quite adamant in their thinking about not joining. If they were vehement enough in their rejection, they were eliminated from the District."

He says there was no shortage of people in the county who thought the reservoir would never fill with water. "They said the Project was a folly. You could go to Putah Creek in the summertime and it was running only a little trickle."

Checkerboarding had to be minimized if the Project was going to be successful. Reaching parcels that were surrounded by non-members would pose serious problems. At the same time, some landowners refused the water because they feared it would cost too much, or they felt their land was too poor to take advantage of irrigation.

The controversy over joining or not joining the District peaked in the spring of 1954. Unless it could be settled, the Solano Project would be threatened.

To bring the matter to a head, the directors called a meeting to hear the petitions of 73 property owners who wanted to be excluded. Their holdings in three central areas came to 11,000 of the 80,000-acre district. Most of them feared the costs would be prohibitive.

An equal number of property owners in the same area stood by the District. They argued that their farms were doomed unless they had a good supply of irrigation water. Twelve other farmers claimed they had signed the exclusion petitions and had since changed their minds.

Ellis Turner, a barley grower and sheep rancher on 88 acres near Elmira, said he wanted out because he owned marginal Class 3 land. He used no irrigation water for farming and a well provided for his domestic needs.

Mrs. W.W. Turner said she had been fighting four or five years against having to buy irrigation water. "Ours is not the kind of land we can raise row crops on. Our land is mostly pasture. We raise sheep."

C.A. Carrington had a 160-acre dairy farm north of Elmira. He irrigated 65 acres from two wells, raising alfalfa, clover, permanent pasture, and corn for silage. "I don't want Monticello water. The cost is going to be out of reason," the county newspaper quoted him as saying.

One of the voices heard in favor of the Project was that of Joe Azevedo, who raised alfalfa, grain, beets, and tomatoes near Dixon.

"For the future of our county, we have to have a supply of water. We all know the water table has been going down. Years ago, when farming started in Dixon, the water table was four feet. [Now] I have one of the deepest wells around here — 988 feet. Arnold Collier's is approximately 1,200 feet."

O.D. Lambert, S.I.D.'s first secretary-manager, told the farmers the District would be in better financial condition to meet its obligations if some marginal lands were excluded.

He cited as examples some marsh land in the Fairfield area owned by William McFadden and Charley Bidstrup. They had petitioned for exclusion. Owners of some isolated parcels who had asked for exclusion would get it because bringing water to them would be too expensive anyway.

Lambert advised the assembled farmers, "Anybody can petition. Some will not be granted. Some people signed up for water in places where there's no possible chance of serving them."

He assured his audience that the directors did not want to "checkerboard" the District. Tracts that could use water might be excluded because they were surrounded by poor land. Marginal land might remain in the District because the adjacent land was valuable.

Lambert promised that studies would be made to determine which lands should be excluded and which kept in.

In opposition, James Fulmer, a Dixon rancher who had been on the Water Council, spoke up. "If they aren't allowed to withdraw, this project will break two-thirds of the people trying to get out."

"My objections all along have been on the cost basis, and I'm still convinced it [the dam] would be very tough to pay for. Remember, not one city in Solano County has signed up as a customer for the water, and how can farmers

April 20, 1950

IS MONTICELLO DAM FEASIBLE?.....

1 In item 15 of publicity released by the Solano County Water Council on March 14, 1950 and signed by Mr. E. H. Uhl, it is stated: **"THE CITIES AND MILITARY ESTABLISHMENTS MUST PAY ONE-HALF, OR MORE. THE COST OF THIS PROJECT—EXCLUSIVE OF THE FARMERS' DISTRIBUTION SYSTEM, BEFORE THE PROJECT COULD BE FEASIBLE."**

2 Another Farmers' Group wants the cities and installations to pay 65 per cent.

3 Commissioner Straus of the Bureau of Reclamation claims in House Document 65 that the cost of Monticello Dam, exclusive of the distribution system, could be repaid in 50 years and that this cost, exclusive of said distribution system, would be THIRTY THREE MILLION, SIX HUNDRED SIXTY SEVEN THOUSAND DOLLARS—($33,667,000.00)—this based on 1948 costs—mind you.

4 **WELL, MR. UHL AND MR. STRAUS SHOULD BOTH KNOW, THEN, THAT MONTICELLO DAM IS NOT AT ALL FEASIBLE!**

5 Do you doubt this? Well, just take a pencil and paper. Water delivered to Vallejo for distribution to Mare Island Naval Shipyard and the greater Vallejo area during 1947 averaged 6.536 million gallons a day—In 1948 the daily average was 6.384 million gallons a day—In 1949 the daily average was 6.490 million gallons a day. These are official figures. Now then, transmitted into acre-feet of water, and there are 325,893 gallons of water in an acre-foot of water, this simply means that Vallejo used an average of 7,242 acre-feet of water a year. Vallejo, according to House Document 65, would pay ten dollars an acre-foot for water. In other words, based on the last three years of water usage, Vallejo would pay $72,420 a year for water! Well, for example, 65 per cent of the cost of Monticello Dam, exclusive of the distribution system, would be $21,883,550.00. At the rate of $72,420 a year it would take close to three hundred years for Vallejo to pay 65 per cent of the cost, exclusive of the distribution system! It would take about two hundred and fifty years for Vallejo to pay even 50 per cent of the cost, exclusive of the distribution system! And from a city and military standpoint, Vallejo would be by far the principal user of Monticello water in Solano county! Will the people of Vallejo absorb $21,883,550.00 by vote?

6 Here's something else. Census figures show that Vallejo has gone backward forty of the last eighty years in the matter of population—the only city in the entire bay area to show such a record. In 1870 Vallejo had 6391—in 1880 Vallejo had 5987—in 1890 a population of 6343—in 1920 a population of 21,107—in 1930 a population of 16,072 and in 1940 a population of 20,072 or less than 1920. Now add up these facts, plus the cost of irrigating water to farmers—$2463 to irrigate one hundred acres with proposed Monticello water—an absolutely prohibitive price—and on top of this figure Bureau Control of water, land, farms and farm living—yes, farm living—and Senator Downey's book, "They Would Rule the Valley" would equally apply to the Solano project!

This is the 3rd in a series of advertisements sponsored by

The Famers' Committee to Investigate Water Problems of the Solano Irrigation District

You may sign petitions asking exclusion of your land at the home of the secretary, Mrs. Helen B. Turner, Vacaville.

Circular Distributed by the Dam's Opponents

bear the full load?"

Olin H. Timm, a farmer and a member of the S.I.D. board, summed up the District's position on the withdrawal issue.

"By law, we can accept withdrawals on some of the property involved, on all of it, or none of it. But it is essential that we avoid checkerboarding. We don't want subscribers to Monticello water surrounded by non-subscribers. That would make the project economically unsound and cause serious engineering problems."

Not all of the land originally included in the District was irrigable. Parcels down in the southeast end of the county, Class 4 and 5 lands, were taken out. The land around Vacaville, Suisun Valley, Dixon, and Elmira was considered good for irrigation. Many of the farmers in those areas raised both fruit and livestock.

Dally says, "We [the Board] considered that one-third or one-half of the District would be planted with clover or crops that could be used for grazing. That didn't happen at all." Instead, the price of sheep went down and the expected growth in irrigated pasture didn't come about.

The problem was resolved by allowing parcels totalling about 8,000 acres to secede. In time, some of these landowners came back to the District.

One reason was their concern over the dropping water table. Fred Tomasini could have served as a prime case history for the ongoing groundwater investigations. Water was a constant concern.

Tomasini's great grandfather was among the valley's original settlers. In the early days, his grandfather and also his uncles irrigated by digging a 10 by 12 foot pit and installing a centrifugal pump. But before too long the water table started dropping.

Tomasini started farming after he came home from WWII, using land he leased from an uncle. He grew apricots, pears, peaches, and prunes.

"It was very difficult when I farmed. We were always

digging new wells."

Then the water became contaminated with various salts, boron among them. The wells went deeper, but the water just worsened in quality. Tomasini was lifting water 145 feet. Some wells in his area were down to 300 feet. Suisun Valley does not have a big underlying alluvial plain like the Dixon Ridge. The water-bearing strata are old creek beds.

"You might find a good well here and 100 feet away you hit a dry hole," Tomasini says. "But those water-bearing strata didn't have a big capacity. If you hit 400 gallons a minute you had a good well. And you might put down four or five dry ones before hitting water. It was very expensive." In contrast, wells in the Dixon area often flowed 2,000 gallons a minute.

During the Korean War Tomasini was called back into the service. When he returned, he decided he would buy a farm and work his own land, with the expectation that S.I.D. would go ahead with the Solano Project.

The general attitude of the Suisun Valley farmers was that their future depended on Monticello, but he recalls that one of the large growers with 200 acres of fruit opposed the Project.

Having an adequate supply from his wells, the grower asked, "Why should I pay taxes to build a water supply for other people?"

Evidently, that grower was an exception. Most of the farmers favored the Project, although some had reservations.

In the Dixon area farmers were concerned about the eventual cost of the irrigation water and about who would build the distribution system.

Tomasini notes that a new landowner in Elmira was putting out a lot of misinformation. People were asking whether he was speaking for himself or working for somebody who wanted to scuttle the Project. Supporters of the Dam held a lot of open meetings to clear the air and settle

people's doubts.

Eventually, most of the opposition came around, even though they still wondered if they would be able to afford the water.

Tomasini was given the task of signing up James Fulmer, the prominent Dixon grower who had been very outspoken earlier in his opposition. "I didn't know if he would, but he did," Tomasini recalls.

Among the other sticky issues to be decided was the price to be charged for irrigation water and for municipal and industrial water. Dally says the Board settled on the figures shown in the 168-page exhaustive feasibility study made for the county by Stone and Youngberg, and Charles West in 1951.

The study recommended that the farmer's price should be $2.65 an acre-foot and municipal water $15 an acre-foot.

Uhl, who had been explaining the Project's economics before Congressional committees in Washington, remembers a session when he was speaking for the farmers and Barney Russell was representing Vallejo interests.

"Agriculture was going to take 84 percent of the water and the cities 16 percent. The cities could only come in on our coattails. The Bureau could not do business with them alone. The cities didn't want to pay more than $10 an acre-foot, whereas they had been paying East Bay Municipal Utility District in Oakland $52 an acre-foot.

"I remember very well that this man at the Bureau of the Budget who was questioning us was a farmer from one of the cornbelt states. He said to me across the table, 'You're representing agriculture. How much should water be?'

"I said that the cities should pick up the tab so the farmers wouldn't have to pay more than $2.25 an acre-foot. The cities should pay something like $15 an acre-foot. And I prevailed." (The differential rate was ultimately determined by a Bureau calculation of interest on the municipal benefit, as required by law.)

The farmers of Solano County, the owners of 72,000

acres, actually put their land up as security to guarantee the success of the Dam and the distribution system. In their view they were taking a definite risk, because irrigation districts that were formed in that era often went broke.

"The farmers took all the risk," one local grower maintains, "but the cities stood beside them and fought too. We all have a valuable water supply to show for it."

CHAPTER 7

HOW BIG IS BIG ENOUGH?

"We all say now we should have built the 2.2 dam."
Morris Dally

Bureau of Reclamation Commissioner Michael W. Straus wrote to the Secretary of the Interior on April 26, 1948. He was responding to the Regional Director's report on the Solano County Project, dated March 15, 1948.

Commissioner Straus commented: "In general, I concur with the findings of the Regional Director and approve his report, except for the two following modifications:

"In reference to the capacity of the Monticello Reservoir, the State of California has maintained that the Monticello Reservoir should be held to 1,600,000 acre-feet.

"A reservoir of this lower capacity would provide a firm water yield about ten percent less than that from the larger 2,200,000 acre-feet structure. The flood control function and the service to municipal and industrial water users would remain unchanged, while the acreage of new lands that would be irrigated would be reduced about 11 percent.

"Although the small project would result in a slightly lower ratio of benefits to costs and would not permit the

same degree of development as the larger reservoir, it would have the advantage of slightly lower annual costs to the water users and slightly greater assurance of a firm water supply."

By adopting a reservoir capacity of 1,600,000 acre-feet, the annual water supply for the Irrigation District would be reduced from 285,000 acre-feet to 258,000 acre-feet, a loss of 27,000 acre-feet. Of the total amount available, 204,400 acre-feet would remain for irrigation, after allowing 15,000 acre-feet for prior water rights downstream and 38,600 acre-feet for domestic use.

About the controversy over the size of the reservoir, Uhl says, "Governor Earl Warren laid down the law that we couldn't have the 2.2 million acre-feet we figured on with the Yolo-Solano Project idea.

"He said we'd have to settle for less. The reason was, we would be going into another watershed, and the hills would have to be tunneled. Warren put his foot down, saying we couldn't take from that watershed [Cache Creek in Lake County]."

The Stone & Youngberg Report in 1951 had considered the matter of reservoir size. Their prophetic conclusion: "Even if Monticello is constructed to create a 1.6 million acre-foot reservoir, the annual yield of 213,840 acre-feet of water, canalside, for domestic and irrigation use is insufficient to meet the ultimate water needs of the county.

"After allowing for 42,000 acre-feet of water for domestic use, 171,640 acre-feet remain for irrigation. This is but 28 percent of the amount . . . required to meet the needs of the county. Other water sources will have to be developed in the future."

Like many others who looked back years later, Dally says the decision to hold the capacity to 1.6 million acre-feet was regrettable.

"We all say now we should have built the 2.2 because the Dam runs over more than we had anticipated. The Proj-

ect was designed to fill every 15th year.

"Even though we might have dry years, we'd still have enough in storage to get through those years — there would be time to recover."

So while the Bureau compromised with the State on reservoir capacity, it held firm against pressures to substitute several small dams for a single large one.

CHAPTER 8

STALKING FUNDS IN FOGGY BOTTOM

President Harry Truman to the Bureau: "No new starts."

The Solano Project was authorized for construction by the Secretary of the Interior and transmitted to the President on November 11, 1948.

Some tough battles remained to be won in the capitol. Uhl and Admiral Tisdale were in the thick of it, haunting the hearing rooms and buttonholing individual legislators.

Uhl says he got involved in Washington D.C. because California Senator William Knowland had gone to Tisdale with news of an imminent hearing of the Senate Appropriations Committee.

Knowland asked Tisdale, "You want to have an attorney, an engineer, or a farmer there?" Then, before Tisdale could reply, Knowland demanded, "What's the matter with having Uhl?"

From then on, Uhl was Solano County's spokesman on the agricultural aspects of the Project. Altogether, he testified 17 times between 1948 and 1956. He also appeared at five hearings in Sacramento.

Uhl says he was one of 15 Solano County delegates at the first Washington hearing on April 13, 1948. Two weeks

later he went back by himself. "The Napa boys were there creating havoc. They thought we would appease them by giving them some of the water."

Funding the Project was nip and tuck all the way. The Korean War had top priority and federal dollars were exceedingly tight.

The message from President Harry Truman to the Bureau of Reclamation was terse and to the point. "No new starts." Until the war was terminated he wanted no new dams competing for the federal tax dollar.

Uhl and Luther Gibson decided to enlist the aid of a top official at Democratic Headquarters in the capital. The man urged them to boil the Solano Project story down to a one-page letter.

He told them, "You do that and I'll see that it gets into the special pouch that goes to the President for his personal attention."

Uhl says, "We got our answer from Truman in 30 days. The message was still, 'No new starts.' "

Prospects improved under Eisenhower but until the war was concluded, no dollars appeared. Often, Congressman John F. Baldwin, who represented Contra Costa and Solano counties, provided important backing.

Uhl says they came close to being shut out on many occasions. Each time, Knowland or Baldwin put a foot in the door. "Knowland finally got us the $100,000 appropriation that kept the Project alive when the situation looked very bad."

In 1951, Congress earmarked $321,000 for advanced planning prior to construction. Then, in 1953, a $3 million appropriation primed the federal pump, enabling the work to roll along.

Nearly a half century after it was first conceived, a dam at Devil's Gate began to materialize.

CHAPTER 9

DEMISE OF A TOWN

All that's left are a few memories.

Solano and Napa counties share an underwater legacy. Submerged beneath Lake Berryessa are the remains of what was once the farming town of Monticello, standing near the middle of the Berryessa Valley.

The town of Monticello was founded by Ezra Peacock in 1867. Before it was evacuated, the town had a population of about 250, with perhaps another 100 people scattered around outlying parts of the valley.

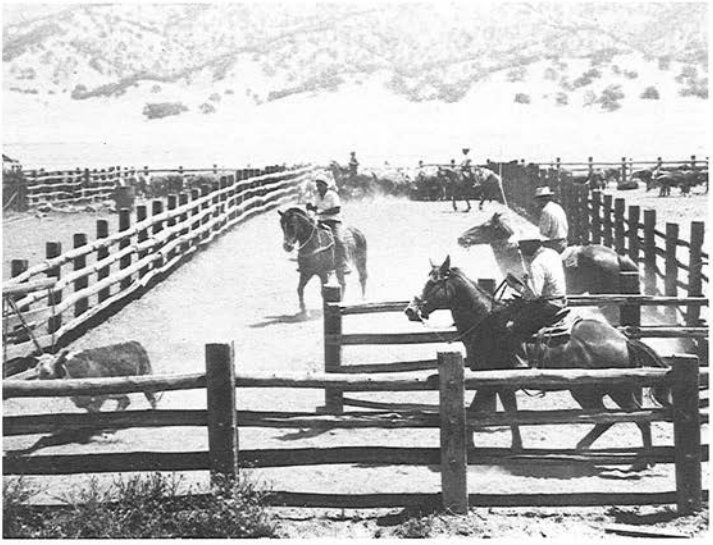
Putah Creek meandered past Monticello, about 300 yards from Main Street. The creek provided water for crops, a swimming hole for the kids, and shaded picnic areas along its banks.

Farmers in the valley had cattle, sheep, and pigs, along with some orchards planted with about 250 acres of Bartlett pears and prunes. Cattle and grain were the main products.

One of the town's former inhabitants, Sandy McKenzie, recalls what had been. Born and raised in Monticello, his grandfather, William D. McKenzie, and Will Cook owned the town's general store.

A typical country store, Cook, McKenzie and Son supplied the basic needs of a farming community. On its

Original Scribner House in Monticello Before its Relocation



The Last Cattle Roundup at Monticello Rodeo Grounds in 1957

shelves and in its bins were groceries, tires, batteries, hardware, fencing, pumps, piece goods, Levis and other clothing for men, women, and children. The store served as the post office and telephone exchange.

Monticello's Main Street included a few bars and a small hotel. The town had no police force, sheriff, newspaper, or movie house. Residents who yearned for a night on the town went to Vacaville.

Local entertainment was pretty much limited to the annual rodeo, which attracted visitors from Vacaville, Dixon, and Davis. The occasional country dance was a special event.

Monticello had a two-room school for grades 1 through 4 and 5 through 8. Teenagers rode a bus to Winters High School.

Before the Bureau of Reclamation condemned the land for the Dam and bought the acreage, the population of the valley had been dropping for 20 years. Farmers were finding it harder to remain solvent.

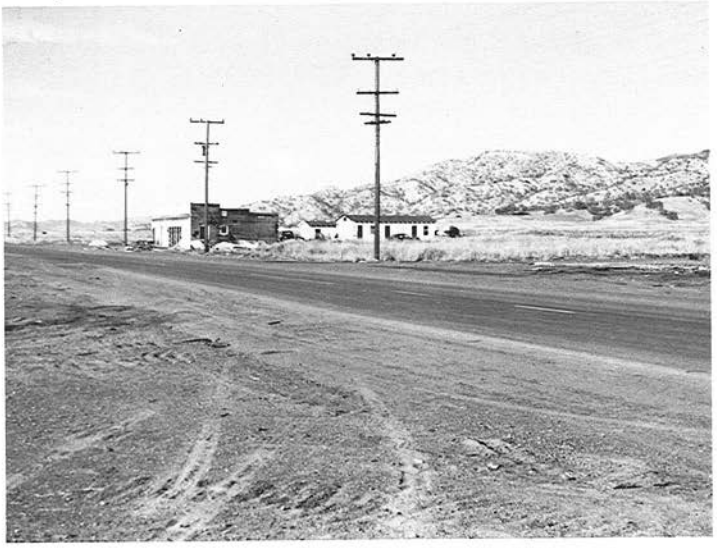
Despite that, the valley's residents and Napa County fought hard in Sacramento and Washington, D.C. to stall the Dam project.

While the Dam was being built, workers removed the town of Monticello and surrounding ranches from the reservoir site. They relocated the cemetery and cleared the area of trees and brush.

A descendant of another old Monticello family, Jim Scribner, now works in the water operations division of the Irrigation District. His great grandfather settled in Monticello in the mid-1800's, soon after the Berryessa brothers, Jose Jesus and Sisto, who received the 35,000 acre land grant for the Valley from the Mexican government in November, 1843.

His grandfather grew up in the town. In addition to farming, his family ran the Napa Milling Company, hauling grain grown in the area. Their original family home was moved to a ranch now on the shore of Lake Berryessa. His

View of Main Street in the Town of Monticello in Early 1950s



Main Street After Most of the Clearing Had Been Done

family documented the process in a series of photographs taken as the town was dismantled.

Most of the town's inhabitants moved out in the summer of 1956. Farmers stayed until the September harvest was in. By the time the November rains started the whole town was gone.

"Everything was taken out and burned or buried, even the fences," McKenzie said.

The valley's residents are now scattered all over. Many of the families bought land in the Sacramento Valley and resumed farming. Townspeople moved to Napa, Sacramento, Winters, and Vacaville.

Harold Moskowite, a Napa County Supervisor who resides on the south side of Lake Berryessa, recalls the days when his family farmed alfalfa and cattle in Monticello. As a third generation resident of Napa County, Moskowite managed his own ranch there from 1946 — 1953. Looking back, he remembers the loss suffered by his family, "They took our property to build a dam entirely within Napa County — and we didn't even get any benefits from it. I just don't think it was fair."

Sandy McKenzie came to Vacaville and opened the Pacific Hardware store with his father, who died in 1971.

"It wasn't hard on me," McKenzie said, "The people it was hard on were my father and grandfather. My grandfather was 85 — it was hard on him to get kicked out. Young people, it doesn't bother them."

Only a handful of former residents remain who remember what once existed beneath Lake Berryessa. Even though all evidence of the town of Monticello was removed before the lake was filled, the Bureau left behind one durable artifact: a bridge over Putah Creek, said to be the largest all-stone bridge in the West. It, too, is now under water.

And all that remains of Monticello is its name on the Dam which impounds the man-made lake, Berryessa. That, and a few memories.

. . .

CHAPTER 10

GROUNDBREAKING AND CONSTRUCTION

"Every month 30,000 people are coming to California, and not one of them brings a gallon of water."

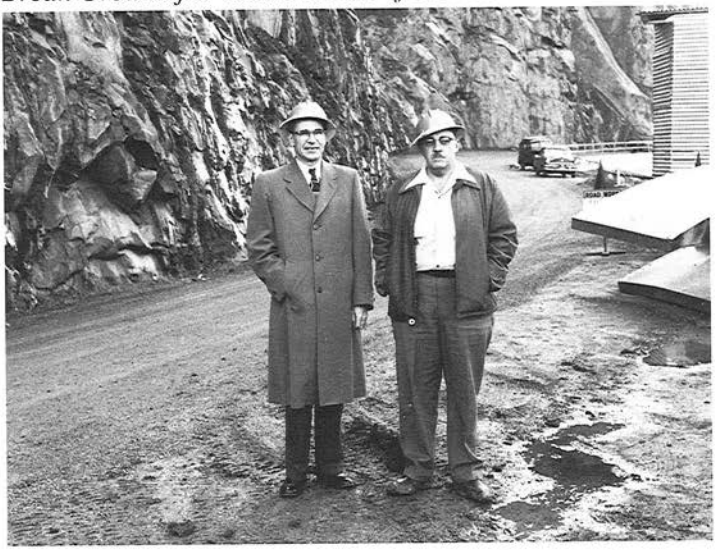
Governor Earl Warren at the Groundbreaking Ceremony

Specifications for the Dam were issued in May, 1953. Twelve bids were received. Peter Kiewit Sons' Company, San Francisco, and Parish Brothers, Benicia, joint venturers, were the low bidder. The first contract was awarded on August 7, 1953.

Preliminary construction work began and groundbreaking ceremonies were held at the Devil's Gate site the afternoon of Wednesday, September 25, 1953. In time, a lake would rise where Berryessa Valley had been. It was five years later that the first release of Berryessa water reached Solano County farmers.

Governor Earl Warren led the dignitaries present at the groundbreaking. A crowd of several hundred watched as the Governor and State Senator Luther Gibson symboli-

Governor Earl Warren and State Senator Luther Gibson Break Ground for Construction of Monticello Dam in 1953



Congressman John Baldwin and Bureau Construction Engineer B.P. Bellport Inspect the Site

cally broke ground atop a bulldozer. The Governor, a firm supporter of the Project, told the crowd, "Every month 30,000 people are coming to California, and not one of them brings a gallon of water."

Prior to construction of the Dam, State Highway 128 was relocated around the damsite through rugged terrain. A concrete bridge was built over Putah Creek below the Dam and more than a mile of road was constructed, much of which had to be cut through solid rock on the mountainside. These were needed to haul the huge amounts of rock, cement, and steel used in the erection of the concrete dam.

This section was completed and opened to traffic on November 9, 1954, with a temporary detour across the reservoir area to connect with the old highway above the Dam.

Two additional contracts were awarded to complete the 16.5 mile permanent highway relocation around the reservoir area. The second stage of the relocation job was started on September 3, 1954, and completed a year later.

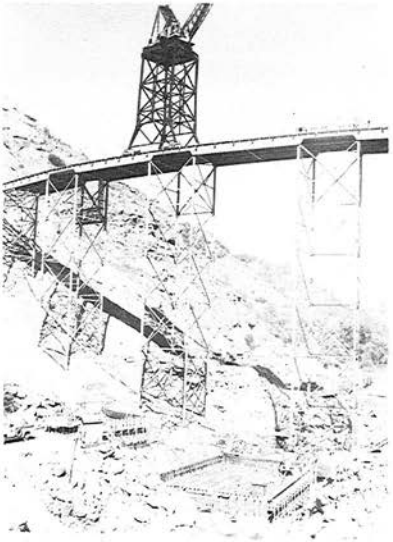
The last section of highway work, begun in September, 1955, was delayed due to heavy rains, slides, and flood conditions. The relocation work was completed and the final section of highway was accepted by the State in September, 1956.

As the major relocation work neared completion, the Dam itself could be tackled. A 28-foot-diameter spillway tunnel with a vertical shaft "morning glory" intake had to be excavated. A diversion tunnel 23 feet in diameter was excavated upstream from the elbow of the spillway tunnel to the channel of Putah Creek.

With a cofferdam across the channel, workers diverted water through the tunnel. They drained the channel at the damsite, and completed excavations for the dam foundation.

On August 9, 1954, the first concrete was placed on the Dam. By December of 1955, workmen had raised the concrete to a maximum height of 95 feet in the high blocks and 65 feet in the lowest block.

Extremely heavy rains caused a flood runoff late in



General View of the Concrete Placing Operations

Interior of the Spillway Tunnel

December. Creek flow increased from 44 cubic feet per second to an estimated 95,000 cubic feet per second. Water backed up in the reservoir and overflowed the incomplete concrete dam, causing considerable damage to the contractor's trestle and some loss of equipment. Construction work had to be halted for about five months.

When the high water receded, debris was cleared, the trestle was rebuilt, and other damage was repaired. Fortunately, the flood waters did not affect the Dam itself. Workers resumed concrete placement on a three-shift per day basis.

The contractors encountered a lesser problem while preparing the foundation for the Dam. The rock beneath was sandstone, "great slabs of sandstone," according to Bureau Engineer Andrew Cortopassi. A few of the slabs had slipped, so the excavations had to be deepened and thoroughly grouted.

Another minor incident occurred during the construction of the low-level bridge below the Dam. A crane operator was moving a pre-stressed concrete bridge beam to the installation point. He got a signal from his supervisor to release the beam before it had been properly positioned.

Cortopassi says, "He let it go. The whole kit and caboodle came down into Putah Creek. Maybe it's still there."

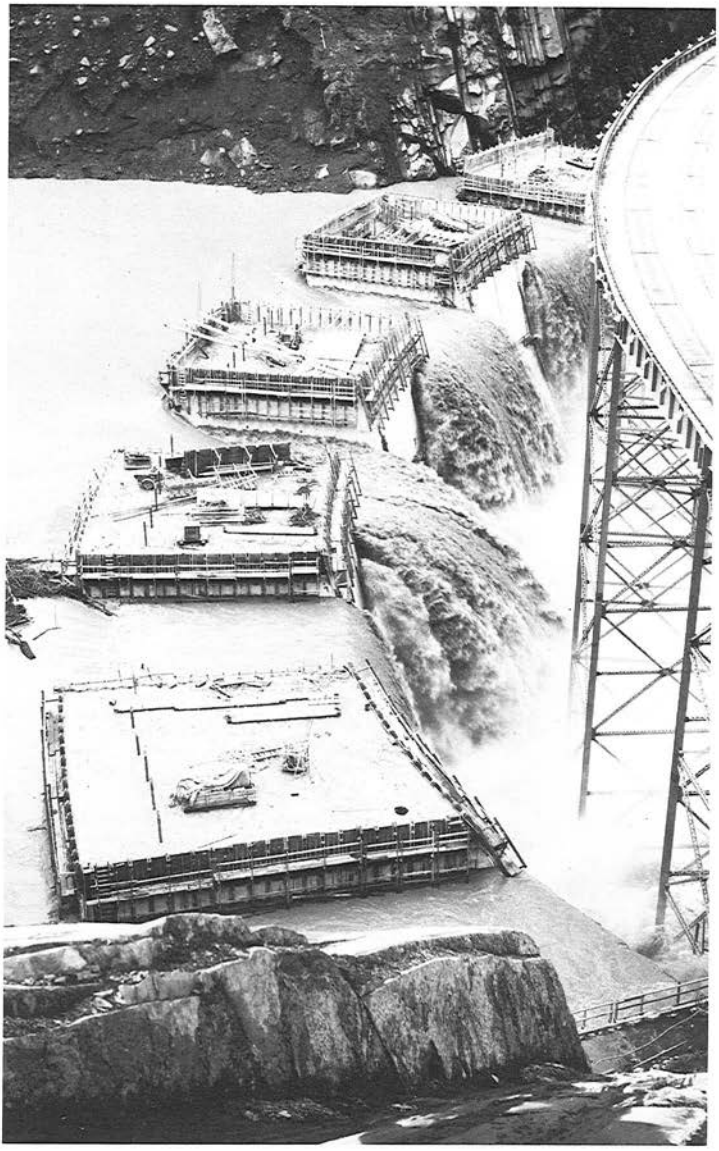
Final concrete was placed on the Dam on February 26, 1957. The contractors completed finish work and cleanup and lined the "morning glory" spillway with concrete. Bureau overseers accepted the job as completed on November 7, 1957.

The building of the Putah Diversion Dam, on Putah Creek about six miles downstream from the main Monticello Dam, created Lake Solano. The lake is about three miles long and serves to hold water for diversion into the Putah South Canal.

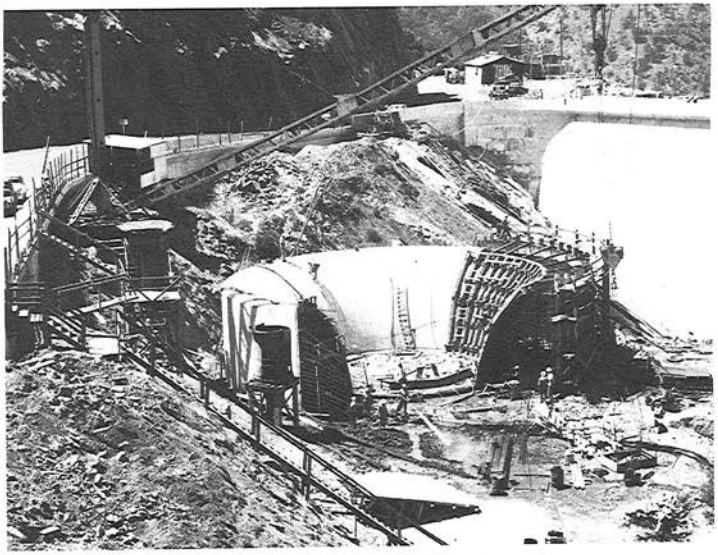
The Diversion Dam, which has a gated concrete weir with an earthfill non-overflow section, is 29 feet high and 910 feet long. Putah South Canal headworks, with two 10-

Lakeside Face of Monticello Dam

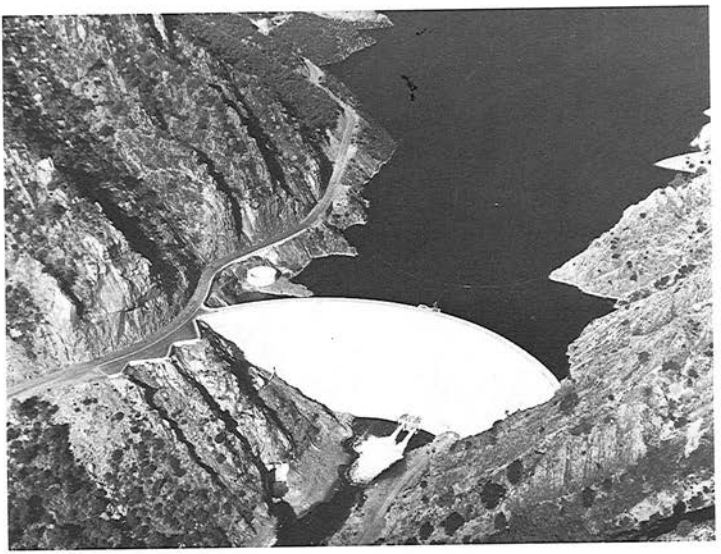
Construction Engineer B.P. Bellport Escorts Senator and Mrs. William Knowland on a Tour of the Site



Flood Waters Roared Over the Unfinished Dam in 1955



"Morning Glory" Spillway Under Construction



Aerial View of Completed Monticello Dam

foot by 9.5-foot radial gates, regulates the amount of water diverted from the reservoir to the canal.

Along its 33.3-mile length, the canal is lined with concrete. Its initial capacity of 956 cubic feet per second diminishes to a terminal capacity of 180 cubic feet per second. At the inlet end the canal is 12 feet wide at the base, 47.4 feet across the top, and is 11.8 feet deep. The lower end of the canal runs through a 5,000-foot siphon, 72 inches in diameter.

Four principal contractors built the canal over a three-year period. They met some challenging engineering problems. The canal had to go under U.S. Highway 40 east of Vacaville with 108-inch concrete pipe, and under the same highway north of Fairfield with 84-inch concrete pipe.

Workers managed the crossings without blocking traffic by jacking the pipe under the roadway using two 400-ton hydraulic jacks.

Three wasteway structures were built at Sweeney Creek, McCoy Creek, and Green Valley. Low ground was crossed by the use of siphons. Under a separate contract, workers put in an additional turnout to serve S.I.D.'s Vaughn Canal.

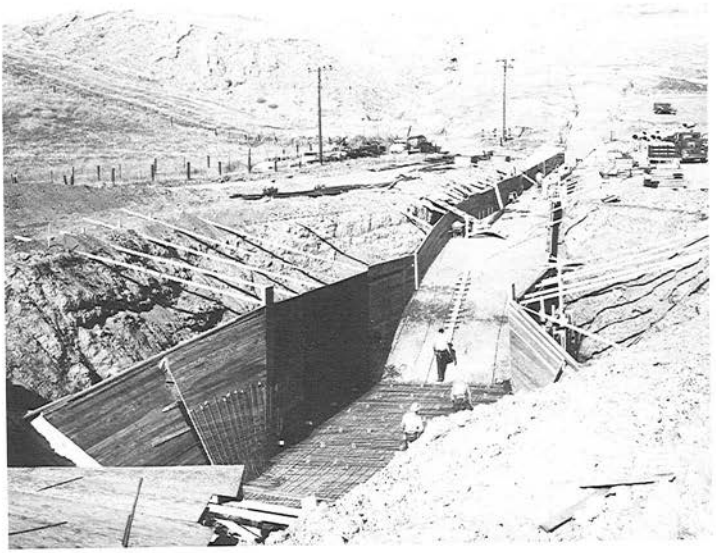
A reservoir is located at the end of Putah South Canal to serve as a terminal reservoir for the canal and a forebay from which water is delivered to Vallejo.

Many of the Bureau engineers who came on the job when construction began in 1953 stayed until the Dam was completed. An example was Andrew Cortopassi, who had previously been assigned to the Delta-Mendota Canal.

He and his family rented a place on the main street of Winters, the closest town to the Dam. Winters was a small village on Highway 128 until the mass of construction workers and Bureau personnel drifted in.

Cortopassi and fellow engineers agree that except for the flooding of the Dam in 1955, the Project went smoothly considering all of the different agencies involved.

Dally agrees, "Our relationship with the Bureau has



Construction of the Putah South Canal

First Water Release from Putah South Canal into S.I.D.'s Vaughn Canal in 1959

been fuzzy sometimes, a little hairy sometimes, but basically we get along pretty well."

During the construction period S.I.D. acquired some 350 miles of rights of way for the distribution system, mostly by negotiated purchases. This was financed through the federal government with $15 million under a Public Law 130 loan.

The rights of way were transferred to the United States to be held in trust for the District until the loan was repaid. That part of the law has since been amended to eliminate the requirement for land transfer, and these lands may be returned to the District prior to the maturity date of the loan.

Construction started in 1958 and was completed in 1962. The S.I.D. distribution system served by the Putah South Canal at some 58 diversion points, consists of about 165 miles of major pipelines and 120 miles of canal. There are seven regulating reservoirs within the District facilities, five major pumping plants, plus a number of smaller pumping plants ranging from three to ten horsepower.

Almost 80 percent of the water delivered by the District is via gravity flow. The District has also constructed an extensive drainage system consisting of more than 60 miles of open channel which conveys both irrigation runoff and storm water.

On May 15, 1959, irrigation water was first diverted from the Putah South Canal at the Vaughn turnout for immediate agricultural use. On that day, Solano County farmers began irrigating with water from the Solano Project.

The Bureau's final (reimbursable) cost was $38 million for all of the Solano Project facilities, not including the $8.3 million nonreimbursable cost for recreation facilities.

The Solano County Flood Control and Water Conservation District executed a long-term service contract with the federal government for water service to the Solano Project in 1955. The contract provided that irrigation water would cost $2.65 per acre-foot at the side of the Putah South

Canal and municipal and industrial water would cost $15 per acre-foot at the place of diversion.

The deficit resulting from the sale of agricultural water to the Irrigation District at a price less than the county was required to pay the U.S., was made up by adding 40 cents per acre-foot or a total of $60,000 per year to the county's operating cost of the Project.

S.I.D. and the growers had a ready answer to charges from some that inexpensive irrigation water represented an unwarranted subsidy at the expense of the taxpayer. They advised the critics to hold their fire until the figures came in.

Stoddard and Karrer, the civil engineering firm selected by S.I.D., predicted the total annual value of agricultural products in 1956 could be expected to more than double when the area's ultimate development reached its potential with irrigation water.

In 1956, total market valuation of land in the District was only $23.2 million according to the District's own figures.

Amasa Morse served as District Assessor from its formation until 1975, when the county took over the role. He explains that S.I.D. did not want to accept the county's assessment method, which was based on land value. The problem with this method was that a lot of land values were being figured in terms of potential subdivision use.

Instead, Morse set the assessment schedule up on the basis of soil classification.

With the advent of plentiful water, land values could be expected to increase substantially, which would mean comparable increases in county tax revenues, by any standard. All taxpayers would be well compensated for their 40 cent "subsidy" by improved county services and a healthy, prosperous farm economy. Not only that, but city dwellers would have access to a supply of high-quality domestic water at prices far below the going rates elsewhere.

It was a "wait-and-see" issue. The coming decades proved that the Monticello Dam was no folly.

CHAPTER 11

LITIGATION AND MITIGATION

A reclamation project is built of three parts cement and steel to one part paper.

Regiments of lawyers have thrived writing contracts and litigating and mitigating contracts in California's endless water wars.

Any reclamation project dam is probably built of three parts cement and steel to one part paper. The Solano Project is no exception. Secretary-Manager O.D. Lambert, experienced in irrigation matters, was right when he advised the directors to quickly hire the best water lawyer they could find.

During the construction and after Monticello was built, reams of complex contracts had to be written and negotiated. The task came to David Balmer after he was hired as County Administrator in 1954 to replace Walter Parker.

In that capacity, Balmer was also Chief Administrative Officer of the Water Conservation District. As indicated, the county supervisors were also the board of directors.

Balmer says, "When I came on the job, they [the supervisors] were in the process of negotiating a master con-

tract with the Bureau. They had already gone through about eight separate drafts. As it turned out, the 15th draft became the final draft of the master agreement between the Conservation District and the Bureau."

While that was going on, other contracts were developed. S.I.D. officially became the member unit that would receive and distribute agricultural water. Balmer also had to arrange contracts with all of the cities that were member units and customers for municipal and industrial (M&I) water.

Some intricate arrangements were necessary to avoid pitfalls. Balmer explains that the master contract between the Conservation District and the Bureau provides that irrigation water will be measured at the headwater of the Putah South Canal.

Any water lost in the canal due to spillage or evaporation is classified as agricultural water for payment purposes. The Conservation District pays this cost as part of the operations and maintenance (O&M) of Putah South Canal on behalf of all the member units. However, M&I water is measured at the point of delivery to a particular member unit contractor.

Other contractual problems arose because the Bureau's estimate of the water yield was off by more than 30,000 acre-feet, due to an underestimation of losses from evaporation and a decision by the State Water Rights Board to reserve the bulk of this water for upstream use.

Because of the miscalculation, Balmer had to devise a Class B contract which came without a guarantee that water would be delivered. He was able to postpone an immediate problem because all of the agricultural allotment still hadn't been claimed, and the excess was diverted for municipal use.

The Conservation District also entered into a Class B contract with the Maine Prairie Water District, with the understanding that water might not always be available.

Situated east of Dixon, the Maine Prairie District is a

totally separate operation. That District later contracted with S.I.D. to purchase water from the District's drainage channel.

In Balmer's view, the 1950's and 1960's were fascinating times. "Everyone was trying to sell water to Solano County because we were part of the economic justification for the projects they were pushing."

The Supervisors, the District Board, and the Conservation District monitored all the reclamation projects being planned by the Bureau and the Army Corps of Engineers that involved Northern California. "We made ourselves heard," Balmer says.

Always in the background was the specter of exportation — the shipment of water south. The Bureau's business is building dams, but it also needs customers to pay for the projects. Southern California contains the eager buyers who were willing to pay almost any price for M&I water, even when untreated.

Already Balmer and S.I.D. officials were planning ahead. They worked with officials of the State Water Project, California's closest equivalent to the Bureau of Reclamation, who were anxious to avoid creating the impression that they were only concerned with shipping water south.

The District updated previous feasibility studies with a report by a San Francisco company that focused on proving that Solano County is financially able to handle further obligations for water. This led to construction of the North Bay Aqueduct (NBA).

Balmer says, "The sum and substance of the updated study was that we should contract for 42,000 acre-feet from the State Water Project, to be delivered via the NBA.

"We [the Conservation District] were to be the master contractor. Like the Bureau, the State wanted to deal with only one entity in a particular area, not all the cities. In turn, we entered into contracts with some of the cities."

NBA water is taken from the Delta based on the volume of releases from the State's Oroville Dam on the

Checking Out the Main Pump Station: Howard Stoddard, Consulting Engineer; David Balmer, County Administrator; James Wiggins, Secretary-Manager of S.I.D.; Supervisor J. Ellis Godfrey; and Supervisor Wallace Brazelton

Feather River. It is too expensive for agricultural irrigation, but not for M&I use in a rapidly urbanizing area like Solano County.

CHAPTER 12

TEAR IT DOWN, BUILD IT HIGHER

"We want to make the most of what we have."
California Department of Water Resources

In September 1963, banner headlines in California's newspapers announced Governor Edmund G. Brown's startling new state water plan in which Berryessa would have a major role.

The $3.7 billion plan included 35 dams, 70 miles of tunnels, 10 pumping plants, and 15 powerplants. The timetable called for start-up in 1976 and completion about 2020.

According to the plan, the still-young, 304-foot high Monticello Dam would be removed, rather than letting it remain as an underwater barrier. It would be replaced with a 650-foot high earth and rockfill dam a mile downstream from the concrete arch dam. The new reservoir would be three times larger than Lake Berryessa, with 10 times its capacity or 16 million acre-feet (compared with Shasta's 4.5 million acre-feet).

The enlarged lake would extend into Pope Valley almost as far as Aetna Springs in Napa County and into Capell Valley, taking nearly 18,000 acres of agricultural and grazing land out of production.

Estimated cost of the Greater Berryessa Project, as it was called, was put at $360 million by the State Department of Water Resources (DWR). The timetable for this part of the project indicated a start-up in about 1990.

In essence, the idea was to integrate the Greater Berryessa Project with the $280 million Clear Lake Diversion Project. The latter included three dams on the Middle Fork of the Eel River, with tunnels to the Main Eel River, Russian River, and Clear Lake to Putah Creek, then through two more dams and Lake Berryessa to the Sacramento River.

From Clear Lake, the water would be diverted by a two-mile tunnel to Soda Creek in the Upper Putah Creek basin, developing 400 feet of powerhead that would be harnessed with the construction of two dams on Soda Creek.

According to the DWR, discharges from the power facilities would be released into an enlarged Lake Berryessa capable of meeting the export demands of the Sacramento-San Joaquin Delta and those of the Solano Project.

Even the Bureau of Reclamation, which had never been accused of thinking small, was impressed by the scope of Governor Brown's plan. R.J. Pafford, Regional Director of the Bureau, described the overall project as "staggering."

He hastened to add, "But it's physically possible, although the proposed reservoir area developments pose some problems, inasmuch as the existing improvements have to be replaced or paid for."

When Pafford was asked about the advisability of replacing a $48 million dam in use only six years with a new one costing $360 million, the Bureau director said, "It was shocking when I first heard of it, but since the Greater Berryessa Project would not be built for at least another 30 years, the present Monticello Dam by that time will have served its useful life." In support of Pafford's view, DWR officials added that adequate reservoir sites were disappearing fast. "We have to make the most of what we have."

No polls were taken, but Brown's plan undoubtedly

was received with mixed feelings in Solano County. The prospect of having 16 million acre-feet stored in a much enlarged Lake Berryessa *was* staggering.

Governor Brown's plan contained worrisome overtones of Owens Valley (which Los Angeles turned into a desert to meet its water demands). Seemingly innocent phrases like, "meeting the export demands of the Sacramento-San Joaquin Delta," had unpleasant overtones for those familiar with the history of California water; the state water plan might well have overwhelmed the good thing Solano had going.

Brown's master plan for the state's water problems never caught on with the public or the legislature, especially with those living between Sacramento and Red Bluff. His grand plans are collecting dust at DWR.

Two decades later Brown's son, Governor Edmund G. Brown, Jr., also tried to move more Northern California water south, though on a more modest scale. But his plan also failed. (The Peripheral Canal proposal faced an initiative which voters defeated at the polls.)

Amidst the clamor coming from Sacramento about building a new dam, J.E. Wiggins, the secretary-manager who succeeded Lambert, quietly announced the completion of all major portions of the distribution system for the standing Monticello Dam.

"The District will now concentrate on completing necessary drainage and flood control projects to enable all land to be brought into full [agricultural] production."

Wiggins further reported that during the 1962 season, 101,862 acre-feet of water had been delivered from the Putah South Canal to S.I.D. laterals, an increase of 12,000 acre-feet over the previous year's usage.

. . .

CHAPTER 13

WHAT A DIFFERENCE A DAM MAKES

"We were getting four tons to the acre. Now we're getting eight."
Frank Cadenasso, Cadenasso Winery

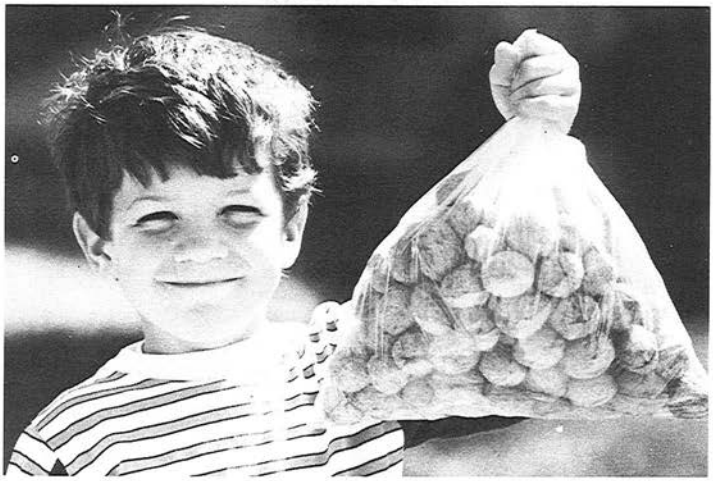
Solano County agriculture has never been the same since the 15th of May, 1959, when the first water from Berryessa poured into the Vaughn Canal near Dixon.

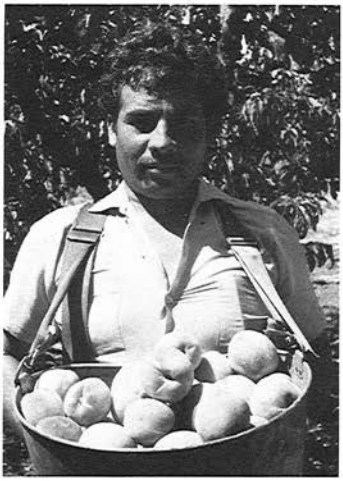
The conversion from dry farming to irrigation sent farmers to their banks to borrow money for land leveling, new tractors, and other equipment needed for intensive row-crop farming.

Between 1959 and 1962, an estimated $10 to $15 million of private capital was invested by the farmers in response to the Project. The new crops that went in paid handsome dividends.

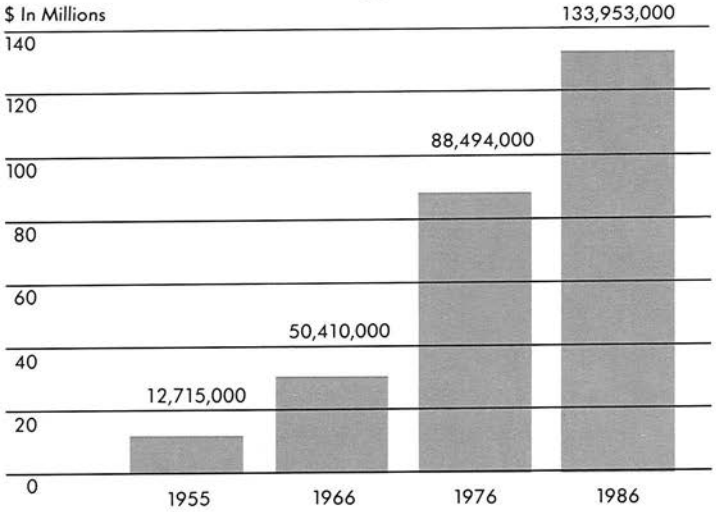
Solano County's number one cash crop, tomatoes, grossed $28 million in 1986. Among all California counties, Solano ranked fourth in the production of processing tomatoes. Acreage in the country's number two crop, field corn, had increased from 3,650 acres in 1958 to 43,551

Solano County Agricultural Crops

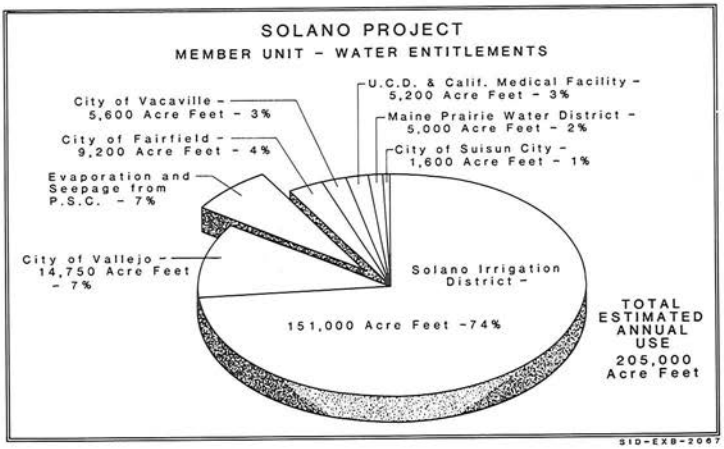




The Rise in Agricultural Production Solano County, 1955-1986



Data from Solano County Department of Agriculture



Solano Project Member Unit Water Entitlements

acres in 1986, with annual gross revenues of $14 million.

Overall agricultural production grew steadily from $12.7 million in 1955 to $50.4 million in 1966, $88.5 million in 1976 and $114 million in 1986. County Agriculture Commissioner John Donahue reported that in 1986, the county ranked second in California in the production of field corn, sheep and lambs, fourth in pears, and fifth in sugar beets and alfalfa seeds.

This cornucopia also produced bountiful crops of apricots, wheat, safflower, sunflower seeds, prunes, plums, peaches, apples, oranges, nectarines, cherries, strawberries, boysenberries, melons, kiwi fruit, walnuts, almonds, and bluegrass turf.

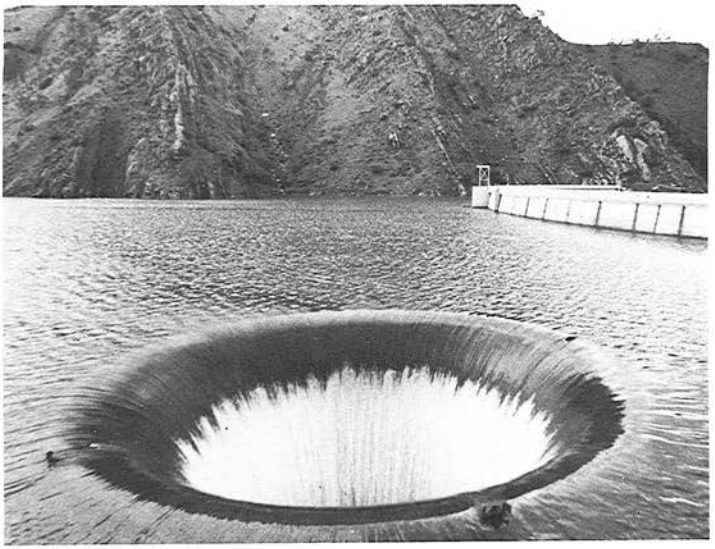
There was a similar impact on the assessment rolls. Between 1958 and 1964, for example, the assessed valuation of all land in the county (without improvements) took a spectacular jump of nearly 60 percent.

During these six years the only significant development in the county was for agricultural lands. The initial Solano Project development was completed and the influx of urban development had not yet begun to inflate land values in the area.

After they had time to feel the effects of the Project, individual farmers lent their voices to the county-wide chorus of testimonials. Frank Cadenasso, owner of the Cadenasso Winery in Fairfield, reported in 1979, the 20th year of water delivery from Lake Berryessa: "It doubled our production. We were getting four tons to the acre on grapes and now we get eight."

Alonzo Farms near Dixon was averaging 275 crates of jumbo corn ears to the acre. Cal Yee's drying yards in Suisun Valley dried and shipped about 3,000 tons of apricots, peaches, and pears that year. Lewis Pierce harvested seven to ten tons per acre of kiwi fruit in Suisun Valley.

Roy Schroeder, an almond grower in Dixon and a member of the S.I.D. Board, harvested a ton of nuts per acre. Warren's Turf Nursery grew 700 acres of heat-resistant



Water Overflows into the "Morning Glory" Spillway

S.I.D.'s Earliest Irrigation Season Begins in January, 1976

turf. Near Vacaville, in Lagoon Valley, Hines Wholesale Nursery was operating the world's largest container nursery, growing popular landscaping plants.

In 1959, the first year of deliveries, the Solano Project supplied water to 6,000 acres of land. The next year 30,000 acres came under irrigation. By 1979, all of the annual total yield from Lake Berryessa — 205,000 acre-feet — was being distributed to farms and cities. (For current entitlements, see chart.)

The Dam brought auxiliary benefits beyond increased agricultural yields. The assurance of a plentiful supply of high quality water had attracted a significant number of businesses and industries, among them the huge Anheuser-Busch brewery near Fairfield.

Other major benefits included the provision of water during droughts and flood control in wet years. Although water management facilities are not able to totally counteract the effects of these conditions, they can have a marked impact.

Like the rest of the Central Valley, Solano County had experienced both phenomena. In both dry years and wet years, the Dam has indeed made a difference. Farmers, ranchers, and city people have had cause to rejoice.

Drought conditions occurred in 1972, 1976, and 1977. In 1972, average rainfall recorded at the Dam was only 10.75 inches, about half the normal amount. The level of Lake Berryessa dropped to 24 feet below the lip of the "glory hole" spillway. No water shortages occurred even though the Irrigation District and the cities were using record amounts. Despite the drought and the resultant heavy drawdown, the lake still held 1,175,000 acre-feet, thanks to ample rainfall in the preceding years.

The 1976 water year was the fourth driest on record; 1977 was the driest. These two years in succession produced the most serious drought of the century in California.

By August 1, 1977 the total storage of 143 reservoirs, representing the bulk of California's surface water storage,

was only 39 percent of the average for that date. While many areas were having to institute drastic conservation measures, the S.I.D. area experienced no water deprivation.

Lake Berryessa also blunted dangerous flooding along Putah Creek from 1963 to 1966, which were wet years, and again in 1978 and 1983. Outflow from the lake is controlled by the "glory hole" spillway, which is 15.5 feet below the top of the Dam. The first overflow through the spillway occurred in the spring of 1963.

During the heavy downpours of that winter, a Bureau spokesman said that Monticello Dam was the greatest single factor in preventing the flooding of Putah Creek and subsequent heavy damage to Solano and Yolo County communities and farmlands.

CHAPTER 14

TURNING ON THE JUICE

"Bledsoe fought the paper tigers and won."
Vacaville Reporter

When Monticello Dam was constructed in the 1950's, installation of a hydroelectric plant was not considered economically feasible. However, penstocks were included to enable turbines and generators to be added sometime in the future.

S.I.D's Secretary-Manager Brice Bledsoe, a prime mover behind the powerplant, recalls six frustrating years of unprecedented litigation over the plant. S.I.D. had to take on the Bureau and other federal agencies, some state agencies, and two Northern California counties.

Bledsoe had been a resident of Solano County since 1953. He had worked for Howard Stoddard, the consulting engineer on the design and construction of the distribution facilities. In 1962 he was hired by S.I.D. as assistant district engineer. From 1970 to 1972 he served as assistant district manager, and in 1972 he succeeded James Wiggins as secretary-manager.

Bledsoe needed all his expertise to deal with the struggles over the powerplant. A low-key person who deals calmly with the District's ongoing problems, he says now,

"Those were the most trying years of my life."

Discussions with the Bureau began in 1975 about adding the power project, because by then electricity rates had escalated. At the start, S.I.D offered to help the Bureau get approval to construct the facility.

At about the same time, the State suddenly decided *it* wanted to build the Monticello hydroelectric plant. S.I.D filed the necessary state and Federal Power Commission (later replaced by the Federal Energy Regulatory Commission) applications only a few weeks ahead of the State in the fall of 1976.

S.I.D was equally willing to build the facility itself, or to let the Bureau do the job, even sponsoring a bill in Congress, HR 3919, that authorized the Bureau to take over. Under that arrangement, 50 percent of the power would be reserved for local use. The rest would be delivered to the Central Valley Project. These principles were included in a memorandum of understanding approved by the Bureau regional office and forwarded to the Secretary of the Interior.

Surprisingly, the Department of the Interior rejected that approach in a 1977 subcommittee hearing on the bill, claiming additional feasibility studies were needed and that action should be delayed for at least two years.

The District and Congressional staff tried to rewrite HR 3919, as directed by the subcommittee, to provide authorization for local construction of the project. Later, the bill was dropped because it was determined that adequate authorization was already provided within the Federal Power Act.

Seemingly endless legal maneuvers and discussions followed, involving the California Department of Water Resources, the new Federal Energy Regulatory Commission (FERC), the Department of the Interior, and the Bureau of Reclamation. Numerous environmental studies and reports added further complications to the process.

New problems developed when the Bureau reversed its

position and decided it did want to build the plant, thereby joining the competition between S.I.D. and the California Department of Water Resources.

In 1979 the Federal Energy Regulatory Commission issued a preliminary permit to S.I.D. and dismissed DWR's application. The Department of Interior instructed the Bureau to negotiate a contract to buy power from S.I.D. The District completed and filed its final application for license with FERC.

More than 85 percent of the voters in the District approved a $17 million bond issue to build the plant. S.I.D solicited proposals from PG&E, SMUD, and other potential customers for the power. At last the wrangling seemed to be coming to an end.

Ten days before the deadline for public comment on S.I.D.'s license application, Napa County Supervisors announced their intent to intervene and filed a competing application to build the powerplant. In the meantime, the City of Santa Clara had signed an agreement to become a partner in Napa's application to build the generating facility.

More than a year of litigation ensued, which also included a dispute over the boundary between Napa and Solano counties where Monticello Dam is situated.

Napa County said it would settle for $120,000 a year for 50 years from the power profits as compensation for having Lake Berryessa and Monticello Dam within its borders. (The actual border is still in dispute.)

S.I.D. retaliated for the Napa attack by having the Solano supervisors cut off Napa's temporary contracts for Solano Project water.

Documents revealed later indicated that Napa County wasn't really serious about building the hydroelectric facility. The litigation was intended to force S.I.D to share the water or the revenue derived from the power sales.

The voters approved the bond measure in April of 1980, but S.I.D. still needed the approval of the District Securities Division of the State Treasurer's Office. Prelim-

inary approval was obtained and the bonds were sold but State Treasurer Jesse Unruh refused final certification.

Unruh said that the 18 percent interest rate being asked in 1981 was much too high. The State might be liable if the project went "belly up," and the unusually high rate might impact the sale of state bonds. The Treasurer's move was unprecedented, especially because PG&E had agreed to assume the annual capital costs of the loan. S.I.D. promised to refinance the loan when the abnormally high interest rates came down, and Unruh relented.

In January of 1981 the Federal Energy Regulatory Commission turned down Napa's application and issued S.I.D. a final license for the project.

Napa County and Santa Clara retaliated by filing an Appeal for Rehearing, which was withdrawn after a negotiated settlement between S.I.D. and Napa and Solano counties.

A week after this agreement, the City of Santa Clara filed a suit in the U.S. Court of Appeals in Washington, D.C., challenging S.I.D.'s federal license to build the powerplant. Santa Clara officials said they had refused to sign off on Napa's agreement with S.I.D. and Solano County. After many days filled with suspense, frustration, and legal maneuvers, the city ended its litigation.

As the District prepared to start construction, word came from Washington that FERC was contemplating a major change in the fee structure for use of federal dams for power generation. Calculation by the new formula would have reduced the net revenue from the facility to almost zero during the capital repayment period.

This proposed drastic change inspired formation of a national lobbying group consisting of public power agencies in most of the 17 western states to oppose it. Solano Irrigation District became the leader in the challenge and Bledsoe chaired the Annual Charges Policy Group which finally succeeded in reducing the charge through federal legislation to fix the maximum charge. That part of the effort required

about three years of work.

During the years of legal entanglements, Bledsoe remained confident about the final outcome. Project planning efforts had included a $2.5 million contract for manufacture of the turbines and generators. S.I.D. was aware that protracted delays could push the project cost beyond the bond authorization.

Construction began in September, 1981. The first electrical energy was generated in March of 1983. Twelve months of testing the facility followed, and full operation was not declared until June of 1984.

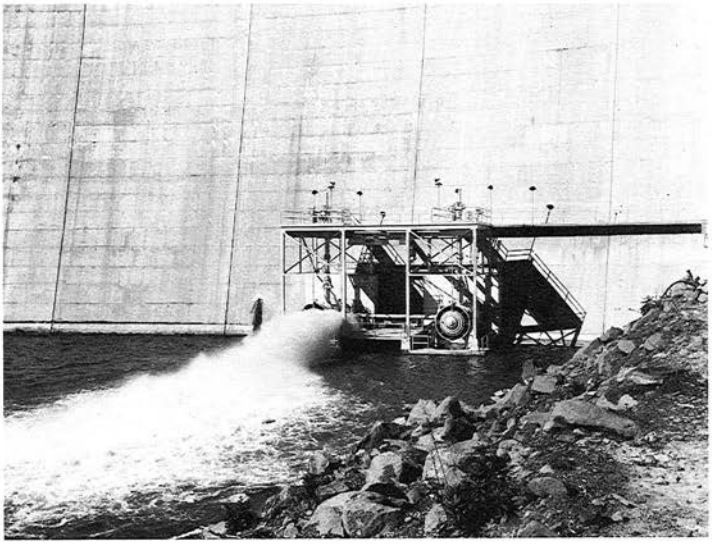
Electrical energy is produced by hydroelectric units, using water releases to Putah Creek from the reservoir through the northern penstock. Electricity is transmitted to PG&E's Vaca-Dixon substation over a 115 kV transmission line.

The installed capacity is 11.5 megawatts, but at full bore the output can be safely raised to 13.2 MW. Annually, the facility produces an average of 52 million kilowatt hours, enough for about 12,000 to 14,000 homes. The amount of energy produced displaces approximately 80,000 barrels of oil per year.

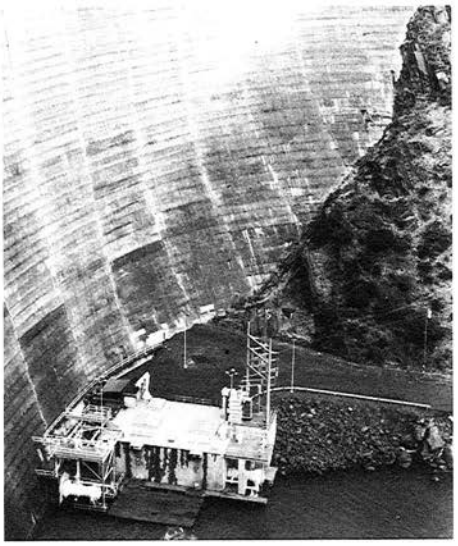
The hydroelectric equipment includes two horizontal Francis-type turbines and synchronous-type generators, each with a rated capacity of 5 MW, and one horizontal Francis-type turbine and induction-type generator with a rated capacity of 1.5 MW.

Extending about 25 feet below the Putah Creek water level, the powerhouse has four levels. Tudor Engineering Company performed the design engineering, with Syblon-Reid Company acting as the general construction contractor.

While getting the job done, S.I.D. accumulated a pile of licenses and permits from the Federal Energy Regulatory Commission, the California Water Resources Control Board, State Treasurer's Office, U.S. Army Corps of Engineers, and the California Department of Fish and Game.



Monticello Dam Outlet Works



Bird's Eye View of Power Station

Writing about the battle over the power facility, the *Vacaville Reporter* concluded, "Bledsoe fought the paper tigers and won."

CHAPTER 15

WATER ON THE MOVE

Solano Project employees deliver about 80 billion gallons of water a year.

All the years of effort behind the Solano Project are in solid evidence at Devil's Gate and on Putah Creek, about eight miles west of Winters on Highway 128.

Monticello Dam, Lake Berryessa, the downstream Diversion Dam, Lake Solano, the Putah South Canal, and the irrigation distribution system can be viewed by the public. Other related facilities, such as the District's water treatment plant in Suisun, the Ulatis Flood Control system, the new water treatment and distribution facilities constructed by the member unit cities are other spinoff components of the Solano Project.

Monticello is the center of the action every day, around the clock. When full, the Dam holds back 1,600,000 acre-feet of water, enough to see the county through six or seven consecutive dry years at the allowable annual drawdown of 241,000 acre-feet.

The Bureau operated the Dam until March of 1981, at which time S.I.D. took over the operation and maintenance of the Project. A surprisingly small force oversees the entire operation. At the top is the secretary-manager, who reports

S.I.D. Board Members William Wetzel, Howard Rogers, and Morris Dally at the Lake Solano Diversion Dam

to the Board of Directors. The director of operations is in charge of the Dam and the powerplant.

The person at the controls in the Dam and the powerhouse is the powerplant superintendent. He monitors the generators that make the electricity and regulates the tailrace of the Dam to ensure that the right amount of water goes out to meet the county's daily needs. His two helpers at Monticello Dam and at the Diversion Dam below are the dam operators.

A door near the face of Monticello Dam opens on a steep flight of stairs. The stairway leads down three stories, past levels of cave-like rooms that house the roaring generators and assorted maintenance and repair tools and gear.

"It's always 50 degrees in here," says the superintendent, opening the door to his noise-proof office. With the door shut, the deafening roar outside is reduced to a faint buzz. A large plate glass window in the right wall enables him to keep an eye on the generators below.

The office is lined with gauges and panels of instrumentation that monitor critical parameters: level and condition of the water in Lake Berryessa, state of the generators, kilowatts of power being produced daily, amount of water being released, and condition of the Dam itself.

Surprisingly, dams are not stationary objects. Plumb lines in an alcove inside the Dam measure its movement. Other data are recorded on strain gauges. External devices measure the oxygen level of the water in Berryessa. If oxygen drops below the level fish in Putah Creek need for survival, the outflow is aerated.

Via an antenna atop the Dam and a satellite hookup, daily reports are sent directly to the Denver office of the Bureau of Reclamation.

Using the controls in his office, the superintendent can quickly reduce or increase the outflow of water and cut generators in or out. The more water being released the more kilowatts are generated. In summer, about 750 cubic feet

Annual Cleaning of the Canal

per second are released into the Putah South Canal. In winter, that drops to about 60 cubic feet per second. The irrigation season typically starts in April and ends in October.

A number of protective devices and electronic gadgets that watch for trouble have been installed at the Dam. Remote monitoring tells what is happening when the control room is empty. If anything goes wrong, a pre-recorded message will be sent, identifying the source of the mishap. To date there haven't been any serious incidents.

But the Dam is not all gauges, high tech instrumentation, and roaring generators. When it was finished, the swallows arrived and built their nests in the vertical grooves between the blocks. They return each year in huge flocks during the second or third week in March and leave about July 15. Monticello brought Capistrano to Solano County.

Six miles below Monticello Dam is the Diversion Dam where some of the water is sent into the concrete-lined Putah South Canal. The remainder continues through Putah Creek's normal channel. Backed up behind the Diversion Dam is Lake Solano.

A well established routine ensures that water in sufficient amounts goes where it is needed every day.

Farmer Fred Tomasini explains how the system works for growers who buy irrigation water. "We work through our water tender, telling him how much water we need and when. Five, seven, or ten days down the line, I'll order the water shut off. The water tender orders for us from the main distribution system on a daily basis. We are billed once a month."

According to Tomasini, orchards usually use about two acre-feet per acre during the summer. Most crops need at least that much or a little more. "I usually water more than most people," he says.

Fourteen water tenders have daily meeting places where they go to receive the next day's order from each farmer. If that isn't feasible, the contact is made by phone. Tenders also collect orders from the member units that have

allocations: Vallejo, Fairfield, Vacaville, Suisun, the California Medical Facility at Vacaville, the University of California, Davis, and the Maine Prairie Water District.

Benicia and Napa are receiving water under temporary contracts that will terminate when they connect with the North Bay Aqueduct.

The director of water operations and his crew of water tenders are responsible for getting water to the fields in their areas. After the irrigation season ends they join forces with the regular maintenance crew to do maintenance work on the ditches and on 73 miles of drains.

The distribution system has 112 miles of surface canals that branch off from the Putah South Canal, extending from the Diversion Dam to Green Valley. About 185 miles of pipeline are used to reach the individual farms in the District.

Solano Project employees deliver about 80 billion gallons of water a year, with a minimum of spillage.

In addition to the water from Monticello, the District has about 40 deep wells that are available for use. The wells are not always in operation, but are used in conjunction with Project water as a backup supply in dry years. In effect, S.I.D. keeps those wells in reserve, using them to store water underground.

CHAPTER 16

THE BOTTOM LINE

A similar project today would cost five to ten times as much.

Originally, repayment to the federal government for the Monticello Dam had been calculated on a 40-year basis, starting from the date of the first delivery of water in 1959, not from the completion of construction.

The first group of contracts have an expiration date of 1999, which is the end of the 40-year period. S.I.D. Manager Bledsoe explains that such contracts are often extended for an additional 10-year period, if more time is needed.

According to Bledsoe, the status of the payout has been affected by an unforeseen increase in sales to municipal water users. Their water brings $15 an acre-foot as compared to the $2.65 for agricultural irrigation water. However, a large increase in operating and maintenance costs has also occurred. Revenue from water sales has had to absorb these increases and at the same time take care of debt service.

"For that reason," Bledsoe says, "we're lagging a little bit behind on repayment, but extending to 50 years may do it. The question is whether or not the Project will repay by the expiration date of the contract — which is 1999.

"We have about 12 years to go. My calculation indicates that at best it will take a five-year extension — which is 2004. That payout will take care of all of the construction

done by the Bureau."

Construction of the powerhouse was done differently. That facility was financed with a $17 million revenue bond issue. The power produced is sold to Pacific Gas and Electric, which guarantees S.I.D. an annual income that is adequate to cover the bond's debt service.

To finance construction of the distribution system that carries water from the Putah South Canal to farms and urban users in the District, S.I.D. took advantage of federal financing under the new Public Law 130. In fact, it received the first loan granted under that law, which provides for interest-free capital.

This loan, too, is on a 40-year payback arrangement beginning ten years after execution of the loan contract to allow completion of construction. S.I.D. borrowed $15 million, then obtained $2 million more under the Reclamation Act, for a total amount of $17 million. The payoff date for the loan is 2006.

Since the completion of initial construction the District has completed additional facilities including some 30 deepwells which provide a supplemental water supply and allow conjunctive use of groundwater and surface water supplies. New construction has also included urban water systems, a water treatment plant, an hydroelectric generating plant and extensive modifications and extensions of the original irrigation facilities. The new construction has been funded separately by the District.

S.I.D.'s net revenues from power sales have been going into their special capital reserve for major repairs and improvements of the distribution system. A current plan calls for rehabilitation work on the system amounting to about $20 million.

When enough money has been accumulated in the reserve account, these repairs will be made, together with some water conservation measures. Needed system improvements include concrete lining of many of the canals. The value of water lost due to seepage would justify the cost

of a concrete liner.

Financing of the Cement Hill Water Treatment Plant near Suisun City was handled through general obligation bonds. However, under S.I.D.'s joint-service agreement with the City of Suisun, water revenues within the joint service area are to be used for all joint service expenses.

Bledsoe says, "That project is breaking even at the present time. Our revenues are keeping up with our expenses. But expansion of the system may have to be financed in part by reserves, which the joint power has from connection fees. We may also have to invest some additional money to expand the system to its ultimate capacity."

Adding up what the Bureau and S.I.D. have both invested in the Solano Project over the years, the total comes to about $80 million. Each spent about half of the total. Bureau engineers who were asked said that a similar project today would cost five to ten times as much.

Bledsoe adds, "Even though Monticello was built before stricter environmental controls were imposed, those environmental protection factors were not ignored. I still look at farmers as being the original conservationists — before it became stylish."

S.I.D. assumed still another financial obligation when it played an active role in the Ulatis Flood Control Project, a rather large undertaking that was financed under Public Law 566. The District became partners with the county and the Ulatis Resource Conservation District in promoting and constructing the Project.

S.I.D. co-sponsored the Project and agreed to contribute 25 percent of the annual maintenance cost. The Project included all of the construction and reconstruction of flood control channels in the Ulatis Creek watershed — McCune, Sweeney, Horse, Ulatis, and Gibson Canyon Creeks. All of these merge into tributaries of Ulatis Creek, which flows into the Delta.

The Ulatis Project took several years to construct. Total cost was over $7 million. S.I.D. had a vital interest in

that project because it brought a lot of non-irrigated dry land farming into an irrigated status. Without drainage, it wouldn't have been feasible to develop those lands.

A system was needed in the summer to collect and carry the return flow from irrigation and to protect the same land during periods of winter flooding. That was particularly important because the watershed, which includes the City of Vacaville, lacked an adequate flood control outlet.

Construction of the Ulatis Flood Control Project began in 1961-62 and was completed before the end of the decade.

Perhaps the best value — dollar for dollar — in the entire Project is the small annual investment ($60,000) which county taxpayers put toward the Project to reduce the cost of irrigation water. Their payments have been repaid to the Solano County treasury ten times over in the past 40 years through an increase in the valuation of agricultural property alone.

Other unforeseen economic changes have affected the bottom line as well. In 1982, Congress passed the Reclamation Reform Act. In limiting corporate farmers' use of federally-subsidized water, and attempting for the first time to regulate leasing of land, the government also applied its new rules to existing contracts with working farmers like those in Solano who, with changing economics, need to farm at least 1,000 acres to stay in business. But that will be impossible for some Solano growers since water charges for the "larger" operations have gone through the ceiling, rising from $2.65 to $30.65 an acre-foot.

CHAPTER 17

URBANIZATION AND CHANGING TIMES

Between 1965 and 1979 nearly 7,000 acres of good farmland were annexed by the cities in Solano County.

Serious concern surfaced in 1970 about the increasingly visible effects of urbanization. While Solano County is primarily agricultural, widening arcs of urbanization had begun to reach it, similar to other counties surrounding the Bay Area.

Inevitably, parts of Solano County were drawn into San Francisco's orbit. At the same time, Fairfield, Vacaville, and Vallejo, like the rest of California, were attracting people departing the East Coast, Midwest, and Southern California in search of elbow room and a more convivial lifestyle.

Commenting on the urban annexation of good farmland, Morris Dally says, "People came to where the good farmland was and that's where the cities were built." Cities grew and annexed more of the prime land on their perimeters.

Dally adds, "I don't think any of us in the early days, when we built the Dam, envisioned the tremendous amount of growth that has occurred in the Fairfield and Vacaville areas. We have to get more water someplace.

"Of course the North Bay Aqueduct is coming in, which will help, but it isn't the whole answer if this growth continues."

The growth pressure around Solano's cities is real. For example, between 1965 and 1979 nearly 7,000 acres, mostly high grade agricultural land, were annexed by the cities of Vacaville, Fairfield, Suisun, and Dixon.

S.I.D. has been affected. Streets went in over water lines. Backyards backed up against canals. Some canals had to be replaced with underground pipes to make way for homes. Sometimes streets and yards had to be dug up to get at water lines below.

The impact of the county's population explosion is evident from census data: 1940 — 49,118; 1950 — 102,750; 1970 — 171,080; and 1980 — 230,228. The projection for 1990 is 342,000. By the year 2000, a further jump of 69 percent is predicted.

Conversion of farmland into subdivisions reduces S.I.D.'s revenue and could raise assessment fees on the remaining land if left unchecked. Maintenance costs have soared.

The financial impact on the District has been offset by an agreement with the cities and the Local Agency Formation Commission regarding repayment of the debt. Fees are collected for lands that are detached for urban use. The "detachment fee" represents the detached area's proportionate share of capital repayment and a share of maintenance costs.

The county's population explosion has had a significant effect on both the water supply and on agriculture. At times the District has had to provide municipal water to certain developing areas in order to protect its dwindling economic base.

When farmlands in the Tolenas area south of Fairfield were being annexed to Suisun, the District faced the prospect of losing a large piece of its service area and tax base. To head off that situation, S.I.D. chose instead to continue supplying water to the area.

Voters approved a $2 million bond issue in 1976 to build a water treatment plant for Suisun City and the unincorporated Tolenas area. The District operates the plant under a joint exercise of powers agreement between the agencies.

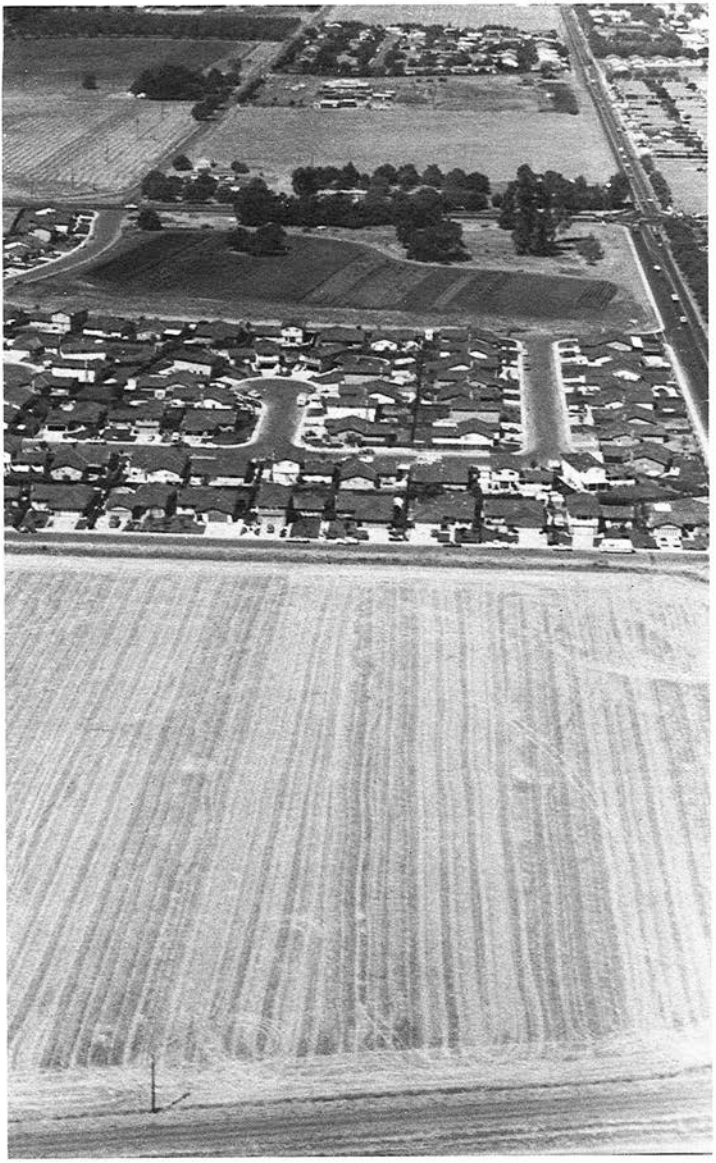
District Manager Bledsoe and the Board urged county and city planners to be aware of the impact of proposed subdivisions on the irrigation facilities and to avoid placing urban developments on prime farmland. Evidently the message is getting through. A new dialogue with the cities indicates that they will work to preserve agricultural uses and open space in the county.

In the Fairfield area, urban encroachment posed a special problem. The surrounding Suisun Valley has historically been a very fertile and productive section of farmland, representing 25 percent of the District's assessed valuation.

Attempting to prevent premature encroachment of suburbia upon irreplaceable farmland, the City of Fairfield, Solano County, and S.I.D. agreed that a major part of the area should be preserved for agriculture.

In 1974, after a year of negotiations, they agreed not to provide urban services within that area before the year 2006. The District hopes to extend the agreement beyond that date. Under the current arrangement, 10,000 acres are protected against further urbanization, and the boundaries have been drawn to conform with the city and county general plans. Other agencies that participated in the agreement include LAFCO, the County Planning Commission, and the Fairfield-Suisun Sewer District.

The agreement also specifies that Fairfield's municipal wastewater can be used by S.I.D. for irrigation purposes and places a short-term prohibition against the installation



Urban Encroachment on Prime Farmland

of new trunk lines adjacent to the Fairfield area.

According to Bledsoe, the parties involved have come up with a unique multi-agency policy that few other public agencies have been able to provide.

Still Bledsoe recognizes that "Solano County is going to continue urbanizing. So far, the District's policy has not been anti-growth, but we're trying to mitigate the effects of growth.

"We are working out agreements with the cities regarding joint service, where it is possible to provide that service. We are keeping industrial and commercial lands on the District's assessment rolls and providing services to these lands jointly with the cities."

Over the long term, the District expects to see a gradual conversion of its customers from agricultural to urban. "The magnitude of that I wouldn't attempt to guess at this point. It could be substantial."

The real estate market also sees this conversion as evidenced by the dramatic rise in assessed land values within the District, increasing from $23.2 million in 1959 to $351 million in 1987.

The District's big campaign in the 1970's was to try to balance the loss of land to urbanization by bringing in new land suitable for irrigation. At this point, in 1988, the District's goal hasn't been fully achieved. Having retained land that is no longer agricultural, the District is still serving about 70,000 acres. But the amount that is agricultural has declined to about 50,000 acres. When the District was originally formed 40 years ago, the directors planned to serve 80,000 acres.

The District has between 7,000 and 8,000 landowners, which would average out to about ten acres per ownership. But actual farm owners/operators of 40 acres or more number about 500. Because of the economics of modern farming, especially with row crops, large acreages are often collected under a single lease. Some of the leases range from 500 to 2,000 acres. Small farming operations are no longer

common.

S.I.D.'s customers have felt the effect of other kinds of changes. Tomasini says that the Suisun Valley could not compete with interior Central Valley growers after the Central Valley Project and State Water Project provided them with water.

Prior to that event, fruit from Pleasant Valley, Vaca Valley, and the English Hills was known all over the country. The hills were covered with orchards and iced box cars hauled the produce to market. Howard Rogers remembers that 2,500 freight cars of cherries, apricots, and prunes were being shipped from Vacaville in a single season.

In recent decades, modern high-speed transportation systems and improvements in cold storage have affected the marketing picture. Produce markets carry apples from New Zealand, grapes and cherries from Chile, and winter vegetables from Mexico — and all at competitive prices.

New styles of farming and marketing have developed. Growers are selling their produce directly to the public at state-certified farmers' markets like the one in Davis, thereby eliminating the middleman. Another method is to sell specialty produce directly to the better restaurants that put a premium on quality, or to switch to profitable new crops like kiwi fruit, as Lewis Pierce did.

In Dixon, Charlotte Glenn and Georgeanne Brennan have developed a prosperous business, LeMarche Seeds International. They sell European and American gourmet and heirloom vegetable and herb varieties. On some small plots they test seeds that are sold all over the world.

People's tastes in food are changing. Americans are eating more fresh fruit, shrinking the market for Bartlett pears and canning peaches. At one time, the county hummed with packing and canning plants. A major canner, Cal Canners and Growers, of which Fred Tomasini was a member, went bankrupt.

He remembers that the Suisun Valley had seven packing houses when he was a young man. Lambert Marketing

was putting out seven to nine carloads a day.

Among the canners were Del Monte, Libby McNeil and Libby, Richmond Chase, and many independents who were taking fruit out of the valleys and hills. Today's outlets have been reduced to Tri-Valley Growers and Glorietta.

Tomasini says, "You can see clear across Suisun Valley now. It used to be solid orchard. A lot of the land is sitting idle. Some people are growing safflower and a few sugar beets."

Yet for all the changes in the public's food tastes and urban encroachment, agriculture continues in Solano County. Data show that thanks to local growers' ready adoption of innovative techniques and crops, agricultural production in Solano County has risen steadily over the past four decades.

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CHAPTER 18

RECREATIONAL DIVIDENDS

Lake Berryessa is one of the most popular of all the Bureau's lakes in the western states.

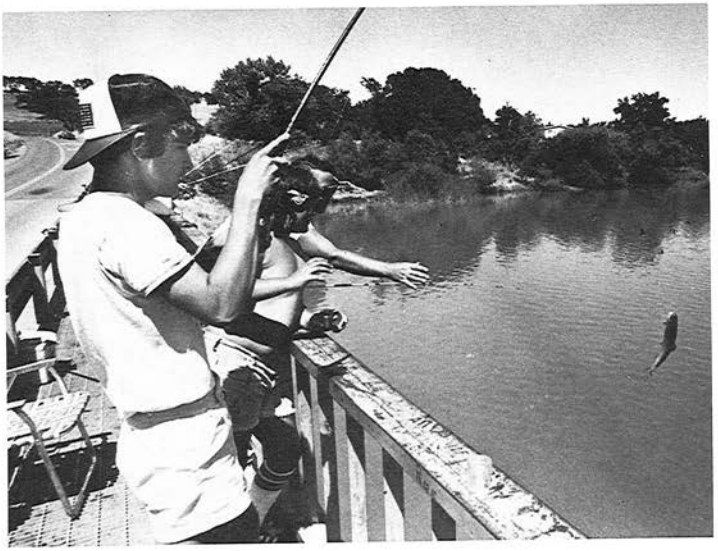
In Solano County summer temperatures often hover around the century mark. For the region's parched inhabitants, Lake Berryessa and Lake Solano provide much needed respite and recreation.

Lake Berryessa, which covers more than 19,000 acres and has 165 miles of shoreline, was under the recreational management of Napa County until 1975. Controversy arose over the lack of public access that was being provided. The General Accounting Office conducted an investigation which resulted in the Bureau of Reclamation taking control of the recreational aspects.

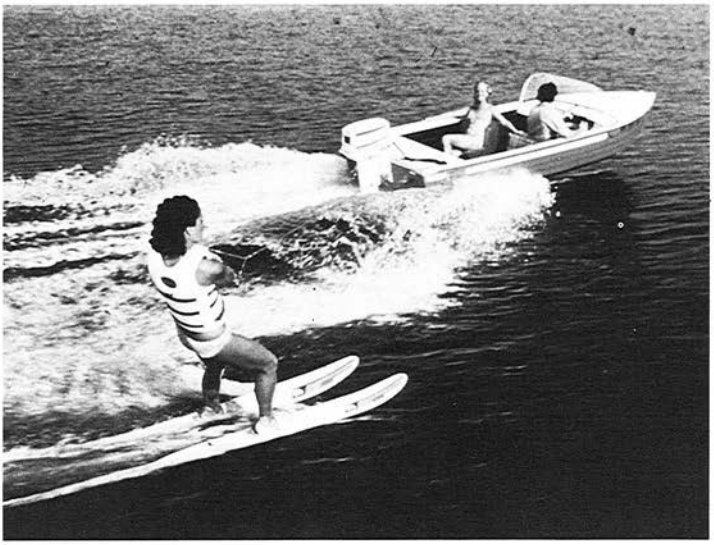
Since that time the lake has become tremendously popular, particularly with visitors from the Bay Area. Figures for visitor days per year doubled from 700,000 in 1978 to 1,400,000 in 1987. Lake Berryessa is one of the most popular of all the Bureau's lakes in the western states.

Berryessa's attractions include swimming beaches, water skiing, boating, picnicking, sightseeing, and fishing. The lake is considered one of the best fisheries in the state for trout, kokanee salmon, catfish, and bass.

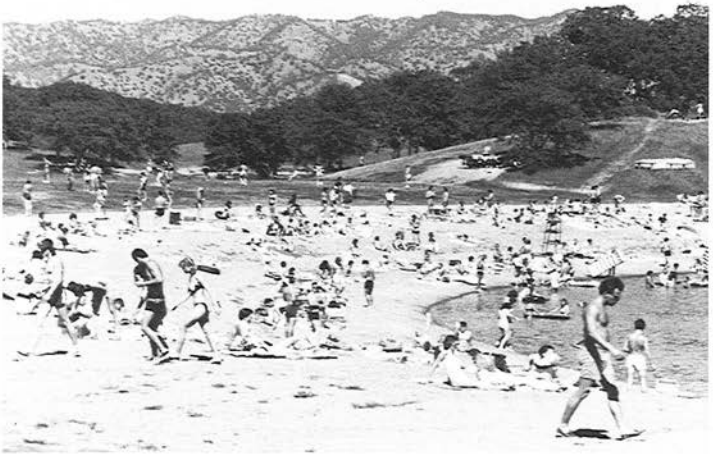
Sailboating on Lake Solano



Fishing at Lake Solano



Power Boating on Lake Berryessa



A Crowded Beach at Lake Berryessa

The recreation area around the lake covers more than 1,000 acres. Short-term use — a day, a week-end, or a one-week stop — is most typical. Some private landowners allow mobile homes and trailers for up to one year. On federal property there is room for 1,600 mobile homes.

Lake Solano, which backs up behind the Diversion Dam six miles downstream, is a separate recreation spot under the direction of the Solano County Department of Parks.

One side of the lake is in Yolo County. The lake covers 150 acres, surrounded by 245 acres of park. Ten acres have been developed for year-round use.

More than 100,000 people used the facilities in 1987. The trout fishing is reputed to be outstanding. On the Yolo County side, five access points are provided for fishing.

Power boating is prohibited, so sail boating and canoeing are popular activities. The ten developed acres are devoted to three different uses: camping, day use, and an area for young people only — Boy Scouts, Girl Scouts, and church groups.

CHAPTER 19

THE SEARCH GOES ON

"We are looking for long-term contracts for additional water."
Brice Bledsoe

In September of 1987, S.I.D. got together with the cities of Fairfield and Vacaville to form the Solano Joint Power Water Authority. All local agencies are being urged to join. The group is studying several major moves.

Among these are the acquisition or the accelerated payout of the Solano Project in advance of the contract's termination date in 1999. By taking either of these actions, the local agencies would avoid greatly increased payments after 1999 as well as many other uncertainties arising from renegotiation of the contracts. Significant unpaid capital costs will remain after expiration of the existing contracts.

Several options are being explored. One would simply be to prepay the Project and leave the ownership in federal hands. Or the member agencies could pay off the outstanding debt on the Project and take ownership. Either choice is likely to require Congressional approval, according to Bledsoe.

Because the Bureau recently has been considering removing itself from the project-operating business, it may

welcome the opportunity to transfer the Project to local water users.

Solano County's current contract with the Bureau makes no mention of transferring ownership to the member agencies, even after payout. Because the Reclamation Act does not provide for such a transfer, Congressional authorization would be required. Standard federal operating procedure has been for the Bureau to retain ownership and collect its administrative costs in addition to operation and maintenance costs.

S.I.D. has had a contract to operate and maintain the Monticello Dam at project cost since 1981. Expenses associated with operation and maintenance are reimbursed to S.I.D. from water payments to the Bureau.

Other promising possibilities relate to the construction of the Noonan Reservoir and an application for additional water from the Central Valley Project or from Shasta Dam. Along with other applicants, S.I.D. is waiting in line, hoping to contract for a portion of the available supply. The District and Solano cities have requested about 92,000 acre-feet from Shasta.

Taking advantage of projects like these will require financing, Bledsoe states. He believes all of the Solano Project's member units have a mutual interest in joining the new Water Authority. The group would be able to sell bonds to finance the projects and share the control and ownership of their water supply.

The Noonan Reservoir is just northwest of Travis Air Base and southwest of Vacaville. The District is proposing to facilitate a cross connection between the State Water Project's North Bay Aqueduct and the Solano Project's aqueduct. These two conveyances come very close to each other at the Noonan Reservoir site.

By linking the two water supplies at the Noonan Reservoir, offstream storage could be provided for the Solano Project. The lake surface would cover about 300 acres and store about 3,000 acre-feet.

Noonan Reservoir could also serve as a terminal point for Central Valley Project water supplies if the District can tap into Lake Shasta's available reserves. A desirable route, Bledsoe says, would be to bring the water through the Tehama-Colusa canal into Yolo County and construct a new aqueduct from that point to Solano County, probably terminating at Noonan.

For many years now, the Noonan Reservoir has been shown in Bureau reports as the terminal point for the West Sacramento Valley Canal.

"We find it useful also in coordinating the supplies we now have from the State Water Project and the Solano Project," Bledsoe says. "If we can tie a third project supply in there, then all the participating agencies will benefit mutually." New water sources like these would be primarily for municipal use.

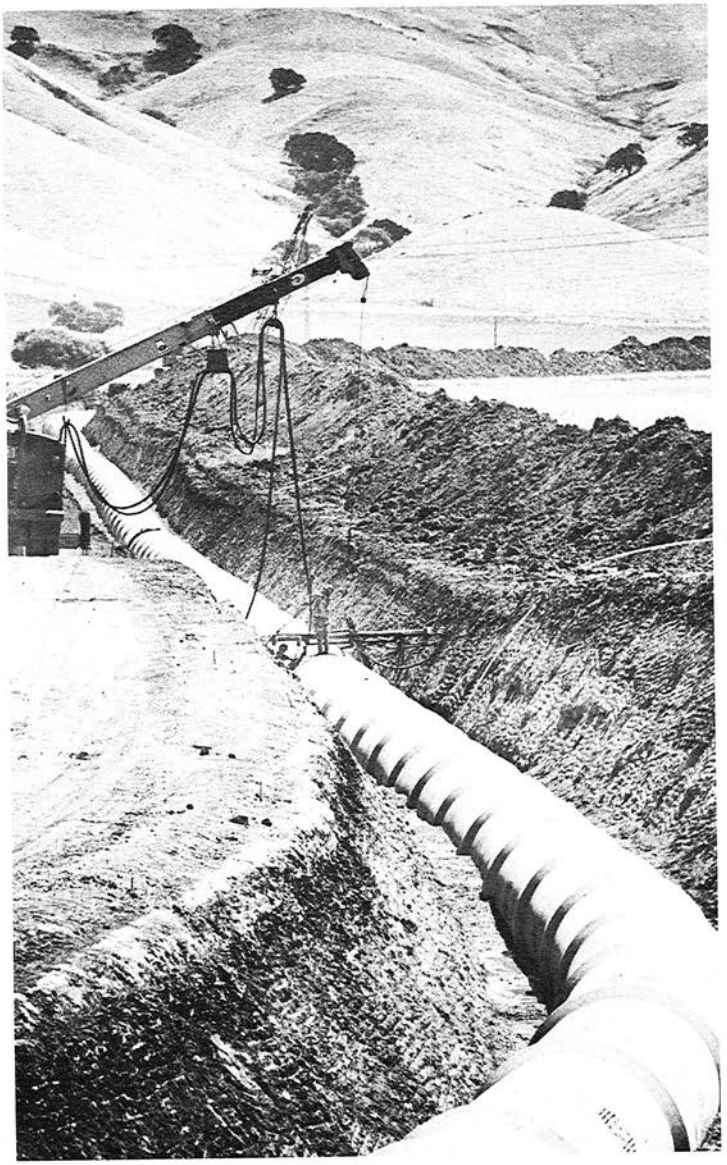
Water from the North Bay Aqueduct, which is also intended for municipal use, comes from Barker Slough in the Delta. Barker Slough is an authorized part of the State Water Project and will provide about 40,000 acre-feet per year for Solano County and about 20,000 acre-feet for Napa County. Nearly complete, the NBA is expected to be operational in 1988.

The NBA winds around north of Travis Air Base. Fairfield and Vacaville are building a joint treatment plant at the Noonan Reservoir location and will tie in to the NBA at that point. Napa county will also tie in there. The aqueduct extends all the way to Cordelia.

Vallejo picks up the supply in Cordelia and transports the water to its own system. Benicia will pick up the supply in Cordelia and transport through its own pipeline.

One leg of the NBA, reaching from Cordelia to Napa County, was built in the 1960's. Although the water is delivered untreated, it is intended for municipal use only. At a price in excess of $100 an acre-foot, the water is prohibitive for irrigation.

"We are looking for long-term contracts that will pro-



North Bay Aqueduct from Vanden Road Looking West

vide additional water in the early part of the next century," Bledsoe says, pondering the future.

He considers talk of heightening Monticello Dam unrealistic because of the cost factor. "Moving downstream and building a totally new dam isn't feasible."

Studies indicate that little if any additional yield is available within the Berryessa watershed. Earlier proposals to move the Dam contemplated using the storage capacity for water from another source, most likely the American River. But the cost of pumping the water uphill would be prohibitive.

Still another suggested proposal is to divert flood flows from Clear Lake through tunnels into Lake Berryessa. The plan is not really feasible, Bledsoe says, because of the high cost and the negative effect on water quality.

CHAPTER 20

TAKING STOCK

"We have a good project. A very good one."
Ed Uhl

In the early 1950's, opponents of the Solano Project exerted every effort to forestall the proposed dam. They charged that it would bring economic ruin to many of the county's farmers and that little Putah Creek would never fill the mammoth reservoir. In the eyes of the critics, the Solano Project could best be described in one word: "folly."

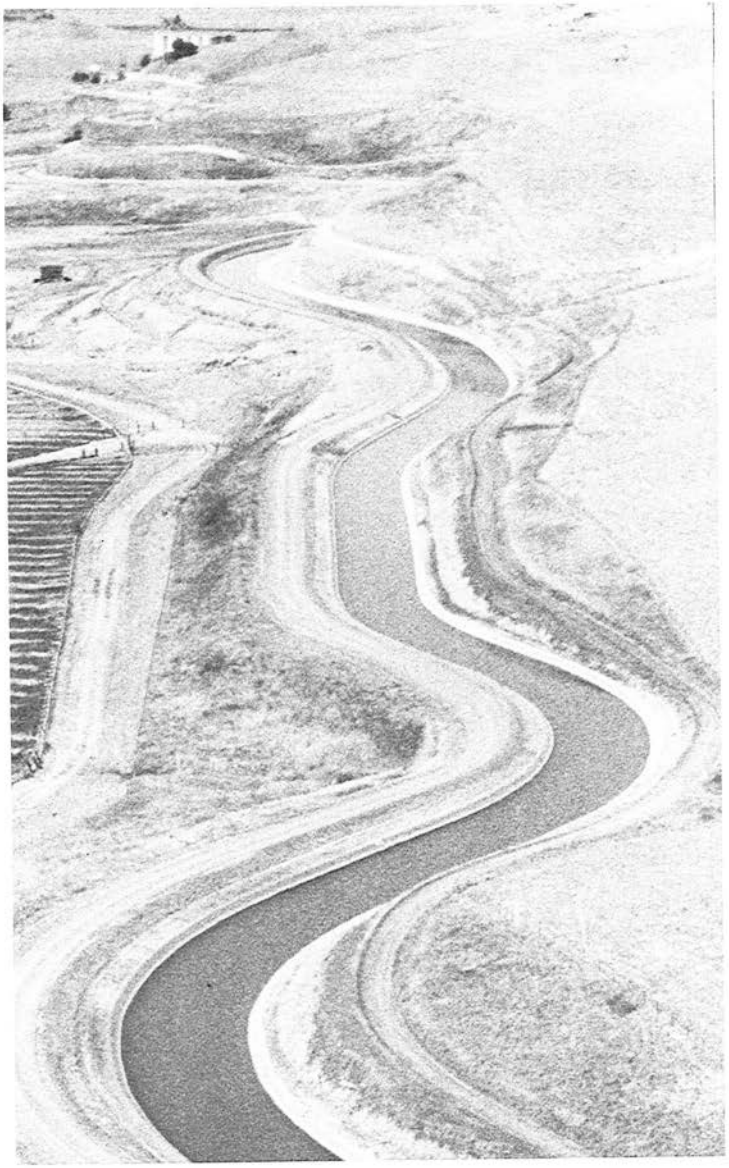
The District's 40th anniversary is a good time to take stock. Untold millions of cubic feet of water have poured through Monticello's penstocks. Enough evidence has accumulated to show conclusively that the naysayers were wrong on all counts.

There have been times when frustrating and unexpected roadblocks delayed or set back the Project's development. Unprecedented growth has confronted the Solano Irrigation District with problems that nobody could have foreseen and prepared for in advance.

But the Solano Project's original projections when judged by any standards have proven to be sound.

Monticello Dam not only filled to its 1.6 million acre-feet capacity (much faster, in fact, than the Bureau of Reclamation had figured), the spillway has overflowed frequently.

Both the agricultural and urban sectors have had abun-



Water Delivery Through the Canal System

dant access to a plentiful supply of good quality water during periods of drought. In wet years they have been spared from the devastating floods commonplace in earlier years.

Many of the benefits of a reliable water supply can be readily quantified in impressive before-and-after figures. Agricultural income has grown from $12.7 million in 1955 to $133.9 million in 1986. Assessed valuation for land during the same period has gone from $23.2 million to $351 million. While inflation and urbanization have contributed, all have been important factors in this meteoric increase.

Were a facility that is the equivalent of the Solano Project to be built today, Bureau engineers estimate its cost would be increased by a factor between five and ten. Recent studies of the beleaguered Auburn Dam show that if it were ever built, water-users will be charged costs between $200 and $400 per acre-foot.

For the residents of Solano and neighboring counties, the Solano Project has meant an improved quality of life that can't be quantified. Considering the pace of life these days, having the nearby recreational benefits of Lake Berryessa, Lake Solano, and a constantly flowing Putah Creek below the Diversion Dam is a priceless gift.

Neither can the trickle-down effect of agricultural prosperity upon the rest of the community be accurately charted. That it benefits the entire business community and county infrastructure is beyond question. Schools, libraries, social services — all the amenities thrive when the economic base is sound. If the Solano Project's supporters erred, it was on the side of conservatism. Even some of the Project's most vociferous early critics now say that Devil's Gate would easily accommodate a 2.2 million acre-foot reservoir and the county could certainly use the extra water.

Oldtimers can render a judgement based on an intimate knowledge of how it all happened. Ed Uhl is one of those who has a unique vantage point.

He says, "The timing of the Solano Project was perfect. We didn't pick the time. That's just the way the ball

bounced. Later, the Dam never would have been built.

"We have a good project, a very good one. It has been a great asset to the county and to the State."

Actually, more than the timing was perfect. The right time needed the right people. Fortunately, Solano County had an ample supply of both. That explains how Solano County and S.I.D. pulled off a coup without parallel among California's irrigation districts.

APPENDIX A

SOLANO IRRIGATION DISTRICT

Board of Directors

J. Max Brazelton	1948-1952
Homer Burrell	1948-1955
Fred Chadbourne	1948-1951
W. Morris Dally	1948-Present
Howard Vaughn	1948-1952
Kenneth M. Finch	1951-1965
Charles Eldredge	1952-1967
Olin Timm	1952-1973
Severt Swanson	1955-1975
Martin Glashoff	1965-Present
Howard Rogers, Jr.	1967-Present
Roy R. Schroeder	1974-1980
William Wetzel	1976-Present
Alfred Alonzo	1980-Present

Secretary-Manager

O. D. Lambert	1948-1957
James E. Wiggins	1957-1972
Brice Bledsoe	1972-Present

Treasurer

Wood Young	1948-1958
John Hansen	1959-1975
Steve Carbonaro	1975-Present

Assessor

Amasa Morse	1949-1975

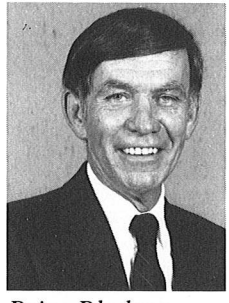
W. Morris Dally, President

Martin Glashoff, Vice President

Howard Rogers, Jr.

William Wetzel

Alfred Alonzo



Brice Bledsoe, Secretary-Manager

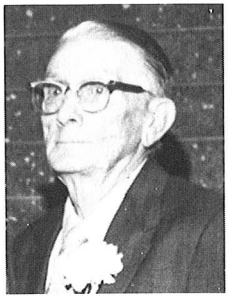
Steve Carbonaro, Treasurer

S.I.D. Board of Directors and Officers, 1988

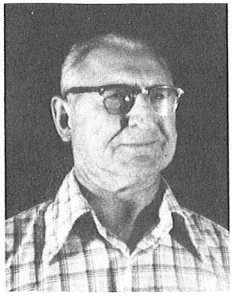
O.D. Lambert,
Secretary-Manager

James E. Wiggins,
Secretary-Manager

Wood Young,
Treasurer



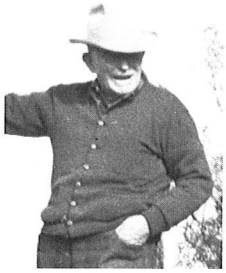
John Hansen,
Treasurer



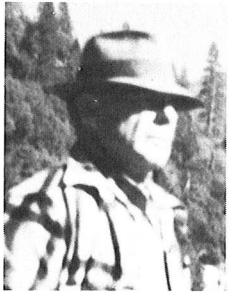
Amasa Morse,
Assessor

Missing:
Homer Burrell

S.I.D. Board of Directors and Officers, 1948-1980

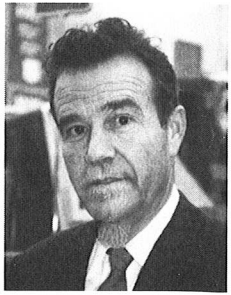


J. Max Brazelton



Fred Chadbourne

Howard Vaughn

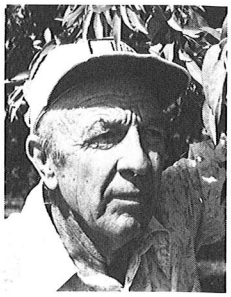


Kenneth M. Finch

Charles Eldredge

Olin Timm

Severt Swanson



Roy R. Schroeder

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APPENDIX B

S.I.D.'S MAJOR MILESTONES

Formation of Solano Water Council	November 4, 1940
Voter Approval of Solano Irrigation District	February 28, 1948
First Formal Meeting of S.I.D. Directors	April 3, 1948
Dept. of Interior Approves Solano Project	November 11, 1948
Formation of Solano County Flood Control and Water Conservation District	Effective 1951
First Large Appropriation for Construction	Fiscal Year 1953
Groundbreaking Ceremony for Monticello Dam	September 25, 1953
Completion of Monticello Dam, Putah South Canal and Diversion Dam	November 7, 1957
First Water Delivered for Agricultural Use	March 15, 1959
Completion of the Distribution System	February, 1963
Spillway Runs Over for the First Time	April 19, 1963
S.I.D. Celebrates 20th Anniversary of the First Water Delivery from Berryessa	September, 1979

S.I.D. Takes Over Operation of Dam from the Bureau of Reclamation	March, 1981
Work Begins on Power-Generator Installation	September, 1981
First Electricity Generated	March, 1983
S.I.D. Celebrates 40th Anniversary of the Formation of the District	February, 1988

APPENDIX C

SOLANO WATER COUNCIL, 1940

Officers

J.H. Freitas, *Chairman*, Fairfield
Guy R. Kennedy, *Vice Chairman*, Vallejo
Frank O. Bell, *Secretary*, Vallejo
Harvey J. Faber, *Treasurer*, Suisun
William Pierce, *Water Advisor*, Suisun

Council Members

John J. O'Grady, Benicia
Charles G. Clyne, Benicia

William J. Weyand, Dixon
Howard Vaughn, Dixon
J.N. Filmore, Dixon

Leo McInnis, Fairfield

Floyd L. Allender, Rio Vista
H.K. Stewart, Rio Vista
Clyde B. Brann, Rio Vista

W.C. Robbins, Jr., Suisun
Dr. Henning Bergh, Suisun

Luther E. Gibson, Vallejo
J. Hayden Perkins, Vallejo
J.H. Johnson, Vallejo

Frank Douglass, Vacaville
H.C. Bolter, Vacaville

APPENDIX D

SOLANO COUNTY BOARD OF SUPERVISORS, 1941

District 1 — George Demmon
District 2 — Dan Foley
District 3 — J.B. Danielson
District 4 — Carl Schmeiser
District 5 — W.B. Brown

. . .

APPENDIX E

EXCERPTS FROM THE CONGRESSIONAL RECORD

1260 April 27, 1956

LAKE BERRYESSA

An act to designate the reservoir above the Monticello Dam in California as Lake Berryessa. (Act of April 27, 1956, ch. 213, 70 Stat. 118)

[**Designation of Lake Berryessa.**]—The reservoir located above the Monticello Dam in Napa County, California, shall hereafter be known as Lake Berryessa, and any law, regulation, document, or record of the United States in which such reservoir is designated or referred to shall be held to refer to such reservoir under and by the name of Lake Berryessa. (70 Stat. 118)

EXPLANATORY NOTES

Not Codified. This Act is not codified in the U.S. Code.

Cross Reference, Monticello Dam. The Act of July 2, 1958, 72 Stat. 287, designated the dam impounding the waters of Lake Berryessa as Monticello Dam. The Act appears herein in chronological order.

Legislative History. S. 2755, Public Law 494 in the 84th Congress. S. Rept. No. 1633. H.R. Rept. No. 1990 (on H.R. 7858).

1422 July 2, 1958

MONTICELLO DAM

An act to designate the main dam of the Solano project in California as Monticello Dam. (Act of July 2, 1958, Public Law 85–485, 72 Stat. 287)

[**Monticello Dam, Calif.—Designation.**]—The main dam of the Solano project in California, which is a reclamation project, shall hereafter be known as Monticello Dam, and any law, regulation, document, or record of the United States in which such dam is designated or referred to shall be held to refer to such dam under and by the name of Monticello Dam. (72 Stat. 287)

EXPLANATORY NOTES

Not Codified. This Act is not codified in the U.S. Code.

Authorization. The Solano project was found feasible and authorized by the Secretary of the Interior on November 11, 1948, under the provisions of section 9 of the Reclamation Project Act of 1939.

Cross Reference, Lake Berryessa. The Act of April 27, 1956, 70 Stat. 118, designated the lake behind Monticello Dam as Lake Berryessa. The Act appears herein in chronological order.

Legislative History. H.R. 9382, Public Law 85–485 in the 85th Congress. H.R. Rept. No. 1547. S. Rept. No. 1706.

LAKE SOLANO

An act to designate the lake above the diversion dam of the Solano project in California as Lake Solano. (Act of July 2, 1958, Public Law 85–481, 72 Stat. 279)

[Lake Solano, Calif.—Designation.]—The lake above the diversion dam of the Solano project in California, which lake is below the main dam (Monticello Dam) of the project, shall hereafter be known as Lake Solano, and any law, regulations, document, or record of the United States in which such lake is designated or referred to shall be held to refer to such lake under and by the name of Lake Solano. (72 Stat. 279)

EXPLANATORY NOTES

Not Codified. This Act is not codified in the U.S. Code.

Authorization. The Solano project was found feasible and authorized by the Secretary of the Interior on November 11, 1948, under the provisions of section 9 of the Reclamation Project Act of 1939.

Legislative History. H.R. 9381, Public Law 85–481 in the 85th Congress. H.R. Rept. No. 1546. S. Rept. No. 1707.

APPENDIX F

SOLANO PROJECT: CONTRACT RELATIONSHIPS

S.I.D.'s Award Winning Offices, Completed in 1985

ILLUSTRATIONS

S.I.D.'s Operational and Administrative Staff, 1988

APPENDIX G

S.I.D. OPERATIONAL AND ADMINISTRATIVE STAFF, 1988

Larry Aguilera
Daniel Albee
Richard Banks
Loren Barton
Jay Bird
Brice Bledsoe
Donald Burbey
David Campos
Leonard Cassieri
Bruce Caulfield
Diane Cuberos
Kevin DeForge
Frank Emmons
William Flack
Elsa Gonzalez
Lauretta Graham
William Graham
William Granillo
Dennis Hartwell
Mark Hukill
Robert Isaac
Debra Jackson
Jay Jones
Cathy Kincaid
Joleene Ladyman
Vince LaNovara
Mark Lincoln
Richard Lockwood
Franklin Lowe
Jesse Lozoya
Brian MacDonald
Eleanor McCarthy
Nancy Melczer
Louis Mendes
Fred Nakatani
Patrick O'Hara
John O'Neill
Dennis Partlow
Jimmy Patterson
Glenn Pecor
Jeff Pecor
Daniel Perkins
Wayne Pugh
Carol Ramirez
Luis Ramirez
Robert Ramirez
John Rosenberger
Cathy Rosenkild
Darrell Rosenkild
Frank Schuierer
James Scribner
Jay Shepherd
Robert Smith
Scott Stancil
Mike Timko
Frank Weber

CONSULTING STAFF

Joseph B. Summers, *Engineer*
Paul R. Minasian, *Attorney*

SOURCES

I drew on many different sources in conducting research for this book.

My primary resources were these individuals who agreed to be interviewed. During the fall of 1987, I talked with: David Balmer, Brice Bledsoe, Mike Catino, Andrew Cortopassi, W. Morris Dally, John Donahue, Frank Douglass, Bob Isaac, Vince LaNovara, Wayne Madison, Sandy McKenzie, Amasa Morse, Harold Moskowite, Lewis Pierce, Howard Rogers, Darrell Rosenkild, Jim Scribner, Jay Shepherd, Vern Smith, Fred Tomasini, and Ed Uhl.

In addition, I relied considerably on the extensive archives of the Solano Irrigation District and the libraries and photo files of the *Vallejo Times Herald* and *Vacaville Reporter*. The Chambers of Commerce in Vacaville and Fairfield were also particularly helpful.

Additional secondary sources included reports by the Bureau of Reclamation; State Department of Water Resources; Federal Energy Regulatory Commission; Stoddard and Karrer, Civil Engineers; State Water Rights Board; Frank Adams; Stone & Youngberg; and the Solano County Department of Agriculture.

H.R.