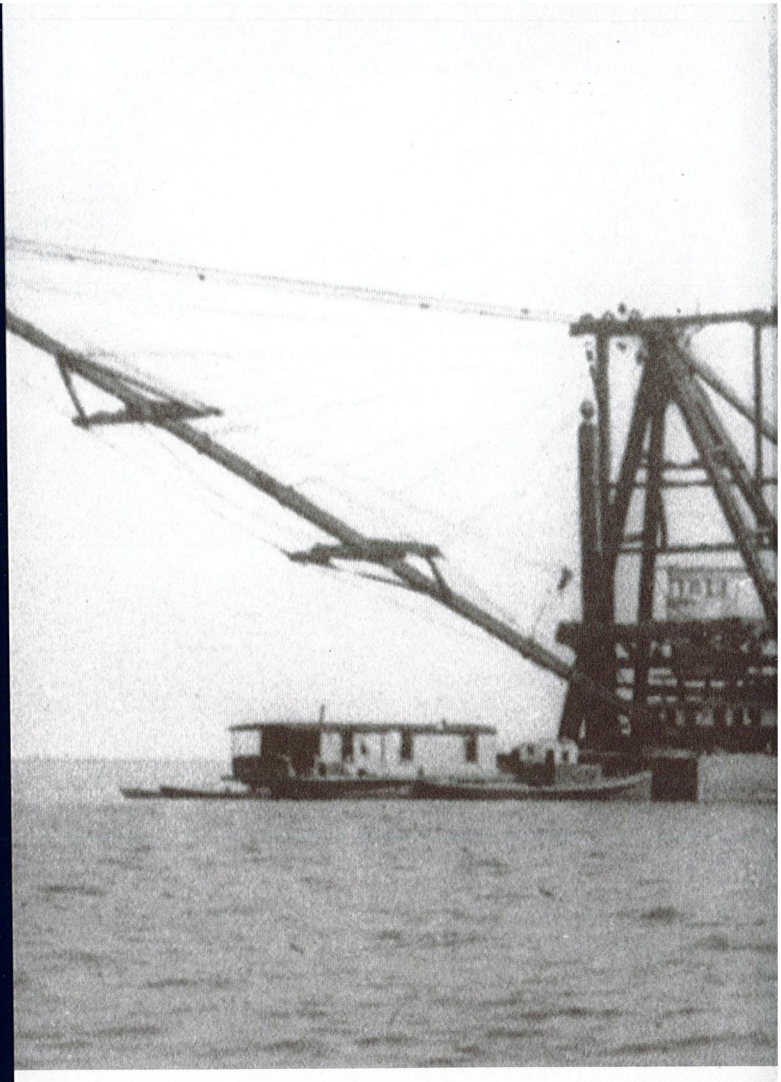
A Century of Protecting Natomas

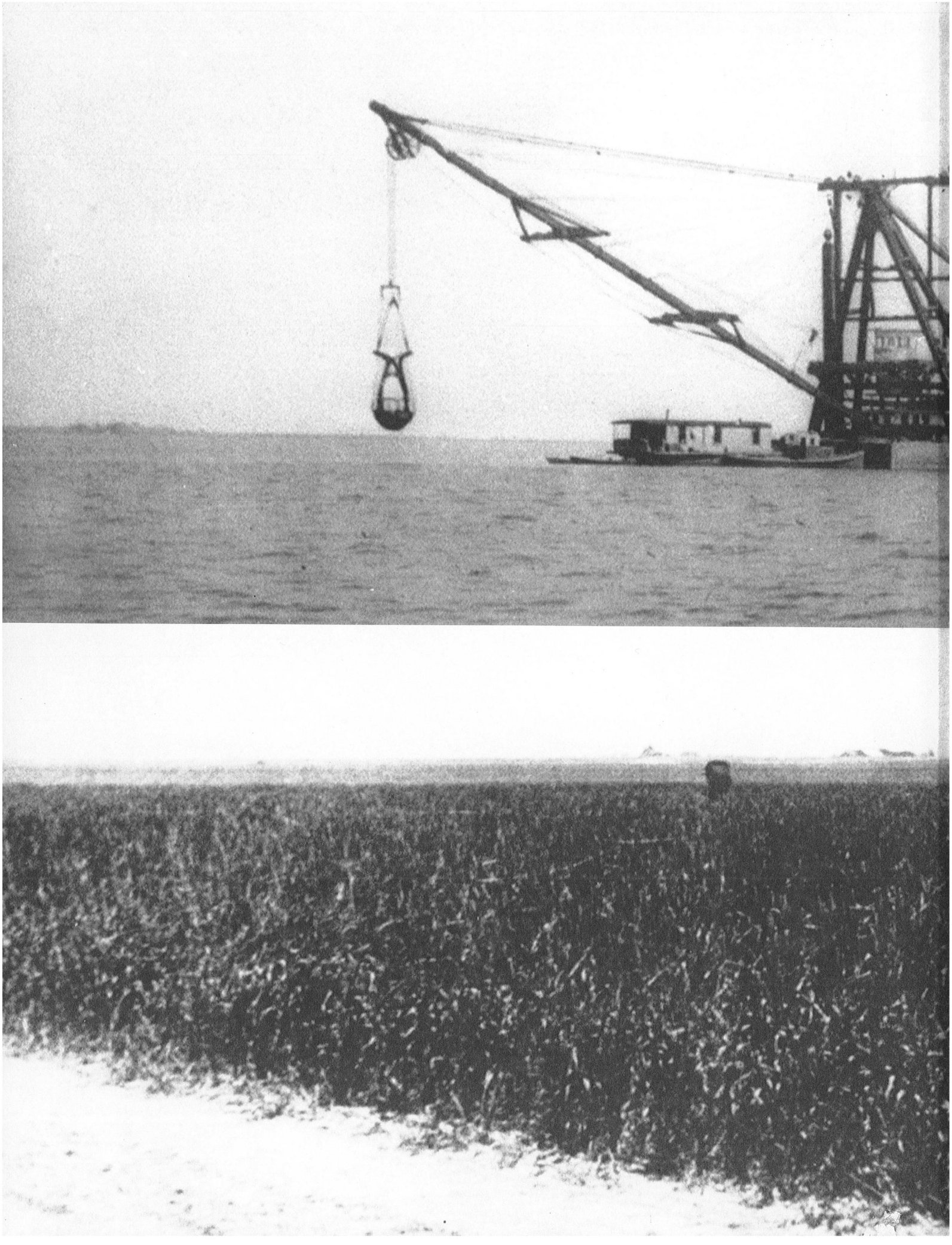
The History of Reclamation District No. 1000 1911–2011

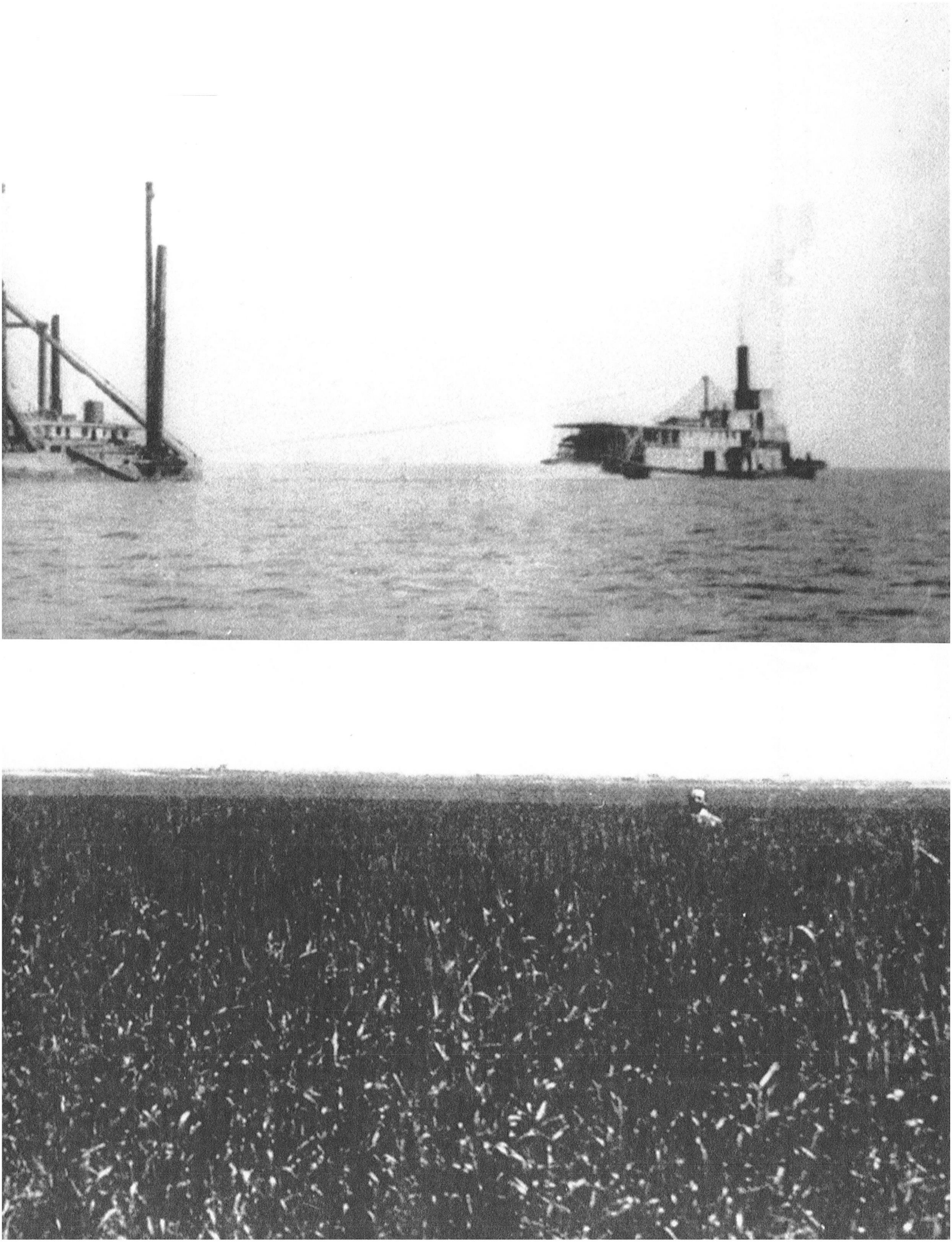
Karen Wilson

The mission of Reclamation District No. 1000 is simple—public safety. Our sole purpose is to protect the lives and property of those living and working in the Natomas basin by safely maintaining the levee system protecting the basin and operating the interior main canals and pump stations. We take great pride in having met our mission for the past one hundred years by keeping the basin safe as it has transformed from an agricultural community to a thriving urban and commercial center, including more than one hundred thousand residents, hundreds of businesses, community centers, parks, schools, two major interstate highways, and the Sacramento International Airport. We hope you enjoy the rich and colorful history of our District and the people whose vision and dedication made this story possible. While in the midst of the most significant overhaul of the levees since their construction in 1911, we look forward to continuing the tradition of protecting the lives and property of those who call Natomas home for the next one hundred years . . . and beyond.

RD 1000 Board of Trustees







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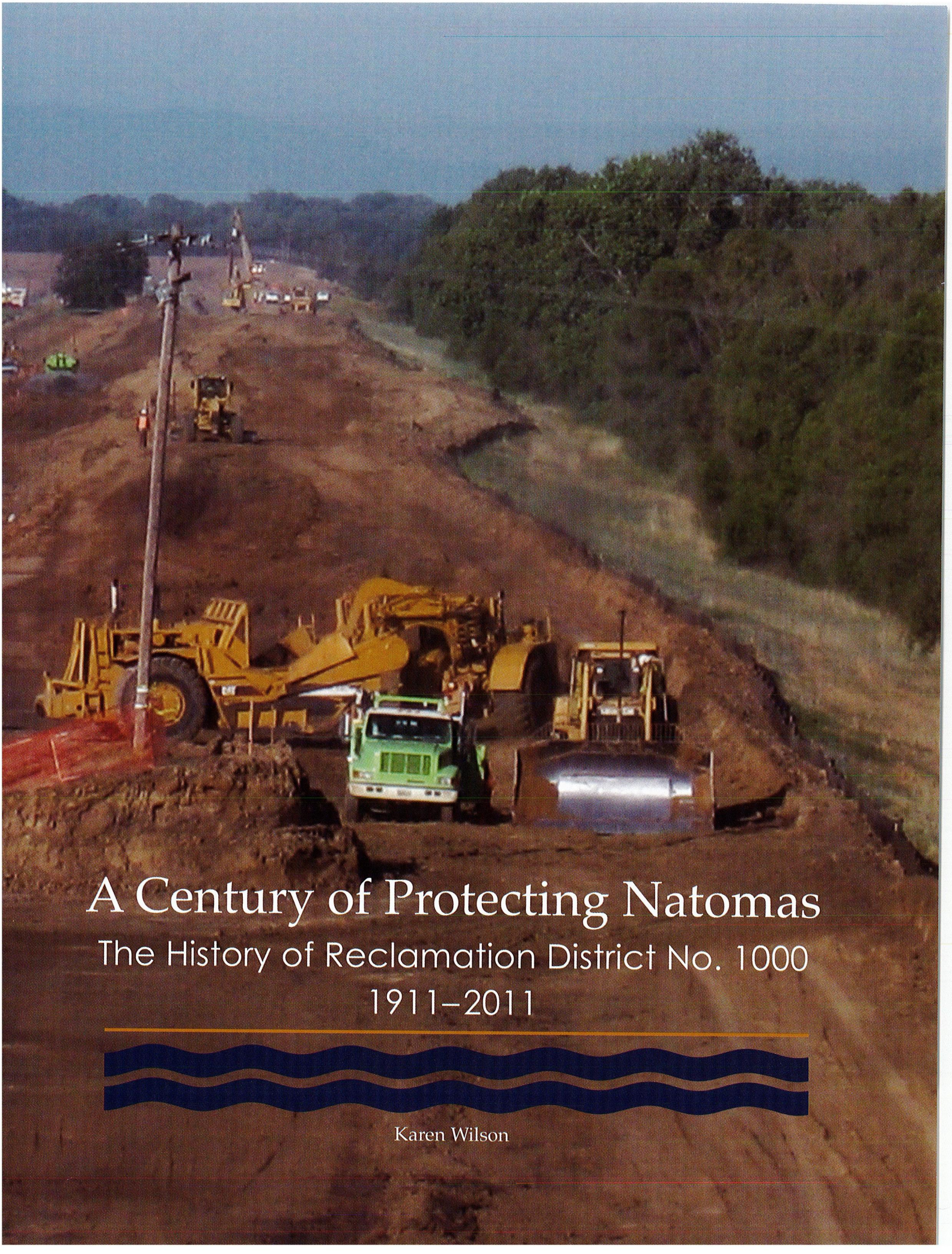

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1911–2011

Karen Wilson

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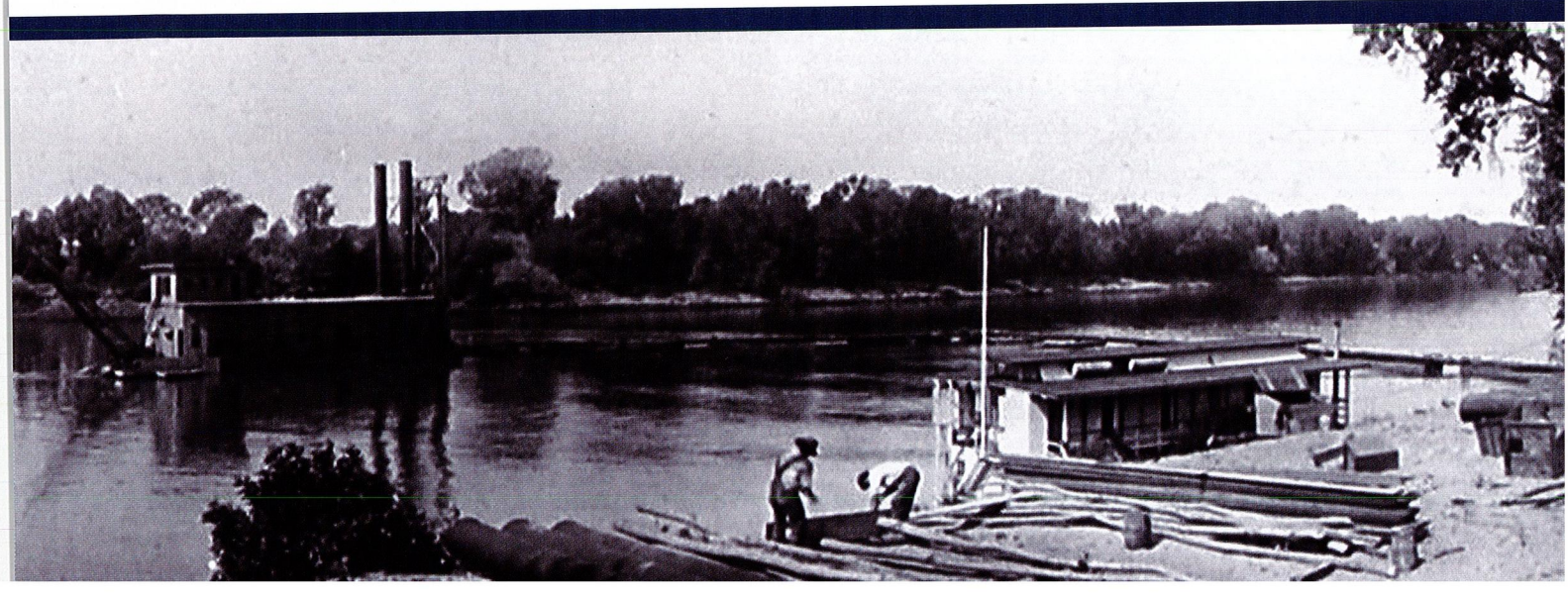
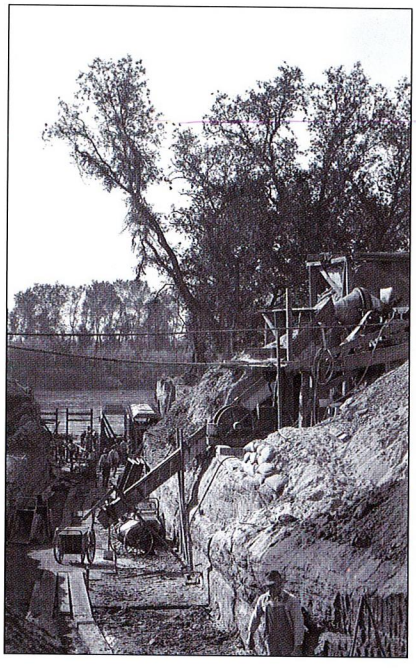


Preface



On May 1, 1911, Frank H. Bennett, Emery Oliver, and Norton Cleaveland took their place in history. As newly sworn-in trustees of Reclamation District No. 1000, they were about to build the largest privately funded reclamation project in the United States. After decades of flood control by trial and error, California was ready to try something new. Governor Hiram Johnson signed Assembly Bills 1475 and 1476 on April 8, 1911, forming Reclamation Districts 1000 and 1001.

Those first trustees had formidable advantages to match the task they set for themselves. Under the umbrella of the Natomas Company, they had huge financial assets available. They could call on some of the best engineering minds in the state. The political timing was right. Faith in large public works projects was high. The Panama Canal was under construction, promising an opening to new markets for farmers, and the country was coming out of a prolonged recession.

RD 1000's first trustees set to work immediately to take advantage of this rising tide, with spectacular results. The system of levees and canals they built in just a few years has stood largely intact, holding back the floodwaters of the Sacramento River for nearly one hundred years.

Those original trustees could, and did, move mountains with engineering and technology. Then came challenges that engineering feats could not control: world wars, a global depression, and population shifts. Caution led those early leaders to build the levees higher than anyone at the time could predict they would need to be. Modern engineers have had to revisit the original designs, and new partnerships have arisen to generate more resources to hold back the floodwaters.

The story of Reclamation District 1000, then, is the story of Northern California in the twentieth century. With more than one hundred thousand people now relying on its levees and canals, its story will continue to intertwine with the Sacramento region. This book will tell the story of RD 1000, from the work that led to its formation through today, with a look at the challenges to come.

Our thanks to Anne Ofsink, president of the Natomas Historical Society, for her generosity in sharing her resources, especially oral histories of Natomas families; Associate Archivist Rebecca Crowther, Deputy City Historian Dylan McDonald, and Senior Archivist Patricia Johnson at the Center for Sacramento History; Curator of Special Collections Gary Kurutz, Librarian Karen Paige, and California History Section Manager Kathleen Correia at the California State Library; Janet Coles and Diane Voll at the Caltrans Transportation Library & History Center; Susan Engstrom; Carson Hendricks; RD 1000 District/Board Secretary Terrie Figueroa, and to Tom Barandas, David Christophel, Gene and Mary Inderkum, and Joaquin and Rose Perriera for sharing their memories.

Chapter 1

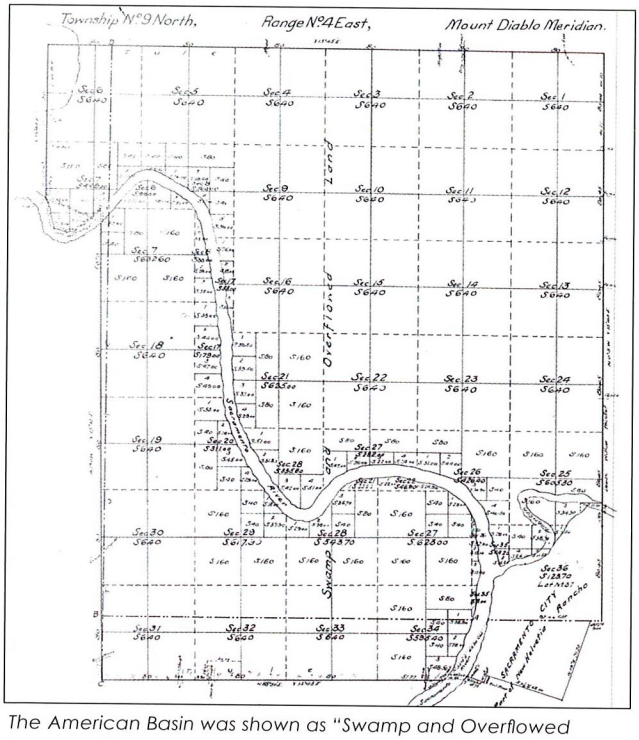
The American Basin: From Swamp and Overflow to Reclamation District 1000

The mission of Reclamation District No. 1000 is public safety. Our sole purpose is to protect the lives and property of those living and working in the Natomas basin by safely maintaining the perimeter levee system protecting the basin as well as operating the interior main canals and pump stations.

March of 1907 saw the worst flood in the Sacramento Valley—the worst damage and the highest water—since the flood of 1862. Railroad grades, bridges, culverts, electric transmission lines, and telegraph and telephone lines were all washed away.[1] Between 1850 and 1893, ten major floods were recorded in Sacramento. The idea of investing substantial public dollars in building levees had been greeted with skepticism. State legislation even encouraged individual landowners to build their own levees, sending floodwater higher and higher on adjacent lands.[2] But the flood of 1907, and one nearly as violent in 1909, finally created a turning point in public thinking.

Spurred by the connection between debris from massive hydraulic mining operations in the Sierra Nevada and rising riverbed levels, State Engineer William Hammond Hall and his staff of engineers conducted the first field surveys of the Sacramento River's flows and water levels in the late 1870s. Hall submitted his landmark report to the legislature in 1880. He recommended that the state take charge of controlling floodwaters with a system of planned and coordinated levees, dams, and reservoirs at several locations.[3]

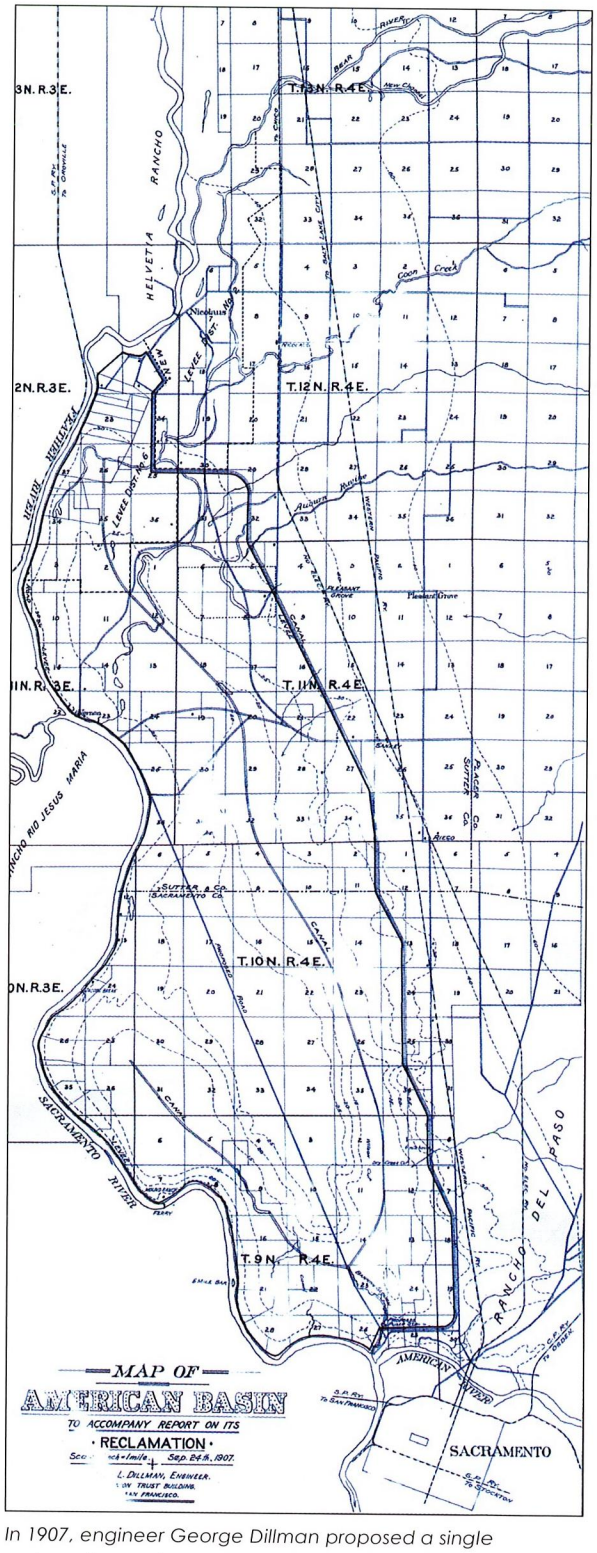
The US Geological Survey had established a datum reference line and installed gauges along the Sacramento River that were in place to measure the 1907 flood waters. The report from the gauges showed that an astonishing 600,000 cubic feet per second (a cubic foot is about the size of a basketball) flowed into Suisun Bay.[4] Just as alarming, because of the



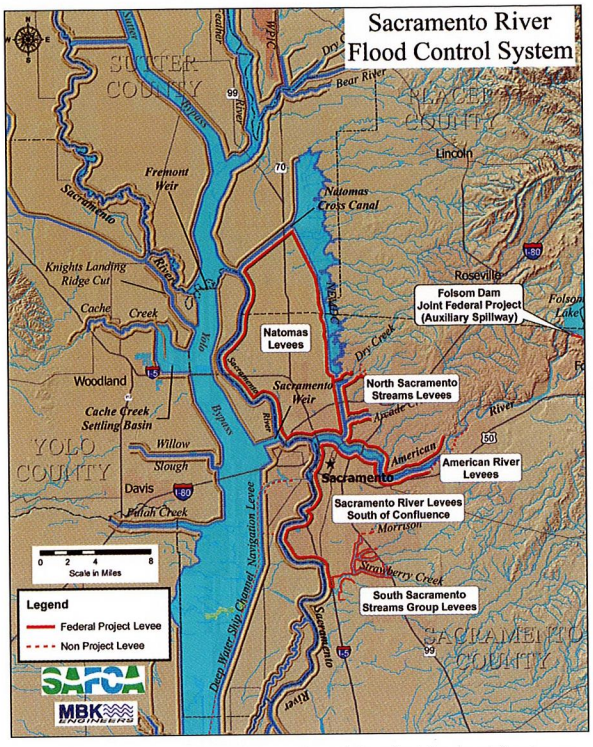
The American Basin was shown as "Swamp and Overflowed Lands" in this 1871 map prepared for the surveyor general's office. (RD 1000 Collection)

raised riverbed, the 1907 flood occurred at two-thirds of the river flow estimated for the disastrous flood of 1861–62.[5]

US Army Corps of Engineers Captain Thomas H. Jackson arrived in California just a month before the flood of 1907 to become a member of the California Debris Commission. He was the leading voice in developing what became known as the "Jackson Report," which built upon William Hammond Hall's work and laid out a comprehensive plan to channel the river's flow with a system of levees, bypasses, and weirs. After several years of review by the Corps of Engineers, the report found its way to Congress and became the foundation for the Sacramento River Flood Control Project in 1917. When Congress adopted the Jackson Report, levee construction came under control of both the Corps of Engineers and the state. The Jackson Report recommended that the federal govern-



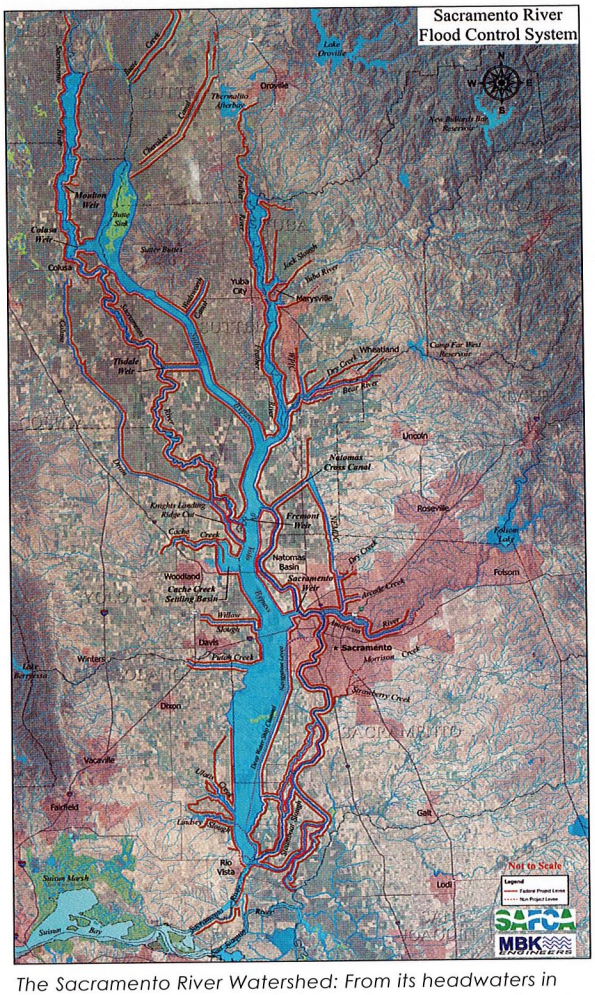
In 1907, engineer George Dillman proposed a single reclamation project reaching from the confluence of the American and Sacramento Rivers on the south, nearly all the way to Nicolaus on the Feather River to the north. (Center for Sacramento History, Natomas Company Collection, 1981-037-4825)



Inset shows Sacramento River Flood Control Project features in the Sacramento region, including dams, bypasses, and weirs to channel the flow of the river during times of high water.[21] (Courtesy of SAFCA)

ment provide $11 million to pay for one-third of the flood control project, with the state and local landowners splitting the rest.[6]

Although Congress did not adopt the Jackson Report until 1917, there was confidence in California that it would eventually be approved and with it federal money to help pay for a comprehensive flood control system that would allow reclamation of vast acreage, creating profitable farm land. The state moved ahead to pass the Flood Control Act of 1911, which adopted the Jackson Report and gave the State Reclamation Board authority to "act upon and approve plans that contemplate the construction of levees . . . along or near the banks of the Sacramento River or its tributaries . . . or within any of the overflow basins thereof." The board was empowered to prosecute landowners who built levees that were not approved by the state board as a "public nuisance."[7]



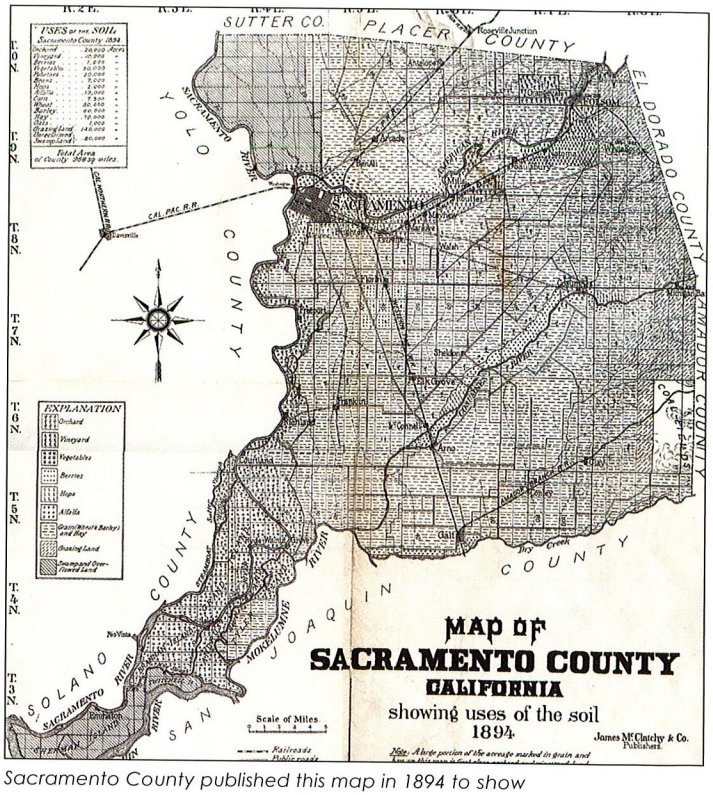
The Sacramento River Watershed: From its headwaters in the Trinity Mountains to its confluence with the San Joaquin River, the Sacramento River traverses the Sacramento Valley for about 370 miles. Tributaries from the east include those on the American River and the Feather River, and its branches, the Yuba and Bear Rivers. Tributaries from the west are much smaller, including Stony, Thomes, Cache, and Putah Creeks, but these are significant during times of high water. In normal flow, the Sacramento carries about five thousand cubic feet of water per second, more than twenty-two million acre-feet of water a year. It is the second largest river on the Pacific coast. Most of the Sacramento Valley is below three hundred feet in elevation. The Valley floor is so flat that the river drops only an average of one foot per mile on its way to the sea. (Courtesy of SAFCA)

The Path to Reclamation

September 28, 1850: Arkansas Act. Congress gave to the states all the federally owned land that was "swamp and overflowed," subject to the condition that the state use the funds from sales of these lands to ensure they would

be drained, reclaimed, and put to productive agriculture.[8] The state sold the lands for a dollar an acre, with a limit of 320, and later 640, acres. To deter speculation, on the Sacramento River from Sacramento to the confluence with the Feather River, only land more than one mile away from the river could be purchased.[9]

May 31, 1861: AB54: An Act to Provide for the Reclamation and Segregation of Swamp and Overflowed, and Salt Marsh and Tide Lands, donated to the State of California by an Act of Congress. This act created the Board of Swamp Land Commissioners, empowered to create "a new class of legal entity called districts, previously unknown in California governance, through which the actual work of reclamation . . . would be carried out." The commissioners established a requirement that a "swampland district" would be created only if it encompassed an area "susceptible to one mode or system of reclamation," usually as-



Sacramento County published this map in 1894 to show prospective immigrants the fertility of the area's soil and the richness of the crops that could be grown here. Note that the area that would become RD 1000 is shown as swamp and overflow land. (Center for Sacramento History, Edwin Beach Collection, 1985-152-0284)

Hydraulic mining operations used giant water monitors to spray high-powered streams of water against a hillside. Soil, sand rock, and gravel were washed downstream where gold and other precious metals were separated from the silt. State Engineer William Hammond Hall's report estimated that hydraulic mining had resulted in a combined total of more than a billion yards of debris being dumped into the Yuba, Feather, Bear, and American Rivers, burying a total of thirty-nine thousand acres of farmlands. The debris had caused riverbeds to rise by ten feet or more, creating more frequent and swifter-moving floods.[21] The Sacramento River Flood Control Project, authorized by Congress in 1917, included a system of levees, bypasses, and weirs to control the river's flow. (Center for Sacramento History, Eleanor McClatchy Collection, 1982-005-5731)

US geological surveyors were at work in about 1900 along the Sacramento River. The same conditions applied a few years later as Natomas Company engineers siting RD 1000 levees surveyed the river. A Natomas Company engineer described them: "[A]long the river the brush was so thick and all too often the located line was tunneled. Wading was a daily occurrence, and if the water was too deep to wade and no boat was available, you swam."[20] (Center for Sacramento History, California State Library Collection, 1974-268-0129)

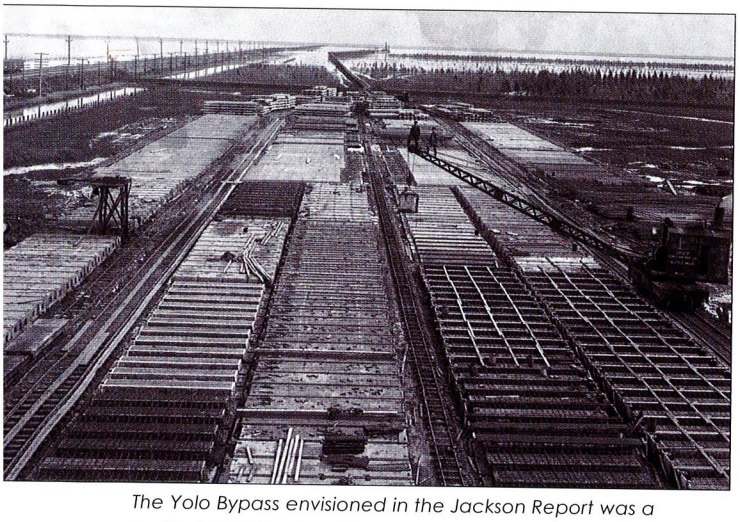
sumed to mean it included an entire basin between the main channels of a river.[10]

1862: Swamp Land District No. 1 was created, encompassing the American Basin. District No. 1 received overflow from a series of small creeks and streams on the east, as well as the Bear, Feather, Sacramento and American Rivers on three sides. The first attempts to reclaim the American Basin included only river levees. In 1861, the engineer for the district estimated that the levees and drainage locks would cost $37,938. Assessed at a dollar an acre, $53,369 was available for the reclamation works.[11]

March 22, 1866: AB591: An Act supplemental to and amendatory of an Act . . . approved May 18, 1861. This act dissolved the Board of Swamp Land Commissioners and gave boards of supervisors the swamp and overflowed lands and all the money from sale of those lands "to hold in trust for the purpose of constructing the necessary levees and drains to reclaim the same." Local supervisors were given authority to approve or deny all levee building plans presented to them, and county surveyors were charged with being the flood control engineers for their jurisdictions.[12]

May 28, 1868: The Green Act lifted restrictions on the amount of swampland acreage an individual could own, though title to the property would not be granted until it was determined to be reclaimed. Power to approve proposed levee systems was given entirely to the Board of Trustees of each district. Reclamation plans were to be presented to the local board of supervisors who would arrange to have "proper tax assessments made on the property owners in the district," not subject

Boom Times and Big Projects:
Sacramento in the Early 1900s



The Yolo Bypass envisioned in the Jackson Report was a reality by 1915, when this photo of the Yolo Causeway under construction was taken. The concrete causeway linked Sacramento and Davis at a cost of $400,000. Dedicated in a huge celebration that lasted from May 11 to May 14, it was 3.1 miles long and 26 feet wide.[22] (Center for Sacramento History, Eleanor McClatchy Collection, 1982-005-6331)

December 13, 1913: The City of Sacramento's levee north of B Street was under construction when this photo was taken next to the Western Pacific Railroad tracks. The Fresno scraper being used on the levee was also in use at this time for levee building in RD 1000. (Center for Sacramento History, Eugene Hepting Collection, 1985-024-1860)

November 3, 1924: The Del Monte Corporation's new California Packer's Plant #11 was in the foundation stage at 17th and C Streets. Train tracks, telegraph lines, and city buildings are in the background. Canneries in and near downtown Sacramento helped to create a stable market for crops raised by farmers on Reclamation District 1000 lands. (Center for Sacramento History, Sacramento Bee Collection, 1981-001-0323)

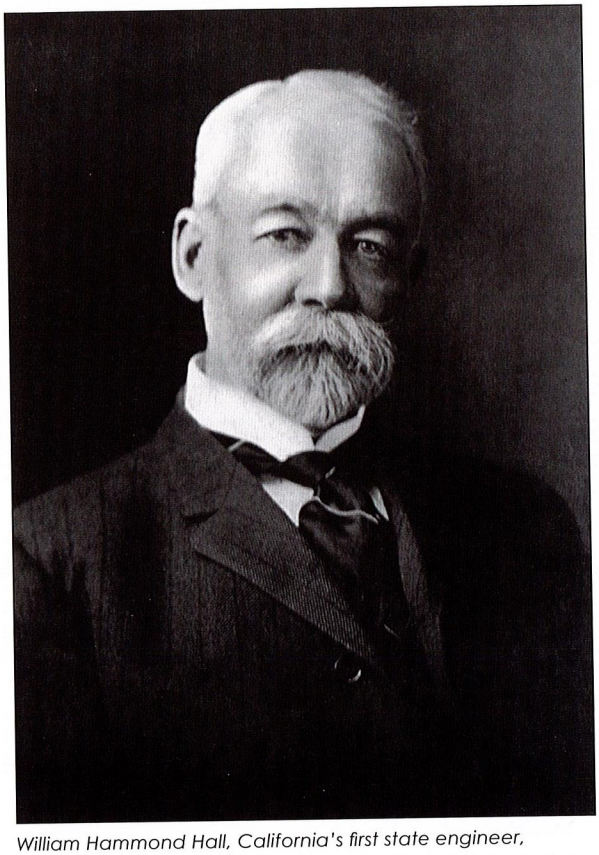
to vote as long as half or more of the landowners agreed.[13]

January 21, 1880: State Engineer William Hammond Hall submitted his report to the state legislature. He recommended diverting flood waters of the Sacramento River into "canals" and expanding main channel capacity to scour mining debris. His plan included construction of a bypass channel on the western rim of the Yolo Basin to the foot of the Montezuma Hills near Rio Vista where it would empty into Suisun Bay. It was the beginning of an integrated, comprehensive flood control plan for the Sacramento Valley.[14]

March 1893: President Benjamin Harrison signed the Caminetti Act, creating the California Debris Commission to mitigate damage caused by hydraulic mining in the Sierra Nevada while allowing mining to continue. The commission was composed of three Army officers of the Corps of Engineers. Its charge included "improving the navigability, deepening the channels, and protecting the banks of the rivers," and making plans for "affording relief from flood damages."[15]

March 1907 and March 1909: Historic level floods occurred in Sacramento.

August 1910: The Jackson Report (officially titled Reports on the Control of Floods in the River Systems of the Sacramento Valley and the Adjacent San Joaquin Valley, CA [HD 81 62nd Congress, 1st Session]) was submitted to Congress. It recommended a series of bypasses and weirs to channel water from north of Colusa, two hundred miles south to Collinsville. It also recommended that almost five hundred miles

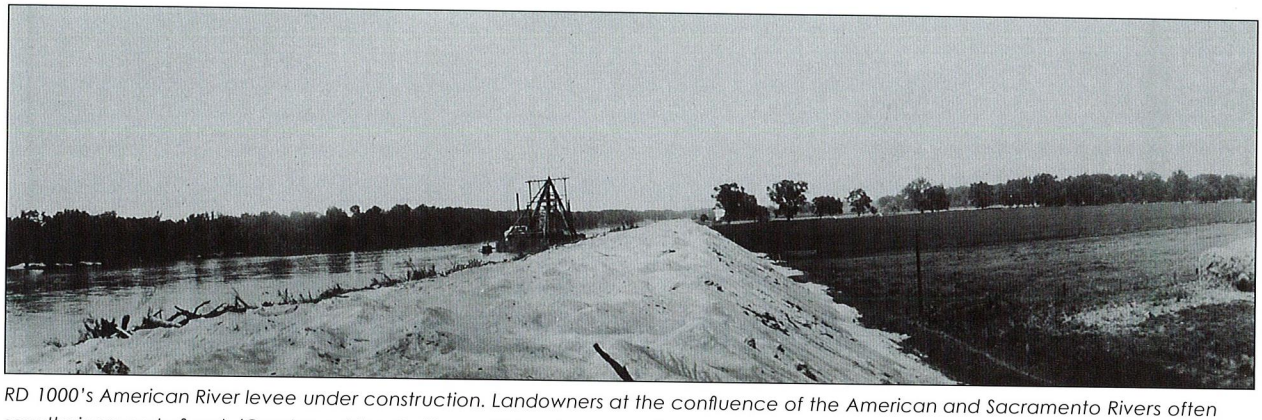


William Hammond Hall, California's first state engineer, undertook the first surveys of the state's rivers, beginning with the Sacramento and San Joaquin Rivers, starting in 1878. (Courtesy of the California History Room, California State Library, Sacramento, California)

of riverbank and bypass levees would be needed, though only seventy-four miles of existing levees were high enough and strong enough to be considered up to standards at the time.[16]

1911: The state legislature adopted the Flood Control Act of 1911, giving the state Reclamation Board power to act on and approve plans for levee construction.[17]

April 8, 1911: Reclamation District No. 1000 was created by an act of the legislature, AB1475, and entitled: AN ACT TO CREATE A RECLAMATION DISTRICT TO BE CALLED RECLAMATION DISTRICT NO. 1000, AND PROVIDING FOR THE MANAGEMENT AND CONTROL THEREOF OF, AND DISSOLVING



RD 1000's American River levee under construction. Landowners at the confluence of the American and Sacramento Rivers often saw their property flood. (Courtesy of the California History Room, California State Library, Sacramento, California)

CERTAIN LEVEE DISTRICTS, SWAMP LAND DISTRICTS AND RECLAMATION DISTRICTS WITHIN THE BOUNDARIES OF SAID RECLAMATION DISTRICT NO. 1000, and PROVIDING FOR THE LIQUIDATION AND WINDING UP OF SAID DISSOLVED DISTRICTS.

June 13, 1913: Reclamation District No. 1400 was created by an act of the legislature. Located in a wedge-shaped section near the American River and the Western Pacific and Sacramento Northern Railway tracks, it was adjacent to the much larger RD 1000. Trustees were G. J. Meister, A. M. Paul, and C. E. Johnston. RD1400 was consolidated with RD 1000 in 1922.

1917: Congress passed the Sacramento River Flood Control Project Act. Reclamation District 1000 became a part of the project, which today is operated and maintained under the authority of the Central Valley Flood Protection Board (formerly the State Reclamation Board). The Act was modified by Flood Control and River and Harbor Acts in May 1928, August 1937, and August 1941, with additional modifications by Flood Control Acts of December 1944 and May 1950.

Chapter 2

The Natomas Company and the American Basin

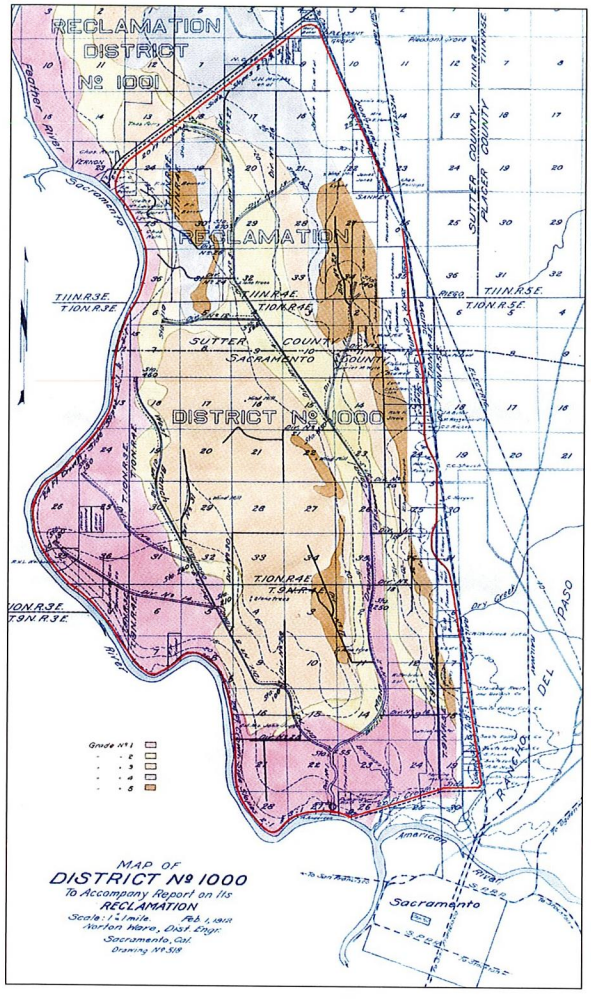
The Natomas Company

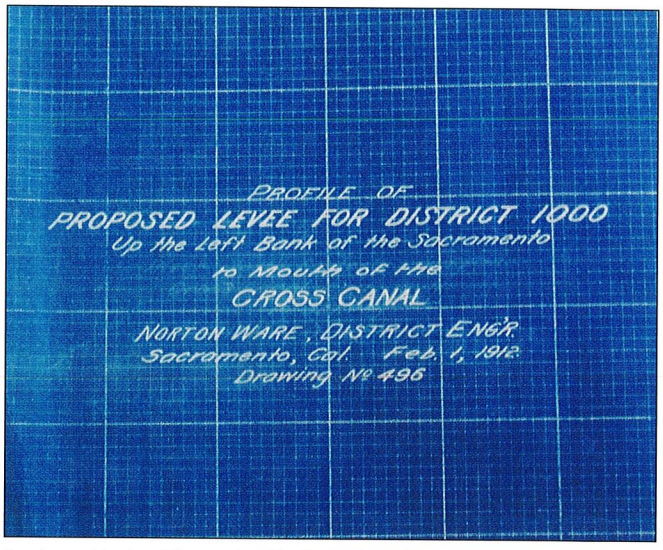
The Natoma Mining Company, established in 1851 by Amos P. Catlin, literally shaped much of the Sacramento region we see today. As the Natoma Water and Mining Company, it supplied water for the mining industry and found that corporate ownership of water rights was a hugely profitable enterprise.

The company began speculating in real estate, and Caitlin sold his stock to Horatio G. Livermore, who led the company away from mining toward agriculture, hydroelectricity, and electric railway systems. The company was a leader in the developing viticulture and wine industries in California, at its height planting two thousand acres in vineyards. During its various corporate reorganizations, it supplied the granite used in construction of the new state capitol building in Sacramento and the crushed rock for the first macadam road in Sacramento County, and sold its land for development of Mather Air Field and Aerojet Corporation. Livermore's family formed Sacramento Electric Power and Light Company.

Profits dipped as the economy stalled in the late 1800s. Land speculation was proving complicated. The courts and public sentiment had curtailed the hydraulic mining industry. Company fortunes rose again when R. G. Hanford, promoter of a Colorado mining syndicate, arrived and began testing bucket-line dredges, a new design from New Zealand that allowed miners to scoop out the gold that had deposited on river bottoms. Between 1906 and 1908, Hanford was the largest stockholder in the two largest gold dredging companies in the Folsom area.

Hanford helped to raise $25 million in capital and organize Natomas Consolidated of California. He was named a vice president, and the company now owned some of the largest dredges in the world. In the early 1900s, public sentiment against large-scale mining began to mount. "To silence opposition so far as possible," says company engineer Norwood Silsbee, the company began to buy large tracts of land in the American Basin. "Thus, for every acre of land to be dredged, many acres, hereto-





Engineer Norton Ware submitted a series of detailed designs for levees and canals designed to completely enclose all fifty-two thousand acres in RD 1000. The boundaries of RD 1000 are shown as the Sacramento River on the west, the Cross Canal on the north, Pleasant Grove Creek and the Natomas East Main Drainage Canal on the east, and the American and Sacramento Rivers on the south. (Left) Center for Sacramento History, Natomas Company Collection, 1981-037-199c
(Above) RD 1000 Collection

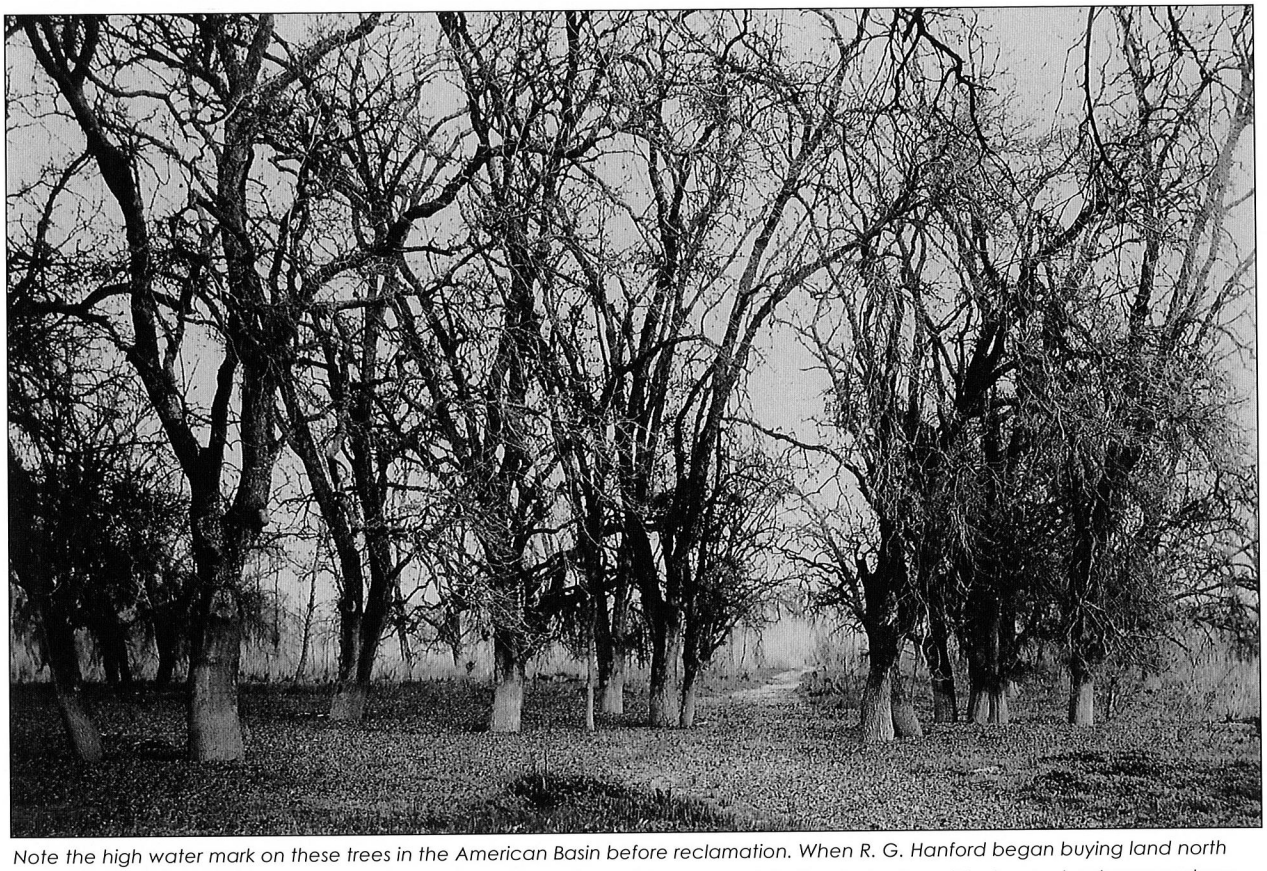
fore unproductive, would become available for settlement and would be added to the county tax rolls."[1]

In 1909, Natomas Consolidated made land north of Sacramento its focus, and set about to construct the largest reclamation project ever built in California and the largest privately funded such project in the United States. The company reorganized again in 1928 as the Natomas Company of California, and refinanced its debt to cover losses in both its mining and reclamation interests. After World War II, the company sold off its still-extensive landholdings in Reclamation Districts 1000 and 1001 for a fraction of their value, using the proceeds to acquire a shipping line, American President Lines, Ltd.

In 1984, Texas oil giant Diamond-Shamrock Corporation bought out all of the company's stock, and after 133 years, Natomas ceased to exist as an independent company.[2]

The American Basin

Fertile soil and proximity to the growing city of Sacramento made the southern part of the American Basin a tempting place to own land. As swamp and overflow land, it had been sold for a dollar an acre and a promise to reclaim it someday. Some of the most influential people in the region bought land in the American Basin. They included C. K. and V. S. McClatchy, Peter J. Shields, who would later become a superior court judge and write the legislation that founded UC Davis, Clarke & Cox Farms, the developers of Fair Oaks, and businessman Charles Silva. Natomas Consolidated bought land from



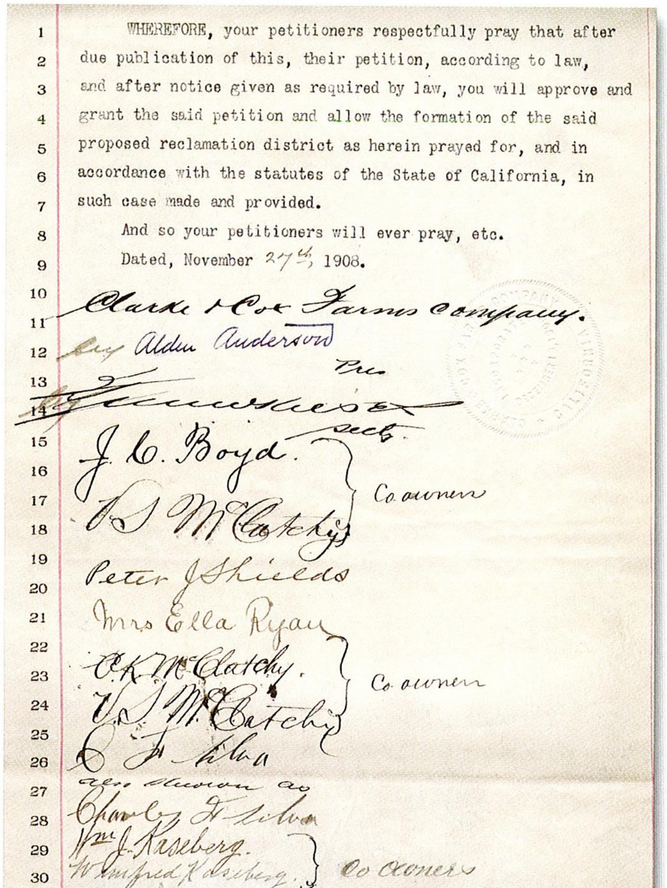
Note the high water mark on these trees in the American Basin before reclamation. When R. G. Hanford began buying land north of Sacramento for the group that became Natomas Consolidated Company of California, he found that many landowners whose property regularly flooded were eager to sell. (RD 1000 Collection)

anyone willing to sell, and owned 85 percent of the land that became RD 1000.[3]

Natomas Consolidated and eleven other large landowners petitioned the Sacramento County Board of Supervisors on November 27, 1908, to request formation of the American Reclamation District. The Board of Supervisors approved their petition on January 4, 1909. Just a few weeks later, the flood of February 1909 made new high water records along the Sacramento River, caused considerable damage, and confirmed the conclusions of the Jackson Report that a comprehensive flood control system was needed.

Hanford had hired two San Francisco–based engineers, George L. Dillman and Stephen E. Kieffer, to perform more studies and provide a report to the new reclamation district. Norwood Silsbee was an engineer for Natomas Consolidated from 1911 to 1955. His meticulous records of the physical and financial formation of Reclamation District 1000 take up twenty-nine volumes and provide a close-up look at every aspect of the district. He credits Kieffer's report and subsequent advice with shaping the district.

"As originally planned when the American Reclamation District was organized," Kieffer said in his report, "it was proposed to take in only that portion of the American Basin extending from the American River northward to the south line of Reclamation District No. 2, about five miles north of Vernon [note that the names Vernon and Verona appear to refer to the same



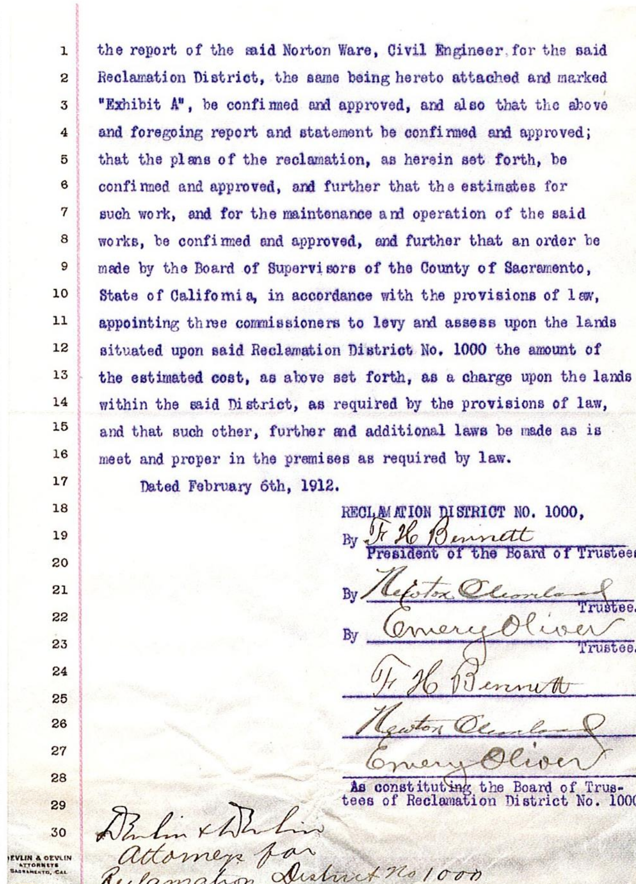
WHEREFORE, your petitioners respectfully pray that after due publication of this, their petition, according to law, and after notice given as required by law, you will approve and grant the said petition and allow the formation of the said proposed reclamation district as herein prayed for, and in accordance with the statutes of the State of California, in such case made and provided.

And so your petitioners will ever pray, etc.

Dated, November 27th, 1908.

Clarke & Cox Farms Company.
By Alden Anderson Pres.
[illegible] Secty.
J. C. Boyd.
V. S. McClatchy } Co owner
Peter J Shields
Mrs Ella Ryan
C.K. McClatchy.
V. S. McClatchy } Co owner
[illegible]
Charles F. Silva
Wm J. Kaseberg.
Winifred K Kaseberg. } Co owners

In their petition to the Sacramento Board of Supervisors, landowners stated that the proposed American Reclamation District covered 54,264.18 acres. It met the legal requirements for forming a district: all of the lands constituted one body of swamp and overflow land "susceptible of one mode of reclamation," and the petitioners held title to more than one-half of the land. The district was to extend from Levee District No. 6 in Sutter County south to the American River in Sacramento County. Sacramento attorneys Devlin and Devlin represented the petitioners and helped shepherd the acts creating Reclamation Districts 1000 and 1001 through the legislature.[10] (Center for Sacramento History, Sacramento County Board of Supervisors, File 7-18 Last page)



the report of the said Norton Ware, Civil Engineer for the said Reclamation District, the same being hereto attached and marked "Exhibit A", be confirmed and approved, and also that the above and foregoing report and statement be confirmed and approved; that the plans of the reclamation, as herein set forth, be confirmed and approved, and further that the estimates for such work, and for the maintenance and operation of the said works, be confirmed and approved, and further that an order be made by the Board of Supervisors of the County of Sacramento, State of California, in accordance with the provisions of law, appointing three commissioners to levy and assess upon the lands situated upon said Reclamation District No. 1000 the amount of the estimated cost, as above set forth, as a charge upon the lands within the said District, as required by the provisions of law, and that such other, further and additional laws be made as is meet and proper in the premises as required by law.

Dated February 6th, 1912.

RECLAMATION DISTRICT NO. 1000,
By F. H. Bennett
President of the Board of Trustees
By Newton Cleaveland
Trustee.
By Emery Oliver
Trustee.

F. H. Bennett
Newton Cleaveland
Emery Oliver
As constituting the Board of Trustees of Reclamation District No. 1000

Devlin & Devlin
Attorneys for
Reclamation District No 1000

DEVLIN & DEVLIN ATTORNEYS SACRAMENTO, CAL.

Frank Bennett, Newton Cleaveland, and Emery Oliver, the first trustees of Reclamation District No. 1000, signed this petition to the Board of Supervisors, which was approved on February 6, 1912. With this action, the Board of Supervisors approved District Engineer Norton Ware's eight-page report with plans for levees, canals, and a pumping plant, and authorized assessing landowners in the district $1,997,344.40 to pay for the cost of building the system. (Center for Sacramento History, Sacramento County Board of Supervisors, File 7-33 Signature Page)

place] at the junction of the Feather and Sacramento Rivers, and including about 53,000 acres of land."

The general plan was to surround this area with levees sufficiently high and strong to "withstand all floods, the north levee being intended to resist the onslaught of any possible overflow from the Bear River, which overflow together with the storm waters of the east side streams was to be carried along the east side of the District adjoining the hills and into the American River at the City of Sacramento by means of a canal, the westerly bank of which was to be the east levee of the District."[4]

The flood of 1909 confirmed Kieffer's design values, which had assumed that the 1907 flood was the worst case, though now he did not assume that such a storm was so unusual. In fact, Kieffer believed that the point of initial protection needed to be further north,

LIST OF ALL LANDS SITUATED WITHIN THE COUNTY OF SUTTER, STATE OF CALIFORNIA, WHICH LIE WITHIN THE BOUNDARIES OF RECLAMATION DISTRICT NO. 1000, CONTAINING A DESCRIPTION OF ALL THE LANDS OF THE DISTRICT SITUATED IN SUCH COUNTY OF SUTTER, WITH NAME OF EACH PERSON TO WHOM EACH TRACT IS ASSESSED AND THE VALUE THEREOF, AS APPEARS FROM THE ASSESSMENT ROLL OF SAID COUNTY, FOR THE FISCAL YEAR 1912-13, the SAID ASSESSMENT ROLL BEING THE NEXT PRECEDING ASSESSMENT ROLL PRIOR TO THIS DATE, AND THE SAID LIST BEING CERTIFIED BY THE COUNTY ASSESSOR OF THE COUNTY OF SUTTER.

NAME OF PERSON TO WHOM ASSESSED	DESCRIPTION OF PROPERTY ASSESSED.	AMOUNT OF ASSESSMENT ON LAND	AMOUNT OF ASSESSMENT ON IMPROVEMENT	TOTAL AMOUNT OF ASSESSMENT ON LAND AND IMPROVEMENT
Wallace, John	In South Kunsman Lots 5,6,7,8,9,10,11,12, 13 and 14,Block 3	$100	$00.00	$100.00
Batson, Clarence O.	In South Kunsman Lots 1,2,3,4,45,46,47 48,49 and 50,Block 4	$100	-----	$100.00
Cross, Fred A.	In South Kunsman Lots 19,20,21,22,23,24 25,26,27 & 28,Block 4	$100	----	$100.00
Staggers, J.K.	In South Kunsman Lots 24,25,26,27, & 28 Block 6	$50.00	----	$50.00
McGarvin, Wm.	In South Kunsman Lots 26,27, & 28 Block 9	$30.00	----	$30.00
Gottrill, C.O.	In South Kunsman Lots 1,2,3,4, & 48 Block 10	$50.00	----	$50.00
	Lots 1,2,3,4, & 50 Block 20	$50.00	----	$50.00
				$100.00
Freeland, F.D.	In South Kunsman Lots 24,25,26,27 & 28 Block 11	$50.00	----	$50.00
	Lots 1,2,3,4, & 48 Block 19	$50.00	----	$50.00
				$100.00

This list of all lands situated within the county of Sutter, California, which lie within the boundaries of Reclamation District No. 1000, was filed with the clerk of the Sacramento County Board of Supervisors in 1913. (Center for Sacramento History, Sacramento County Board of Supervisors, File 7-32 List of Lands)

at the Bear River. This would have created a district that incorporated "not only Districts 2 and 6, which were already in existence, but also the large body of land extending along the South bank of Bear River as far eastward as the Southern Pacific Railroad, near Sheridan."[5] George Dillman suggested that all side streams from the Bear River south be diverted into an intercepting canal along the east side of his proposed district, emptying into the American River opposite Sacramento. But runoff measured in 1909 made it clear this would endanger the city's levee. Kieffer proposed diverting a large portion of the flow into a canal similar to the present Cross Canal, emptying into the Sacramento River near Verona, with the balance carried south as first proposed, into the American River.[6]

Natomas Consolidated of California's company logo shows its four primary areas of interest: dredging, rock crushing, reclamation, and irrigation. (Center for Sacramento History, Natomas Company Collection, 1981-037-4753)

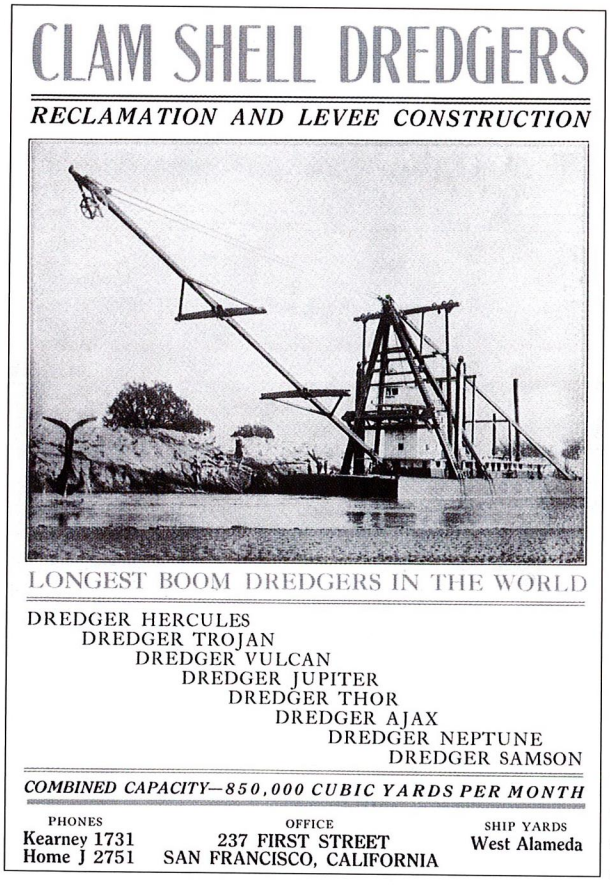
The gigantic district Kieffer's proposal would have created was politically unfeasible, but the same level of protection could be achieved by splitting the project into two districts. Natomas Consolidated bought land in Reclamation Districts 2 and 6 as well as in two levee districts north of the area, with the idea of unifying these five districts into a single reclamation project.[7] Reclamation Districts 1000 and 1001 were designed by Emery Oliver, chief engineer for Natomas Consolidated of California. Combined, they included the entire area proposed by Kieffer.[8]

Governor Hiram Johnson signed Assembly Bills 1475 and 1476 on April 8, 1911, dissolving the American Reclamation District

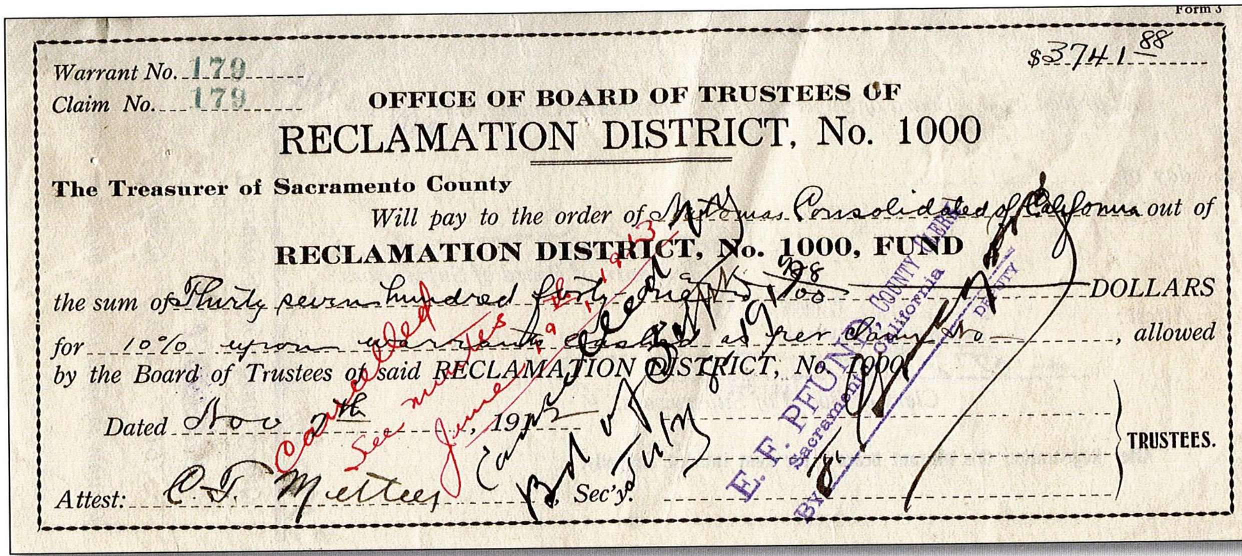
Stock certificate, Natomas Consolidated of California, circa 1906. (Center for Sacramento History, Natomas Company Collection, 2001-135-0001)

and four other districts, and forming Reclamation Districts 1000 and 1001. The Sacramento County Board of Supervisors appointed two Natomas Consolidated executives, Emery Oliver and Newton Cleaveland, and pioneer farmer Frank Harris Bennett the first trustees of Reclamation District 1000. It encompassed 32,919.72 acres in Sacramento County, giving that county jurisdiction, and 21,344.46 acres in Sutter County.

Natomas Consolidated performed the reclamation work in both Reclamation Districts 1000 and 1001. It began in 1911 in the Bear River Tract in RD 1001, the company's dragline excavator working around the clock to repair, strengthen, and raise the levees. By December 1911, eight miles of levee in the tract had been reinforced or constructed. Attention soon turned to RD 1000.[9]



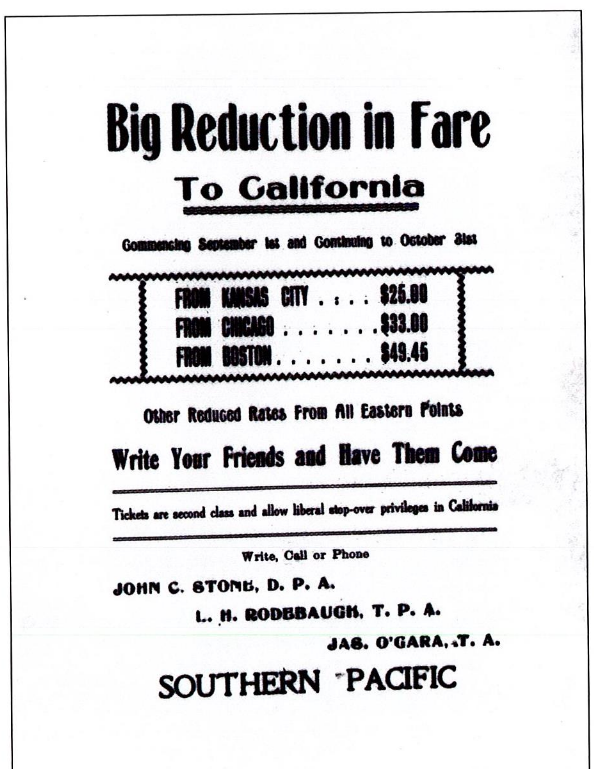
This advertisement appeared in the October 12 issue of Natomas Consolidated's public relations newsletter, Natomas News. *Several of these dredgers were used in building RD 1000. (Center for Sacramento History, Natomas Company Collection, 1981-037-4751)*



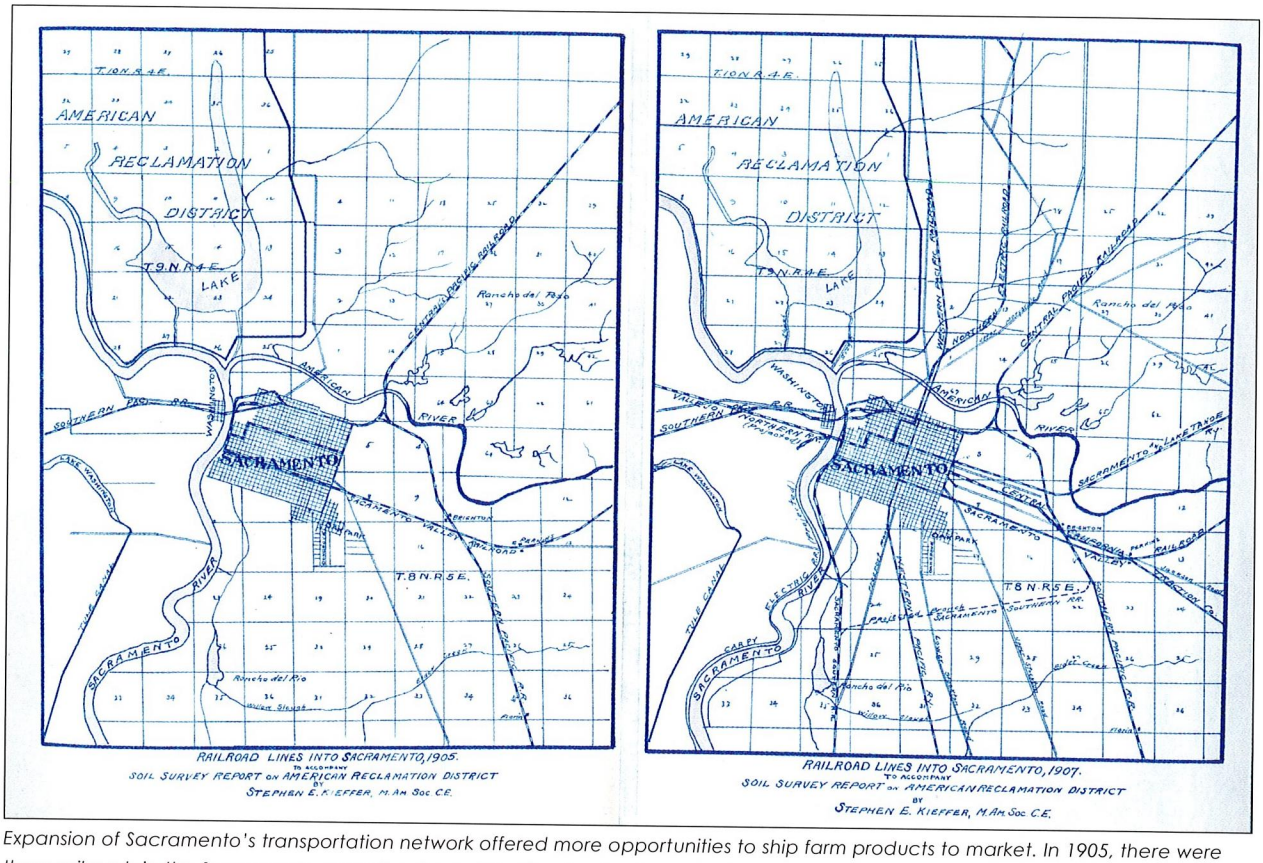
This cancelled check was made out to Natomas Consolidated of California for $3,741.88. The company performed all the work of reclamation for RD 1000 and 1001. (Center for Sacramento History, Sacramento County Board of Supervisors, File 7-32 Check)

Financing the Biggest Reclamation Project in California

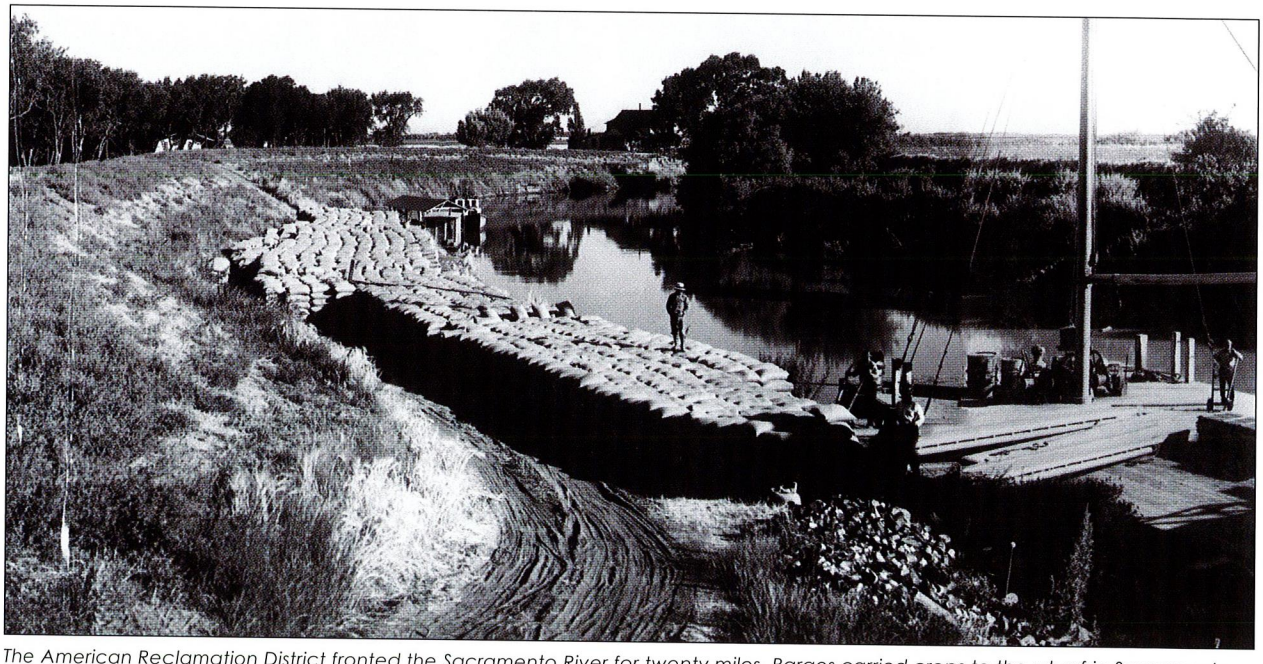
Even for Natomas Consolidated, construction costs of nearly $2 million to build RD 1000 were astronomical. What made the company so optimistic? It was hardly alone in believing that large reclamation projects were gaining momentum. California was among several states pressing Congress to help pay for such projects, for flood control as well as reclamation. R. G. Hanford commissioned J. G. White & Company of New York to study how profitable the resulting farmland would be. The White Report recommended setting prices based on soil composition and estimated that the land could be sold for $75 an acre for the poorest land away from the river up to $300 an acre for rich, alluvial river bottomland. On an average selling price of $200 an acre, there would be a net profit of $110 an acre after the land and reclamation costs had been met. If these lands were then irrigated, they could sell for anywhere from $350 to $600 an acre, figures that the New York engineers be-



Southern Pacific Railway ran a campaign advertising cheap fares for riders from the East and Midwest coming to California. These "colonist excursions" were needed to bring in workers, customers, and taxpayers for the young state of California. Natomas Consolidated hoped they would bring in the farm families needed to buy its lands in RD 1000. (Center for Sacramento History, California State Library Collection, 1974-268-0104)



Expansion of Sacramento's transportation network offered more opportunities to ship farm products to market. In 1905, there were three railroads in the Sacramento area: the Central Pacific, the Southern Pacific, and the Sacramento Valley Railroad. By 1907, there were five, and the Western Pacific Railway was prepared to build a sixth line, which, like the Northern Electric, would run on tracks along the eastern side of the American Reclamation District.[18] *(Center for Sacramento History, Natomas Company Collection, 1981-037-4825 Rail Lines 1905, 1907)*



The American Reclamation District fronted the Sacramento River for twenty miles. Barges carried crops to the wharf in Sacramento, where they could be shipped anywhere in the world. Work on the Panama Canal began in 1904, and R. G. Hanford wanted to complete reclamation in time to be among the first to take advantage of the access it would offer to world markets.[19] *(Center for Sacramento History, Robert Heringer Collection, 1985-005-007)*

ESTIMATED COST OF CONSTRUCTING LEVEES AND DRAINAGE SYSTEM

DISTRICT NO. 1000. Sacramento & Sutter Counties.
California.

- LEVEES: RIGHT OF WAY, CLEARING, GRUBBING, MOVING BUILDINGS, EXCAVATING CORE, BUILDING EMBANKMENT AND ALL WORK NECESSARY to the completion of the levee in a substantial manner, and as shown on plans and profiles attached,

  TOTAL ESTIMATED COST: $1,204,534.40

- DRAINAGE CANAL—INSIDE DISTRICT: RIGHT OF WAY, CLEARING, GRUBBING, EXCAVATING, BUILDING TRESTLE OPENINGS...ROADWAY CROSSINGS

  $198,130

- PUMPING PLANT: RIGHT OF WAY, PUMPS, ENGINES, BOILER, CONDENSERS, PUMP HOUSE, PIPING, FUEL OIL, SUPPLY AND STORAGE AND ALL EQUIPMENT NECESSARY ... ALSO ALL LABOR REQUIRED:

  $197, 450

- TELEPHONE LINE: about 41 miles of DOUBLE CIRCUIT TELEPHONE line with stations every two miles, running around the district, following the line of the River Levee, East side Levee, and Cross Canal Levee. POLES, WIRES, CROSS ARMS, INSULATORS, TELEPHONES AND ALL MATERIAL REQUIRED FOR COMPLETE INSTALLATION OF TELEPHONE SYSTEM. ALSO ALL LABOR REQUIRED:

  $6,760

ESTIMATED COST OF MAINTENANCE based on a three-year period:

- First year after Levees and Canals are complete:

  $112,800

- Cost of pumping seepage water and rainfall from the reclaimed area including Engineers, helpers, fuel, tools, oil, waste and repairs will probably amount to:

  $30,000 per year for three years: $90,000

- Maintenance of levees and drainage canals after first year including foremen, laborers, scraping, dredging, repairs to roads and bridges, etc.

  $20,000 per year for two years: $40,000

TOTAL COST (counting the major items listed plus miscellaneous items): $1,947,344.40

Extracted from Engineer Norton Ware's 1912 report to trustees of RD 1000, who presented it to the Sacramento County Board of Supervisors on February 6, 1912.[11]

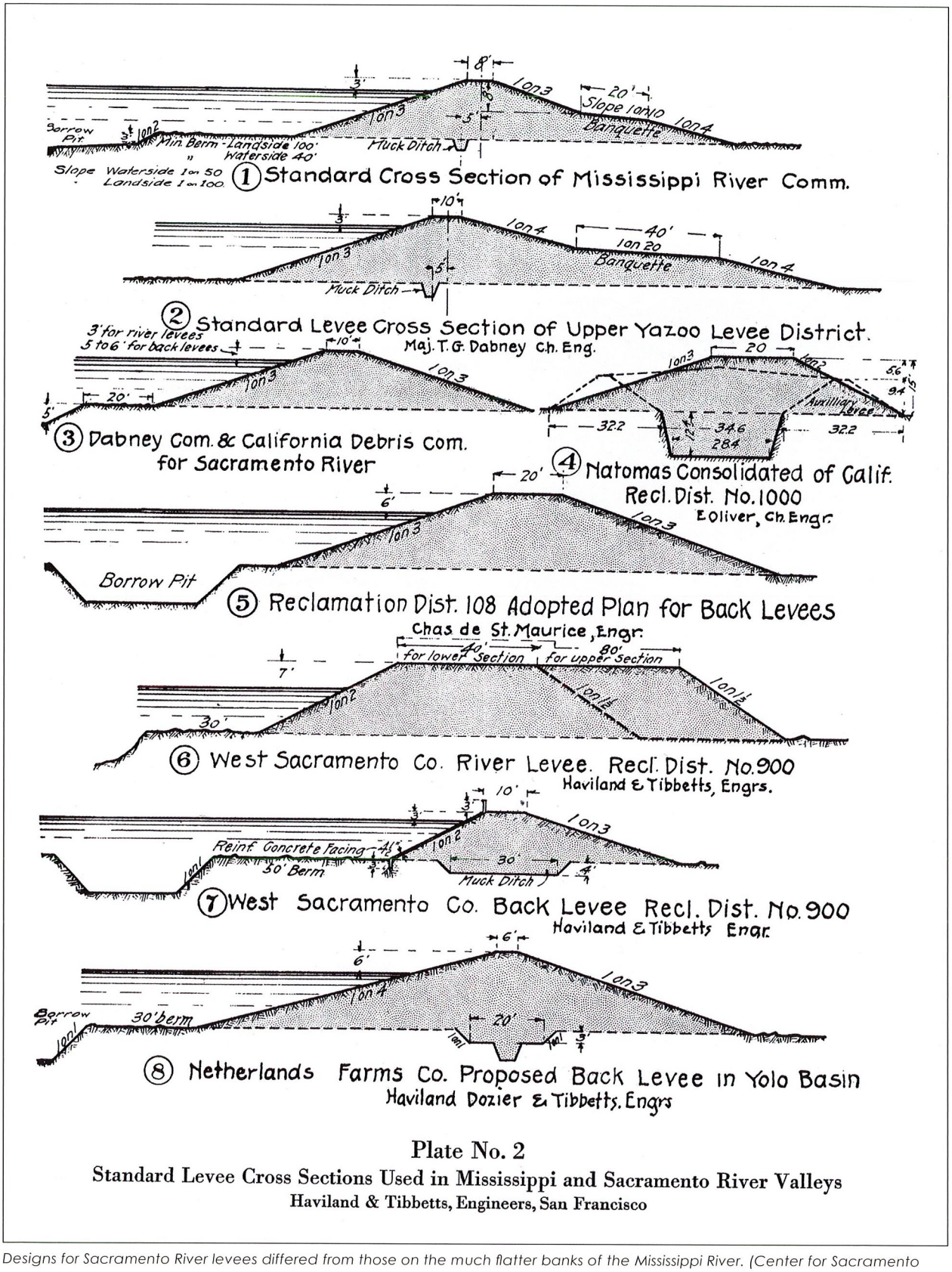
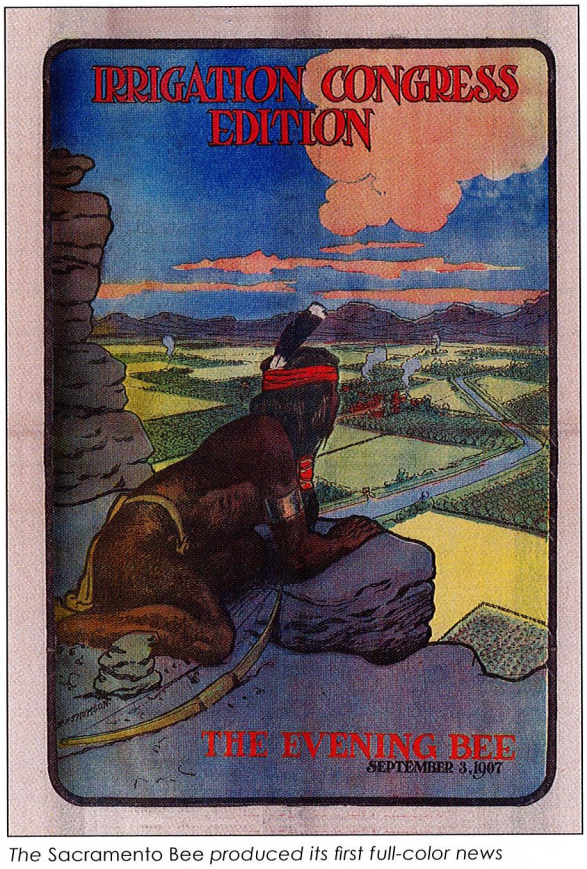


Plate No. 2

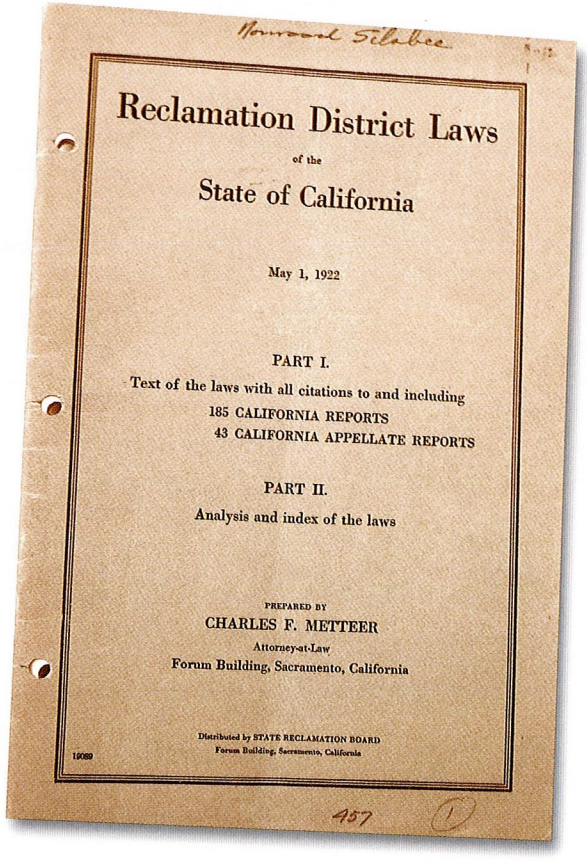
Standard Levee Cross Sections Used in Mississippi and Sacramento River Valleys

Haviland & Tibbetts, Engineers, San Francisco

Designs for Sacramento River levees differed from those on the much flatter banks of the Mississippi River. (Center for Sacramento History, Eleanor McClatchy Collection, 1982-004-0193)



The Sacramento Bee produced its first full-color news page on the occasion of the Fifteenth National Irrigation Conference, held on Admission Day, 1907, in Sacramento. Thousands of people visited a special "Irrigation Palace" and came away with a favorable impression of the potential wealth to be gained by development of all kinds, including large-scale reclamation. This was the year that R. G. Hanford commissioned a study of the American Basin by the J. G. White Company of New York.[20] (Center for Sacramento History, Sacramento Bee Collection, 2005-054-XXXX)


Reclamation District Laws
of the
State of California

May 1, 1922

PART I.
Text of the laws with all citations to and including
185 CALIFORNIA REPORTS
43 CALIFORNIA APPELLATE REPORTS

PART II.
Analysis and index of the laws

PREPARED BY
CHARLES F. METTEER
Attorney-at-Law
Forum Building, Sacramento, California

Distributed by STATE RECLAMATION BOARD
Forum Building, Sacramento, California
19089

Charles Metteer, author of a compendium of Reclamation District Laws, served as RD 1000's secretary/attorney for many years. (Courtesy of the California History Room, California State Library, Sacramento, California)

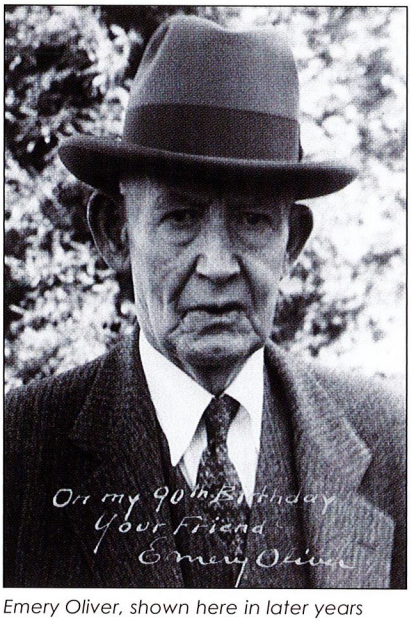
lieved were "reasonable when compared with the prices obtained for irrigated lands of no better quality in southern California."

White estimated that the developers would net over $12 million, while the total cost for levee construction, drainage ditches, irrigation canals, and roads would be only $4 million. To be conservative, White estimated it would take ten years to sell all of the company's property in the district.[12]

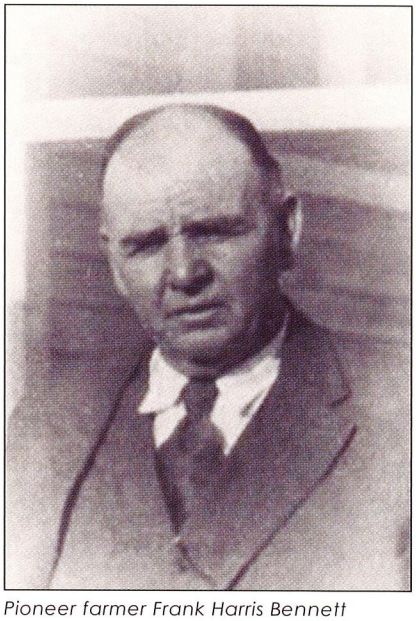
Hanford asked one of the region's leading real estate firms, Wright & Kimbrough, how quickly the land might sell. The firm replied that, if the land were reclaimed as outlined and advertised, "5,000 to 10,000 acres per year could be disposed of." Given the magnitude of the project, Howard & Kimbrough added, "the East would, of course have to be invaded and people brought out, but in view of the fact that the Colonist excursions alone bring 50,000 people per year to California, while the State is filling up at the rate of 100,000 people per year, it should not be a difficult matter to . . . conduct a campaign of education for this particular project that would attract great numbers of prospective purchasers and actual settlers." Wright & Kimbrough even produced a design for a township in the southern part of the American Basin.[13]

First Trustees of Reclamation District

When Newton Cleaveland became one of three founding trustees of RD 1000, he was holding down three jobs. He went to work at Yuba Consolidated Gold Fields in 1905. By 1907, he was general manager of that company as well as Yuba Construction Company. In 1908, he accepted the position of general manager of Natomas Consolidated of California. He resigned his first two jobs in 1911, and left Natomas Consolidated and the RD 1000 board in 1912, returning to manage Yuba Construction Company, manufacturers of some of the dredges, tractors, and irrigation pumps used to build RD 1000.[21] (Courtesy of the California History Room, California State Library, Sacramento, California)



Emery Oliver, shown here in later years on his ninetieth birthday, was general manager and chief engineer of Natomas Company of California, and one of the first trustees of the new RD 1000. He supervised the company's engineering department during construction of levees, and served as a trustee until 1929. (Courtesy of the California History Room, California State Library, Sacramento, California)



Pioneer farmer Frank Harris Bennett served as a trustee from the board's inception in 1911 until 1921. Members of his family continued to live and farm in the district for many years. (Courtesy of the Bennett family)

Hanford planned to offer the land for sale with 20 percent down and the balance due in ten yearly installments at 6 percent interest. Although this would add $25–50 to the selling price, this arrangement would enable people to pay for the land out of their crop earnings. Moreover, there would be no interest charges the first year or any maintenance assessment charges for five years.[14]

With these optimistic expectations of profit, Natomas Consolidated developed a method to finance its reclamation project. Under terms of a contract dated May 27, 1912, all engineering and construction work for RD 1000 was done by Natomas Consolidated of California and its successor, Natomas Company of California, for cost plus 10 percent.[15] Natomas Consolidated agreed to take district warrants (or promises to pay) bearing 7 percent interest in payment.[16]

(Natomas Consolidated also agreed to cash warrants that had been paid to other companies, such as Great Western Power Company, which refused to supply power to Reclamation District 1000 unless these warrants were redeemed annually.) With the Reclamation District's warrants, Natomas Consolidated then bought bonds issued by the district, paid the assessments (which as a landowner the company was required to do), and borrowed money to continue its reclamation work, using the warrants as collateral.[17]

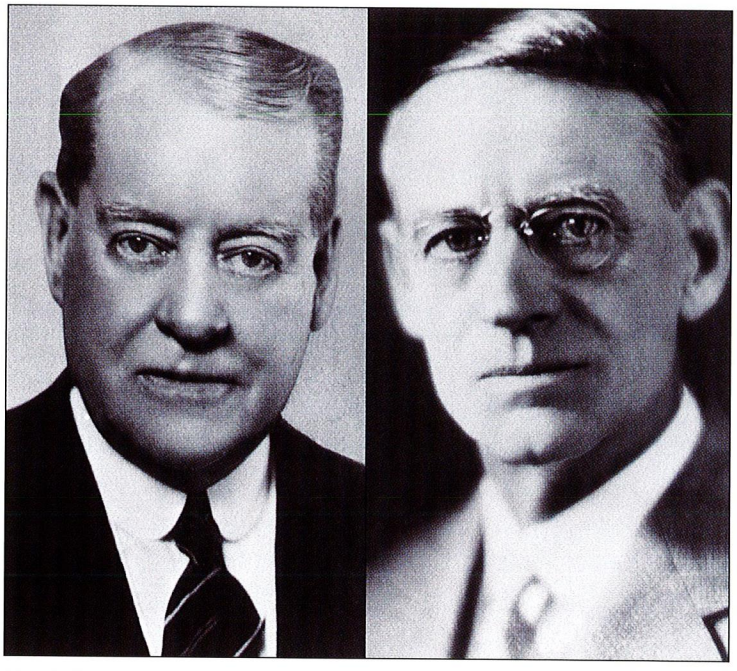
Natomas Consolidated Company of California envisioned its role in RD 1000 as a catalyst for converting swampland to productive farmland that would sell within ten years and provide a return on its investment. To protect its investment, company officials would remain on the board until that day came. As it happened, Senator Thomas McCormack was the last Natomas Company of California official to hold a trustee position, which he held until his death in 1949. RD 1000's repayment of bonds took until 1967.

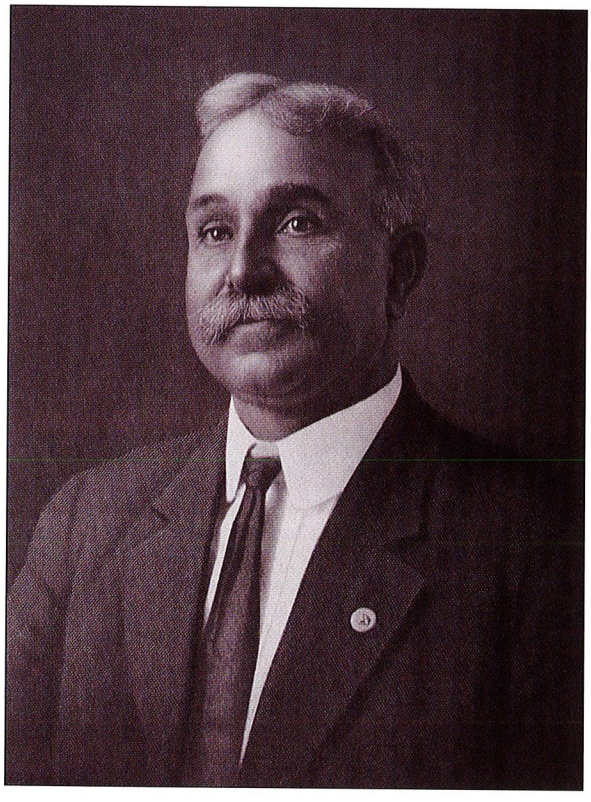
Influential Businessmen and Landowners Promoted the American Reclamation District

Charles F. Silva arrived in Sacramento with his brother Frank F. Silva from Fayal, in the Azores Islands, at age eleven. With $2.50 in his pocket, Charles paid $1.00 to reach Vernon, Sutter County, where he went to work milking cows on a dairy ranch for fifty cents a day. When he was thirteen, he learned the craft of cheese making, and then went into the business for himself, and his career as an entrepreneur was launched. Silva bought the 160-acre Ramsey ranch six miles above Vernon on the Feather River and rented ranches on the Sacramento River. He owned steamers, including the *Neptune*, as well as barges and trading boats whose routes included the towns on the Sacramento River between the capital and Butte City. He was a well-known cattle and horse breeder, and bought and sold tens of thousands of acres of land in Sacramento, Sutter, and Modoc Counties. He was a director of the Natomas Land Company and the Sutter Basin Company and was a trustee of the Vernon Reclamation District. As a landowner in the American Basin, he was one of the signers on the petition to form the American Reclamation District, which later became RD 1000.[26]

Alden Anderson was a leader in the fruit business when he was elected to the state Assembly in 1896 from Solano County. He served as Speaker of the Assembly from 1899 to 1901, Lieutenant Governor from 1902 to 1907, and was the state's first Superintendent of Banks.[27] A Republican, he ran against and lost to Hiram Johnson in the governor's race. He was also director of many companies, including the Natomas Company of California and the Natomas Company, as well as Clarke & Cox Farms, second-largest landowner in the American Basin. In that capacity, Anderson was one of the signers of the petition to form the American Reclamation District.[28]

Charles Kenny (C. K.) and Valentine Stuart (V. S.) McClatchy owned land in what became RD 1000. V. S. was a popular speaker on the topic of reclamation and, in 1913–14, was chair of the State Reclamation Board. In 1914, he testified before Congress on behalf of the Jackson Report and its recommendation for a comprehensive flood control system for the Sacramento River. In 1916, he presented a paper at the annual meeting of the National



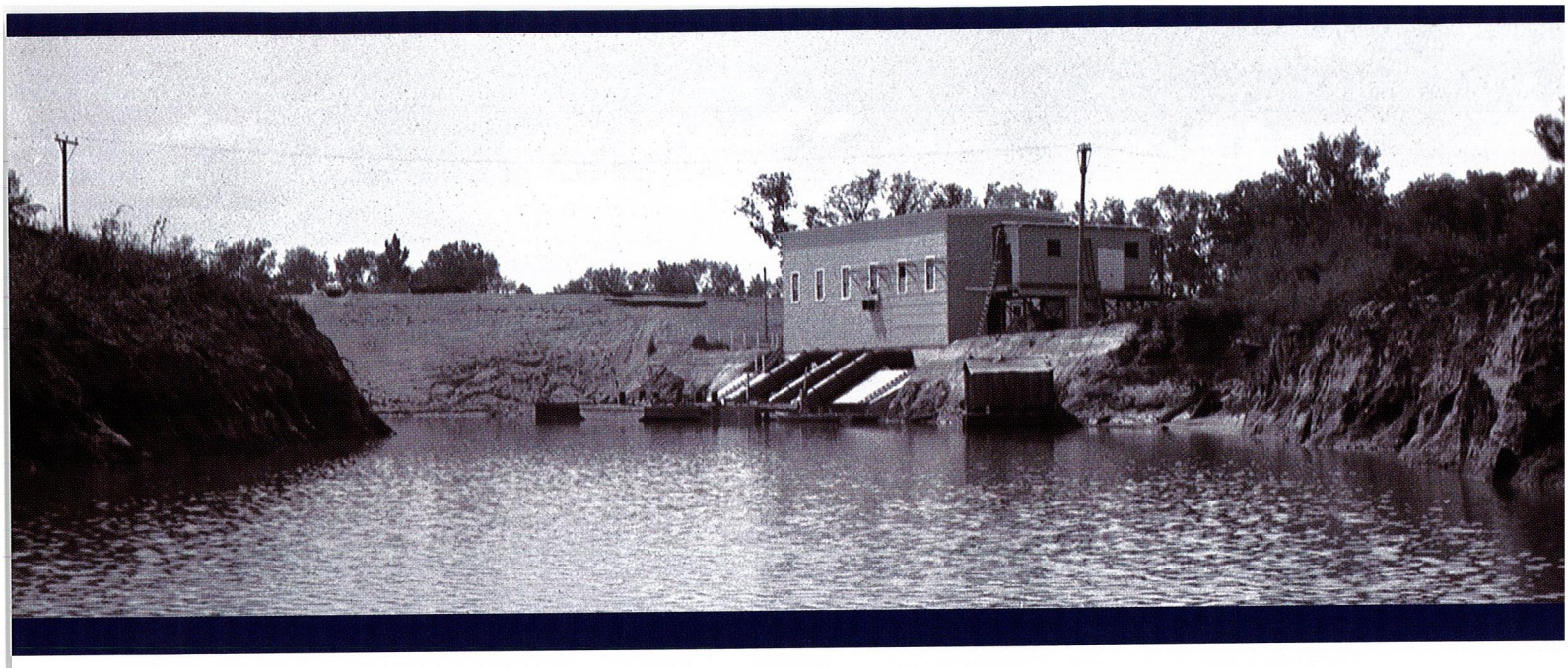


(Top left): Alden Anderson (Courtesy of the California History Room, California State Library, Sacramento, California)

(Top right): C. K. and V. S. McClatchy (Center for Sacramento History, Sacramento Bee Collection, 1983-001-20638)

(Bottom left): Charles F. Silva (Courtesy of the California History Room, California State Library, Sacramento, California)

Drainage Congress in Cairo, Illinois, where he noted: "The Sacramento River is, in amount of maximum flood, the fourth greatest river in the United States, being exceeded only by the Mississippi below its junction with the Missouri, by the Ohio, and by the Columbia; while in proportion to the square miles of territory drained, its flood is over five times as great as that of any river in the Union. Its maximum flood discharge is usually estimated at 660,000 second feet, though a total peak or crest flow into the valley of 835,000 second feet has been recorded."[29]



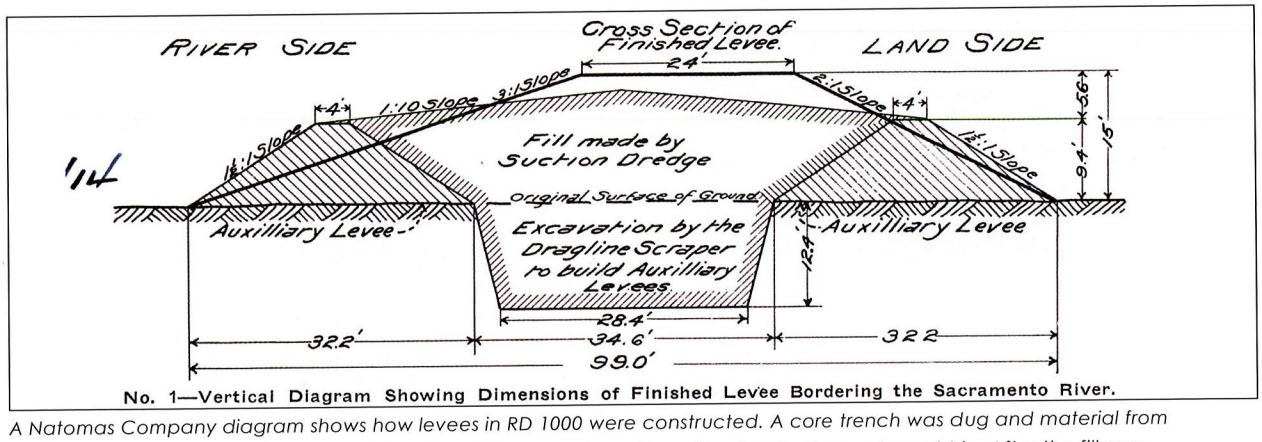
Chapter 3

Building the System

The concept for the flood control system designed by Emery Oliver and detailed by Norton Ware was simple: build levees to keep the water out, canals to collect water until it could be pumped out, and pumping plants to pump the water into the Sacramento River. The challenge lay in the sheer size of the 52,000-acre enterprise. Work went on simultaneously on levees, canals, and pumps, beginning in May of 1912 and finishing in January of 1917. A series of irrigation canals was added as work was coming to a close on the rest of the system, and was complete by 1918. To accomplish the project in such a short time, crews worked day and night with the aid of powerful searchlights.[1]

River Levee

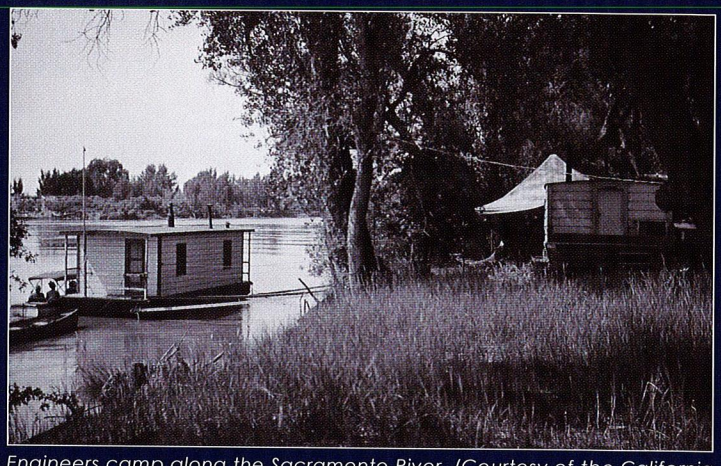
Twenty-four-inch pipes were placed through one side of the river levee as it was being constructed. The discharge pipe from the suction dredge in the river ran through this



No. 1—Vertical Diagram Showing Dimensions of Finished Levee Bordering the Sacramento River.

A Natomas Company diagram shows how levees in RD 1000 were constructed. A core trench was dug and material from the trench thrown up on either side of the ditch. Fill was suctioned from the river bottom or brought in. After the fill was compacted, the soil was scraped up the sides and over the top. (Center for Sacramento History, Natomas Company Collection, 1981-037-Natomas News V2, June 1912, p22)

An Engineer's Paradise

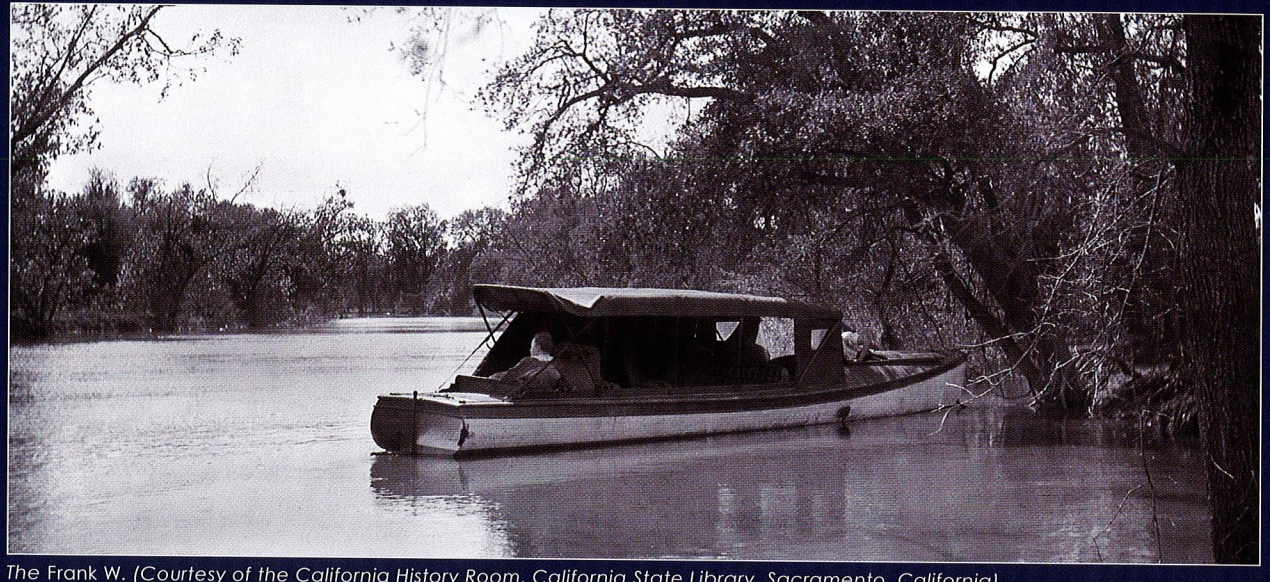


Engineers camp along the Sacramento River. (Courtesy of the California History Room, California State Library, Sacramento, California)

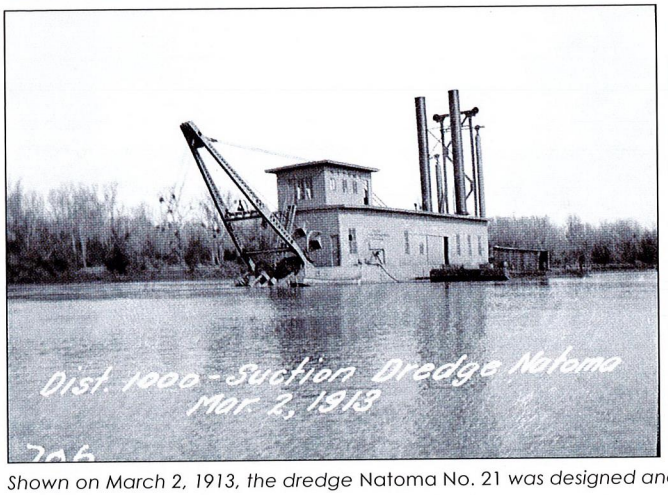
"A permanent engineers camp was established on the Elkhorn Road near the River Levee, and another in a houseboat at Smith's Mound. Transportation was by wagon, or you walked; along the river it was by rowboat or, if you were lucky, by the *Frank W.* [a small company passenger boat]. Timekeepers rode horseback or drove a two-wheeled cart. In those days a daily record had to be kept of the number of horses and mules at work on canals, and the cost of their feed.

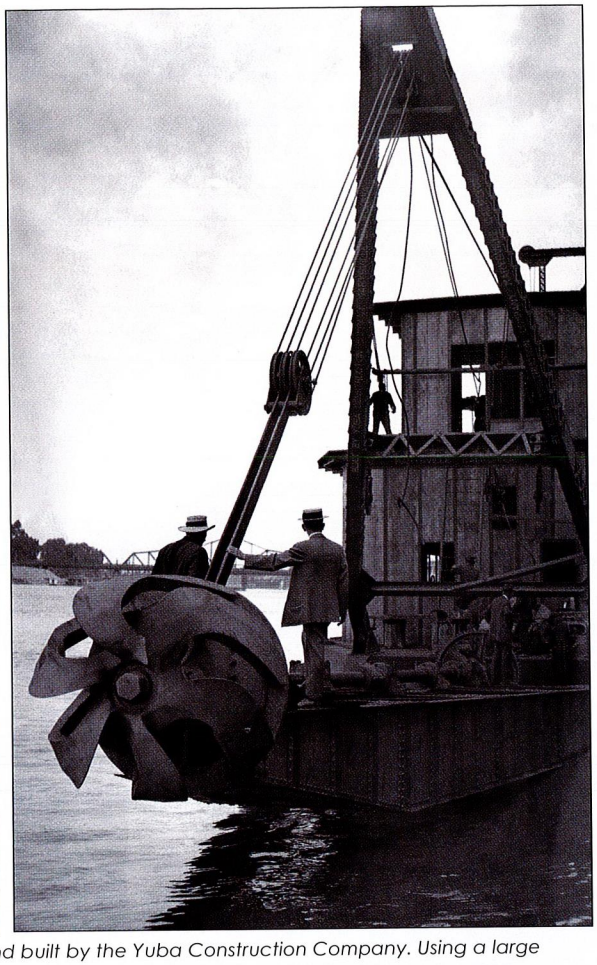
"Survey parties were at work in the field in the morning before today's parties have finished breakfast; and after dinner at night the evening was usually spent in working up notes taken during the day. Other departments of the Company might have regular hours, Saturday afternoons off and annual vacations, but the engineers' hours of work were unlimited. There were no vacations during the first three years of work. Every advantage had to be taken of dry weather; bad weather meant patrolling all points of possible trouble, day and night, no matter how disagreeable or dangerous. And the men were happy."

Norwood Silsbee, engineer, Natomas Consolidated Company of California[2]



The Frank W. *(Courtesy of the California History Room, California State Library, Sacramento, California)*





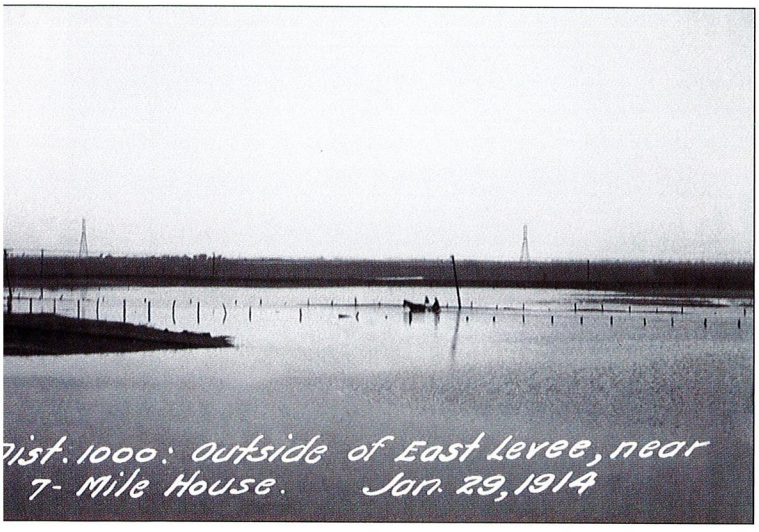
Shown on March 2, 1913, the dredge Natoma No. 21 *was designed and built by the Yuba Construction Company. Using a large cutter head, it was capable of digging thirty feet below the water line. Its centrifugal pump, operating at 300 revolutions/minute and driven by a 700 hp engine, sucked up solid material from the riverbed that was then transferred to a twenty-inch steel pipe at the stern of the boat. This steel pipe, in turn, was connected to a pontoon pipe that ran approximately 350 feet to the riverbank where it connected with about 650 feet of shoreline pipe and discharged dredge fill between the "auxiliary levees."[4] (RD 1000 Collection)*

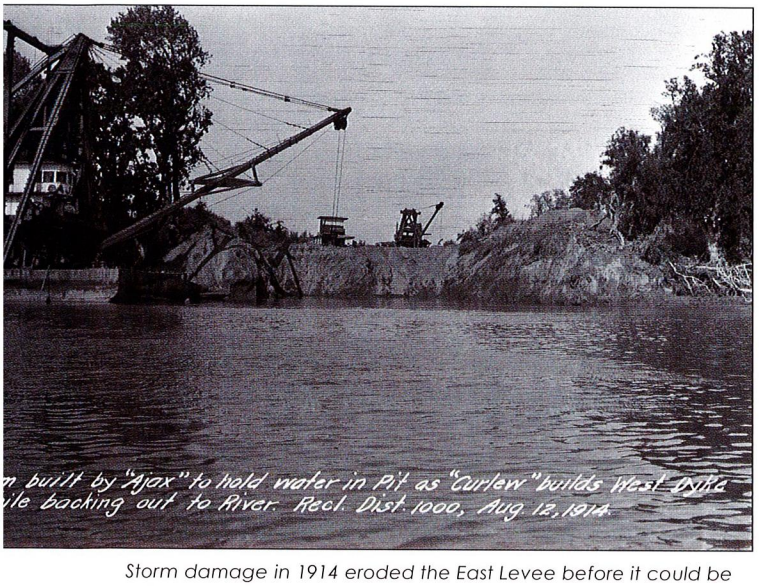
pipe. After the fill was complete to the height of the pipes, the discharge pipe from the dredge was raised to the top of the embankment to complete the levee. The pipes acted as an outlet for the water used to sluice the levee fill into place so that water between the two side levees did not stand at a higher level than the surface of the ground. After the levee was complete, the pipes were removed.[6]

The dredge tender Natoma followed its namesake, providing space for its crew and equipment. Company records show the crew consisted of "3 levermen, 3 engineers, 2 firemen, 2 deck hands, all on the dredge, besides a shore gang of 34 men total for the two 12-hour shifts. The levermen worked 6 hours on and 12 hours off, making an average of 8 hours/day."[5] (RD 1000 Collection)

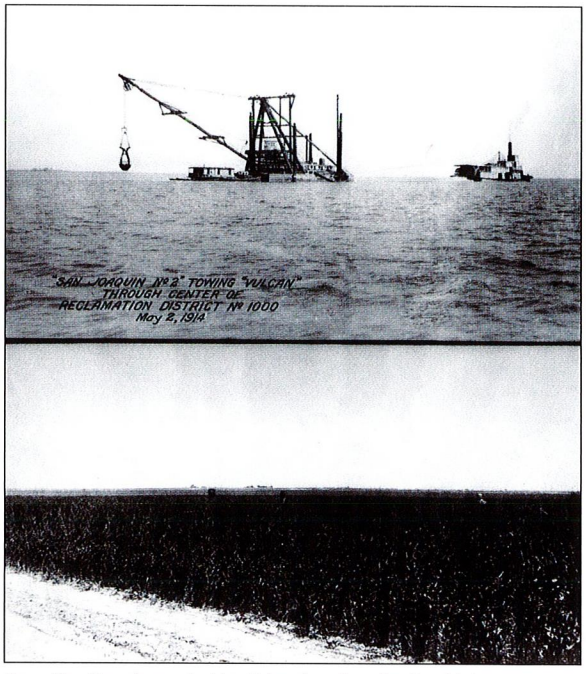
High Water in 1914

In January 1914, prolonged heavy rains produced high water in the rivers, breaking





Storm damage in 1914 eroded the East Levee before it could be closed, causing a delay of several months. (RD 1000 Collection)



Top: The San Joaquin No. 2 *towing the dredge* Vulcan *through the center of RD 1000 on May 2, 1914. Bottom: The same location one year later. (RD 1000 Collection)*

through the partially constructed levees and flooding the district. Wave-wash from strong winds caused erosion on the landside of the East Levee and some damage to the River Levee. Note the height of the water as a man and horse ford the water (top left photo). Nearly two miles of levee were damaged and had to be rebuilt. On August 12, the dredge *Curlew* was rebuilding the west levee. The *Curlew* was a small clamshell dredge with a fifty-foot boom and a one-and-a-quarter-yard bucket. In three and a half months, it placed approximately 45,600 cubic yards at a cost to the company of 23.3 cents per cubic yard.[7]

Canals and Levees

Construction of drainage canals began in March 1913, and by January 1917, more than 127 miles had been completed with a total of 2,111,000 cubic yards of material excavated.

RD 1000 As Built

River Levee

Crown: 24 feet
Work began May 1912; levee closed September 1914
Length: 17.99 miles containing 5,070,000 cubic yards of earth and sand
Concrete road: 16 feet wide, 5 inches thick

East and Cross Canal Levees

Crowns: 20 feet
East Levee work began August 1912; levee closed December 1914
Cross Canal Levee work began October 1912; levee closed November 1914
Side levee crowns: 8 feet
All levee slopes: 1 in 3 on the waterside and 1 in 2 on the landside
The East Levee as built: 14.51 miles long containing 2,550,000 cubic yards of fill
Cross Canal and Levee as built: 8.78 miles long containing 841,000 cubic yards of fill

Drainage Canals

Work began March 1913, completed January 1917

Pumping Plants

Pumping Plant No. 1 first operated December 23, 1914
Pumping Plant No. 2 first operated January 13, 1916

Main Canals

20.92 miles
Laterals 104.49 miles
Total: 125.41miles with 2,111,737 cubic yards of material excavated.

Irrigation

Elkhorn Subdivision: 29.2 miles of canals
Pumping plant with two 18-inch centrifugal pumps
Distributing reservoir to provide storage for one day's average supply to the whole district
40 miles of irrigation canals in Elkhorn, Riverside, and Central Subdivisions complete by 1918

Dredges

The *Natoma* No. 21 and the *Thor* were the largest clamshell dredges in the world.
Natoma No. 21: hull 105 ft. x 35 ft. and 9 ft. deep. The limits of digging were 7 ft. minimum and 36 ft. maximum; the average was 18 to 32 feet. The lift was from 20 to 30 feet.
Jupiter
Hercules
Trojan
Vulcan
Ajax
Mars
Curlew[3]

Construction on the East Levee. (Center for Sacramento History, Natomas Company Collection, 1981-037-2754)

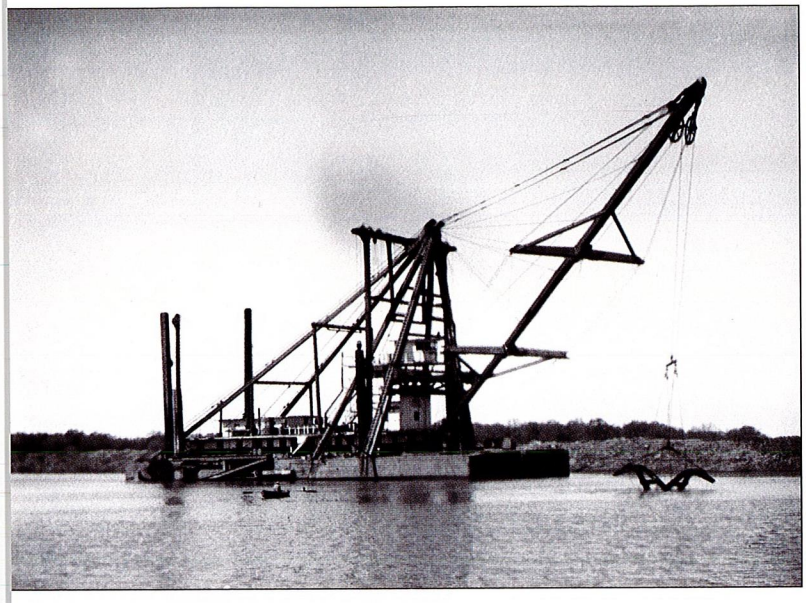
The Main Canal and much of the West Branch Canal were dug by small clamshell dredge. Austin, Buckeye, and dragline excavators were used on the balance of the job. Pumping Plant No. 1 at the lower end of the Main Canal was designed to handle all ordinary runoff. In heavy rains, runoff from the North Branch Canal was to be diverted directly to Pumping Plant No. 2 at Pritchard Lake.[8]

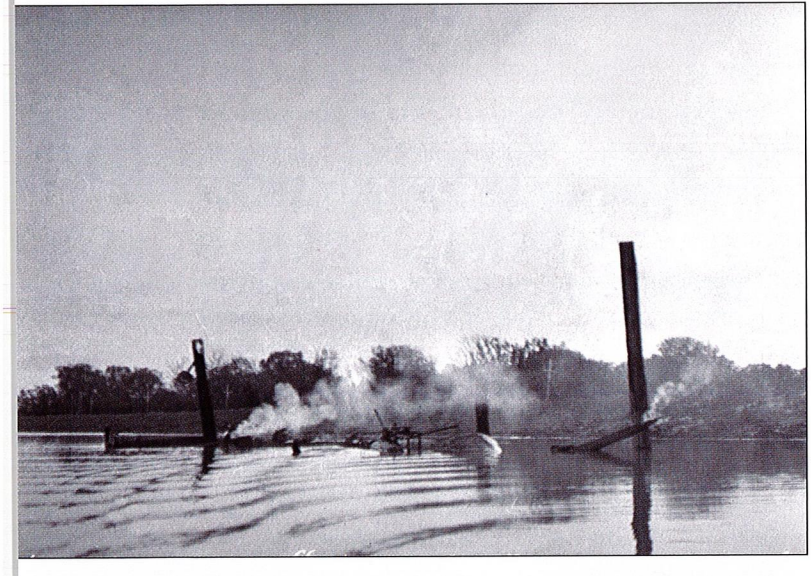
Main canals had a bottom width of ninety-five feet and the smallest laterals a bottom width of two feet. Some grades were as flat as 1:20. Since the capacity of the Main Canal varied with the head created by pumping, the Main Canal had a much greater capacity than that of Plant No. 1. Lowest land in the district has an elevation of ten feet. Low water at the sump of Plant No. 1 was at elevation four. Storage in the canals between the two elevations amounted to 444 acre-feet, or as much as the four fifty-inch pumps could return to the river in 9¼ hours.

The East Levee was the last portion of levee to be completed, "so as to avoid any pumping until the entire District is surrounded by levees."[9]

Animal-drawn excavators and teams did the work of constructing the East Levee, which began in August 1912. Material was taken from between the levee and the Western Pacific Railway embankment and turned onto a conveyor belt that then carried the dirt to dump wagons. The levee rose layer by layer, each layer compacted by the repeated crossing and re-crossing by horses and wagons.[10] The large borrow pit formed a canal to intercept streams along the east side of the district. The portion of this levee along the American River was built by clamshell dredges.[11]

The Cross Canal began at Sankey Station in Sutter County, running northwest to Pleasant Grove, then southwest to the Sacramento River Levee below Verona. From the river to Pleasant Grove, the Cross Canal Levee was constructed by clamshell and suction dredges borrowing material from the north side. A similarly constructed levee, the Cross Canal Levee of RD 1001 had its borrow pit on its south side, making a waterway four hundred feet wide to carry drainage water to the Sacramento River from intercepted streams east of RD 1001 and from Sankey Station to Pleasant Grove on the east side of RD 1000. From Pleasant Grove south, animal-drawn excavators were used to construct the levee.

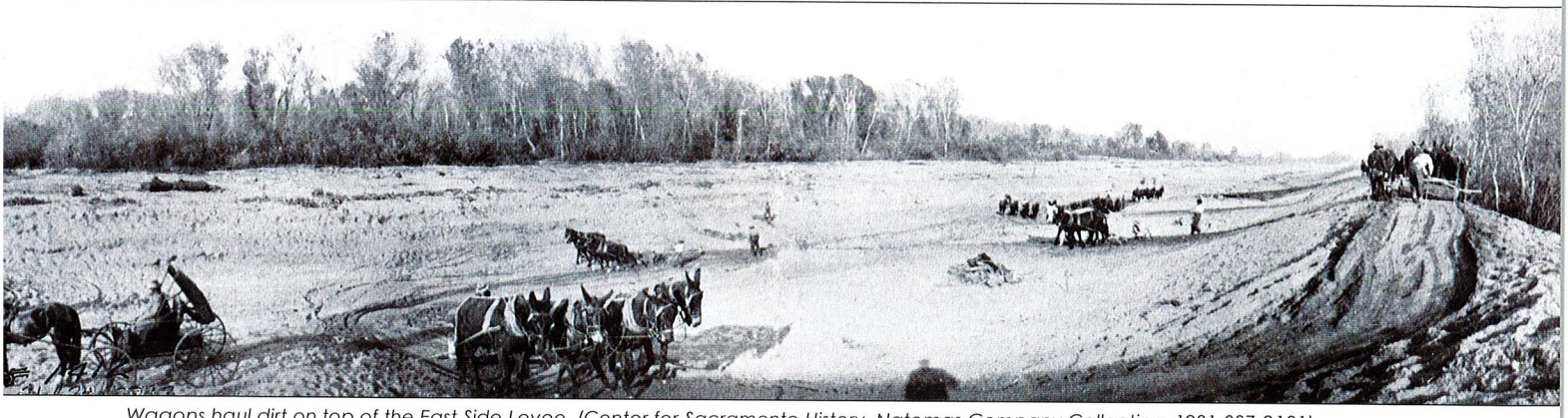




The Hercules was the largest clamshell dredge in existence. It was employed to use its 205-foot boom to dredge silt from the river bottom and deposit it on the bank, creating levees. On February 6, 1915, the Hercules was at work on the Cross Canal Levee. On May 1, 1915, it sank in the Cross Canal. Natomas Consolidated had the resources to replace it quickly. (RD 1000 Collection)

Bannon Slough

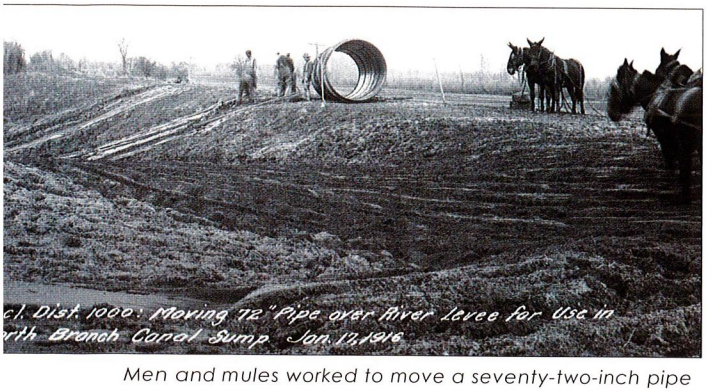
Patrick Bannon was the sheriff of Joliet, Illinois, before he joined a wagon train headed west and arrived in Sacramento in 1849. He bought the block later owned by the Crocker family in downtown Sacramento. As his family grew, he exchanged the downtown block for several hundred acres of land at the confluence of the American and Sacramento Rivers. The home Bannon built for his family had a four-foot brick foundation to keep it above the winter floods. There were three sloughs flowing into the Sacramento River from the Bannon property, but only one remained after the River Levee was built. Second Bannon Slough was deepened and straightened to form the Main Canal.[13]



Wagons haul dirt on top of the East Side Levee. (Center for Sacramento History, Natomas Company Collection, 1981-037-2131)

Pumping Plants

Pumping Plant No. 1 at Second Bannon Slough was constructed in 1914 and first operated on December 23 of that year. This spot is the lowest elevation in the district, and all ordinary runoff was handled through this plant. It was built with three Byron Jackson and one Pratt fifty-inch centrifugal pumps direct-connected to two 600-hp General Electric and two 650-hp Westinghouse motors, giving a capacity of 65,000 gallons per minute each at a twenty-four-foot head, or a combined capacity of 578 cubic feet per second. Pumps and motors are still housed in a steel-concrete building with concrete outlet tunnels under the River Levee. This pumping plant is still operational today but is used only during extreme rainfall events.



Men and mules worked to move a seventy-two-inch pipe over the river levee for use in the North Branch Canal sump. (RD 1000 Collection)

Pumping Plant No. 2 at Pritchard Lake was first operated on January 13, 1916. It was equipped with two thirty-eight-inch Allis Chalmers centrifugal pumps direct-connected to two 300-hp Westinghouse motors, giving a capacity of 35,000 gallons per minute each at a head of twenty-four feet, or a combined capacity of 155 cubic feet per second. The outlet for this plant was designed for inflow as well as outflow so that water from the river could flow by gravity into the sump, where it could be lifted into irrigation ditches by pumping.

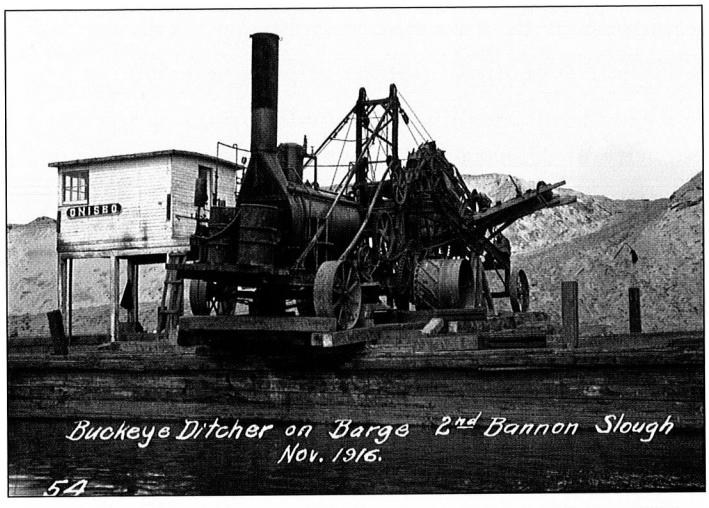
Together, the pumping plants were designed to handle a rainfall runoff of 3/8 inch in twenty-four hours. While this estimate was recommended as standard by leading authorities as ample for flat, undeveloped land in the Valley, it was soon discovered to be much below what actually occurred.[14]

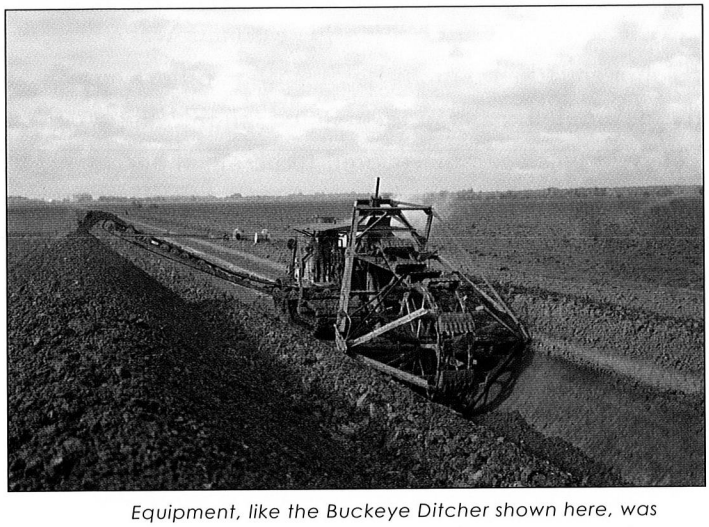
Power for Plants 1 and 2 was originally supplied by Great Western Power Company, which was absorbed by PG&E and later incorporated into SMUD.

Plant No. 1

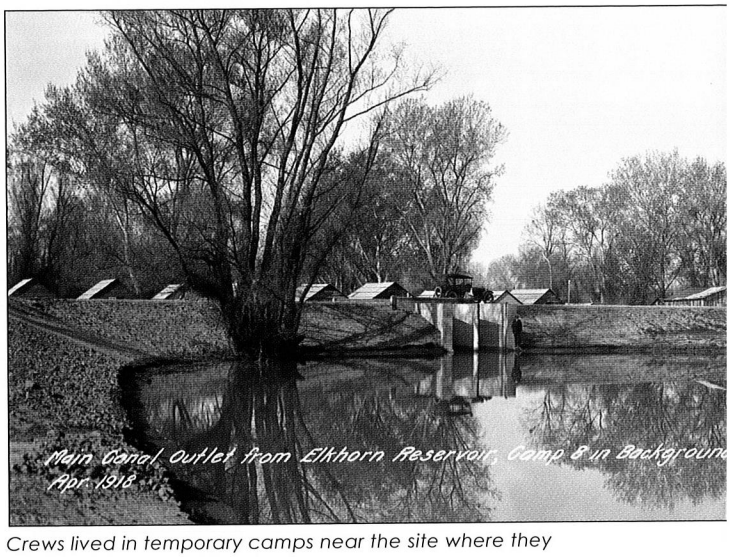
A series of photographs (Pages 39–40) taken from February 25, 1913, to April 22, 1915, shows the construction of Pumping Plant No. 1.

A supervisor watches from above as workmen line a canal. Where soils were sandy, canals were concrete lined. (RD 1000 Collection)

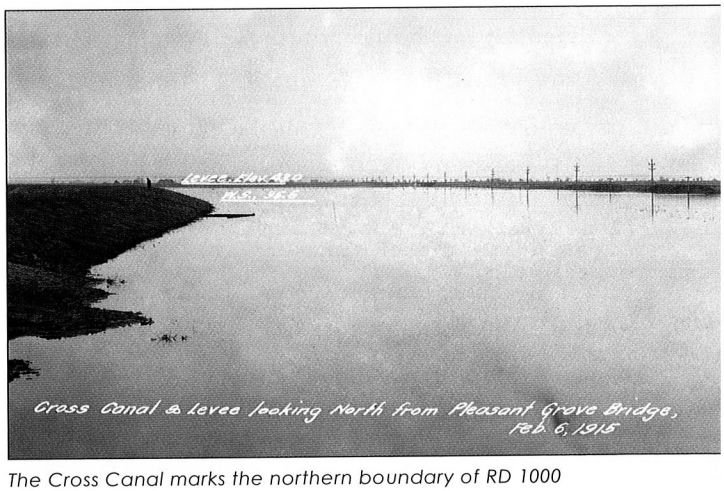




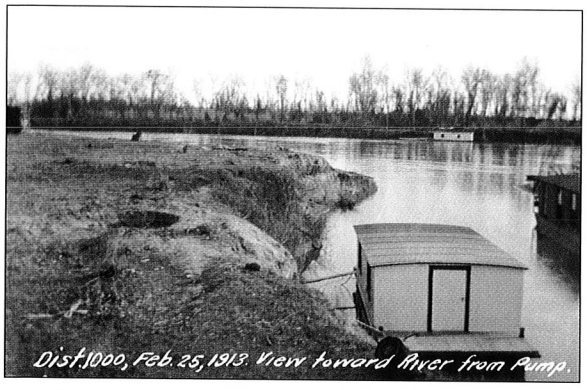
Equipment, like the Buckeye Ditcher shown here, was moved from one project to another by barge, and was in constant use during construction. The Austin Excavator was used to dig irrigation ditches and canals. (RD 1000 Collection)

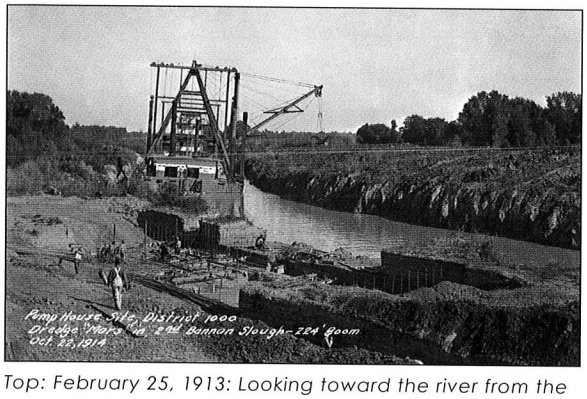


Crews lived in temporary camps near the site where they were working. Sleeping quarters for the men and the cookhouse were often mounted on skids so that they could be moved from place to place.[12] In some areas, more permanent camps were set up. Some of Camp 8, shown in the background, remains today, housing RD 1000's equipment and field office. (RD 1000 Collection)



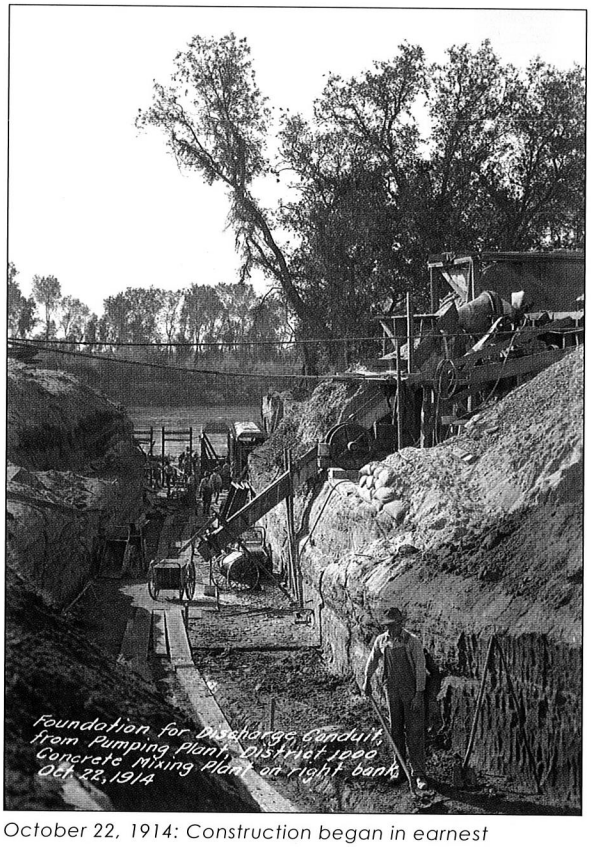
The Cross Canal marks the northern boundary of RD 1000 and the southern boundary of RD 1001. Hand markings on this photograph taken February 6, 1915, show the levee elevation on the RD 1000 side at 43 feet and the water surface level at 35.6 feet. (RD 1000 Collection)



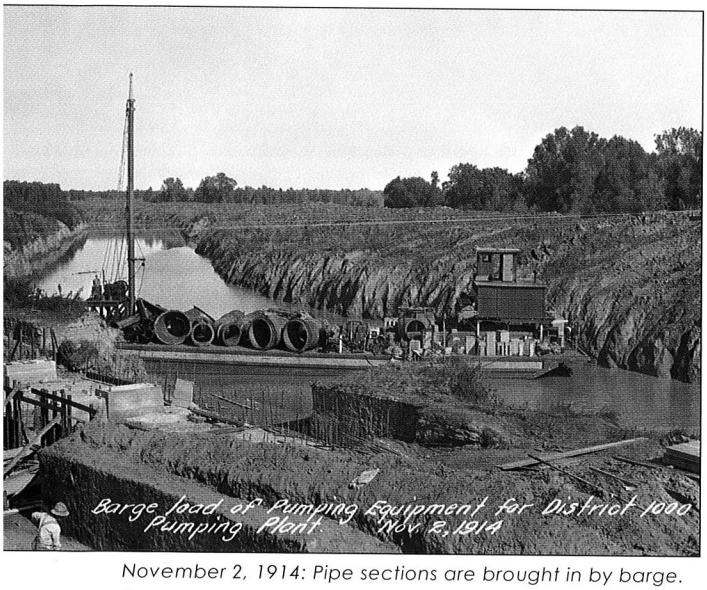


Top: February 25, 1913: Looking toward the river from the cleared site, only an equipment barge was in place. (RD 1000 Collection)

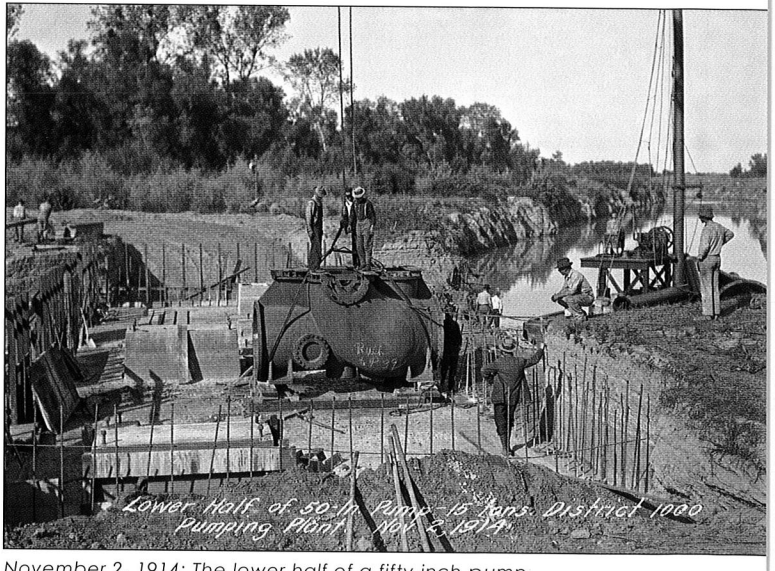
Bottom: October 22, 1914: The dredge Mars widens and deepens Bannon Slough, piling the river bottom silt up on the bank. (RD 1000 Collection)



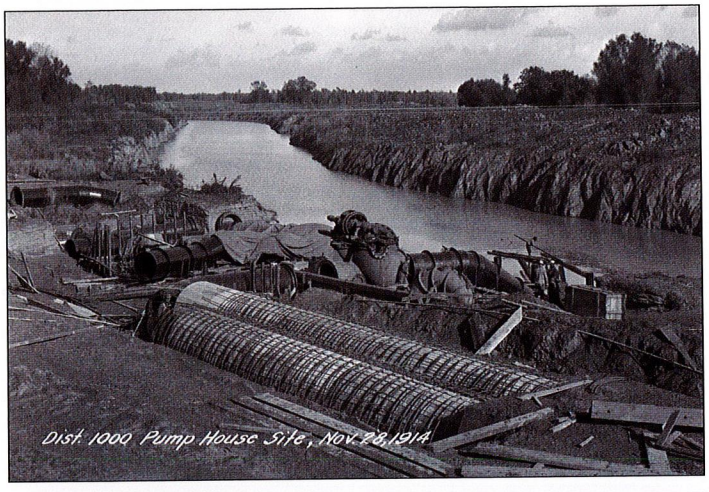
October 22, 1914: Construction began in earnest after heavy flooding in early 1914 caused delays. The foundation is being prepared for the discharge conduit from the plant. Note the concrete mixing plant on the right. (RD 1000 Collection)

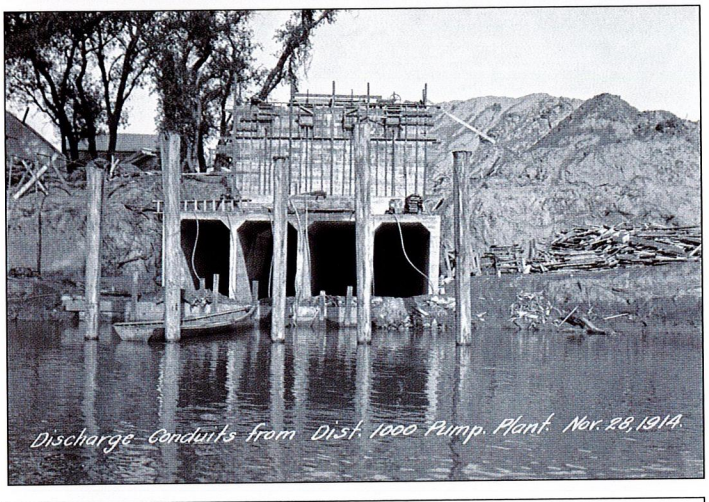


November 2, 1914: Pipe sections are brought in by barge. (RD 1000 Collection)



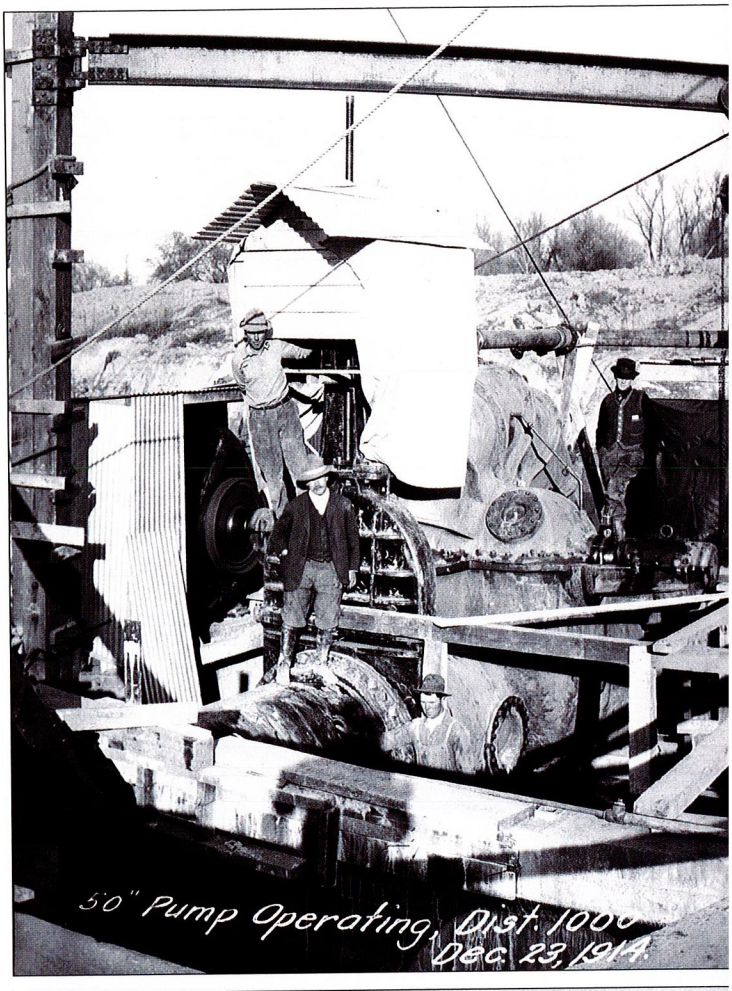
November 2, 1914: The lower half of a fifty-inch pump, delivered by barge, is lowered into place by the dredge Mars. (RD 1000 Collection)

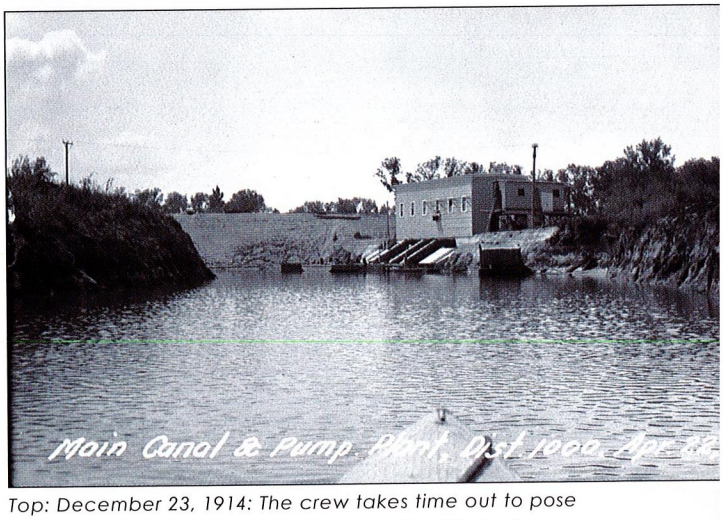




Top and middle: November 28, 1914: Within two weeks, the pipes are laid in the trench, and the gigantic concrete gates are in place.

Bottom: December 23, 1914: Work begins on the pump house. (RD 1000 Collection)



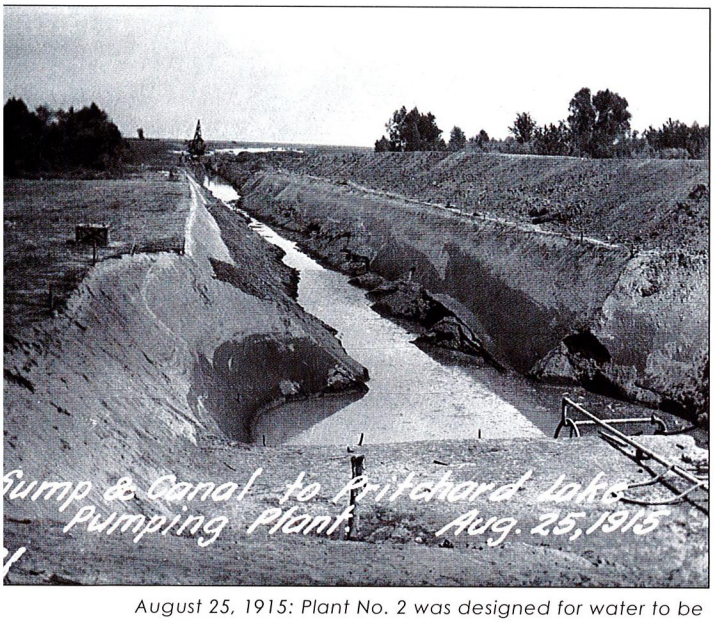


Top: December 23, 1914: The crew takes time out to pose for a photograph marking a milestone: the fifty-inch pump begins operating. (RD 1000 Collection)

Bottom: April 22, 1915: Plant No. 1 is substantially complete. In this view looking toward the river from Bannon Slough, also known as the Main Canal, the plant is recognizable as the one still standing today. (RD 1000 Collection)

Plant No. 2

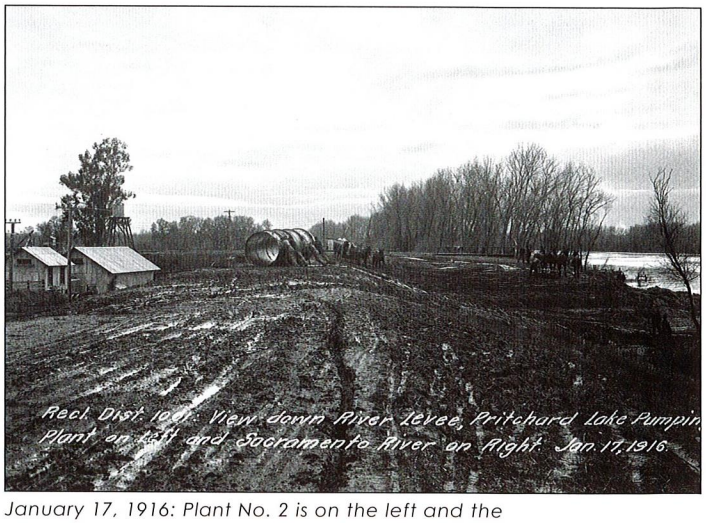
This series of photographs taken from August 25, 1915, to February 3, 1917, shows construction of Pumping Plant No. 2 from start to finish. "Pritchard Lake" referred to a natural slough in the area.



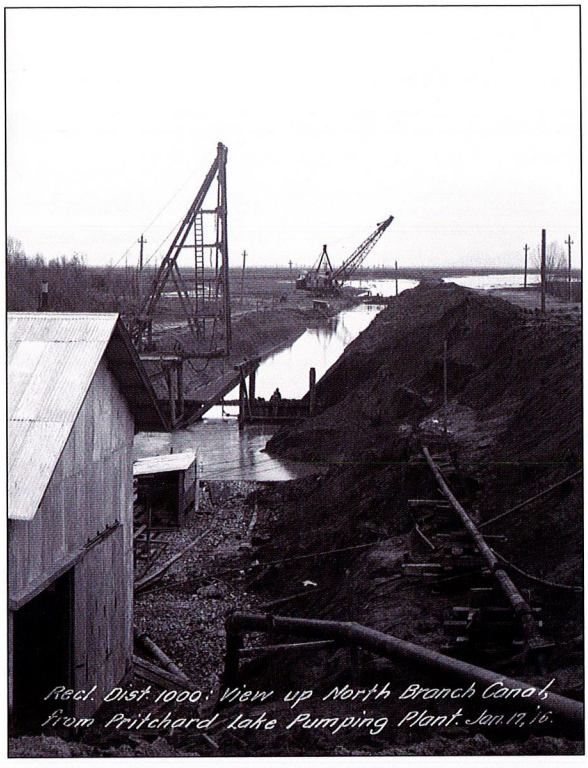
August 25, 1915: Plant No. 2 was designed for water to be pumped both into the river for flood control and out for irrigating fields. (RD 1000 Collection)

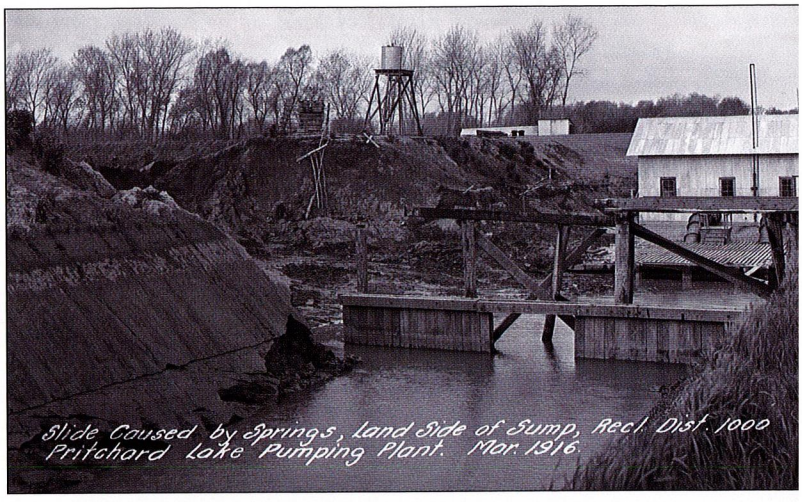
November 10, 1915: The North Branch Canal levee is shown on the left. Note the boards on the right for dragline tracks. (RD 1000 Collection)

November 10, 1915: A dragline just outside the frame of this photograph is lifting a sixty-inch pipe into place. (RD 1000 Collection)



January 17, 1916: Plant No. 2 is on the left and the Sacramento River is on the right as men struggle to place the sixty-pipe. (RD 1000 Collection)



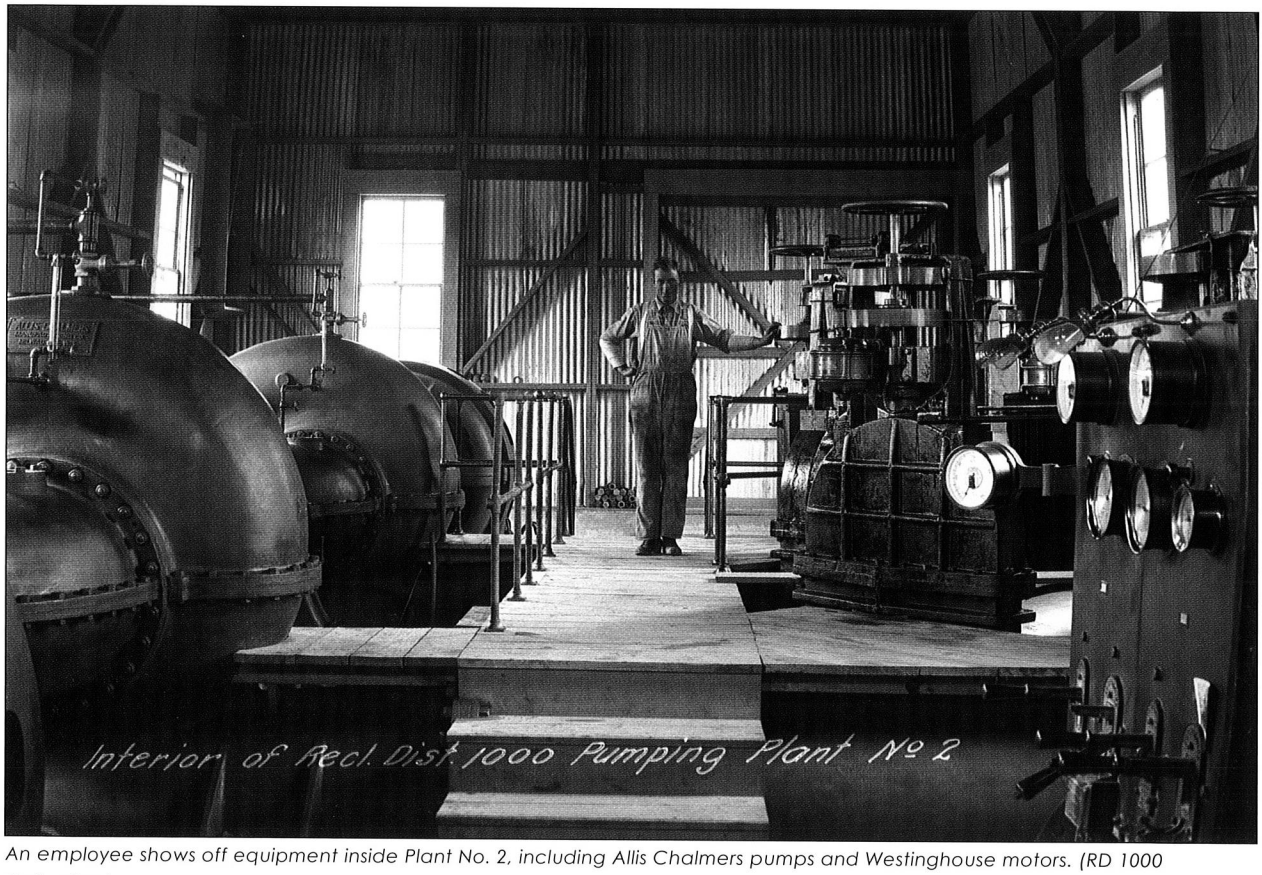


Left: January 17, 1916: Pipes are in place to carry irrigation water from Plant No. 2 in this view up the North Branch Canal. (RD 1000 Collection)

Above: March 1916: A slide caused by springs on the landside of the sump was the first of several sloughs encountered at the site of Plant No. 2. Problems at the site continued, with repairs over the years, until the plant was removed in 2006 when boils threatened the stability of the adjacent river levee. (RD 1000 Collection)

February 3, 1917: The finished plant includes a water tower to prime the pumps located inside the plant. (RD 1000 Collection)

The berm surrounding Plant No. 2 is seen from the North Branch Canal. (RD 1000 Collection)



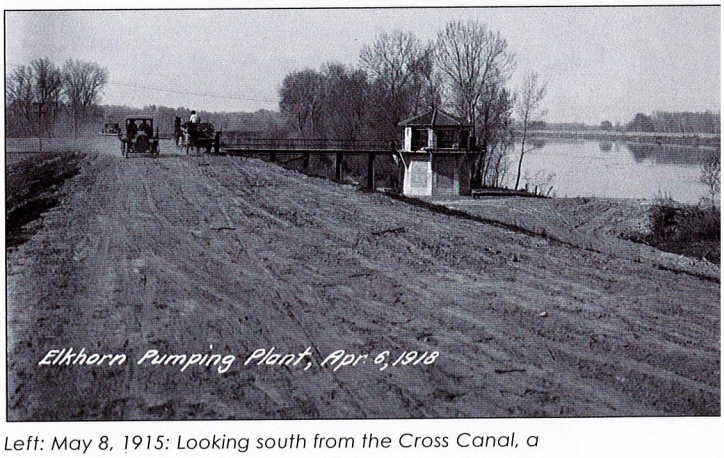
An employee shows off equipment inside Plant No. 2, including Allis Chalmers pumps and Westinghouse motors. (RD 1000 Collection)

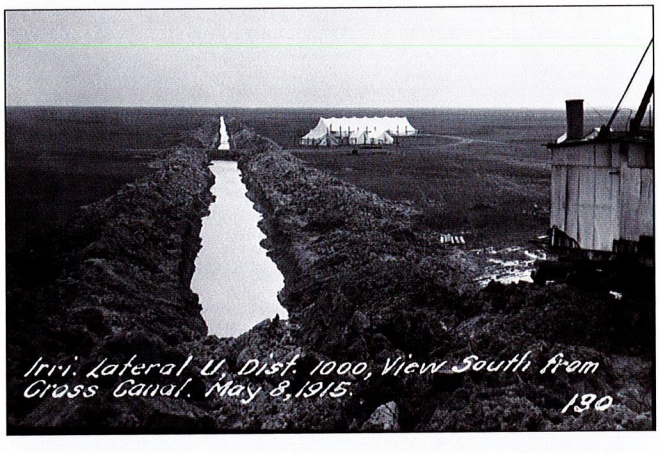
Irrigation

Construction on an irrigation system began immediately after reclamation was complete. Natomas Consolidated organized and financed four mutual water companies and applied for diversion of Sacramento River water. Each company was incorporated for fifty years, and one share of stock, with a value of ten dollars, was assigned to each acre of land. Water stock was inseparable from the land.

The water companies were Elkhorn Mutual, incorporated May 31, 1918; Natomas Riverside Mutual, incorporated January 10, 1920; Natomas Central Mutual, incorporated July 21, 1921; Natomas Northern Mutual, incorporated May 6, 1926 (consolidated with Natomas Central Mutual in 1938). RD 1000 and Natomas Central Mutual made a complete separation of their operations in 1949. RD 1000 still pumps out the irrigation water that drains into its canals.[15]

By 1924, the *Sacramento Bee* reported, "ample water for every purpose has been supplied by means of an irrigation system covering more than 30,000 acres of land. The pumping plant which supplies this water has a 310,000 gallon capacity, sufficient to flood the entire area with water four feet in depth during a season."[16]





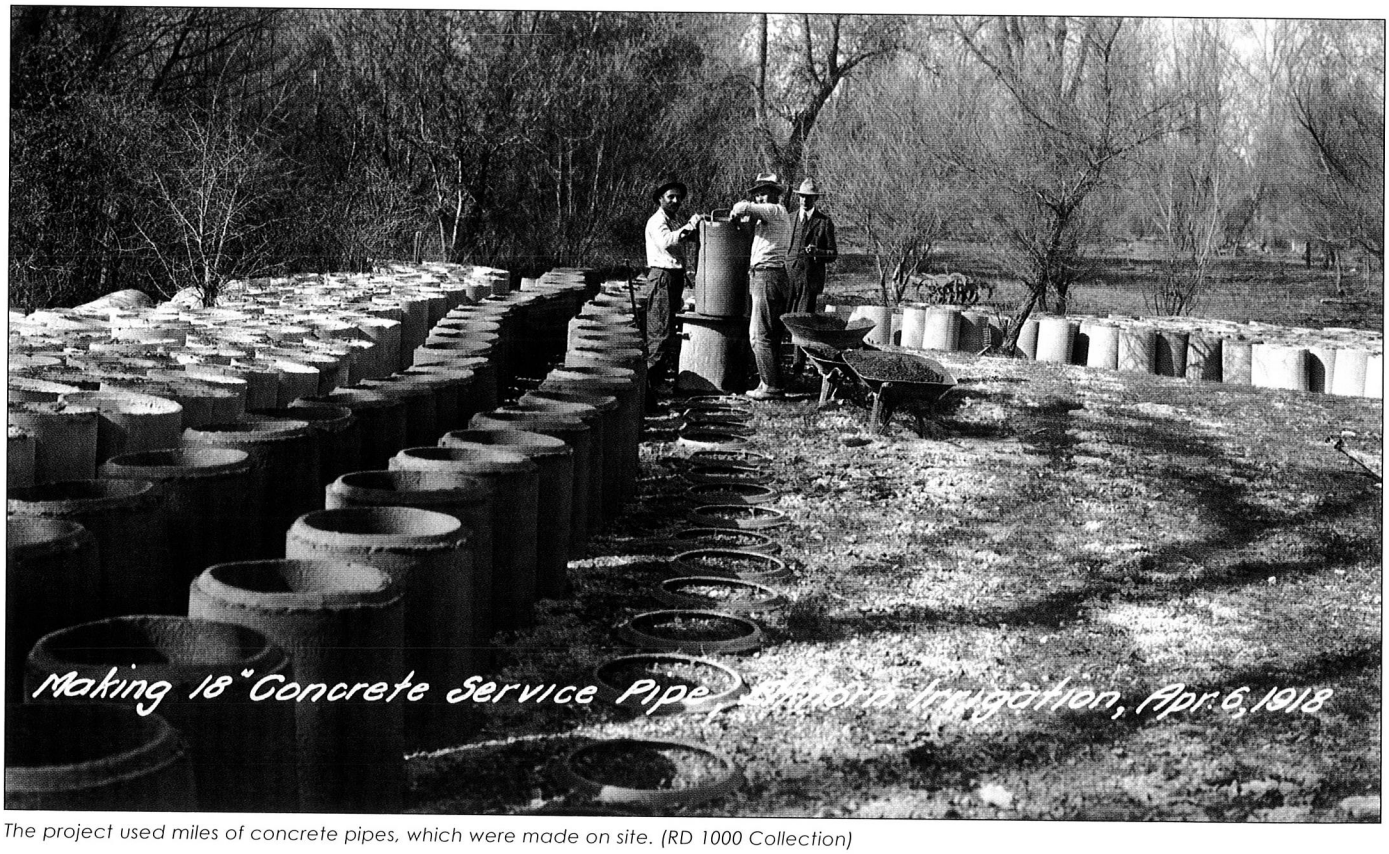
Left: May 8, 1915: Looking south from the Cross Canal, a work camp sits near a lateral U installed to carry irrigation water. (RD 1000 Collection)

Top: April 1918: A mixing crew feeds a cement gun used to build the Elkhorn irrigation system. (RD 1000 Collection)

Middle: April 1918: This tractor hauled half a railroad carload of rock eight miles for use in the Elkhorn irrigation system. (RD 1000 Collection)

Bottom: April 6, 1918: A horse and buggy passes cars on the dirt road beside the finished Elkhorn Pumping Plant, still in use today by the Natomas Central Mutual Water Company. (RD 1000 Collection)

To clear space and provide access, first to build the system and then to attract farmers, Natomas Consolidated crews worked constantly pulling stumps and building roads. (Left: Center for Sacramento History, Natomas Company Collection, 1981-037-2423; Right: RD 1000 Collection)



The project used miles of concrete pipes, which were made on site. (RD 1000 Collection)

Chapter 4

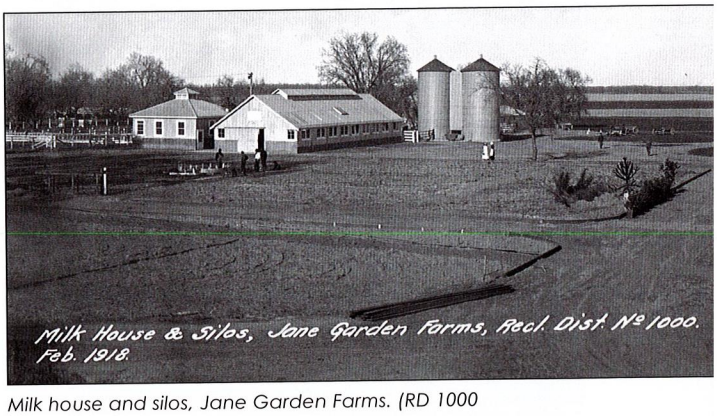
Life in RD 1000

"DISTRICT 1000 ONCE OVERFLOWED, NOW PRODUCTIVE: Completion of Levee System In 1914 Made River Section Tillable: CROPS RAISED ARE VERY DIVERSIFIED: Alfalfa, Beans, Spinach, Grain And Fruits Pay Well On This Land"
Sacramento Bee, *July 28, 1925*[1]

Once the levee perimeter was closed and the responsibility for maintaining the new system was turned over to RD 1000, Natomas Consolidated of California was anxious to put reclaimed land into production immediately. It subdivided its 43,532 acres into forty-acre tracts with irrigation, drainage, and roads for each.[2] The company sometimes leased its lands for nothing in exchange for a promise to place the land under cultivation, or for a share of crops raised. An immediate show of the reclamation project's success was vital.[3]

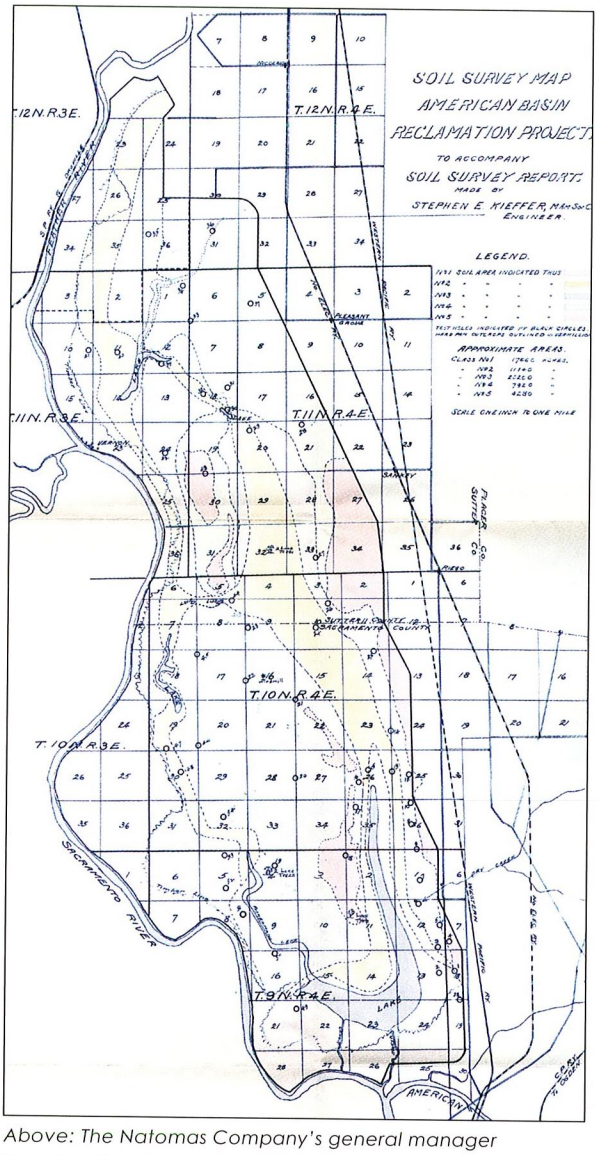
Goodland Company of Chicago bought fifteen thousand acres of Natomas Consolidated land in 1919 and 1920, and marketed it to farmers from the East and Midwest. It launched a massive publicity campaign featuring prosperous farmers to get the word out about RD 1000's fertile soils and proximity to lucrative markets.

These photos from various parts of the district were taken in 1918.[4]

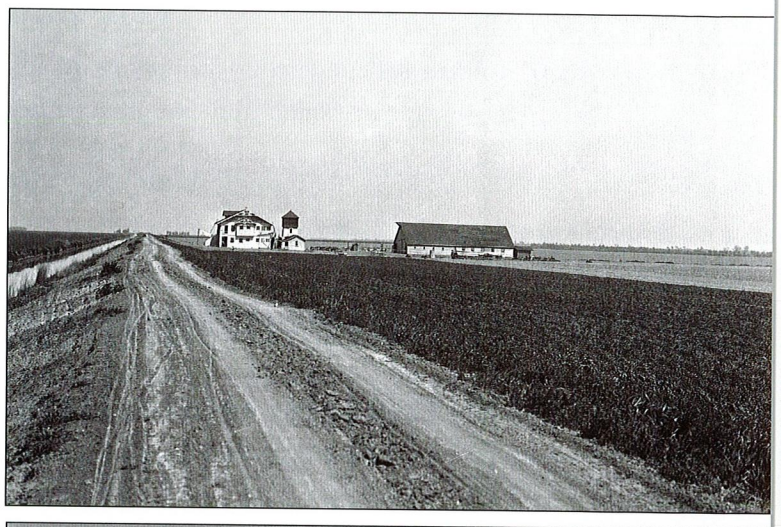


Milk house and silos, Jane Garden Farms. (RD 1000 Collection)

Top photo: Billed as "The largest harvesting scene in the U.S.," c. 1924, this photo was probably staged as part of a publicity campaign to sell land in RD 1000. Seven 90-horsepower tractors are pulling seven combine harvesters cutting a swath from thirty to thirty-eight feet each, harvesting up to seven hundred acres per day. (RD 1000 Collection)



Above: *The Natomas Company's general manager included this map showing crops and soils in Reclamation Districts 1000 and 1001 in his 1917 report. (Center for Sacramento History, Natomas Company Collection, 1981-037-4825)*



Top right: Manuel Machado became known as the "Bean King" when, as longtime farmer Manuel Costa recalled, "Machado one time made $100,000 and that was a big killing during the First World War."[5] His home was on the East Canal. (RD 1000 Collection)

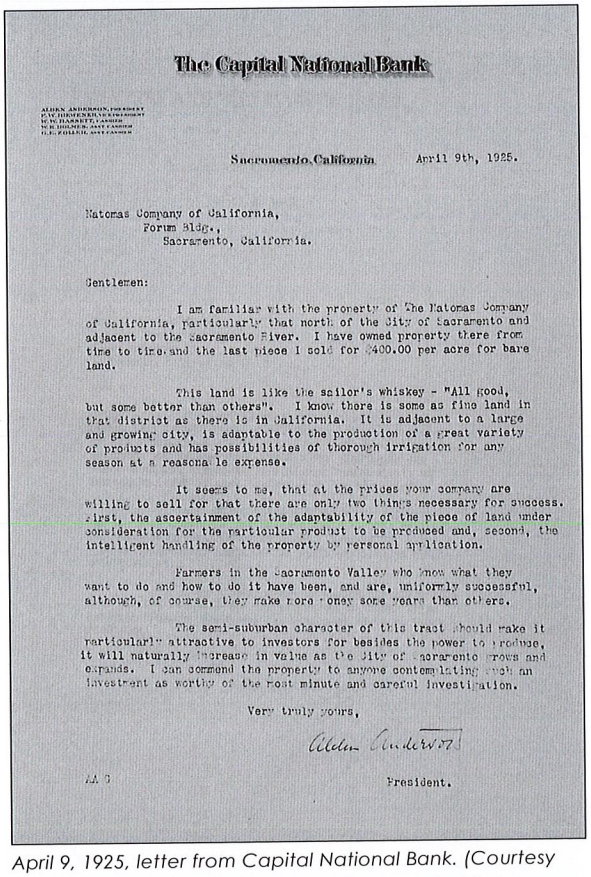
Middle right: The home of Joe Azevedo Jr. (Courtesy of the California History Room, California State Library, Sacramento, California)

Bottom right: The home of E. H. Nicholson. (Courtesy of the California History Room, California State Library, Sacramento, California)

Letters praising growing conditions in the district were solicited from farmers, bankers, and leading businessmen and bound together with the photos into an album entitled "Letters That Tell Their Own Story." A representative sampling tells a story of bountiful soil and prosperous farmers.

Capital National Bank President Alden Anderson: "This land is like the sailor's whiskey—all good, but some better than others." Joe Azevedo Jr.: "The peas that I raised yielded from 10 to 30 sacks per acre . . . White, Pink and Bayo beans . . . yielded from 20 to 30 sacks per acre . . . alfalfa has produced from 8 to 10 tons per acre . . . I am well satisfied with my land, as I believe it to be as good as there is in the Sacramento Valley." County Treasurer Frank P. Christophel: "I own 35 acres, which I consider to be as fine a piece of land as there is in the State. . . . 18 acres is planted to Bartlett pears . . . 5 acres is planted to peaches . . . 2 acres is planted to cherries . . . 8 acres is planted to alfalfa . . . The pear trees, which were three years old last Spring, produced eleven tons and the price for same averaged $80.00 per ton. Alfalfa sold from the eight acres amounted to $1130.00 besides feed for three horses and one cow all year. . . . I am very proud of my place and am sure that others could do equally as well by giving their orchard the same good care that I have."[6]

A temporary pumping plant on the Cross Canal served an experimental rice crop in 1914–15. Natomas Consolidated was skeptical



The Capital National Bank

Sacramento, California April 9th, 1925.

Natomas Company of California,
Forum Bldg.,
Sacramento, California.

Gentlemen:

I am familiar with the property of The Natomas Company of California, particularly that north of the City of Sacramento and adjacent to the Sacramento River. I have owned property there from time to time and the last piece I sold for $400.00 per acre for bare land.

This land is like the sailor's whiskey - "All good, but some better than others". I know there is some as fine land in that district as there is in California. It is adjacent to a large and growing city, is adaptable to the production of a great variety of products and has possibilities of thorough irrigation for any season at a reasonable expense.

It seems to me, that at the prices your company are willing to sell for that there are only two things necessary for success. First, the ascertainment of the adaptability of the piece of land under consideration for the particular product to be produced and, second, the intelligent handling of the property by personal application.

Farmers in the Sacramento Valley who know what they want to do and how to do it have been, and are, uniformly successful, although, of course, they make more money some years than others.

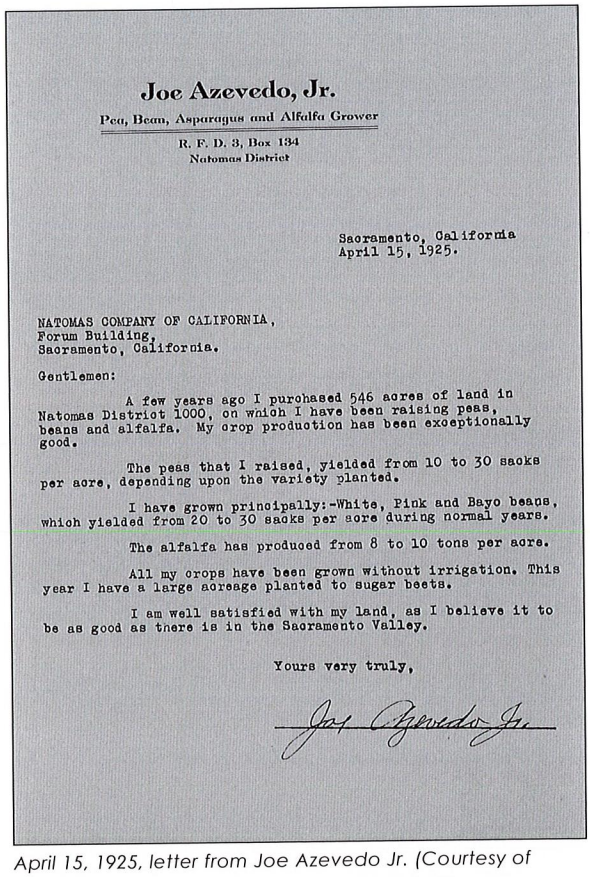
The semi-suburban character of this tract should make it particularly attractive to investors for besides the power to produce, it will naturally increase in value as the City of Sacramento grows and expands. I can commend the property to anyone contemplating such an investment as worthy of the most minute and careful investigation.

Very truly yours,

Alden Anderson

President.

April 9, 1925, letter from Capital National Bank. (Courtesy of the California History Room, California State Library, Sacramento, California)



Joe Azevedo, Jr.

Pea, Bean, Asparagus and Alfalfa Grower

R. F. D. 3, Box 134
Natomas District

Sacramento, California
April 15, 1925.

NATOMAS COMPANY OF CALIFORNIA,
Forum Building,
Sacramento, California.

Gentlemen:

A few years ago I purchased 546 acres of land in Natomas District 1000, on which I have been raising peas, beans and alfalfa. My crop production has been exceptionally good.

The peas that I raised, yielded from 10 to 30 sacks per acre, depending upon the variety planted.

I have grown principally:-White, Pink and Bayo beans, which yielded from 20 to 30 sacks per acre during normal years.

The alfalfa has produced from 8 to 10 tons per acre.

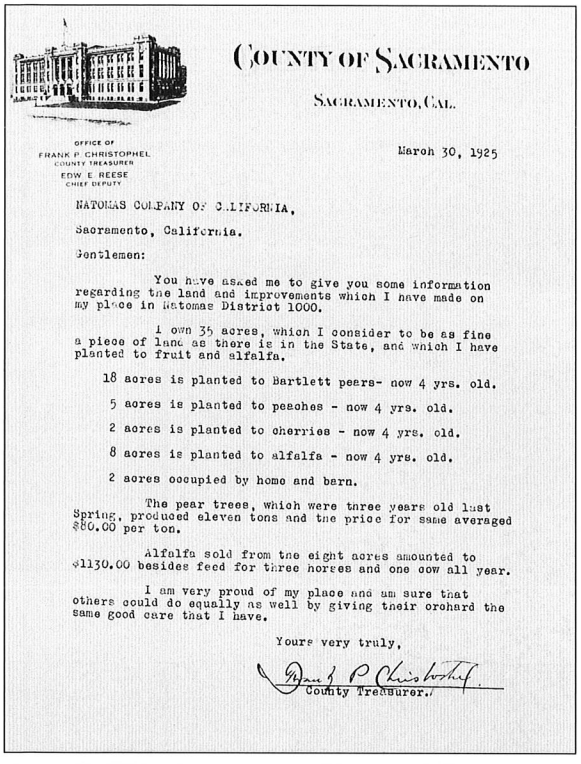
All my crops have been grown without irrigation. This year I have a large acreage planted to sugar beets.

I am well satisfied with my land, as I believe it to be as good as there is in the Sacramento Valley.

Yours very truly,

Joe Azevedo Jr.

April 15, 1925, letter from Joe Azevedo Jr. (Courtesy of the California History Room, California State Library, Sacramento, California)



COUNTY OF SACRAMENTO

SACRAMENTO, CAL.

OFFICE OF
FRANK P. CHRISTOPHEL
COUNTY TREASURER
EDW. E. REESE
CHIEF DEPUTY

March 30, 1925

NATOMAS COMPANY OF CALIFORNIA,

Sacramento, California.

Gentlemen:

You have asked me to give you some information regarding the land and improvements which I have made on my place in Natomas District 1000.

I own 35 acres, which I consider to be as fine a piece of land as there is in the State, and which I have planted to fruit and alfalfa.

18 acres is planted to Bartlett pears- now 4 yrs. old.

5 acres is planted to peaches - now 4 yrs. old.

2 acres is planted to cherries - now 4 yrs. old.

8 acres is planted to alfalfa - now 4 yrs. old.

2 acres occupied by home and barn.

The pear trees, which were three years old last Spring, produced eleven tons and the price for same averaged $80.00 per ton.

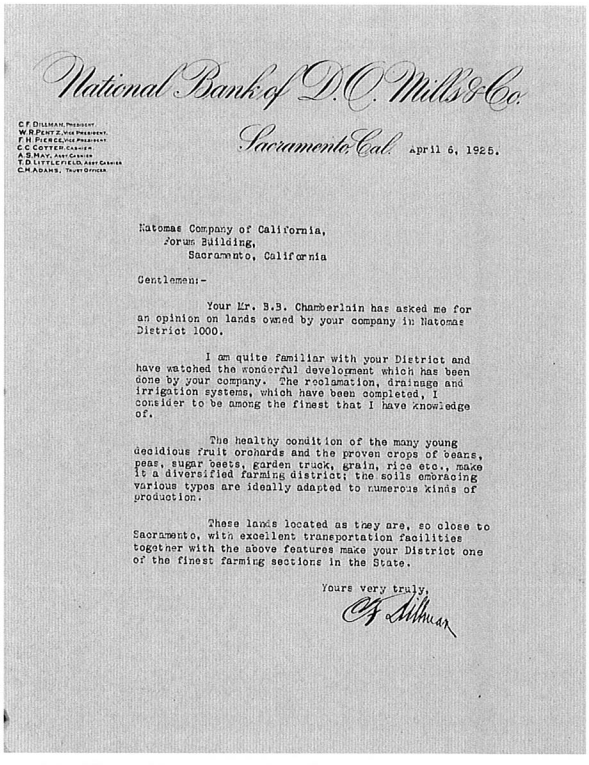
Alfalfa sold from the eight acres amounted to $1130.00 besides feed for three horses and one cow all year.

I am very proud of my place and am sure that others could do equally as well by giving their orchard the same good care that I have.

Yours very truly,

Frank P. Christophel
County Treasurer.

March 30, 1925, letter from Frank Christophel. (Courtesy of the California History Room, California State Library, Sacramento, California)



National Bank of D. O. Mills & Co.

C.F. DILLMAN, PRESIDENT
W.R. PENTZ, VICE PRESIDENT
F.H. PIERCE, VICE PRESIDENT
C.C. COTTER, CASHIER
A.S. MAY, ASST. CASHIER
T.D. LITTLEFIELD, ASST. CASHIER
C.M. ADAMS, TRUST OFFICER

Sacramento Cal. April 6, 1925.

Natomas Company of California,
Forum Building,
Sacramento, California

Gentlemen:-

Your Mr. B.B. Chamberlain has asked me for an opinion on lands owned by your company in Natomas District 1000.

I am quite familiar with your District and have watched the wonderful development which has been done by your company. The reclamation, drainage and irrigation systems, which have been completed, I consider to be among the finest that I have knowledge of.

The healthy condition of the many young deciduous fruit orchards and the proven crops of beans, peas, sugar beets, garden truck, grain, rice etc., make it a diversified farming district; the soils embracing various types are ideally adapted to numerous kinds of production.

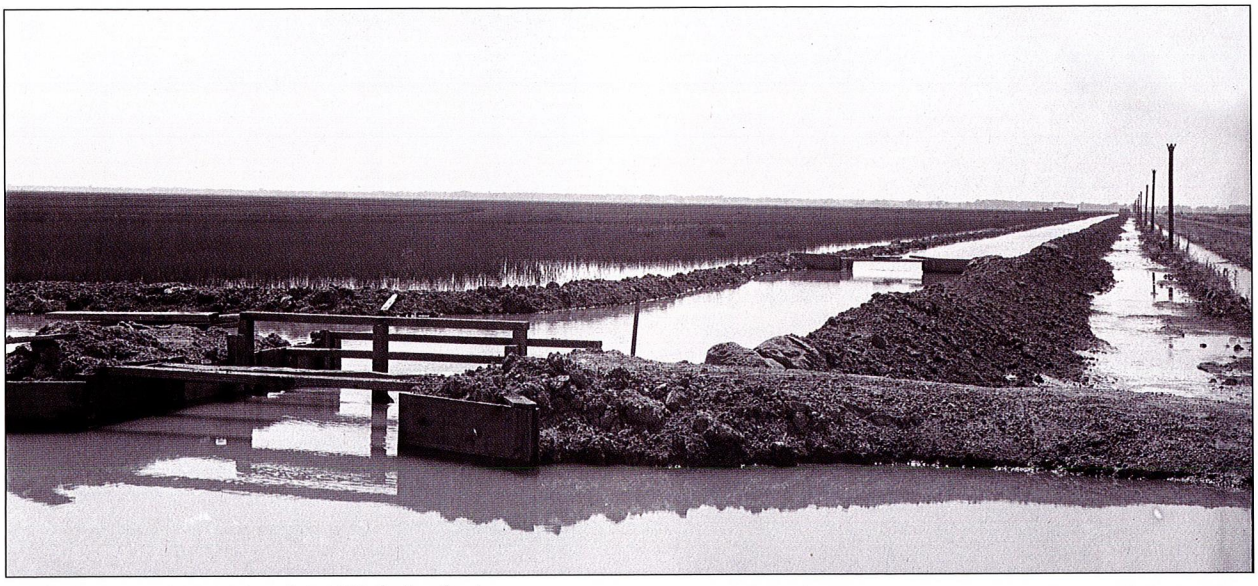
These lands located as they are, so close to Sacramento, with excellent transportation facilities together with the above features make your District one of the finest farming sections in the State.

Yours very truly,

C F Dillman

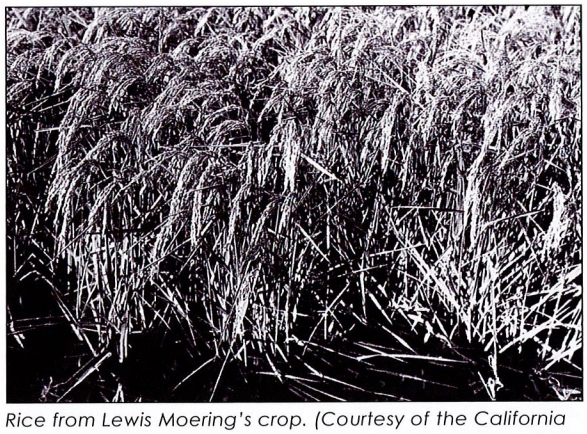
April 6, 1925, letter from D. O. Mills Bank. (Courtesy of the California History Room, California State Library, Sacramento, California)

A temporary pumping plant for an experimental rice crop, 1914. (RD 1000 Collection)



Irrigational canal 1914–1915. (RD 1000 Collection)

at first about the potential for rice growing in the district, perhaps because water from wells drilled for irrigation proved too cold for young rice shoots. The first rice in RD 1000 was produced in 1914 on land leased from the company, which furnished the funds to harvest the crop.[7] Growers such as Lewis Moering, whose rice is shown here, quickly convinced others in RD 1000 that the crop was suited for the clay soil in the northern part of the district, where it is still grown.



Rice from Lewis Moering's crop. (Courtesy of the California History Room, California State Library, Sacramento, California)

GARDEN HIGHWAY

"Garden Highway Opens To Year-Round Traffic; Fine Farm Section Road: Property Values In Sacramento And Sutter Section Now Greatly Increased; Farmers Can Get Products To Market Without Loss Of Time, by Donald Ashton, Editor, Auto and Outing."

Front page, Auto and Outing section, *Sacramento Bee*, July 28, 1925

"Now that the Garden Highway is completed, the folks who live in the rich lands that face this great roadway can take advantage of quick access to Sacramento and Place Their Dental Needs in Care of Dr. H.T. Wells, 501½ K Street"

Advertisement in the *Sacramento Bee*, July 18, 1925[10]

The Natomas News featured the Lincoln White ranch in RD 1000 more than once. Its May–June 1911 issue noted: "Thirty-five hundred turkeys there are, wandering over the fields like live stock, and in a special enclosure are some huge Bronze gobblers, any one of which is large enough for the White House. The turkeys are herded with dogs, and it seems strange indeed to see them half way running and half way flying over the field."[8] When the American Basin School burned down, classes were held at the White Ranch for one school year while construction was underway for a new school.[9] (Center for Sacramento History, Natomas Company Collection, 1981-037-2804)

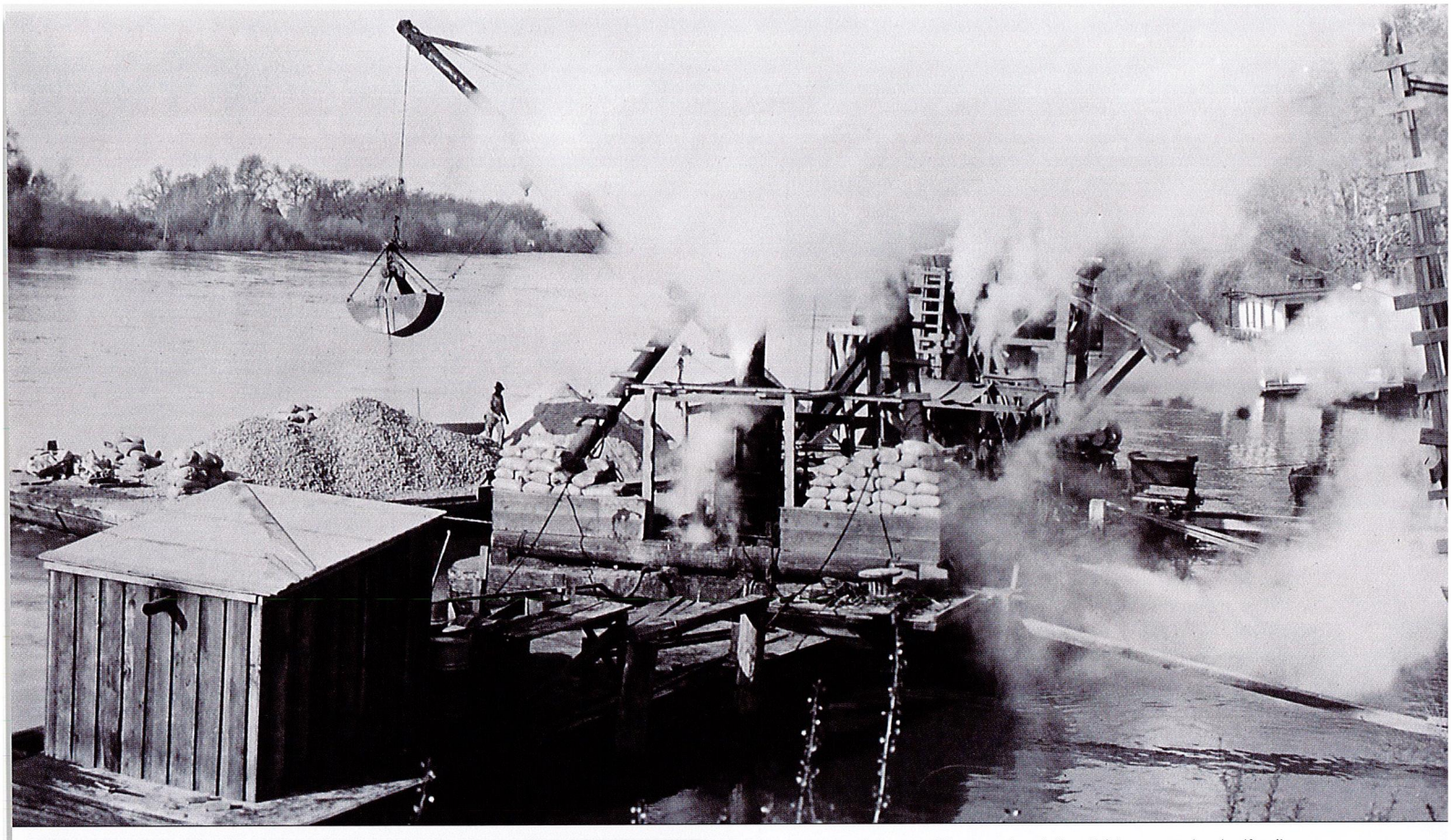
In 1918, the Natomas Company built the first thirteen and a half miles of what Judge Peter Shields later christened the "Garden Highway." To connect the road with Sacramento on the south and Yuba City on the north, Joint Highway District 3 was formed with James K. O'Brien of Smartsville, Supervisor John Russi of Sacramento County, and Supervisor John Helken of Sutter County as commissioners. Sacramento and Sutter Counties worked with RD 1000 to ensure the structural integrity of the levee on which the road was built.

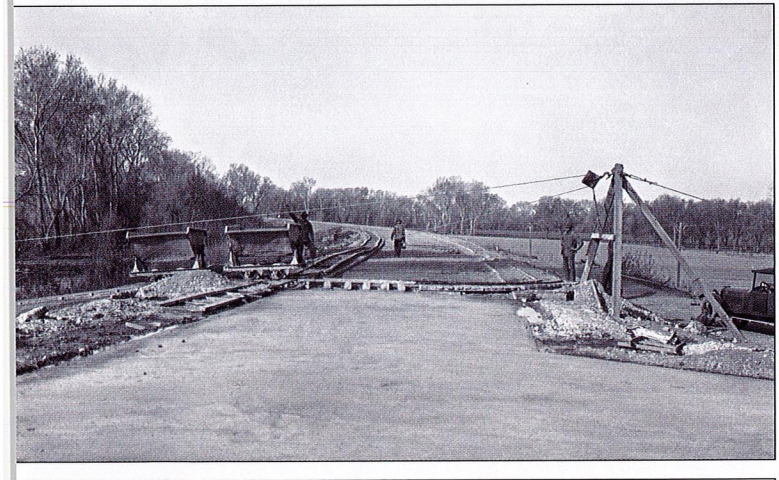
The total estimated cost of the paving was $604,200. Sutter County put up $176,227 and Sacramento County a similar amount, even though most of the new road was in Sutter County. The State of California, under the joint highway district act, contributed $100,701. The remainder was raised by assessment against the property in the district through which the road passed. The project was hailed as an example of regional cooperation. Its grand opening on

In the south part of the district and along the river, much of the land was subdivided early. This map of Reclamation Districts Nos. 1000 and 1400 shows ownership of lands and location of subdivisions in 1921. RD1400 is located in the lower right corner. (RD 1000 Collection)

October 18, 1924, was a cause for celebration. Caravans left from Yuba City and Sacramento and met at Nicolaus for picnics and entertainment that lasted well into the night.[11] In 1925, the Natomas Company sold its section of the Garden Highway to Sacramento County.[12]

Burton Lauppe's family has owned land in RD 1000 for more than a century. His great-



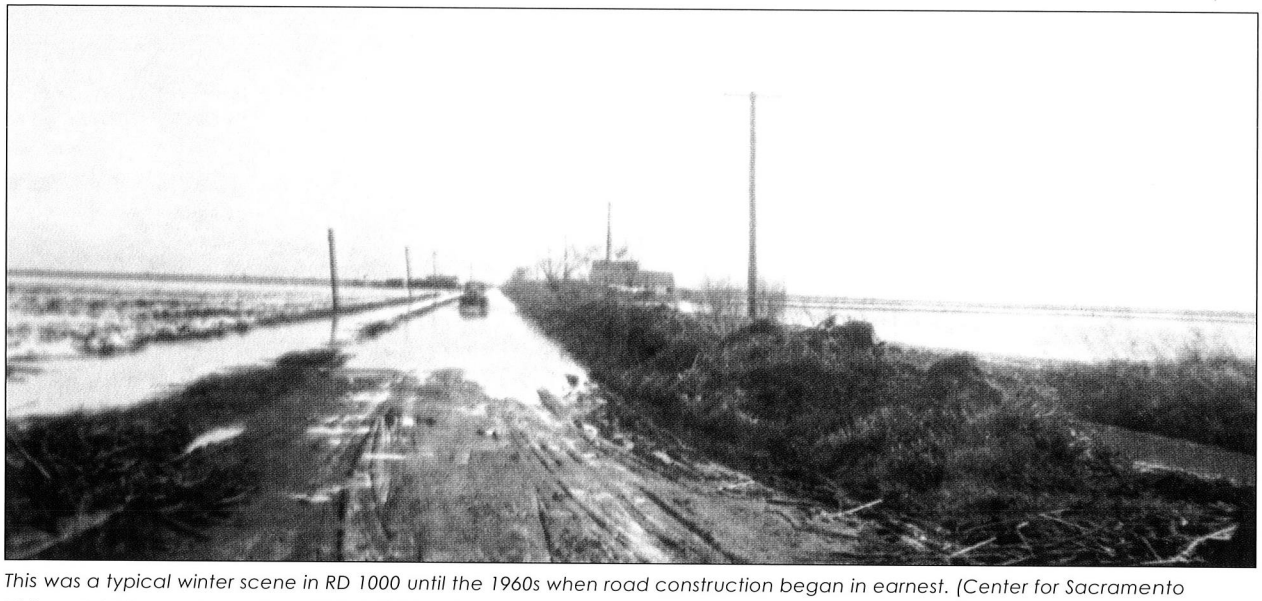


Above: All materials used to construct the thirteen-and-a-half-mile stretch of the Garden Highway built by the Natomas Company were brought in by barge. Concrete was mixed on a barge, shown here. (Courtesy of the California History Room, California State Library, Sacramento, California)

Left: Concrete was hauled by wheeled cartloads over the levee. (RD 1000 Collection)

Bottom left: The sixteen-foot-wide highway connected to Sacramento via the Garden Highway Bridge, now a bicycle/pedestrian bridge through Discovery Park. This 1930 photo shows a crane at work on a steel bridge span with concrete piers. (Center for Sacramento History, Sacramento County Clerk/Recorder's Collection, 1976-035-0299)

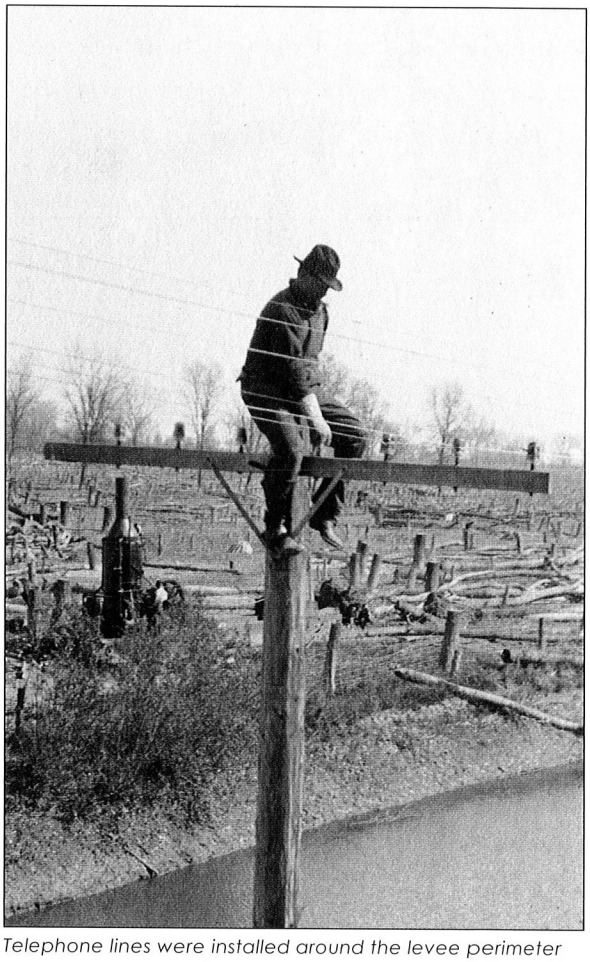
grandfather ran a 16 Mile House on what is now I-80, where prospectors boarded horses as they transported equipment over the Sierra Nevada. Lauppe's grandfather farmed in the Antelope area. He recalls the arduous task of getting around in RD 1000's early days: "My grandfather's brother came down to Natomas and bought a piece of ground on Bayou Way and Power Line Road, on the north end of it. For several years my dad came down and helped him farm it. Eventually he bought 80 acres there on Bayou Way. They built the levee



This was a typical winter scene in RD 1000 until the 1960s when road construction began in earnest. (Center for Sacramento History, Ed Witter Jr. Collection, 1999-074-0008b)

in 1915. There was only one road and that was Power Line Road. It was the only one that was paved. Once you got off that you were stuck in the mud, in the wintertime. It was just . . . you couldn't go."[13]

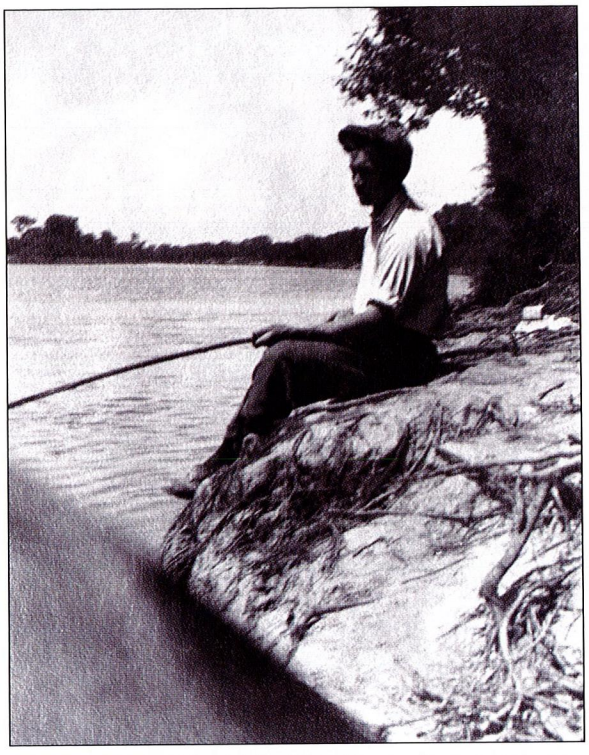
The original cost estimates for building RD 1000's levee system included $6,760 for telephone lines around the entire levee periphery for emergency communication. Farmers soon tied into the line. Burton Lauppe recalls: "The Natomas Company had three lines all the way around the levee. The farmers all went together and had a cooperative phone line. It was old hop poles was what it was. Redwood square poles stuck all up and down the road. They put in the telephone line and in those days why there was two wires and the most you would ever get was four people on one side and four people on the other. So you'd have eight people on the line. Dad ended up as president of the phone line so he had to take care of the thing. I was old enough to climb poles by then so you know who took care of the telephone lines whenever they went out. Twenty-four subscribers with three lines were all that we had. There were not



Telephone lines were installed around the levee perimeter for emergency communication. Farmers soon tied into the lines. (Center for Sacramento History, Natomas Company Collection, 1981-037-2432)

too many people out here then. We went down and tied the end to Ma Bell's line down there where the old Jibboom Street Bridge was, way down there in Gardenland."[14] RD 1000 trustees offered to sell the internal phone system to Pacific Bell in 1940 for $10,000.[15]

The Sacramento River stood in for the Nile, the Amazon, and the Congo Rivers in Hollywood films of the 1920s. It was the Mississippi River in films including *The Adventures of Tom Sawyer*, Will Rogers' last film, *Steamboat 'Round the Bend*, and Buster Keaton's silent film, *Steamboat Bill, Jr.*[16] Burton Lauppe recalls: "I can remember the old paddle wheelers that they had on the river that were in the movies. The films were black and white in those days. Red showed up blacker than black did on your film so [when] they needed some cows for the Will Rogers movie, they went to Inderkum's [dairy] and wanted a red

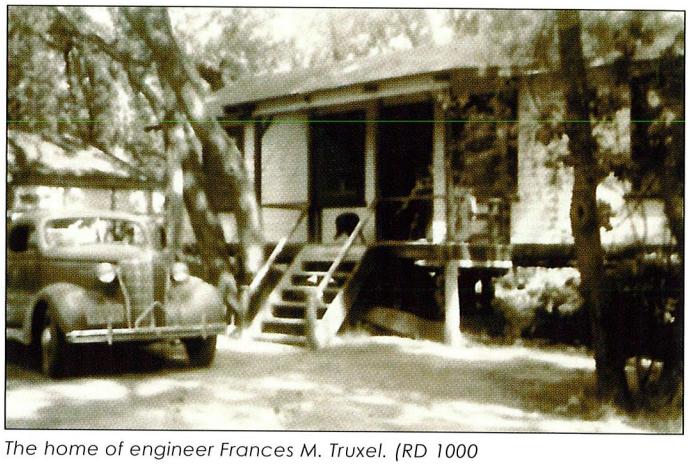


Fishing on the Fourth of July, 1912. (Center for Sacramento History, 1997-033-0027)

The easiest way to move large loads was to pile them on a barge pulled by a tugboat, a common sight in the district. (Center for Sacramento History, Ed Witter Jr. Collection, 1999-074-0001)

Holstein. Well, Holsteins only come in black and white. They did end up finally getting a Holstein and painting the thing with red paint where the black was, for the movie."[17]

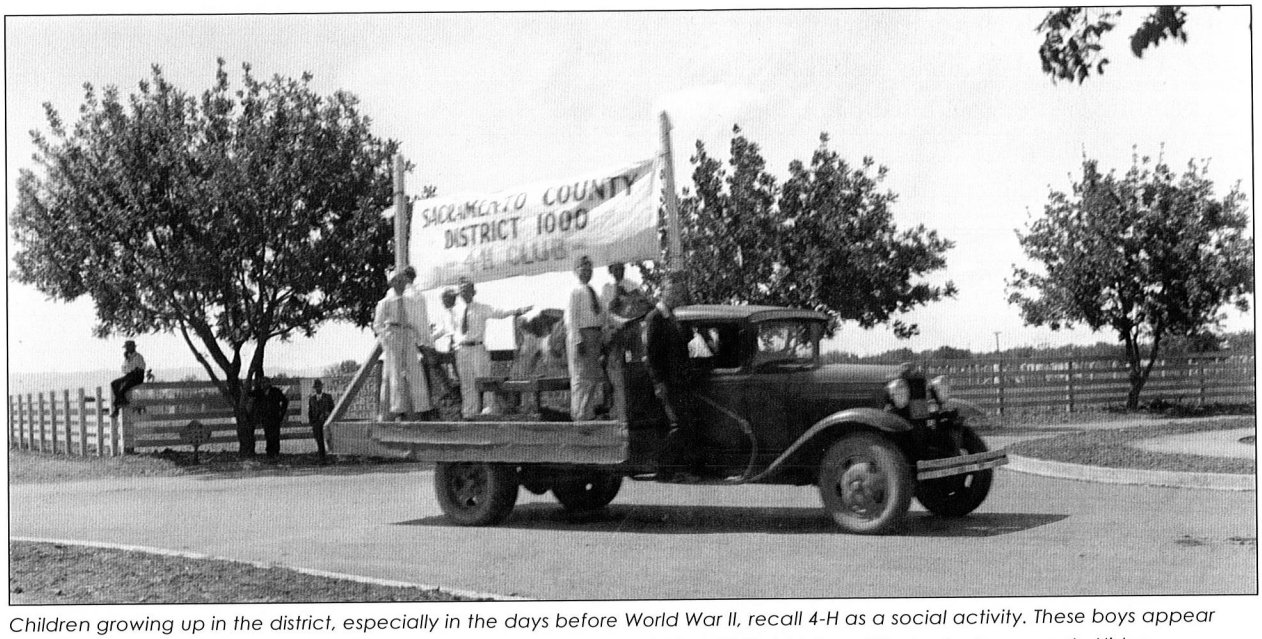
Virginia Bennett Harder recalls: "Natomas was by today's standards very sparsely settled. There were three homes on the riverbank just downriver from us. The Parkinsons lived near the Power Line Road. Their home was built on a mound that was connected to the levee so there was no need for stilts or an elevated walkway. . . . Mr. Truxel [Francis M. Truxel, a Natomas Consolidated engineer who performed survey work on the levees] lived further downstream. His home required a walkway to get to it. Nobody lived on the riverbank. I guess people couldn't afford to build there. You had to either build on a mound of dirt or build on pilings because the river overflowed the banks all the time . . . so nobody did. My father called it free land. He put the cows to graze over there and horses."[18]



The home of engineer Frances M. Truxel. (RD 1000 Collection)

Prior to the 1950s, the State Reclamation Board, Corps of Engineers, and RD 1000 prohibited construction of any structures outside of the

Bird hunting was a popular sport in RD 1000 for many years. David Christophel, a third-generation Natomas resident, recalls hunting pheasants as a teenager with the RD 1000 Recreation Association, a group of farmers who supervised hunting on their properties. These unidentified hunters posed with doves after a day's hunting in the district in 1917.[20] (Center for Sacramento History, Ernest Meyers Collection, 1989-041-5504)



Children growing up in the district, especially in the days before World War II, recall 4-H as a social activity. These boys appear to be in a parade, showing a banner for the Sacramento County District #1000 4-H Club. (Center for Sacramento History, Sacramento Agricultural Extension Collection, 1980-002-2035)

levees, so land between the levee and the river was considered of little value.[19] This changed dramatically when waterside homes along the Sacramento River began to be permitted by the State Reclamation Board and RD 1000.

Tom Barandas, whose family farmed in RD 1000 for three generations, recalls his father Manuel's account of the impact of Shasta Dam on RD 1000 crops. The dam was operational in 1945. "The land didn't get as much deep percolation, because there was a sustained high level of flow in the river. The water stayed close to the surface, and it did have a detrimental effect on what could be grown. After Shasta, because of the water levels, the fruit trees couldn't survive because they're sensitive. Walnuts survive. They're a hardier kind of tree. So a lot of land my dad converted to a row crop, shallow rooted and just in the summer months."[24]

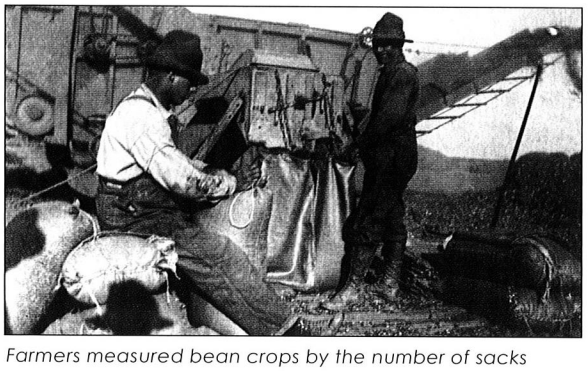
American Basin School was a gathering place for the whole community. Virginia Bennett Harder recalls: "The American Basin School was the only reasonably large structure

Automobile rallies in the early 1900s often featured a route that included views of the Sacramento River. This rally in 1911, sponsored by the Real Estate Agents Association, featured a stop beside the dredge Natoma No. 9. *The Natomas Consolidated Company of California began work the following year in RD 1000 but began promoting the project early. (Center for Sacramento History, City of Sacramento Collection, 1977-054-0068)*

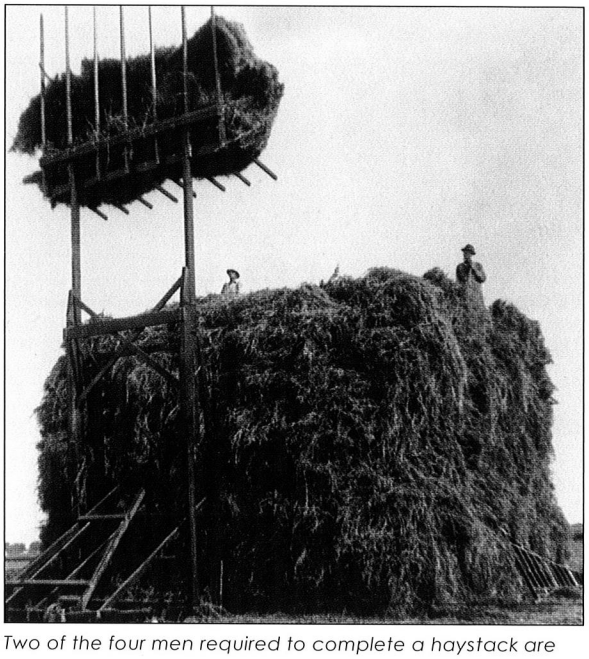
in our area of (north) Natomas. . . . that was also where the elections were held. Everybody came to American Basin for the Farm Bureau meetings. There were less than a handful of families of people who lived out in that area

February 1918: American Basin School was a gathering place for the whole community. (RD 1000 Collection)

in those years who did not farm. So we used to have card parties . . . virtually every winter, January and February when nothing was going on on the farm. They were whist parties. . . . you paid $.25 to play. It was a money-raising event. The 4H sponsored some."[21]



Farmers measured bean crops by the number of sacks per acre. One worker sews and another fills the sacks in the field. (Center for Sacramento History, Ed Witter Jr. Collection, 1999-074-0026)

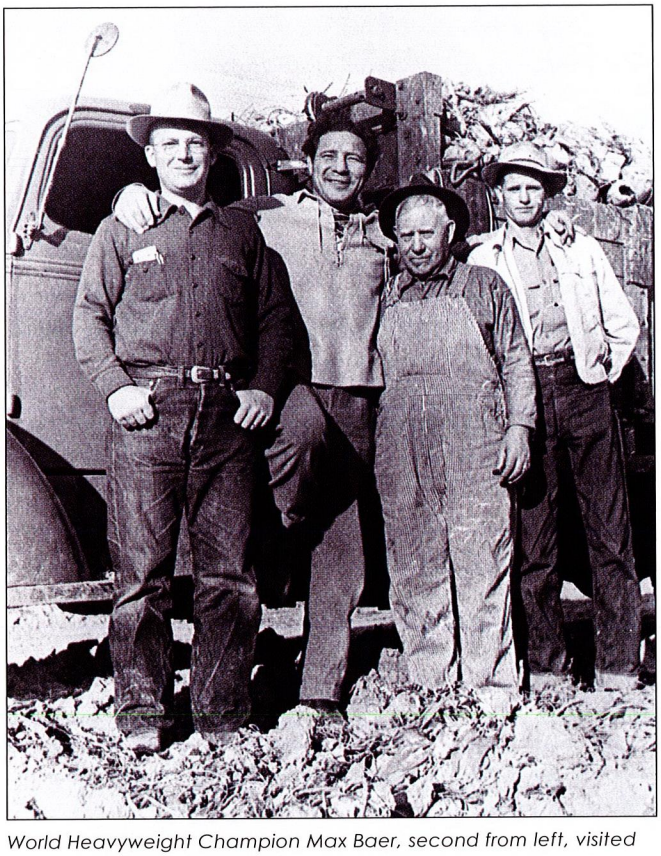


Two of the four men required to complete a haystack are visible here. Manuel Costa recalls baling and stacking hay. "We cut the hay with horses. We raked the hay with horses, and buck raked the hay on the old style John Deere buck rakes. We had tipster haystacks . . . Later on they had gasoline power with the belts."[22] (Center for Sacramento History, Ed Witter Jr. Collection, 1999-074-0036)

In this rare photo of a tomato planter, men are taking plant slips from a box in front of them and placing them in a row of earth below and between them. By kicking a lever, they can open and close a reservoir to get water to the new plant. The tractor is a McCormick-Deering with wheel skirts for orchard use.[23] (Center for Sacramento History, Ed Witter Jr. Collection, 1999-074-0045)

Top: Farmers in RD 1000 made good use of old railroad cars, which were readily available. This Pullman car was parked at the Silva Dairy and used by the Dapelmeyer family in the 1940s. The car was donated to the California State Railroad Museum for restoration in April 2002. As a boy, Joaquin Perriera lived with his widowed mother in a railroad car on Silver Eagle Road.[24] (Center for Sacramento History, Boudier Family Collection, 2007-046-FP018-046)

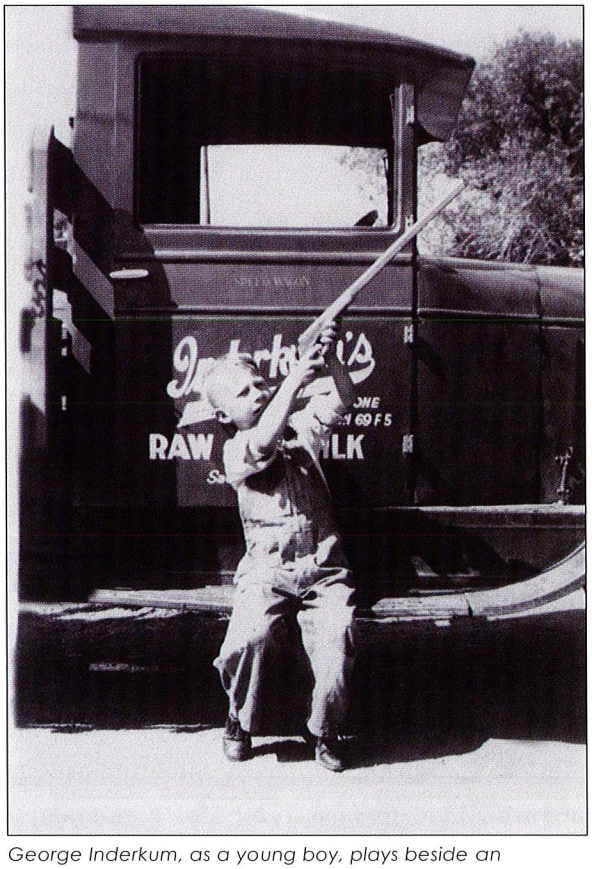
Bottom: The Boudier family owned the Diamond B Ranch in what is now North Natomas. This family picnic was captured in 1950. The land is now part of the Natomas Basin Conservancy. (Center for Sacramento History, Boudier Family Collection, 2007-046-FP043-028)



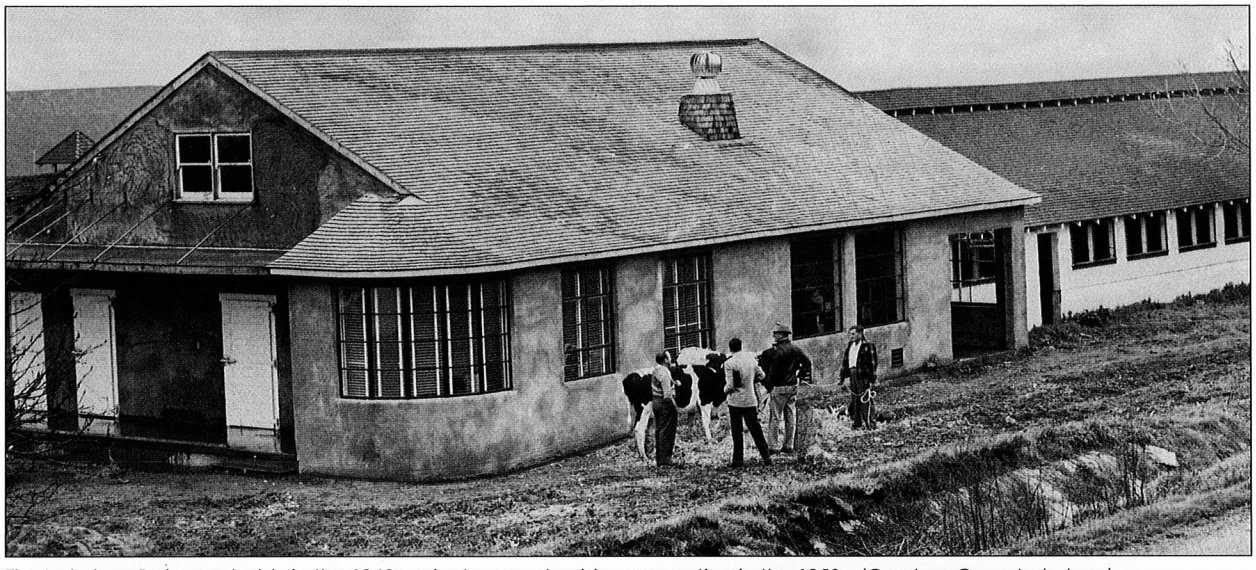
World Heavyweight Champion Max Baer, second from left, visited Joseph Bettencourt's sugar beet farm in 1920. Bettencourt is on the left. (Center for Sacramento History, Portuguese Historical Society Collection, 1984-181-0200)

Betty Jones Novak identified these friends gathered for an occasion: (left to right top) Flavia Jones, Mary Sweeney, Abert White, Ethyl Jones, Zue Owens, Lylse Spangler, Vern Chapman; (left to right bottom) Albert J. Sweeney, Fred Jones, Margaret Sperry Spangler, Max Owens, John Chapman. (Center for Sacramento History, Ed Witter Jr. Collection, 1999-074-0057)

The Inderkum Dairy was one of the largest farm operations in Natomas for several decades. John and Salome Inderkum owned a home on H Street in Sacramento at the site of Mercy Convalescent Hospital. Their son Frank delivered milk in a Glen Dairy horse and buggy. In 1918, Frank and his wife Lillian moved to RD 1000 lands on the Garden Highway and started their own dairy with one hundred cows. Their son Frank Jr., his brother George, and sister Margaret grew up working at the dairy. Frank Jr.'s son Gene Inderkum recalls that the dairy was host to school field trips at least once a week. "It was the only commercial establishment in Natomas. They had to get an M-1 zoning permit to be there because everything else was agriculture. They milked the cows, pasteurized the milk, packaged it and put it on trucks back in the day when they delivered door to door and to schools and groceries. In those days you took sugar beets and



George Inderkum, as a young boy, plays beside an Inderkum Dairy delivery truck. (Courtesy Gene Inderkum)

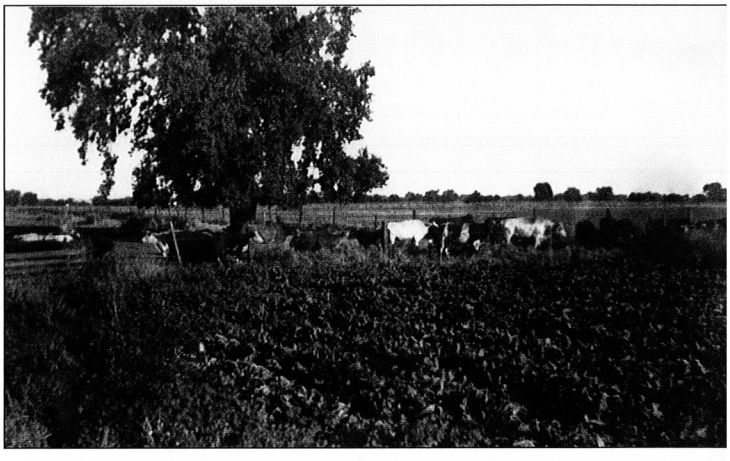


The Inderkum Dairy, probably in the 1940s, prior to a modernizing renovation in the 1950s. (Courtesy Gene Inderkum)

chopped them up and put them in a silo and that was sugar beet pulp. You did the same with corn, chopped it up with a swather, for milk production."[26]

Some RD 1000 farmers prospered when demand for agricultural products increased during World War I, but as demand began to decline, the effect on others was immediate. Farmers were struggling to get by. The average annual $56 per acre reclamation assessments added to assessments levied by the Sacramento-San Joaquin Drainage District were a burden. (The Sacramento-San Joaquin Drainage district helped provide operating expenses to the State Reclamation Board to implement the California Debris Commission's plan to construct four weirs that would allow the Sacramento River to overflow into naturally occurring basins during flood conditions.)[28]

Reclamation districts are authorized under Section 3456(b) of the Political Code of the State of California to place a valuation assessment on land to raise funds for maintenance and operation. In 1921 the Board of Supervisors appointed a commission to review proposed assessment rolls. In addition to its initial assessment of $1,947,344.40, the district issued assessments of $2 million in September 1912 and $1 million in May 1917 for a total bond debt of $6,325,882.92. This was believed to be the first large valuation assessment made under the provisions of the law.[29]



Dairy cows graze near a sugar beet field. (Center for Sacramento History, Ed Witter Jr. Collection, 1999-074-0010)

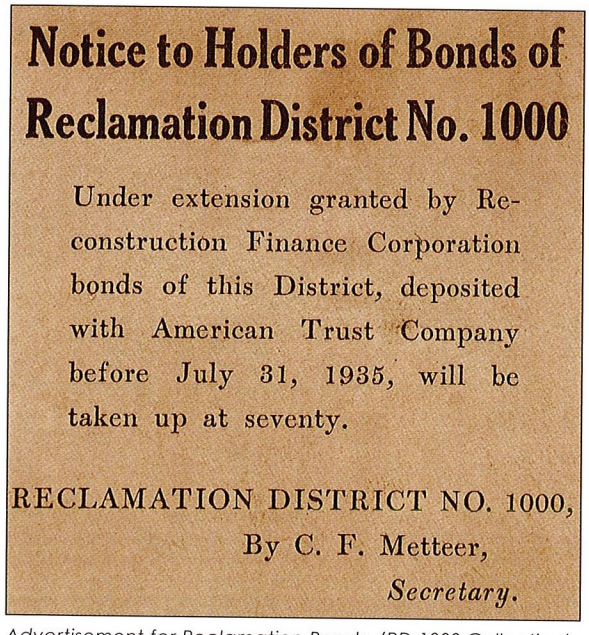
The Depression was setting in. The District 1000 assessment calls for October 1933 amounted to $253,248.90—an amount impossible for strapped landowners to pay. The calls

HARD TIMES

"Thereupon, and at the hour of 11 o'clock in the morning of said day, the Board of Trustees removed to the front of the Court House of the said County of Sacramento and proceeded to sell the tracts upon which the said installment of the assessment had not been paid.

"Then and there the Board of Trustees offered Tract No. 111 for sale to the highest bidder for gold coin of the United States. The only and highest bidder for the said tract was William E. Kleinsorge, who bid for the said tract the amount of the delinquent seventh installment of the assessment due on the said tract, together with accrued interest thereon and the penalty provided by law, to-wit, the sum of $1.06. The Board of Trustees thereupon sold the said tract to said William E. Kleinsorge for the said sum of $1.06 gold coin of the United States."

Minutes, RD 1000 Board of Trustees, November 23, 1916[27]



Notice to Holders of Bonds of Reclamation District No. 1000

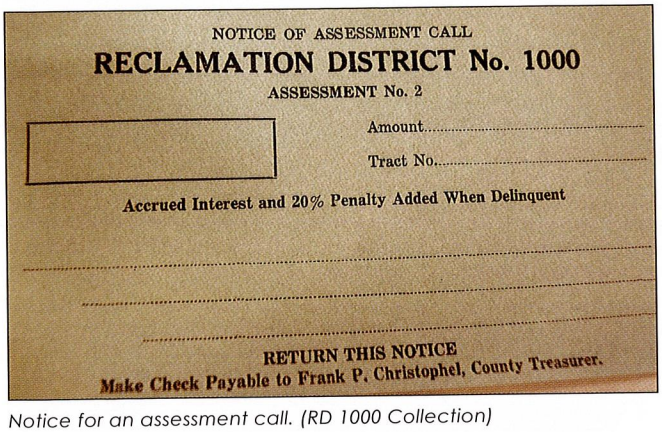
Under extension granted by Reconstruction Finance Corporation bonds of this District, deposited with American Trust Company before July 31, 1935, will be taken up at seventy.

RECLAMATION DISTRICT NO. 1000,
By C. F. Metteer,
Secretary.

Advertisement for Reclamation Bonds. (RD 1000 Collection)

1920s Assessment Rolls. (RD 1000 Collection)

were defaulted. Charles Metteer, the district's secretary and attorney, negotiated with the Reconstruction Finance Corporation (RFC) for a refunding loan, which was granted in 1934. The RFC bought the district's outstanding bonds at seventy cents on the dollar and an interest rate of 4 percent instead of the 6 percent that had applied. The bonds were to mature in thirty years instead of twenty. The bonds were



NOTICE OF ASSESSMENT CALL

RECLAMATION DISTRICT No. 1000

ASSESSMENT No. 2

Amount.....

Tract No.....

Accrued Interest and 20% Penalty Added When Delinquent

.....

.....

.....

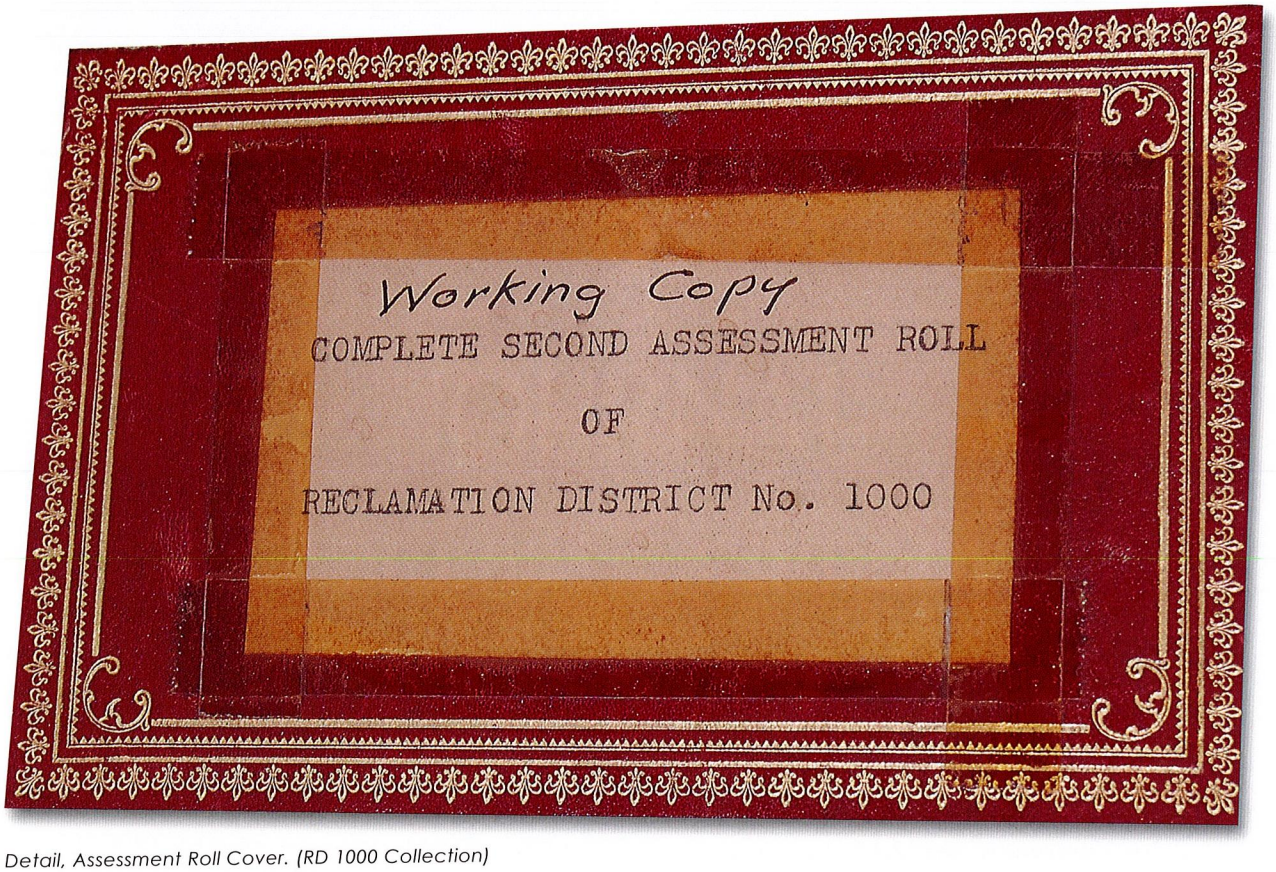
RETURN THIS NOTICE

Make Check Payable to Frank P. Christophel, County Treasurer.

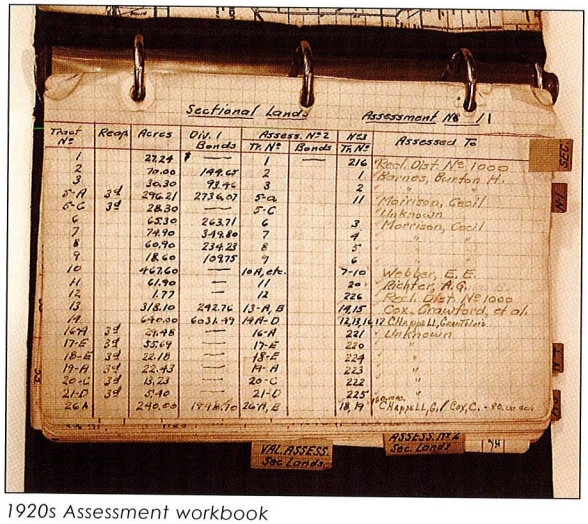
Notice for an assessment call. (RD 1000 Collection)

held by RFC until they were placed on the market and sold.[30] Over the years, the Board of Trustees issued thirty-seven calls assigning assessments to pay off the district's bond debt.

The working document for an assessment on landowners shows how calculations were made of what to assess each parcel in RD 1000. Engineer Norwood Silsbee, who kept the assessment records, explained: "Points, rather than dollars, were used for the various factors determining value of benefits derived. The total valuation, $6,325,882.92, divided by the total number of points, gave the dollar valuation of one point. This, multiplied by the number of points on the tract benefited, gave the dollar valuation of the tract. . . . Not a single landowner made any objection or suggested any change in his assessment." This roll was updated and in continual use through the time when the bonds were paid off in 1967. RD 1000 continues to file an annual Assessment Role that uses the benefit concept, now tied to flood depths and type of



Detail, Assessment Roll Cover. (RD 1000 Collection)



1920s Assessment workbook

land use rather than quality of soil and agricultural benefits.[31]

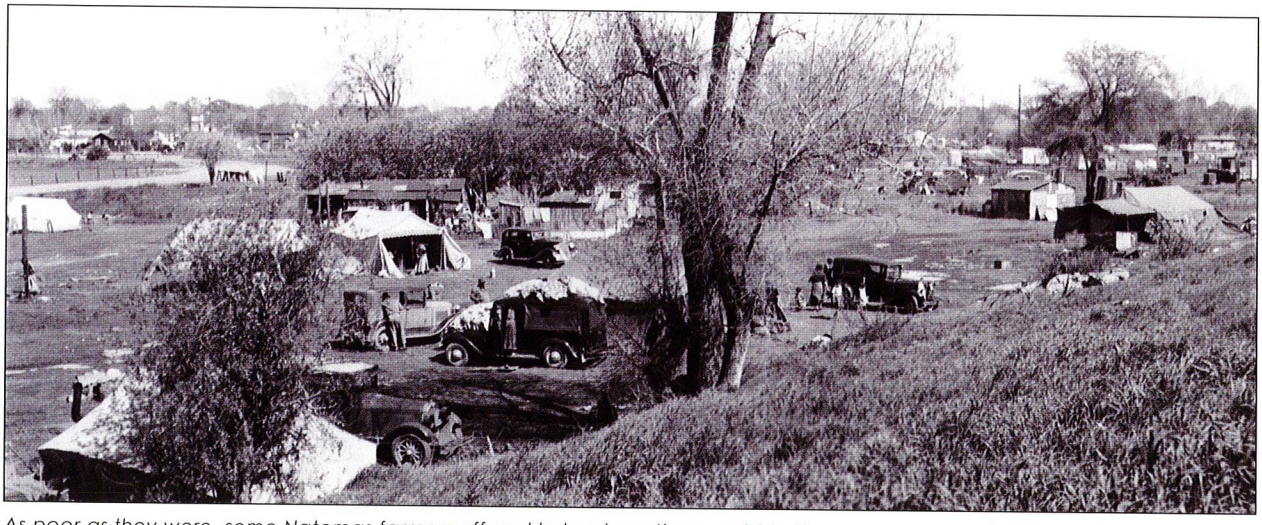
Many RD 1000 property owners in the 1920s, '30s, and '40s lost their land, or redeemed it, for amounts as low as seventy-seven cents. Manuel Costa recalls: "During that time, everybody that bought land in this Natomas was [in] the neighborhood of $400–$500 an acre, $450 mostly. By the time you paid your county taxes twice a year, and your first reclamation [assessment] twice a year, and the second reclamation twice a year, the third reclamation that was maintenance, once a year, you couldn't make any money. I used to sell beans for $1.95 a hundred and stuff like that. You just couldn't go nowhere [*sic*]."[32]

Tom Barandas, whose family farmed in RD 1000 for three generations, recalls his father Manuel's account: "He talked about how many times people would buy the same piece of property. They'd buy it then the crop wouldn't support the payment and they would have to give it up. The company would say, 'We own it, but please stay on the farm and grow, because that's something.' There was no negative to giving up the land. That was common."[33]

Joaquin Perriera recalls: "All over this Natomas area they were selling land really cheap, ninety dollars an acre after the Depression. They usually had a bond on it from the Natomas Company for the levees around here. That brought the price of the land down."[34]

Virginia Bennett Harder put it succinctly: "We were all pretty poor."[35]

It took another world war to raise crop prices, and with them land values.


As poor as they were, some Natomas farmers offered help where they could to those even worse off. This photo was taken on April 1, 1940. High waters the previous winter drove homeless families from their riverside tent encampments. This "Hooverville gypsy camp" on the Garden Highway was home to several families.(Center for Sacramento History, Pete Hepting Collection, 2006-023-0023)

Chapter 5

Maintaining the System: Levees Hold in High Water Years

"The Engineer of the district reported that the work contemplated by the original plan of reclamation of the district . . . had been wholly completed and the said district had been for several years last past wholly reclaimed, and that the moneys spent by the said district during the last year or so, had been solely for the maintenance, repair and operation of its works of reclamation, and that hereafter the said district would only require funds for the maintenance, repair and operation of its works of reclamation, the yearly cost . . . being estimated at $52,000."

District Engineer Reginald G. Clifford, report to the Board of Trustees, February 18, 1921.[1]

Engineer Reginald Clifford's prediction that only routine maintenance would be needed in the future proved correct for about sixteen years. During that time, the district cleaned canals, patrolled levees for signs of erosion, and established rules for landowners. In 1918, trustees adopted a resolution: "That no person, firm or corporation whatsoever shall make any excavation in, under or about, or shall place or maintain or repair or replace, any pipes, flumes or other things, in, through, over or under, any levee or other embankment of this district, without the express consent in writing of this Board of Trustees first obtained . . . ." In addition to requiring a permit to perform work around levees, the resolution required the district engineer to make annual inspections of all the pumping plants and levees.[2]

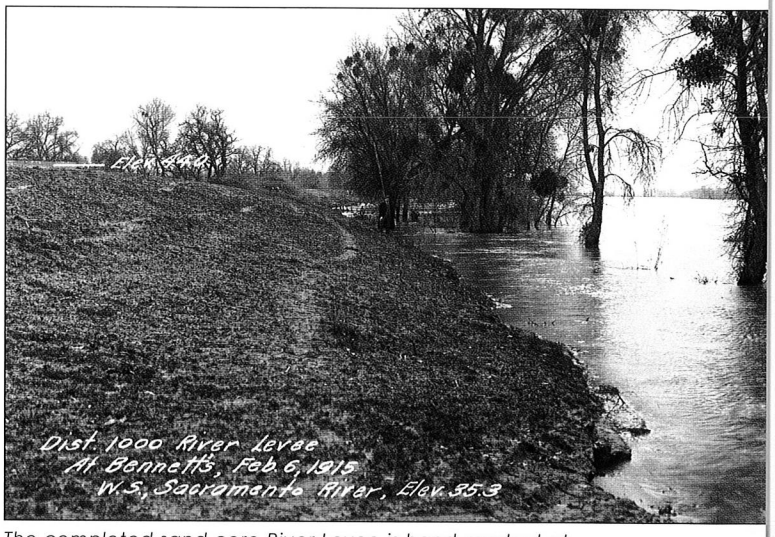
"Sacramento, California, May 2, 1922
"Mr. John T. Piggott
California Fruit Building
Sacramento, California.

"Dear John:

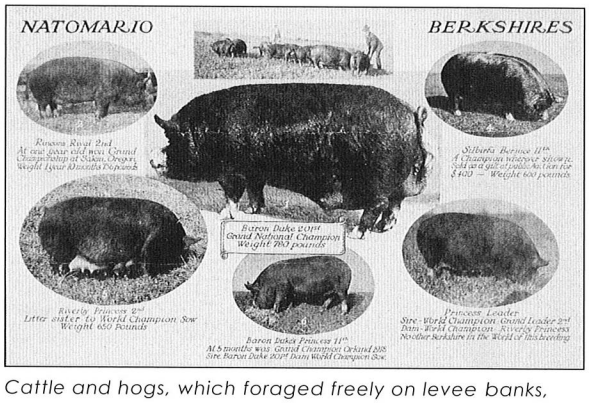
"In the way of a memorandum, and for the purpose of bringing up the matter at the next meeting of Trustees of Dist. #1000, am advising that land owners have a habit of blocking drainage canals for the purpose of holding up the water to benefit their individual holdings. This is indulged in quite indiscriminately and might injure other land owners. Such practices, without a permit from the engineer, should be dealt with severely, and I think if one or two were arrested it would stop this vicious practice.

"I know of no district where the individual land owners take the liberty of doing just about what he pleases without consultation, and think it is time an example is made of some of them. Mr. Herget, for example, regardless of many warnings, persists in pasturing hogs on the outside of the levee, and he should be gotten after.

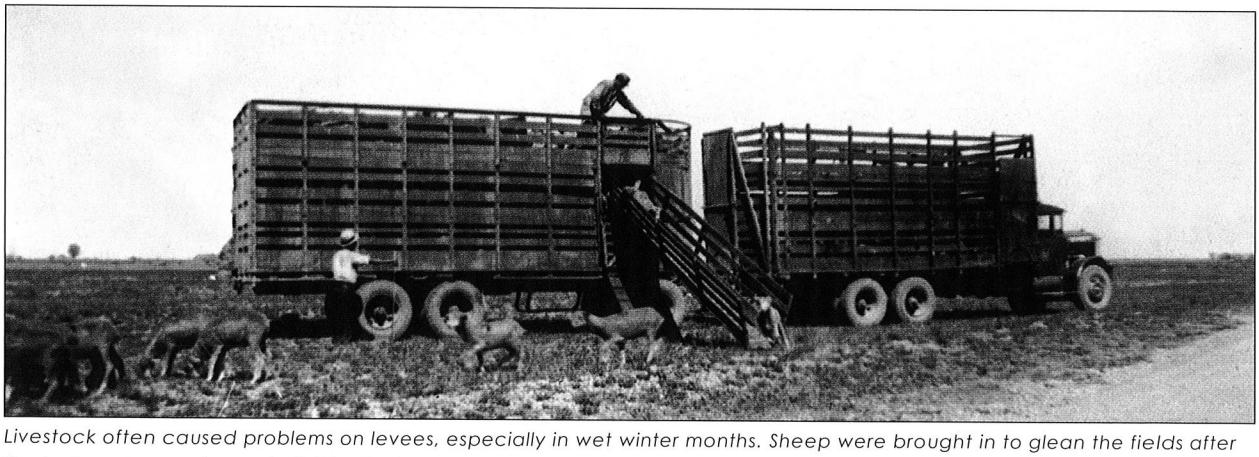
Yours very truly
Fred W. Kiesel"



The completed sand core River Levee is hand-marked at Elev. 44.0 feet, and the water surface level at 35.3 feet in this 1915 photo taken in the northern part of RD 1000. (RD 1000 Collection)



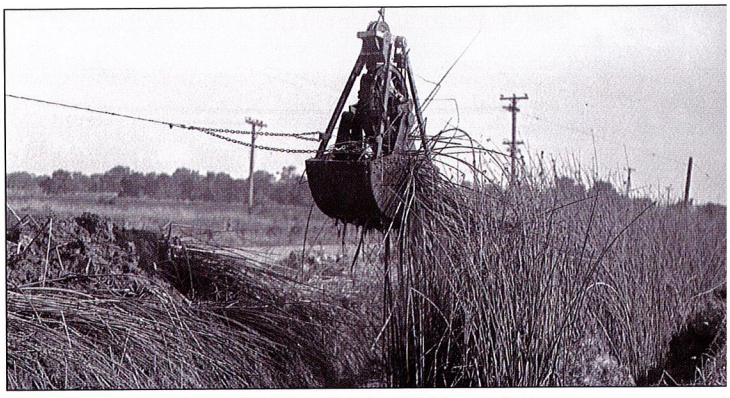
Cattle and hogs, which foraged freely on levee banks, were a problem. This is a detail from a Sandercock Land Company advertisement for Natomas lands. (Courtesy of the California History Room, California State Library, Sacramento, California)



Livestock often caused problems on levees, especially in wet winter months. Sheep were brought in to glean the fields after the last crops were harvested. (Center for Sacramento History, Ed Witter Jr. Collection, 1999-074-0011)

In response to Trustee Kiesel's memo to the district's legal counsel, John T. Pigott, the trustees adopted a resolution notifying landowners that no obstructions of canals or culverts would be tolerated and that violators would be prosecuted.[3]

Levee and canal maintenance activities have not changed appreciably in the last century. Primary activities such as mowing, herbicide spraying, vegetation trimming and removal, rodent control, beaver activity, canal



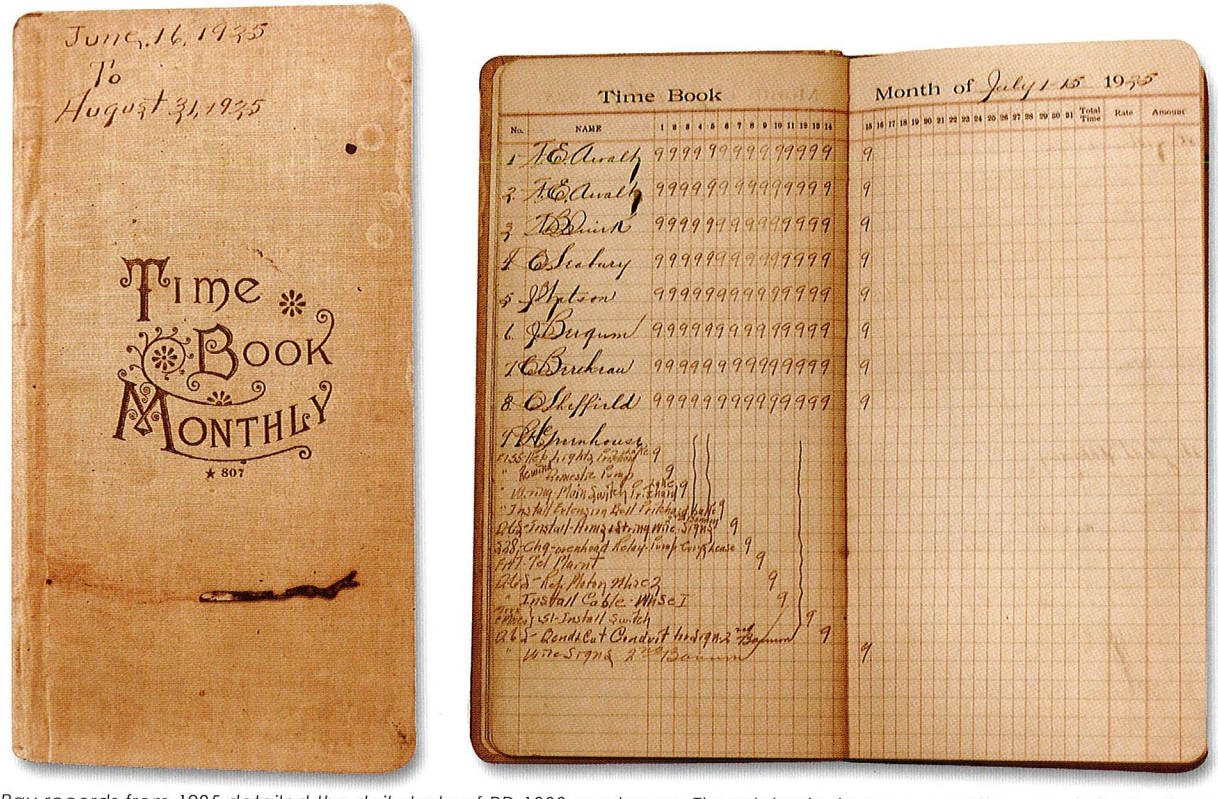
The district bought this P&H dragline in 1921 to make cleaning RD 1000 canals more efficient. (RD 1000 Collection)

State Levee Maintenance Criteria

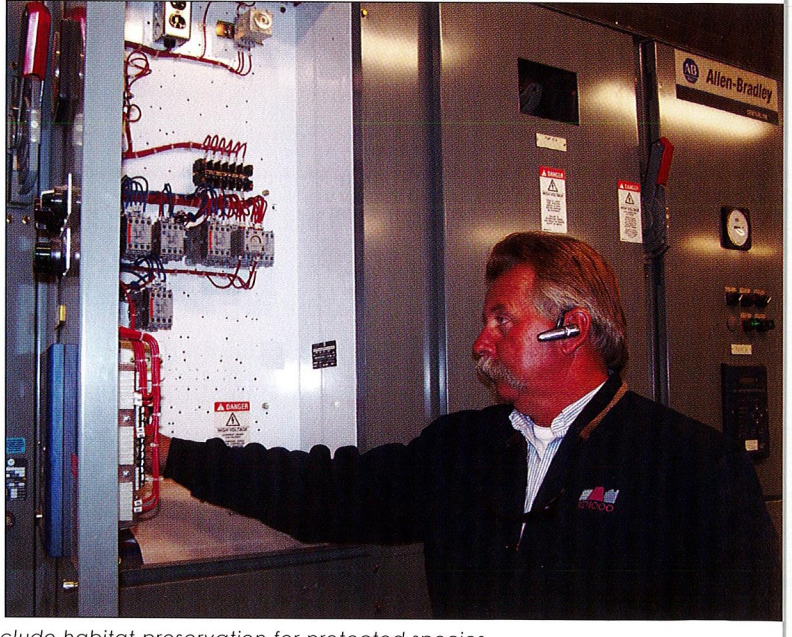
The early, common sense measures adopted by RD 1000 trustees to protect the levee system have been codified in law as maintenance requirements. The California Department of Water Resources (DWR) rates RD 1000's levee maintenance based on criteria in Title 33, Code of Federal Regulations and the State Water Code. The DWR inspects the district's levees twice a year, in the fall before flood season and again in spring after the flood season. The district is required to inspect and report to the state on the condition of its levees in the summer and winter. The state's inspections rate the district on the following criteria:

- Readiness for Flood Emergency
- Adequate Levee Section and Grade
- Presence of Encroachments
- Control of Wild Vegetative Growth
- Rodent Control
- Repair Cracks, Erosion, and Caving
- Repair of Access Gates
- Condition of Rock Revetment
- Condition of Levee Crown
- Control of Livestock Grazing
- Condition of Pipes and Appurtenances (through the Levee)

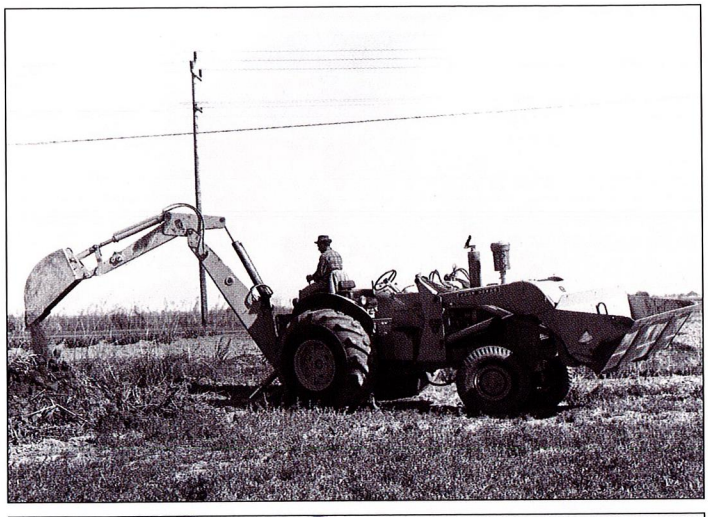
RD 1000's maintenance practices have consistently been found to be "acceptable" to the State based on their annual inspection ratings throughout the years.[4] However, following the catastrophic flood in New Orleans in 2006, the Corps of Engineers has adopted more stringent standards for levees, especially in the areas of vegetation and encroachments. This primarily affects the Sacramento River levee where waterside development and habitat are at odds with these more stringent standards. Construction of the new "adjacent levee" along the Sacramento River as part of current Natomas Levee Improvement Project will alleviate much of the conflict, although some encroachments may still have to be modified.



Pay records from 1925 detailed the daily tasks of RD 1000 employees. Though basic, in many ways they are similar to those required today. A sample: Mow thistles along Delta Rd.; Mow grass along Elverta Rd.; Dig Irrigation Ditches, Lot 1, 2, &3– Riverside; Fill Holes—Elverta Road; Backfilling Pipe in canal at Jefferson; Haul priming pump parts to town and back; Patrol levee; Poison squirrels; extend culvert along Del Paso Rd.; Build Roadway thru Whse I; Haul rock to Cory's Lease; Telephone maintenance; roll and spread gravel—roadway—Warehouse I. (RD 1000 Collection)

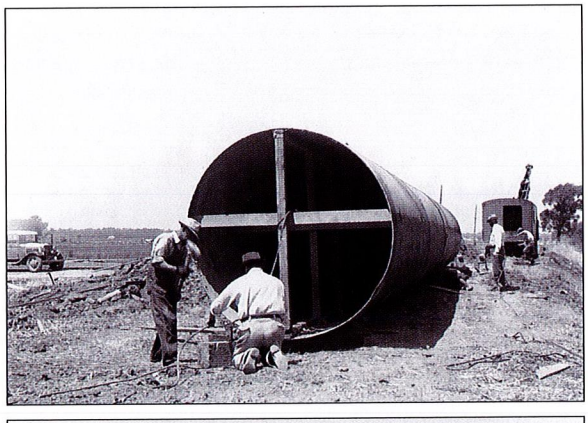


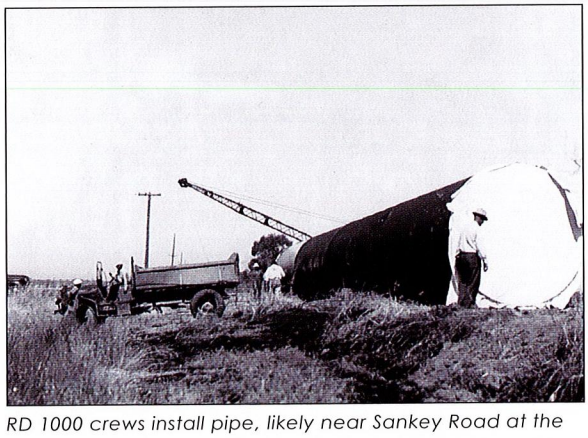
Changing with the times: (left) River levee improvements today include habitat preservation for protected species. (right) Foreman Don Caldwell checks the electrical panel for one of the pumps at Plant 1B.



Hernani DeMattos, shown here on a backhoe, worked for RD 1000 as a laborer for twenty-seven years. He raised his family in the district, and retired in 1987. His daughter Mary Inderkum recalls that her father's job also included pulling debris out of canals during stormy weather: "I can hear my dad with the pitchfork throwing the stuff out over his shoulder . . . hearing the white caps hit the pump. That was hard work. You didn't have the equipment you have now, the automatic pumps and computerized equipment. If there was a problem, they had to find out what it was." The DeMattos family lived at Camp 8 where he provided security for district equipment stored there.[5] (Courtesy Mary Inderkum)

and levee slope erosion and sloughing, access road maintenance, ditch cleaning, trash removal, drainage pipe installation, and pump and discharge pipe maintenance have all been performed over the years. Equipment advances and new methods have allowed these tasks to be done in a more efficient manner, but continued urbanization of the district adds its own challenges to maintenance practices. For example, levees, which were routinely burned to control vegetation, now must be mechanically mowed with a water truck at the ready in case a fire is started by the mowers next to houses. Herbicide applications to levees and canals must also be monitored more closely in urban areas.

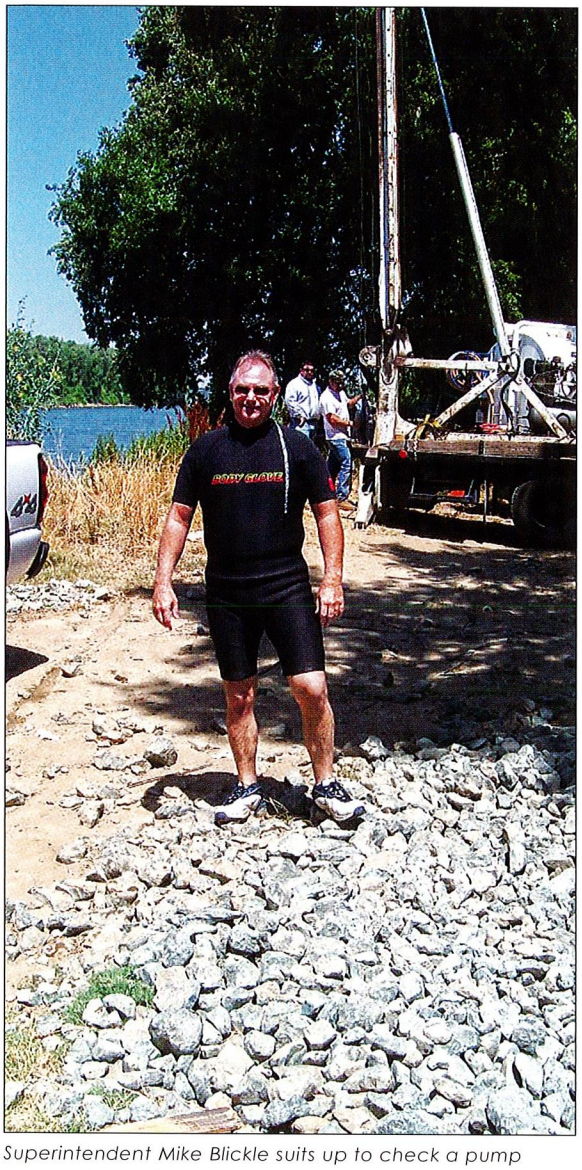




RD 1000 crews install pipe, likely near Sankey Road at the North Drain, in these undated photos from the 1930s. (RD 1000 Collection)

Equipment changes, but the tasks are similar. RD 1000 crews make an emergency levee repair in January 2011. (RD 1000 Collection)

Beto Gutierrez, Jose Ramirez, Carlos Ramirez, and Antonio Romero work on emergency levee repairs in January 2011.



Superintendent Mike Blickle suits up to check a pump intake. (RD 1000 Collection)

Removing vegetation from a District canal that is plugging the pipe culvert in August 2008.

Removing sediment from the East Drain to improve capacity, 2011.

Flood Waters Challenge the District's Defenses

The Flood of 1938

December 29, 1937:

District Engineer Louis F. Vaile reported, "The river rose very rapidly during the storm period of the 10th to the 14th of the month. The Cross Canal high water on the 14th was at a stage of 38.2 feet, this being within .5 of a foot of the highest recorded stage since the completion of the district levees."[6]

February 25, 1938:

Superintendent John Taresh reported, "The river gauge at the Second Bannon Pumping Plant varied from 16.1 feet to 31.2 feet. The rainfall for the storm beginning on January 28th and continuing to February 18th was 8.86 inches bringing the seasonal rainfall to 17.27 inches. The excessive rainfall overtaxed the capacity of our pumping plants and from February 9th to the 19th we were unable to lower the water at the Second Bannon Pumping Plant. By the 21st of February water in the canal at Second Bannon was down so that the water from the low ground in the district could drain into the canals.

"The excessive seepage increased the load on the pumping plants adding to the difficulty of gaining control of the drainage. The pumps were operated a total of 54½ hours during the beginning of the storm from January 28th to the 31st and 1,923½ hours during February to date and the Pritchard Lake Plant operated 706½ hours. Power was off 5

Widespread flooding in the Sacramento River Basin December 11–14, 1937, exceeded the district's drainage capacity. (Top) Flooding at Burton Lauppe's home is shown in this undated photo from the 1930s. (Center for Sacramento History, Ed Witter Jr. Collection, 1999-074-0008a) (Middle) In March of 1937, the Marshall Property at Pleasant Grove in Sutter County flooded. (RD 1000 Collection) (Bottom) High water on March 1, 1940, rose beneath the Western Pacific Levee that formed one side of the East Canal. (Center for Sacramento History, Eugene Hepting Collection, 1985-024-4077)

hours at Second Bannon and seven hours at Pritchard Lake on the 9th, permitting water to gain on the pumps.

" . . . The high water made it necessary to patrol the levees with two patrolmen on from the 2nd to the 8th of the month and from then on to the 21st the patrol was increased to seven men; the levees showed no dangerous condition, although surface was rather soft due to the continuous rainy period."[7]

March 25, 1938:

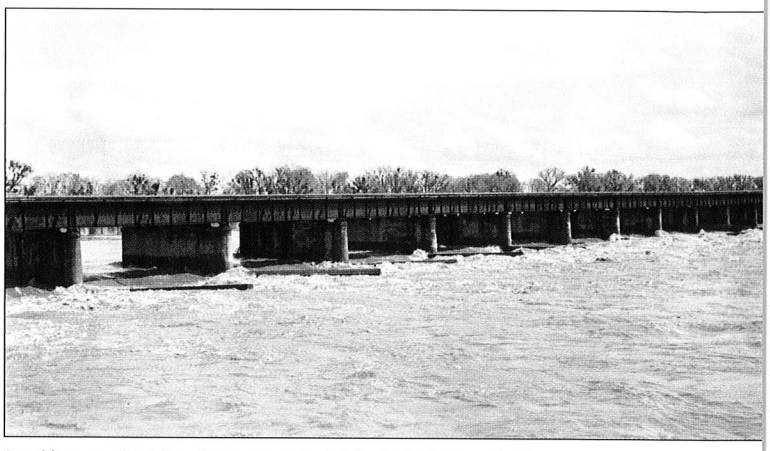
Superintendent John Taresh reported, for the month of March, "The river gauge at the Second Bannon Pumping Plant varied from 24.1 feet to 30.8 feet; at the Cross Canal gauge the low reading for the entire period was 31.9 feet and high was 36.8 feet, the river remaining high during the entire period. The rainfall during the month was 3.66 inches bringing the seasonal total to 20.93 inches.

"The seepage in the district was excessive and it was necessary to operate the pumping plant at Second Bannon day and night while the Pritchard Lake Plant was operated from 5 to 24 hours each day, bringing the total pump hours at Second Bannon to 1,143.50 and 353.00 hours at Pritchard Lake."[8]

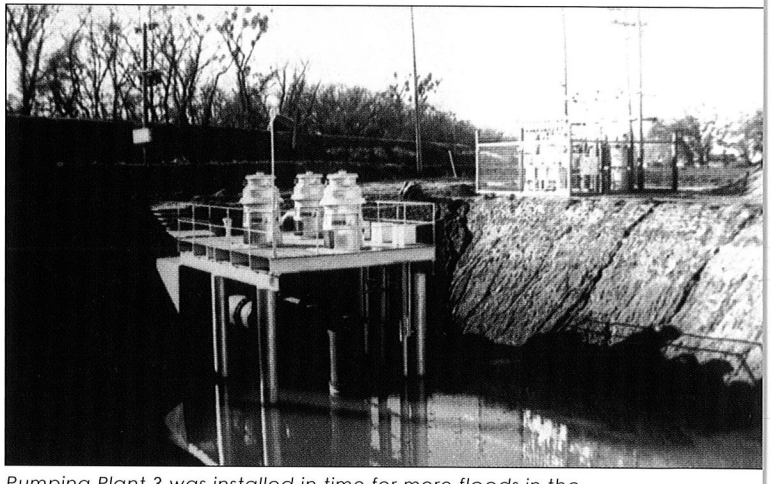
RD 1000 Trustees acted immediately after the flood of 1937–38 to shore up the district's pumping capacity. They levied a special assessment of $49,800 to construct a third pumping plant, which increased the runoff capacity to half an inch per day. Plant No. 3 is located on the bank of the Sacramento River at the end of a canal leading from the West Branch Drainage Canal. It was built to handle "extreme conditions in winter."[9]

Construction was complete in late 1939. On January 26, 1940, District Engineer Louis F. Vaile reported, "River was over the banks for six days, but is now at the minimum for the period . . . The ground took most of the water, but considerable run-off can be expected if present rainstorm continues."[10]

By March, the district engineer reported a storm of "very unusual magnitude which taxed the pumping facilities to full capacity, and caused some minor damage to crops on account of flooding . . . The new pumping plant worked effectively."[11]



Looking east at the Sacramento Weir, forty-two out of forty-eight gates were open on March 31, 1940. (Center for Sacramento History, Eugene Hepting Collection, 1985-024-1667)



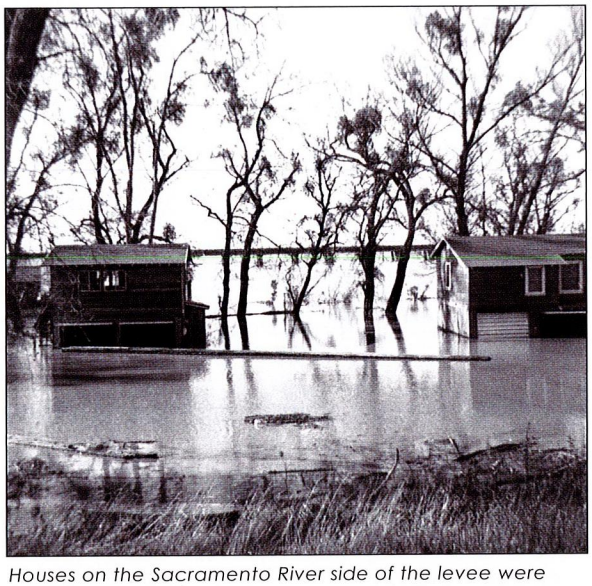
Pumping Plant 3 was installed in time for more floods in the spring of 1940. This shot was taken shortly after installation. (Center for Sacramento History, Ed Witter Jr. Collection, 1999-074-007cy)

Just how timely the new pump proved to be was apparent by April, when the engineer reported, "Heavy storms during the last week of March during which 4.19 inches fell in 7 days—caused considerable additional pumping, but no land in the district was flooded for more than 24 hours and the pumping capacity seems to be enough for the storm. . . . A force of 30 men were, however, left on standby one night at Pleasant Grove to assist the Sacramento Northern on the Cross Canal should the reported high water have arrived."[12]

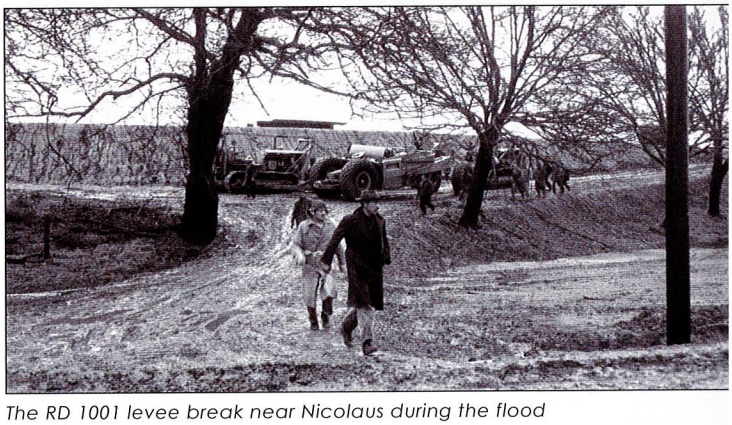
The Flood of 1955

Phillip J. "Fitz" Fitzpatrick had just been named district superintendent in 1955, but he had been working at the district since 1935. The record flood of 1955 drew on all twenty years of his experience.

"What really saved us that time was the break in 1001 at Nicolaus. That river just dropped down. It had 38,000 acres of real low land it just moved right in on. That river just dropped. But, that wasn't the end of our problems. . . . When it broke, we were really on pins and needles. This river was really high, especially on this side. The east side wasn't quite so high, because that was the year that Folsom Dam first opened, started receiving water. And it, the American actually was comparatively low, in comparison to the Sacramento. But the Sacramento was, it was just unbelievably high. Of course, we were scared to death. Then we heard that the levee had broken at Yuba City. So then, about two days later, I think about Christmas Eve of that year, it broke at Nicolaus.

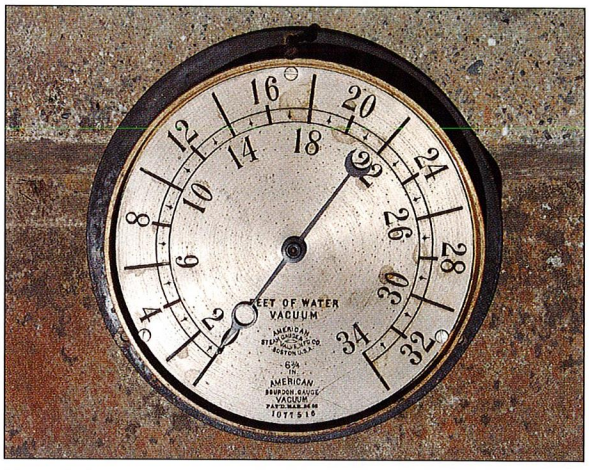


Houses on the Sacramento River side of the levee were flooded in 1955. (Center for Sacramento History, Eugene Hepting Collection, 1985-024-6017)



The RD 1001 levee break near Nicolaus during the flood of 1955 lowered water levels in RD 1000. Hundreds of people in Yuba City were evacuated, and the cleanup from widespread flooding lasted for months. (Courtesy of Caltrans)

Phillip J. "Fitz" Fitzpatrick, shown here in the 1940s, began working for RD 1000 in 1935. He rose to become district superintendent from May 1, 1955, to August 8, 1975. (Courtesy Virginia Fitzpatrick Harris and the Natomas Historical Society)



The original vacuum gauge from Plant 1, installed in 1916 and in use during the 1955 flood.

That's the one that really lowered the river for us."

On December 28, 1955, Sacramento County sent two hundred volunteers and two thousand sandbags to help bolster the RD 1001 levee at a spot off El Centro Road about five miles north of the Sacramento-Sutter county line. A spokesman for RD 1000 explained in the *Sacramento Bee*: "Wave action stirred up by a north wind is causing a certain amount of washing away of the north levee running east from Verona, Sutter County, along the bank of the Natomas Cross Canal. . . . The damaged levee actually is the first of two which would have to be breached before water could enter Reclamation District 1000 and filter on down into Gardenland. We are certain that even if the second levee, on this side of the canal, should go, the movement of water would be so slow that we would have several hours to issue a warning to Gardenland area residents."[13]

Fitzpatrick conducted a school to teach district employees how to stack sandbags around potential levee breaks. "You don't pay much attention to the side of the levee the water is on. You look on the other side. And there's [*sic*] some places that the water will be oozing out, and you look at that water and you can tell how dangerous it is. If it's real clear, it's not dangerous. But if it's coming bubbling out of there with mud, then that's what we call a boil, and that is going to be a levee break . . . you get the sandbags as fast as you can. Not just a few of them, but a lot of them. And you get out and

build a base, build up a wall around this. And you build it as high as the water on the other side. . . . It's important how you put these sacks together, how you lap them. We always kept about, at least 2,000–3,000 burlap sacks, and wire, and canvas, lots and lots of canvas. But canvas is very, very valuable. If you have a wash, with the wind coming, that's what raises Cain with your levee. That wind rain wash. Where it's particularly bad, you put this canvas on it, what you do, you take the lower end of the canvas and put a piece of wire and a rock, or some weight, and then you throw that down, and that will keep the water from rolling it back up. It does the job."[14]

During flood season today, RD 1000 staff monitors weather reports, and river and reservoir levels daily. As the surrounding river and creek levels rise, so does the district's vigilance. Once the river level reaches the "Monitor Stage," which is an elevation of 25.0 feet on the I Street gauge or 32.0 feet on the Verona gauge, district crews patrol the levees twenty-four hours a day as part of its responsibility to the state. At these levels, the river is over its bank and on the levee slope. Levee patrollers look for signs of "boils," seepage, erosion, or other signs of levee distress. The level and frequency of patrolling increases as the river stage rises.

RD 1000 augments its levee patrol staff with employees from the Natomas Central Mutual Water Company, who are familiar with Natomas and the levee system. The district has mutual aid agreements with both the city and county of Sacramento for more resources, including engineers and inspectors to provide more eyes on the levees when needed. If a problem is found, RD 1000 crew will make the initial response and can usually address the problem. If a serious problem is identified, the district will notify the State Flood Center and Army Corps of Engineers and liaison with the City/County Emergency Operations Center. Outside contractors may be called in when needed. In significant events, such as in February 1986 when the levees were in danger of failing, the Army Corps of Engineers will be requested to conduct a flood fight to save the levee.

2011: A Day in the Life of the Superintendent

"We're out here to perform a service," says Mike Blickle, "and that's flood control." Blickle, who grew up in a Yolo County farming family, has worked for RD 1000 for more than twenty years. His day as superintendent begins by 5:45 a.m. with a check of river and canal water levels. In winter months, he also checks the river elevation and the quantity of water flowing from reservoirs. His six-member field crew starts work at 7:00 a.m. Their year-round job is keeping the flood control system working. "Every drop of rain that falls in the district ends up in our canals," Blickle says.

During summer months, Blickle and his crew clean ditches and remove silt and vegetation that slow down the flow of water in canals. They check pumps and spray for weeds whose invasive biomass can clog canals. In fall, crews mow levees and ditches so that the view down the slope and out away from the toe of the levee is clear. They operate and maintain a fleet of heavy equipment that helps them do the job.

Garbage is a year-round issue. "It's a health hazard and an environmental problem," Bickle says. "During one high water event on the East Levee, auto dismantlers near the site were just throwing their tires into the canal. We picked up ten thousand tires during that event alone. We encounter anything from regular household waste to drug lab debris. We routinely find dead animals in canals. It's not a glamorous part of the job."

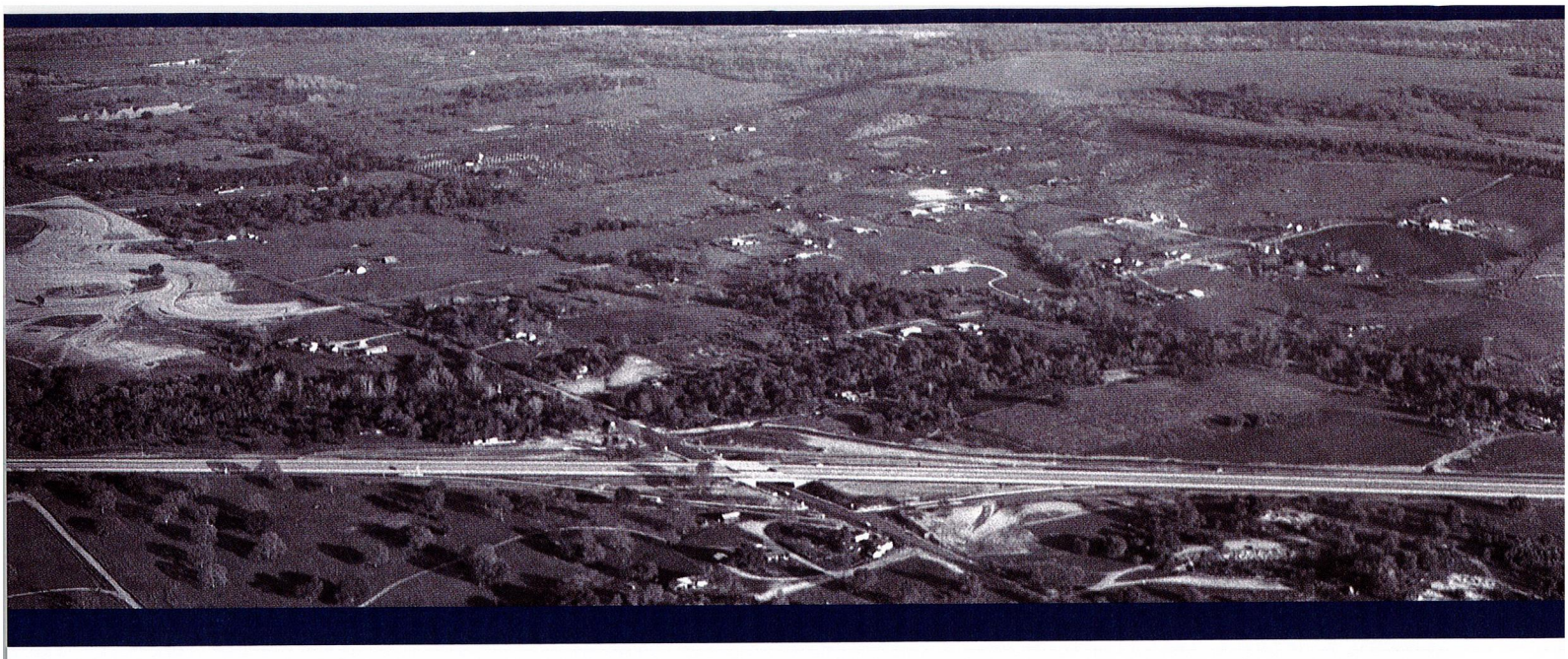
Blickle and his crew have daily encounters in both agricultural and urban areas with people who ignore the "No Trespassing" signs posted on levee slopes. Motorcyclists, cross-country bicyclists, four-wheel drive vehicles, hunters, and others create ruts on the levee slope that become erosion channels during heavy rains. Besides reminding people to stay off the levees, RD 1000 crews routinely answer questions from bicyclists and pedestrians using paths atop levees. "We're always out in the field, so we hear from a lot of people," Blickle says. "We have the right-of-way for levee maintenance, but people don't know that, so it often happens that we have to stop and move out of the way and wait," Blickle says.

Blickle travels the perimeter of the fifty-five-thousand-acre district daily, and the Garden Highway stretch from Verona in Sutter County to the southernmost part of the district several times a day. During heavy winter rains, he checks weather reports often so that he can plan ahead, setting up night shifts and calling in volunteers or Natomas Central Mutual Water Company employees to help patrol the levees. He stays in constant contact with the City of Sacramento, checking on the holding capacity of their detention basins. On many weekends throughout the year, he can be found driving around the district checking river and canal levels. When it starts raining at his house, he heads into work to check the pumps and turn on more if necessary to maintain the canals at safe levels.

"Once the Department of Water Resources (DWR) sends out notice that the river's going to reach patrol stage, by law we have to patrol on a regular schedule twenty-four hours a day. When water's really high, you're checking it every hour. In those events, we're usually running all our pumps. Ninety-nine times out of a hundred, we can tell before DWR can that the water level will rise. We've been doing this a long time."

New berms and wider Sacramento River levee slopes will more than quadruple the acreage that Blickle and his crew must maintain, and new regulations will bring changes in how the job is done. Blickle is confident his crew is up for the challenge. "They are self-motivated and share their knowledge with each other. We keep our guys a long time. They take pride in their work."

"The public doesn't see the hours and hard work Mike puts in," says District General Manager Paul Devereux. "His dedication keeps RD 1000's flood control system working, protecting lives and property during even the worst of floods."



Chapter 6

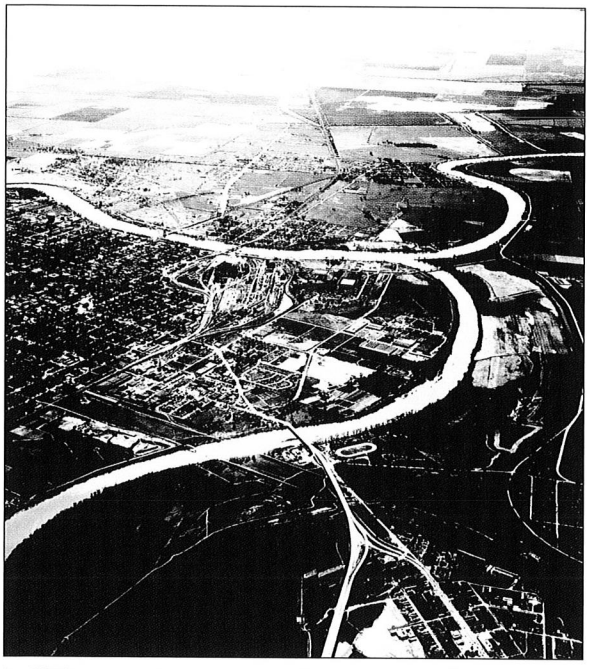
Urbanization

NORTH NATOMAS

Year	Dwelling Units	Population
1975	176	476
1980	290	673
1990	276	643
2000	416	1,082
2006	15,000	34,000
2007	16,000	36,000
2010 Census		55,141
Buildout (2025)	32,500	66,000

SOUTH NATOMAS

Year	Dwelling Units	Population
1975	2,826	8,412
1980	3,851	10,418
1990	15,242	35,336
2000	16,217	40,141
2006	N/A	N/A
2010 Census		43,697
Buildout (2025)	18,065	44,700[1]

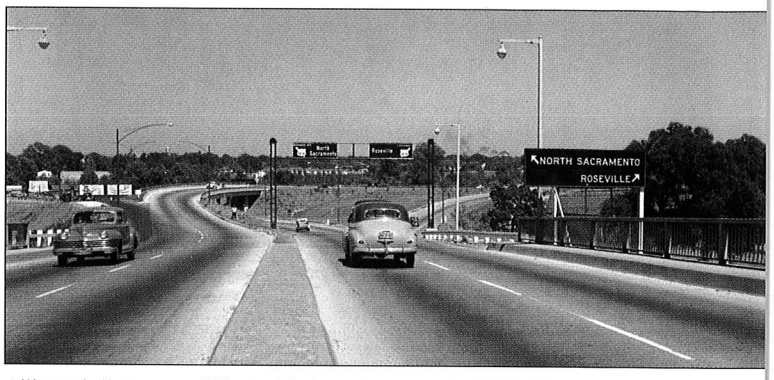


In 1953, a growing downtown Sacramento, left, contrasted with agricultural fields on the other side of the American and Sacramento Rivers. (RD 1000 Collection)

In its second fifty years, RD 1000's responsibilities grew from providing flood control for a sparsely populated agricultural community to working with an urban community of nearly one hundred thousand people. The adjustment was a learning process for the district, other agencies, planners, and developers that now had to take flood control into account.

Roads, telephone and power lines, and sewer and water systems in RD 1000 were designed on a grid pattern to protect farmland from flooding. The challenge posed by urbanization was how to overlay freeways, an airport, interceptor pipes for massive sewer systems, thousands of homes, more than a dozen schools, an arena, office parks and shopping malls on that original grid without compromising the levees and canals that now served them all.

Natomas, still called "District 1000" as late as World War II, was entirely under county jurisdiction until 1960 when the City of Sacramento annexed 1,221 acres known as Northgate. The



Although there was little traffic into Natomas in 1950, big changes were on the way. This shot was taken at the North Sacramento off-ramp for US 99E, just north of the American River. (Courtesy of Caltrans)

pace of subdivisions steadily increased in the southern part of the district, though vast tracts were still in farming.[2]

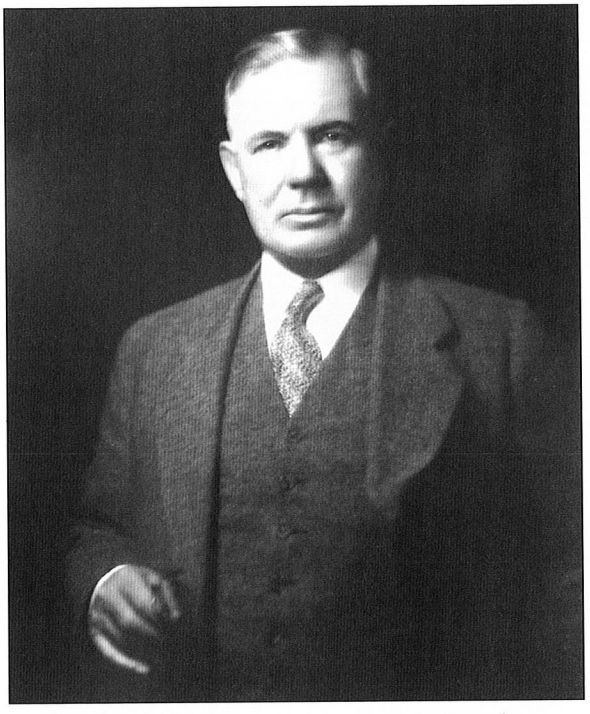
RD 1000 retained its responsibilities under the California Water Code to review construction proposals and recommend denial or approval of permits for encroachments that affected the levees, forwarding their recommendations to the State Reclamation Board, which formally approved plans affecting the levees. On matters affecting the interior drainage system, the district was on its own and had to deal with the city or county and developers to ensure the drainage system was not compromised and that improvements were made to accommodate the additional runoff from urbanization. Engineering reports and infrastructure plans were reviewed by the district.

By 1948, the Natomas Company had sold all but three thousand acres of its land in RD 1000 and 1001, and was aggressively divesting itself of the remainder with an asking price of $60 an acre to balance losses on its dredging operations. At the end of 1950, all of its land in RD 1000 and RD 1001 was sold. As early as 1955, investors who bought low sold for as much as a hundred times what they had paid the Natomas Company.[3]

The pace of change in RD 1000 after World War II was evident to landowners, who requested more representation on the district's board. Trustees changed the district's bylaws to expand the number of trustees from three to five, and to move board meetings from the Anglo Bank Building in downtown Sacramento to the district office on the Garden Highway. The board's first regular meeting on the Garden Highway was on August 12, 1955. By September 16, the board had five trustees: George Meister, Eugene Boyd, T. B. Sills, Lorris Lauppe, and James F. Bennett.[4]

On February 24, 1956, the trustees asked attorney John F. Downey for his views about how urbanization might impact RD 1000's operations. His predictions proved prophetic. He predicted that storm water runoff would increase because paved areas would not be able to absorb rain, perhaps even requiring more pumping facilities; drainage ditches would be more difficult and expensive to maintain as they were bordered by fences, power and telephone lines, and crossed by more roadways, making it impractical to clean them with machinery; and that heavily populated areas would mean more debris to clean up.

Downey also predicted that urban areas would demand more representation on the RD 1000 Board of Trustees: "Because the election of trustees is based on assessed valuation, the urban areas will eventually gain more and more control in the administration of the reclamation district. This is an additional reason why that property should bear a continually increasing proportion of the expense. Particularly since the original bonds for the construction of the drainage system are still unpaid, and stand against the properties on the basis of the old values with no consideration to urban development [the original bonds that funded reclamation were paid off in July 1967]. Since the farming land will therefore pay an undue proportion of the capital costs, certainly there should be no objection to the maintenance being spread more equitably."



Senator Thomas McCormack served as a trustee of RD 1000, as well as president of the newly reorganized Natomas Company, from 1929 until his death in 1949. (Courtesy of the California History Room, California State Library, Sacramento, California)

He added that trustees should ensure that "no drains are installed, relocated or enlarged unless the size thereof will be completely adequate to take care of the contemplated development." He recommended that the district abandon its land-based valuation assessment roll and levy on the basis of county assessments. That would, he said, "place the expense in administering the District on the persons who have the largest vote in determining its policies."[5]

In 1958, the trustees began the process of transferring administration of assessments to the county treasurer, who would then put them

on county tax rolls and turn the funds over to the district. The first assessment to appear on county tax rolls was in 1959, and was based on the value of property with improvements, which sent the amount up dramatically and incensed property owners. The district sought legislation to clarify that its maintenance and operation revenues were to be raised by a tax levied on the county tax rolls but assessed against land alone and not improvements. The same legislation allowed Sutter County landowners to pay their RD 1000 assessments to the Sutter County Treasurer, who sent them to RD 1000.[6] The district returned to doing its own billing and collecting of assessments for a period during the 1980s and 1990s but has since returned to collecting through Sacramento and Sutter County tax bills.

In 1991, landowners again asked for more representation on the RD 1000 Board. State Assemblyman Phil Isenberg sponsored AB3414, expanding the number of board members from five to seven starting with the 1993 district election, and specifying that all trustees had to be residents of the district. (The residency requirement did not apply to trustees who held office on July 1, 1992.) The bill set benchmarks based on the percentage of land in the district used for agricultural purposes, increasing the number of "parcel seats" (one vote per parcel) as the percentage of land in agriculture decreases. The remaining "assessment seats" are elected on the basis of one vote for each dollar of assessments paid, with the Sacramento County Airport having the largest voting block. The Isenberg bill provides for the transition of up to five seats on the board to "resident voter seats" if less than 20 percent of the land in the district is used for agriculture.[7]

The learning process that led to successful agreements in place today with agencies responsible for growth within RD 1000 began in the 1960s. Discussions between the district and the state Division of Highways about construction of Interstate 5 and Interstate 80 (then called 880) occurred simultaneously with County of Sacramento discussions about construction of Sacramento Metropolitan Airport, as well as developers who were beginning to take an interest in the area. A sampling shows the evolving relationship.

January 24, 1961: Letter from RD 1000 Attorney John Downey to Mr. R. E. Watkins, road commissioner, County of Sutter, regarding Rio Romaza Estates

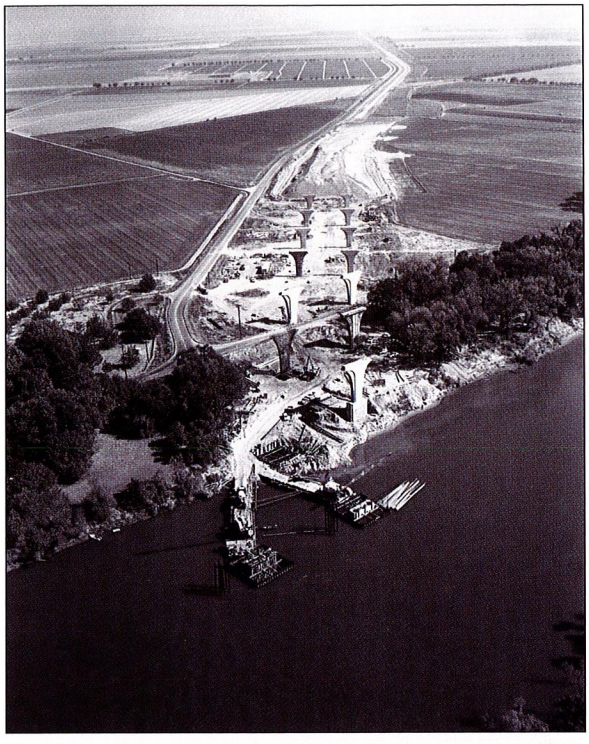
"Necessarily this Reclamation District must make a very careful study of all subdivisions created within its boundaries. . . . The District takes the position, I am sure rightfully, that the expenses of any capital improvements required to enable the District to handle the additional drainage waters or effluent placed into its drainage system must necessarily be borne by the subdividers. Subdivisions may even cause such additional drainage problems that the installation of new pumping plants to lift the water over the District levee system may be necessary."[8]

July 14, 1961: City of Sacramento Engineer E. A. Fairbairn told the trustees that since the city had recently annexed portions of the district, "this will inevitably result in occasional need for coordination between the District and the City of Sacramento, particularly with reference to drainage in the areas of mutual concern and jurisdiction." Assistant City Engineer J. Carl Jennings offered assurances that "no further development will be authorized until there has been a Master Plan for Drainage established."[9]

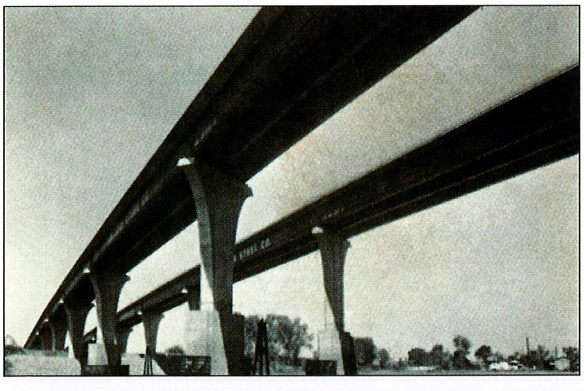
February 16, 1962: RD 1000 trustees approved the Northgate Drainage Assessment District. The city agreed to maintain all ditches in the new district as well as District 1000's Drain B-1 from San Juan Road north to the intersection with Drain B. Trustees expressed concern that agricultural drainage service already provided by the RD 1000 drains not be compromised by the inclusion of urban runoff.[10]

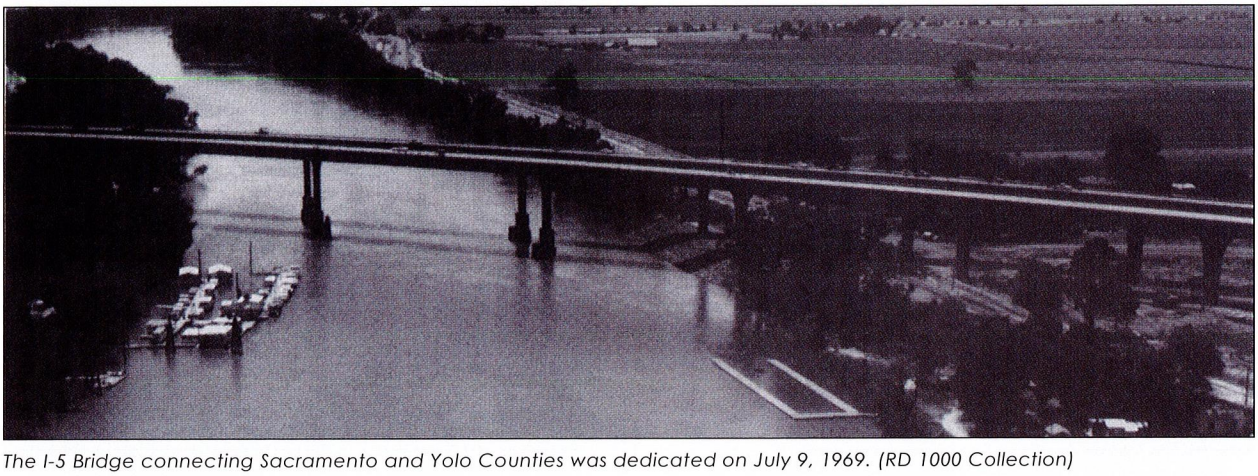
Freeways

The only county road in RD 1000 until reclamation was complete was the Lower Marysville Road, "a miserably poor dirt track useable only in summer." Landowners along Power Line Road formed Road District 5 to finance construction of an asphalt-concrete road from the Garden Highway north to Elkhorn Road, connecting with the Garden Highway. Natomas Consolidated built a sixty-mile network of two-lane dirt roads across the district to provide access to canals for construction and maintenance, as well as to serve farm roads. Most were paved with macadam or concrete during the 1920s and '30s. They generally followed the township and section survey lines and the canals, forming large grids in the landscape.[11]

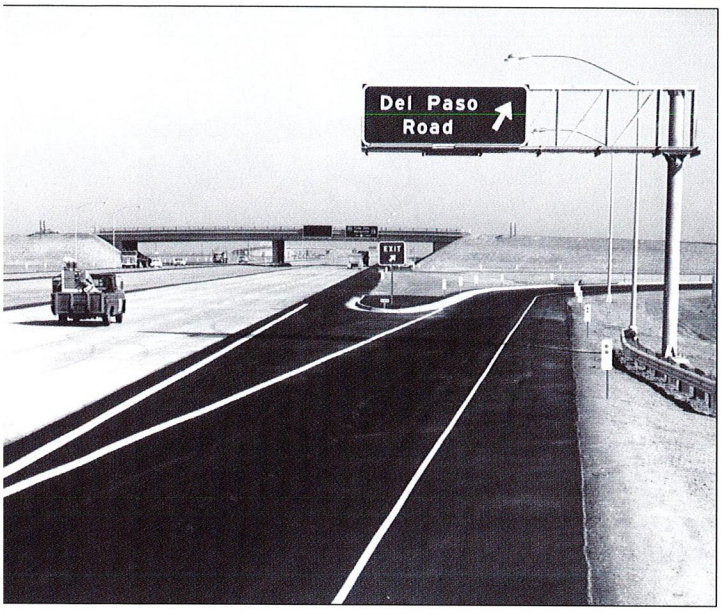


The Elkhorn/I-5 Bridge under construction in November 1967.





The I-5 Bridge connecting Sacramento and Yolo Counties was dedicated on July 9, 1969. (RD 1000 Collection)

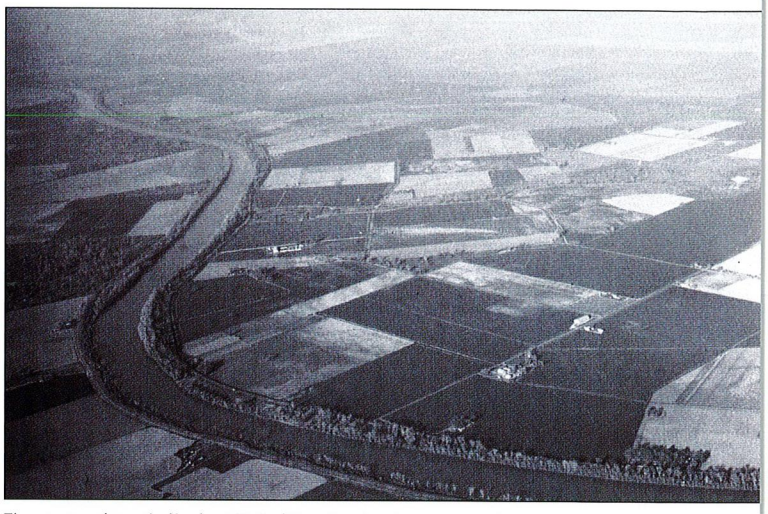


The I-5 Del Paso Road off ramp, August 9, 1968. (Courtesy of Caltrans)

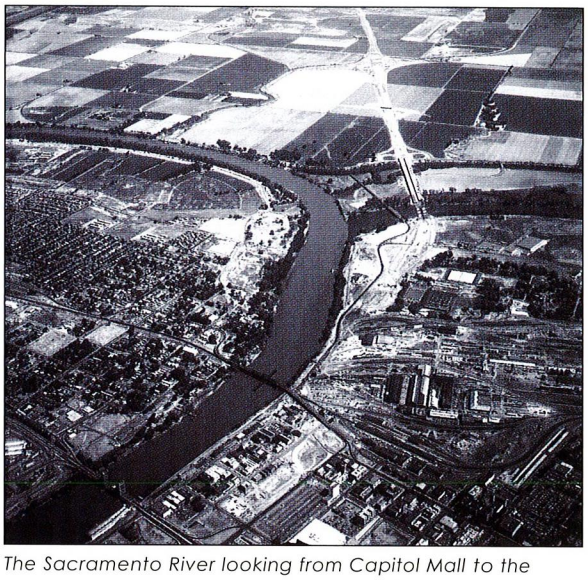
Road building remained slow until the 1960s when the state Division of Highways began discussing construction of Route 238, which became Interstate 5, as well as Route 880, which became known as Interstate 80. Massive road construction involved major work for projects such as moving drains at West El Camino Avenue,[12] and relocating a portion of the East Main canal for the I-5/880 interchange.[13]

Ronald Reagan was governor when the I-5 bridge over the Sacramento River near the old Elkhorn Ferry was dedicated on July 9, 1969. The program for the ceremony notes that the old ferry, in service since 1912, carried two cars or one truck for a five-minute river crossing.

The program notes, "Today's ceremonies mark the conclusion of just over two years' construction effort. Twin bridge spans are 3,360 feet long and rise 70 or more feet above the surface of the water at low flow. The height gives 55 feet of clearance to rivercraft even at flood stage . . . By 1972 this interstate freeway will be completed between Sacramento and Canada . . . ."[14]



The new airport site in 1960. (Center for Sacramento History, Sacramento Bee Collection, 1983-001-SBPM Wood, New Airport Site, 3-17-1960)



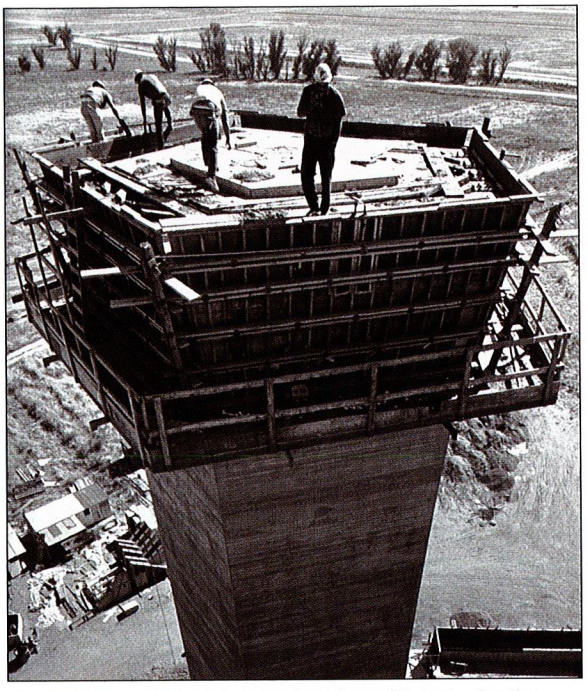
The Sacramento River looking from Capitol Mall to the Elkhorn Ferry, June 26, 1967. (Courtesy of Caltrans)

Sacramento International Airport

Sacramento Metropolitan Airport opened on October 21, 1967. It was the first public use airport west of the Mississippi that had been built completely from the ground up. The six-thousand-acre site in RD 1000 was chosen in 1957.[15] The West Main canal ran through the site, and irrigation ditches and pumps served farmers.

An Air Force transport flashed over the site of the future Sacramento Metropolitan Airport during a groundbreaking ceremony on October 3, 1964. (Center for Sacramento History, Sacramento Bee Collection, 1983-001-SBPM Sac Metro Airport, 10-3-1964)

Both Sacramento International Airport and I-5 were complete on July 20, 1970. (Courtesy of Caltrans)



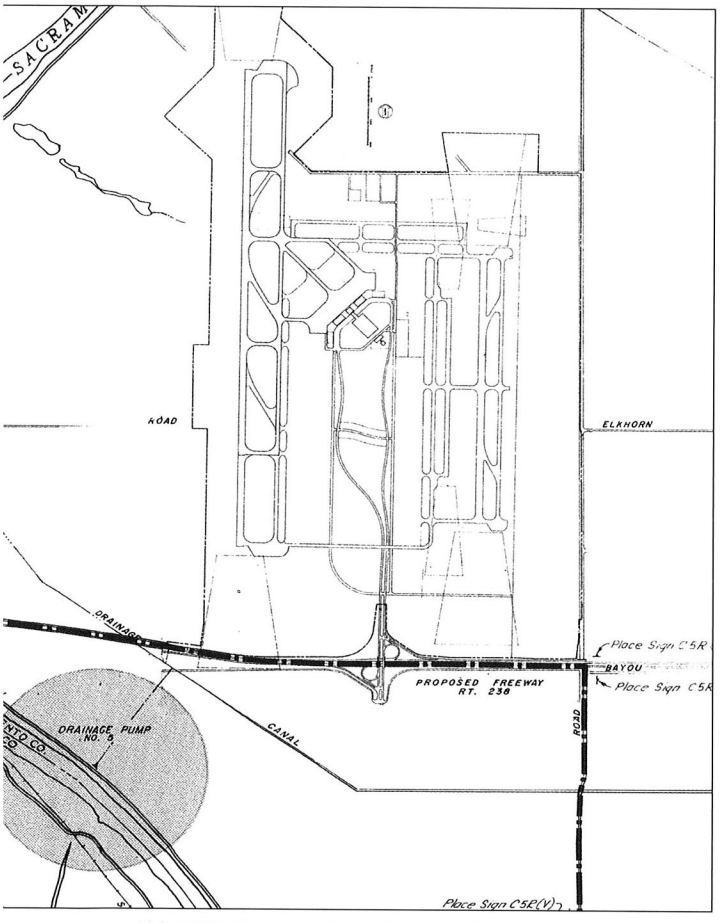
The last concrete was poured on June 12, 1966, for the 140-foot air traffic control tower. (Center for Sacramento History, Sacramento Bee Collection, 1983-001-SBPM Sac Metro Airport, 6-13-1966)

Airport planning was another example of an evolving relationship:

July 2, 1963: District counsel noted the district had been named a defendant with other property owners in the county's condemnation suit for airport land.[16]

August 9, 1963: Natomas Central Mutual Water Company and RD 1000 officials arranged a meeting for problems to be "ironed out" in the area to be used by the airport facility. Construction of the first phase of the project was due to start on June 1, 1964.[17]

October 11, 1963: Board members expressed satisfaction with Sacramento County's plans to change the drainage pattern at the airport site in the Natomas Elkhorn Subdivision. This included installing a pump,



This 1966 diagram shows the location of Pump Plant No. 5, irrigation pumps, and the location of the West Main Canal relative to the airport. (RD 1000 Collection)

digging a canal, putting the pipe through the levee, turning the completed facility over to the district for maintenance and operation, and continuing to pay the district's annual maintenance assessment on the properties acquired for the project.[18]

March 11, 1966: A. J. Huber, Director of Airports, notified the board that Sacramento County now intended to install pumps in early spring 1967, "due to the fact the airport is not going to be opened until the summer of that year." Trustees replied: " . . . much of the surfacing and blacktopping will be accomplished this year and that consequently the runoff resulting from this condition will exist throughout the winter of 66–67. Trustees were therefore very firmly of the view that at least one unit of the pumping plant should be installed and in operation so that it can be utilized throughout the entire winter season to discharge this runoff."[19]

Sacramento Metropolitan, now Sacramento International Airport, is the largest landowner in RD 1000. Its multibillion-dollar infrastructure and operations are dependent on the perimeter levee system for protection. This mutual interest in the effectiveness of the flood control system has necessarily forged a relationship between airport and district staff, especially during flood events. Airport personnel joined RD 1000 to monitor levees and canals during the floods of 1986, 1997, and 2005.[20]

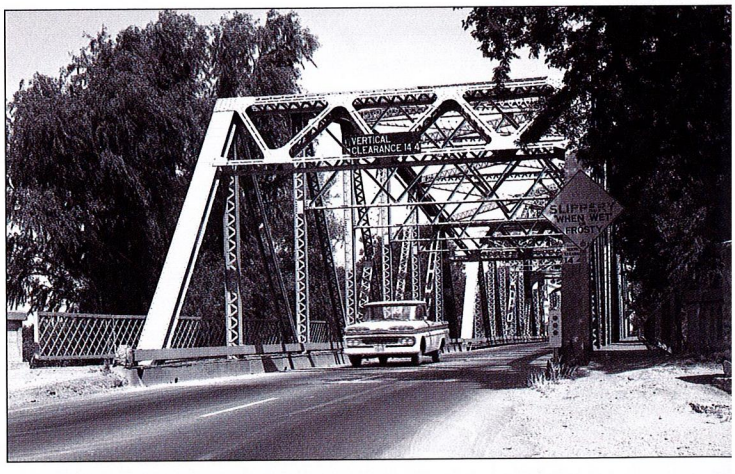
In recognition of the greater runoff in the Natomas Basin owing to airport runways, terminals, and supporting infrastructure, the agreement between RD 1000 and the airport allows for the temporary storage of stormwater runoff in detention ponds on the airport property for up to five days. This was done during the 1986 flood. In 2008, during a large windstorm, all power was lost to Natomas. No pump stations could be operated as the rain fell and canal levels rose. Again following the terms of their agreement, District Engineer Paul Devereux and airport staff arranged for the temporary storage of drainage waters on airport property. Fortunately, within a couple of hours, power was restored to some of the district's pump stations and the threat passed without incident. New Federal Aviation Administration requirements may limit the ability to store water on airport property in the future because of aviation safety concerns from birds attracted to the open water.

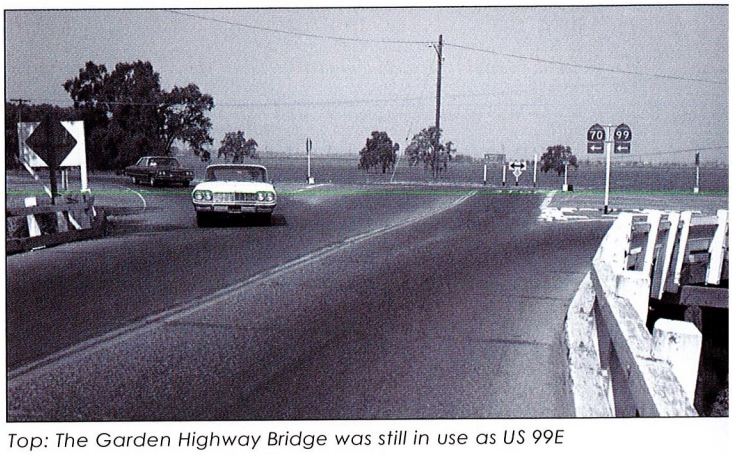
Community Plans Tell the Story

The Sacramento real estate firm of Wright & Kimbrough submitted its design for a township at the southern end of the American Reclamation District to promoter R. G. Hanford in 1907. They envisioned a suburban town with a commute time to the Courthouse in downtown Sacramento of only 15–25 minutes as opposed to the 45–60 minutes that it took to reach downtown from Oak Park, a newly opened subdivision in the southern section of the city. The prospect of attracting residents to the American Reclamation District appeared good, but the plan was abandoned in favor of developing Rio Oso as a flagstop on the Northern Electric Railway. It was a short distance from the Western Pacific Railroad line, thus potentially serving both commuters and crop shipments. "To avoid the expense and hassle of creating a new town and the inflated prices often associated with boom communities, Natomas Consolidated planned to construct only a depot, store, water works, company office, and a demonstration farm at Rio Oso, allowing the town to grow naturally thereafter if that should occur."[21] Even a promoter with the grand vision of R. G. Hanford could not have foreseen the next community plans for the Natomas area.

The South Natomas Community Plan was adopted in 1978 with a revision in 1988. It encompassed 7.7 square miles, or 5,041 acres, bounded on the north by I-80, on the south by the American River and Sacramento River, and on the east by the Northgate Boulevard. It included provisions for more residential development as well as commercial development on the riverside of the Garden Highway, and specified that these would not obscure the view of the Sacramento River from the Garden Highway. It established a Facilities Benefit Assessment District to provide a funding mechanism to pay for infrastructure.[22]

The 1994 North Natomas Community Plan (NNCP) area encompasses 9,001 acres in the Natomas Basin, bounded by Elkhorn Boulevard on the north, I-80 on the south, the Natomas East Main Drainage Canal on the east, and the West Drainage Canal, Fisherman's Lake,





Top: The Garden Highway Bridge was still in use as US 99E on May 16, 1961. (Courtesy of Caltrans)

Bottom: The North Natomas area on September 22, 1967. Caltrans crews were surveying the area in preparation for construction of I-5. (Courtesy of Caltrans)

and Highway 99 on the west.[23] The NNCP called for a comprehensive drainage plan. Funding for design, construction, operation, and maintenance of all facilities constructed or improved under the plan was to be proportioned among users that benefited by the facilities. This provision led to the Joint Community Facilities Agreement between the City of Sacramento and Reclamation District 1000, signed on September 2, 1997, forming a Community Facilities District that allowed North Natomas to be developed.

The Joint Community Facilities Agreement of 1997 provided for cooperation in the design and construction of drainage facilities to serve the North Natomas area. New facilities and improvements to existing district facilities to accommodate new development were to be financed entirely with bonds through the community facilities district under the Mello-Roos Community Facilities Act of 1982. Three phases were specified:

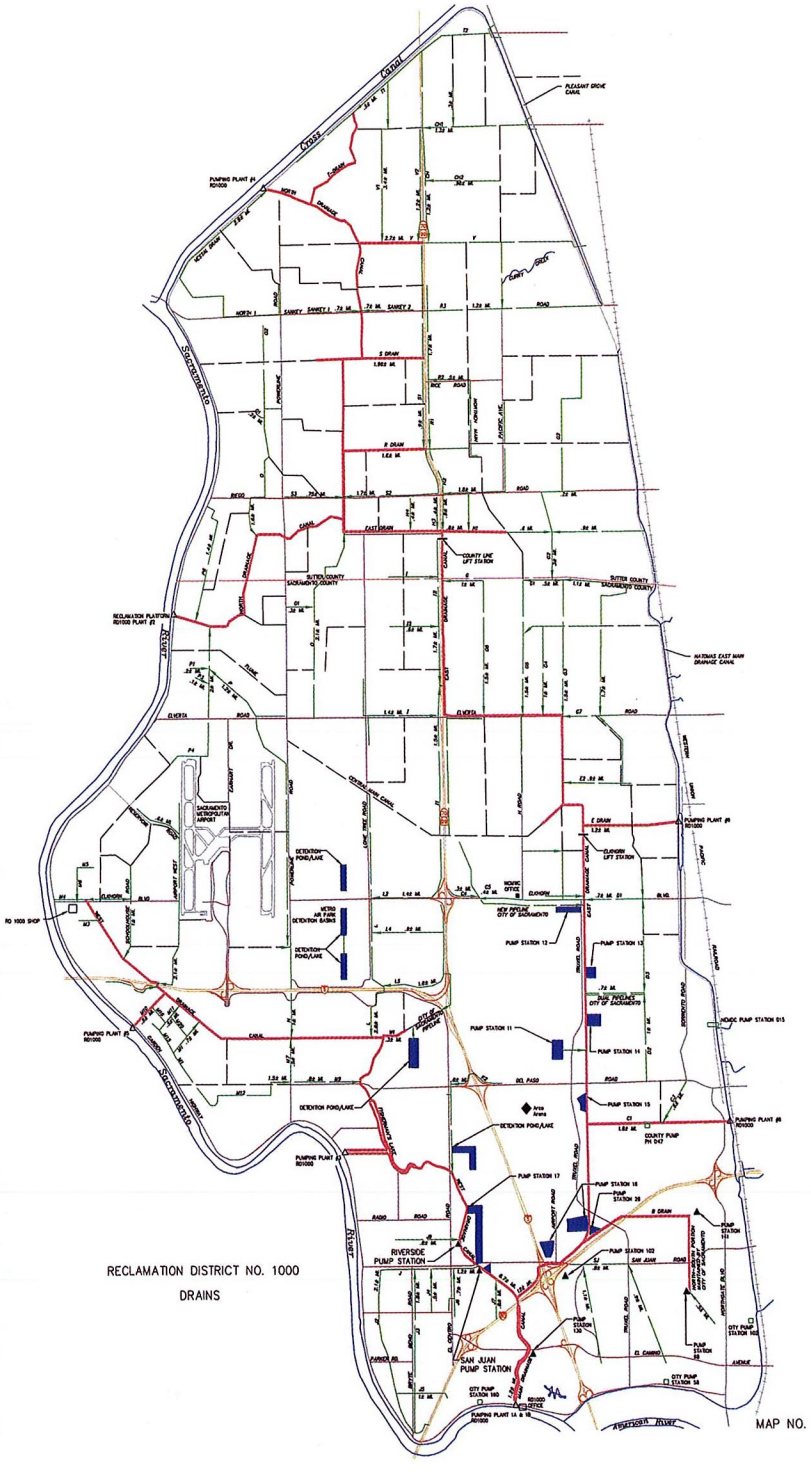
Modeling Improvements Refine RD 1000's Ability to Assess the Impact of Urban Runoff

Following the record rainfall from the 1986 flood event, RD 1000 and the engineering consulting firm of Ensign and Buckley began an effort to assess the system's ability to handle large runoff events and predict what impacts future development would have. The multiyear project resulted in a drainage model capable of determining the impact of runoff from specific developed sites on the district's drainage system and pumping capacity, and modeling specific improvements to the system to fully mitigate these impacts.

The district began using the model exclusively to calculate drainage fees when the Board of Trustees adopted a development drainage policy as the Natomas Basin began to develop rapidly in the 1990s. That policy included three simple criteria:

- The rate of runoff from a developed site could not exceed the agricultural rate of runoff, thus requiring onsite stormwater detention basins.
- The new stage in the receiving canal could not exceed the one-hundred-year water surface level.
- Any increase in runoff volume must be mitigated.

When the North Natomas Community Plan was developed, the model was instrumental in sizing city detention basins and pumping plants as well as calculating the increased capacity at district pumping facilities. The model is updated regularly to ensure its accuracy. Costs to develop and maintain the model are spread among the development projects. The model is now being used for other proposed development including Sutter Pointe in south Sutter County.



Drainage map of RD 1000

Phase 1

Time of Completion: December 31, 1997

Construct new levees and raise existing levees along interior canals

Add 50 cfs pumping capacity at Plant 6

Construct new 60 cfs and 25 cfs pump stations on the West Drainage Canal

Sediments will be removed on the East Drain between Del Paso Road and the confluence with the Main Drain and the Main Drain between the confluence with the East Drain and West El Camino Ave.

Phase 1A

Time of Completion: December 31, 1998

Sediments will be removed along the remaining sections of the East Drain and Main Drain and the West Drain to approximately 3200 feet north of Del Paso Road

Phase 2

Time of Completion: November 1, 2002

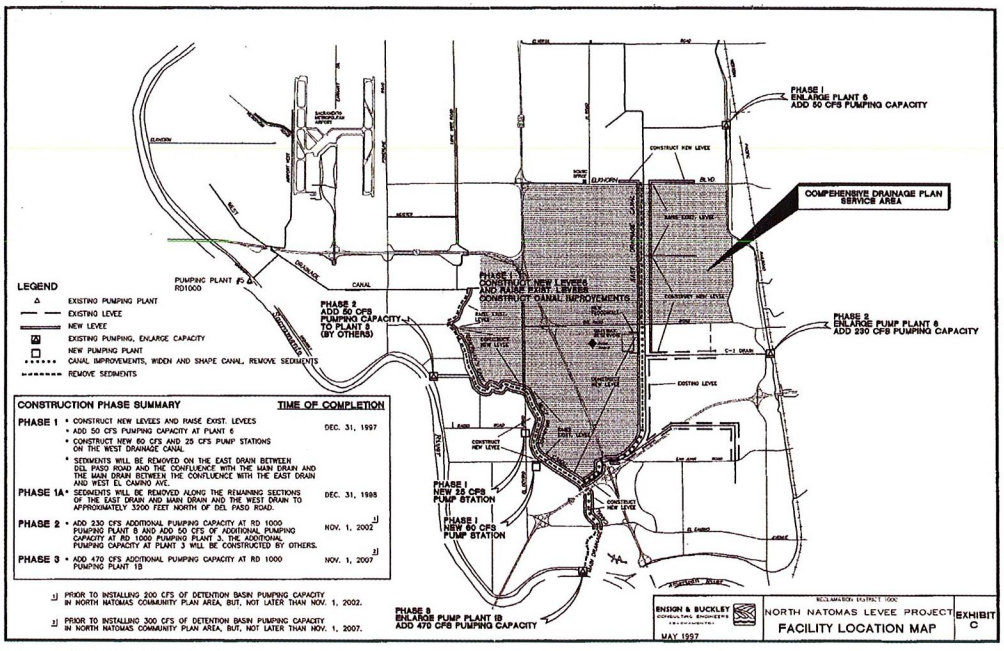
Add 230 cfs additional pumping capacity at RD 1000 Pumping Plant 8 and 50 cfs of additional capacity at RD 1000 Pumping Plant 3. The additional pumping capacity at Plant 3 will be constructed by others.

Phase 3

Time of Completion: November 1, 2007

Add 470 cfs additional pumping capacity at RD 1000 pumping plant 1B

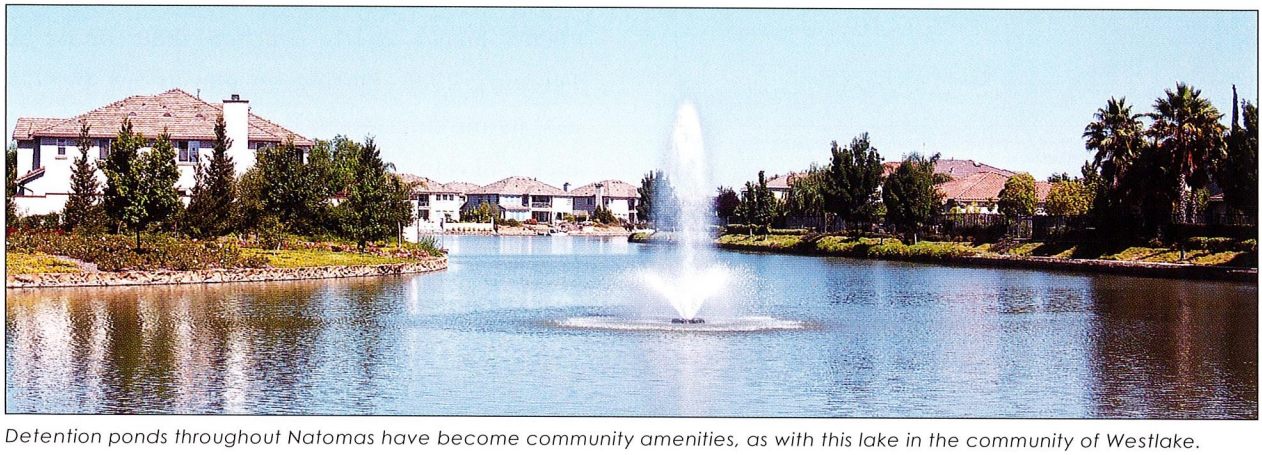
Due to cost overruns, funding issues, and a slowed economy, some of these improvements have not yet been implemented.[24]



The 1997 Joint Facilities Agreement provided for RD 1000 drainage improvements, indicated on this map, to handle urban runoff from North Natomas development.

This city pumping plant on West El Camino Avenue was constructed well in advance of the new homes in the background to take runoff from South Natomas into RD 1000's Main Drain, foreground.

The Sacramento Bee reported: "Trucks and construction equipment rumble along the levee of the natomas east man drainage canal [sic] Thursday 7/19/98 as construction continues on the first major residential development in Natomas, north of Del Paso Road.—Sacramento Bee/Chris Crewell" (Center for Sacramento History, Sacramento Bee Collection, 1983-001-SBPM Crewell 4A, 7-10-1998)



Detention ponds throughout Natomas have become community amenities, as with this lake in the community of Westlake.

Chapter 7

1986: The Flood that Changed Everything

Just as plans were taking shape for population in the Natomas Basin to more than double from its 1980s levels, RD 1000 levees were about to face the most severe test in their history. The levees around Natomas were designed to handle the 1907 and 1909 historical "floods of record" on the Sacramento River. In response to a large flood event in 1937, a third pumping plant was added, and the levees continued to hold. After the 1955 flood, the Army Corps of Engineers raised the Natomas Cross Canal and Pleasant Grove Creek Canal levees as much as two to three feet in anticipation of future, even larger flood events. Shasta Dam, operational in 1945, and Oroville Dam, operational in 1968, provided storage for the Sacramento and Feather Rivers as part of the Sacramento River flood control system. By 1955, Folsom Dam was operational, providing additional flood storage capacity along the American River on the district's southern flank. (Another record flood in 1964 caused engineers to re-evaluate storm frequency, and to decide that Folsom Dam was designed to handle a one-in-120-year storm and not the 500-year storm protection previously thought.)

Even with these measures in place, RD 1000's levees nearly reached their limits in February 1986. During an eleven-day period, a slow-moving storm dropped more than ten inches of rain on Sacramento. The heaviest rainfall in the Sierra occurred on February 17 when nearly eighteen inches of rain was reported in

Top: Trucks line up on the Garden Highway levee, delivering rocks to shore up sloughing during the 1986 flood.

Left: Flooding on the Natomas East Main Drain Canal at Dry Creek in 1986. The Main Avenue Bridge, since replaced, is in the middle ground.

the Feather River Basin. Twenty-nine inches of rain were reported at Blue Canyon during a ten-day period. The combined rainfall and increased river flow made this the current "flood of record" on the Sacramento and American River basins.[1] The Federal Emergency Management Agency (FEMA) declared most of northern California a disaster area on February 21.

RD 1000 levees were seriously challenged. Large areas along the Sacramento River experienced significant seepage, causing the backside of the levees to erode. Nearly ten thousand feet of levee west of the airport sustained major sloughing. The district initiated a flood fight, placing large amounts of rock in the landside voids left by the river seeping through the sand core levee. Quick action by the district and the efforts of the Corps of Engineers, who assumed responsibility for the flood fight, prevented a levee failure that would have occurred somewhere along the Sacramento River during the flood.

Jim Clifton was the general manager of RD 1000 when the 1986 flood hit. He had been on the job for only two years. He recalls:

A gap in the Pleasant Grove Creek Canal Levee along Sankey Road caused heavy local flooding in 1986.

"The rain started on February 14. We had a board meeting that morning, and it had just started to drizzle and rain. The rain continued for days. We started pumping on Saturday or Sunday, and the river started to rise. It was the 'Pineapple Express' coming in.

"The first slough was at the horse ranch at the location where Teal Bend Golf Course is now. That area was just very sandy. The guy

After the 1986 flood, the Sacramento Urban Area Levee Reconstruction Project addressed seepage through the levee by installing stability and seepage berms.

A view of the Northgate Boulevard area in the south part of RD 1000 during the flood of 1997.

saw the ramp on the levee start to slip out. It was a boil and we sandbagged it, and that slipped. He got all of his horses out. We started discovering sloughs on the landside of the levee north of Elverta and south of Plant 2. We ended up with about 9,600 lineal feet of sloughs. Our first reaction was to call the Department of Water Resources to have them send out an inspector. The guy was used to dealing with flood fights in the Delta. He told us to put plastic sheeting on it and weight it down. We knew that wouldn't work. Our board president, Dick Willey, called John Wright, retired State Reclamation Board chief engineer. John contacted the Corps of Engineers on our behalf. They sent Lt. Col. Burt McCollum out. Prior to that we had started hauling rock.

"I was fortunate to have three board members who really pitched in: Dick Willey, Manuel Barandas, and Jim Sopwith. Jim lined up three rock pits and the trucking companies. Manuel and Dick and I were supervising work in the field. We started dumping rock on top of Garden Highway and pushing it over with a large loader. We did that for about fifteen hours, and then the Corps of Engineers awarded the contract to Teichert Construction. At one time, we had trucks lined up half a mile on the levee and down Elverta Road. As fast as they dumped it, we pushed it over the side of the levee. That saved the levee because the water was up high enough long enough that it just seeped through the sand core levee and the landside of the levee just sloughed off to the edge of the asphalt.

"All of the pumps in the district were on. We pumped almost 35,000 acre-feet the month of February, which was about half a year's worth of rainfall. In March we pumped another 18,400 acre-feet out as result of rain that fell in March. Every plant pumped that month also. According to our old superintendent, Phil Fitzpatrick, and verified by the model we developed after the '86 flood, after nine inches of rain in the district, you pump out everything else that falls. The ground is saturated at about nine inches.

"Bruce Mosley was the airport operations manager. He asked me to give him a call if there was any levee break. He required the plane crews to stay at the hotel at the airport. On any one night he would have approximately twenty planes at the airport and he could have those planes off the ground in twenty minutes. Some of the sloughs were very close to the airport. Jack White was the field superintendent. He was in charge of all the grounds around the airport and maintenance of everything on the ground. He and I worked very closely during all of that time. We sandbagged what we thought was a slip or a boil under a flume at Plant 2. Jack was patrolling the levee on his own. That was before cell phones, but we communicated

Sacramento River during the flood of 1997.

very closely. As a matter of fact, we closed the valves, closing off airport drainage per the district's agreement with the airport. We closed them on the southwest corner of the airport and built water up on the airport property. It didn't reach the runways. Our agreement allows the district to close those valves for twenty-four hours, then open them up, [and] then close them again. The same thing for drainage on the east side of the airport.

"It was a big show. I'm convinced that the actions we took saved the district from flooding. We came as close to flooding as we ever have."[2]

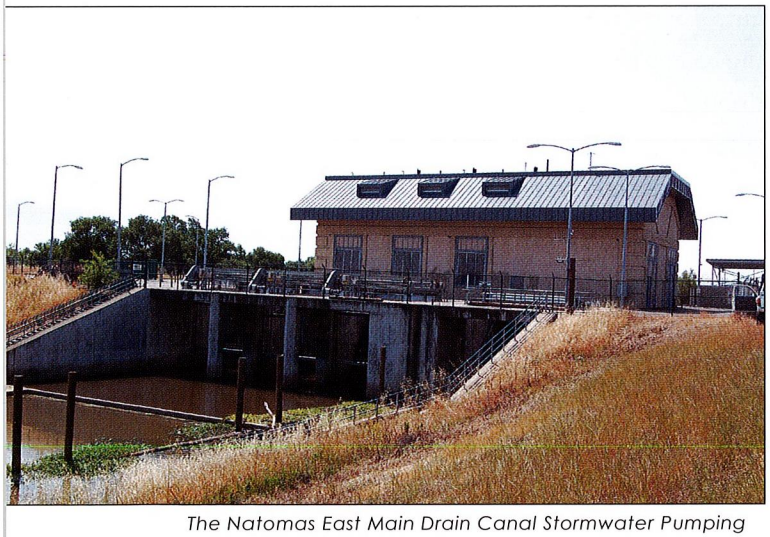
In addition to the drama unfolding along the Sacramento River, the water surface levels on the east side of the basin along the Natomas East Main Drain Canal rose to within one foot of the levee top from the combined flows from Dry Creek and the backwater of the American River. Releases from Folsom Dam had been increased to 134,000 cfs—more than the design capacity of the downstream levees. Despite being close to overtopping, the levees on the east side held without incident because they were not constructed with the same sand core as the Sacramento River levees.

Because of the high stage on the Sacramento, water began spilling through a gap in the Pleasant Grove Creek Canal levee at Sankey Road into the basin. The district and Sutter County took action to close the gap, and after several attempts, succeeded in closing the gap as crews pushed large rock from both sides of the opening.

The effect of the flood was felt throughout the region's flood control system. During March of 1986, the Yolo Bypass, which holds about 80 percent of the Sacramento River's floodwaters, conveyed about 12.5 billion cubic meters of water, more than three times the total flood-control storage volume in all Sacramento basin reservoirs. The Bypass levee had eroded under wave action and as much as a third of the levee crown was lost to erosion within twelve hours.[3]

Response to the 1986 flood was on a regional scale. The City and County of Sacramento, Sutter County, the American River Flood Control District, and RD 1000 pooled their common flood control authorities, es-

With levee strengthening work underway, heavy winter rains in 2006 again caused concerns about levees. RD 1000 Trustee David Christophel's father, Bill Christophel, was on the RD 1000 Board during the flood of 1986. David Christophel helped sandbag the levee during the storm of 2006. He recalls: "That was the first time I'd seen dirty water coming out of the levee. We had a lot of folks, Jim Clifton, all the RD 1000 crew, folks from SAFCA, people from the state, the Corps . . . the city . . . helped bring sandbags."[7] (Photos courtesy David Christophel)



The Natomas East Main Drain Canal Stormwater Pumping Station is seen from the East Levee looking southwest. The plant was installed by SAFCA in 1995 to address flood issues identified in 1986. Water in Dry Creek flooded Rio Linda until this plant and new levees on Dry Creek were built. A plug in the canal allows water to flow through the plant unrestricted at low flow levels. When the canal stage increases, the low flow pipe is gated off and water is pumped from the north side of the plant to the south side, allowing a lower stage upstream, preventing flooding in Rio Linda.

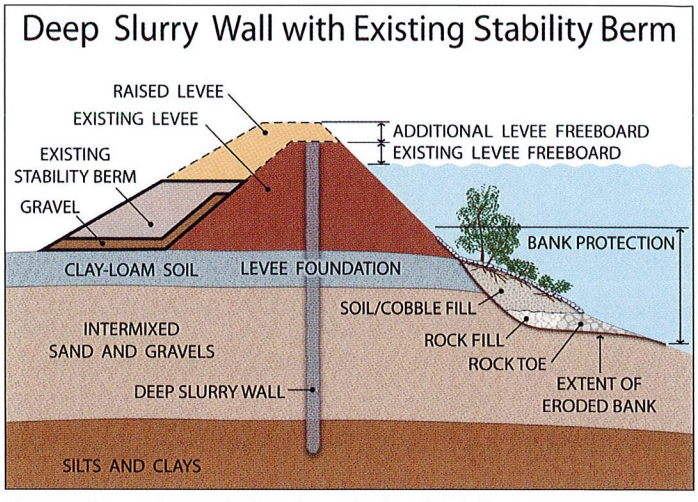
tablished a management structure, and developed a program for improving Sacramento's flood control system under a new joint powers agency, the Sacramento Area Flood Control Agency (SAFCA).

RD 1000 has two permanent seats on SAFCA's thirteen-member Board of Directors. Following the 1986 flood, SAFCA's initial charge was to:

- Ensure the structural integrity of the existing levee system;
- Provide at least a one-hundred-year level of flood protection as quickly as possible to the areas within the Federal Emergency Management Agency (FEMA) one-hundred-year floodplain by, among other actions, increasing the space available for flood control at Folsom Dam and Reservoir; and
- Work toward achieving at least a two-hundred-year level of flood protection for Sacramento.[4]

From 1990 to 1993, the Corps of Engineers repaired the Sacramento River levees from Verona to Freeport to remediate the levee seepage problem. Along the Sacramento River, a "slurry wall" was constructed in the sand core levee from the district's Garden Highway office to Power Line Road. North of Power Line Road, a stability/seepage berm was placed on the landside of the levee to support the backside and provide a relief drain for seepage so the levee would remain intact. In 1993, following a long debate about the best project to provide long-term flood protection for Sacramento, including discussion about the proposed Auburn Dam, SAFCA began construction on the North Area Local Project. The project included levee improvements along the Natomas East Main Drain Canal, as well as Arcade and Dry Creeks to protect Rio Linda, North Sacramento, and Natomas. That work was funded by a local assessment on benefiting properties, including all of Natomas, and was completed in 1998 when the levees were again "certified" by the Corps as providing one-hundred-year flood protection.

On New Year's Day 1997, a flood eerily similar to the 1986 event hit Sacramento, cresting at almost the same river level. It was the fifth record flood in Sacramento in forty-six years. Unprecedented flows from rain and melted snow surged into the Feather and the San Joaquin Rivers. Because of the improvements constructed by the Corps and SAFCA several years earlier, the Natomas levees safely passed this flood with some seepage but little to no levee damage. However, this flood caused levee failures elsewhere in the Sacramento River flood control system and awoke concern about potential "underseepage" issues and their potential to cause a levee failure in the future.



Slurry walls constructed after the 1986 flood stabilize existing levees. Bentonite, a material with the consistency of moist clay, is pumped into a deep trench. The bentonite slows down the rate at which water seeps through the levee soil and is not subject to cracking.

Because the very large flood events of 1986 and 1997 occurred so close together, experts now believed that Sacramento should plan a flood control system and levees for even larger floods. In addition, engineers expressed new concerns about potential levee underseepage. As a result of these combined concerns, FEMA again "decertified" the levees surrounding Natomas, putting a halt to any new development and triggering mandatory flood insurance for many residents in Natomas. Following the catastrophic damage and loss of life in New Orleans as a result of Hurricane Katrina in 2006, Natomas became the focus of national attention on levee-protected urban areas. This resulted in extensive engineering studies and analysis of RD 1000's perimeter levee system by the Corps of Engineers, the State of California, and SAFCA.

Efforts are now underway to address potential risks with the goal of providing Natomas at least a two-hundred-year level of flood protection (a 0.5 percent risk of flooding in any given year), and the region is looking for opportunities to improve the system even beyond that level.

Chapter 8

Yesterday, Today, and Tomorrow in RD 1000

In 1886, the American Basin was described in the *Sacramento Union* as "that body of swamp land . . . than which, probably, none other in the State is more difficult to reclaim."[1] The most advanced engineering and technology available in the world at the time built one of the biggest levee systems ever seen in the United States. Natomas Consolidated of California, one of the biggest land developers in Northern California, spurred construction of its huge reclamation project to create profitable farmland and bring in new residents.

Today, RD 1000 has a population of one hundred thousand and is preparing for a future that includes more urbanization. Projects working their way through the development process include continued buildout of North Natomas; expansion of Sacramento International Airport and the large-scale commercial and industrial development envisioned in the original airport plan; a new community in south Sutter County with more than seventeen thousand homes proposed in the area of Riego and Sankey Roads; and several smaller development projects. Eventually all fifty-five thousand acres in RD 1000 will be taken up by urban development, habitat and open space set aside as mitigation for the urban development, airport property, or flood control infrastructure, leaving a few small pockets of agriculture.

The district is at a critical juncture, trying to support its agricultural roots as well as urbanization and all its associated impacts. Routine operation and maintenance activities become more complex when houses, businesses, and people surround flood control facilities. The desire to use the district's levees and canals for recreation and open space is inevitable. Combined with more rigorous environmental permitting including air quality, water quality, and endangered species, the end result is less efficiency and higher operation and maintenance costs.

Major pump station system improvements over the years are summarized in this chart.

Plant 1A today

Plant No.	Year Constructed	Capacity
1A	1916	621 cfs

Remarks

Consists of two 600 hp centrifugal pumps and two 650 hp centrifugal pumps with manual controls. Full-time surveillance is required when operating.

Improvements

1958—Motors rewound

1978—Suction lines replaced

1989—Outfall structure modified/stabilized

1990—Pumps and switchgear rehabilitated

Future Improvements

Replace flapgates, automate slide gate operation, reline outfall tunnels through levee

Plant No.	Year Constructed	Capacity
1B	1959 Reconstructed 2003	700 cfs

Remarks

Consists of six 400 hp pumps, which can be operated automatically.

Improvements

1978—Trash rack and sump improved and stabilized using sheet piles.

Reconstructed in 2003 under an agreement with the City of Sacramento with added capacity to mitigate development of North Natomas.

Future Improvements

Diesel generator will be installed for emergency power

Top: Original Plant 1B adjacent to Plant 1A in the 1990s

Bottom: Six new pumps were added at Plant 1B as a result of the 1997 Joint Facilities Agreement to handle runoff from development in North Natomas.

Plant 2 as it had been reconstructed in 1976. During January 2006 serious boils occurred in the sump (note sandbags lower center) and the plant was removed so the sump could be filled to prevent a levee failure.

Plant No.	Year Constructed	Capacity
2	1917 Reconstructed 1976	0

Improvements

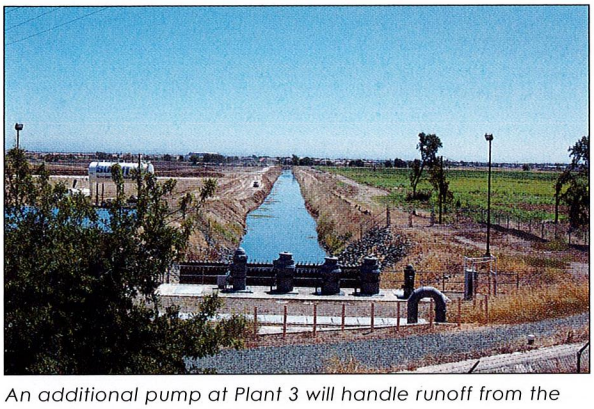
1980—New trash rack

1984—New sump floor

1991—New discharge valves installed. Old pump house demolished. Plant was removed in 2006 due to boils and seepage threatening the adjacent levee.

Future Improvements

Plant will be replaced as part of the Natomas Levee Improvement Project. The replacement will have two 300 hp pumps.



An additional pump at Plant 3 will handle runoff from the Metro Air Park industrial development adjacent to the airport when that project is built.

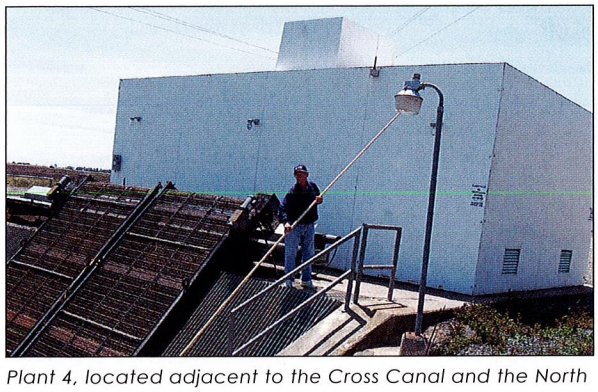
Plant No.	Year Constructed	Capacity
3	1939 Reconstructed 2001	276 cfs

Remarks

Consists of three 200 hp pumps and one 300 hp pump, which can be operated automatically.

Improvements

Reconstructed in 2001. Added 130 cfs capacity for development of North Natomas. Configured for an additional pump to be added by Metro Airpark developer in the future.



Plant 4, located adjacent to the Cross Canal and the North Drain, was added in 1964 to accommodate development. Former district engineer Jim Clifton shows three kinds of debris removal technology to keep trash and fallen vegetation from damaging pumps: the old style trash racks, far left; new style racks with electric lifts; and Jim demonstrates use of a tule fork, in use until the early 1990s at all district pumping plants.

Plant No.	Year Constructed	Capacity
4	1964 Reconstructed 1986	306 cfs

Remarks

Consists of two 400 hp and one 300 hp pumps, which can be operated automatically.

Improvements

1992—Trash rack replaced

Future Improvements

Install automatic trash rack. Recommend relocation of plant setback from the levee as part of the Natomas Levee Improvement Project.

Plant 5, located off the Garden Highway, was built in 1965 to handle runoff from Sacramento International Airport, which funded the plant.

Plant No.	Year Constructed	Capacity
5	1965	57 cfs

Remarks

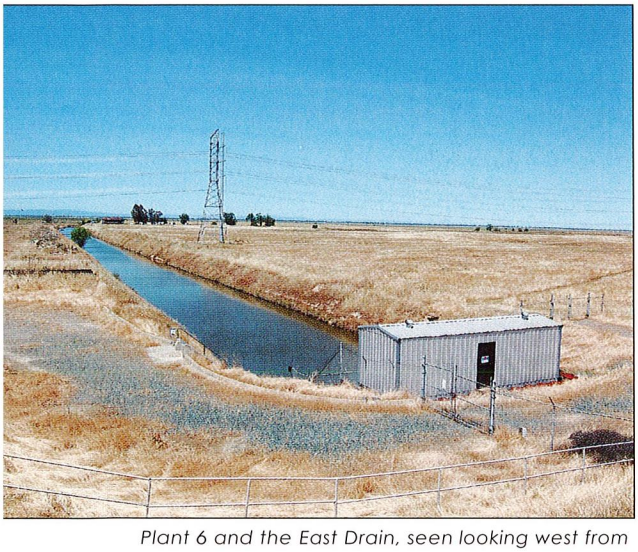
Consists of three 100 hp pumps. Constructed by Sacramento County to handle runoff from development of the Sacramento International Airport site.

Improvements

1986—Trash rack modified (paid for by Sacramento County)
1991—Switchgear building constructed

Future Improvements

Canal stabilization
Recommend plant be relocated back from the levee as part of the Natomas Levee Improvement Project.
May need additional capacity due to expansion and Federal Aviation Administration requirements.



Plant 6 and the East Drain, seen looking west from the East Levee road, was built in 1974 to handle runoff from a portion of South Natomas.

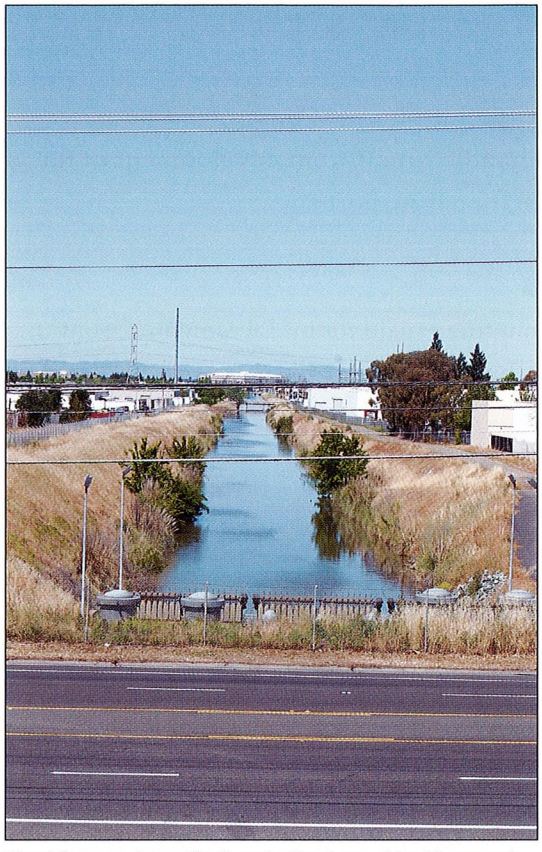
Plant No.	Year Constructed	Capacity
6	1974 Modified 1999	180 cfs

Remarks

Consists of one 125 hp, one 200 hp, one 250 hp, and one 300 hp pumps. The plant was constructed as the result of an agreement between the City of Sacramento and the District to handle runoff from a portion of South Natomas. Modified in 1999 to add 50 cfs capacity for North Natomas development.

Improvements

1993—Trash rack and debris removal modifications
1999—Added 50 cfs per NNCDP agreement



Plant 8, seen from Northgate Boulevard looking west on the C Drain with Power Balance Pavilion (formerly Arco Arena) in the background. Pumps are in the foreground.

Plant No.	Year Constructed	Capacity
8	1983 Modified 2001	779 cfs

Remarks

Consists of four 700 hp, two 500 hp, two 300, and one 200 hp pumps. Includes modifications in 2001 per the North Natomas Community Drainage Plan adding 230 cfs capacity for North Natomas development. Originally built to mitigate a portion of South Natomas development around Del Paso, I-80, and East Drain. Capacity added to replace the need for proposed Plant 7 near I-80. Most-used plant in the district due to location and ability to adjust discharge.

Improvements

1996/97—Added pipe manholes and recoated inside of pipes

2001—Completely new motor controls; added trash rake and added capacity (230 cfs)

Future Improvements

Replace electric motors with diesel for one or more pumps to provide pumping capacity during power outage

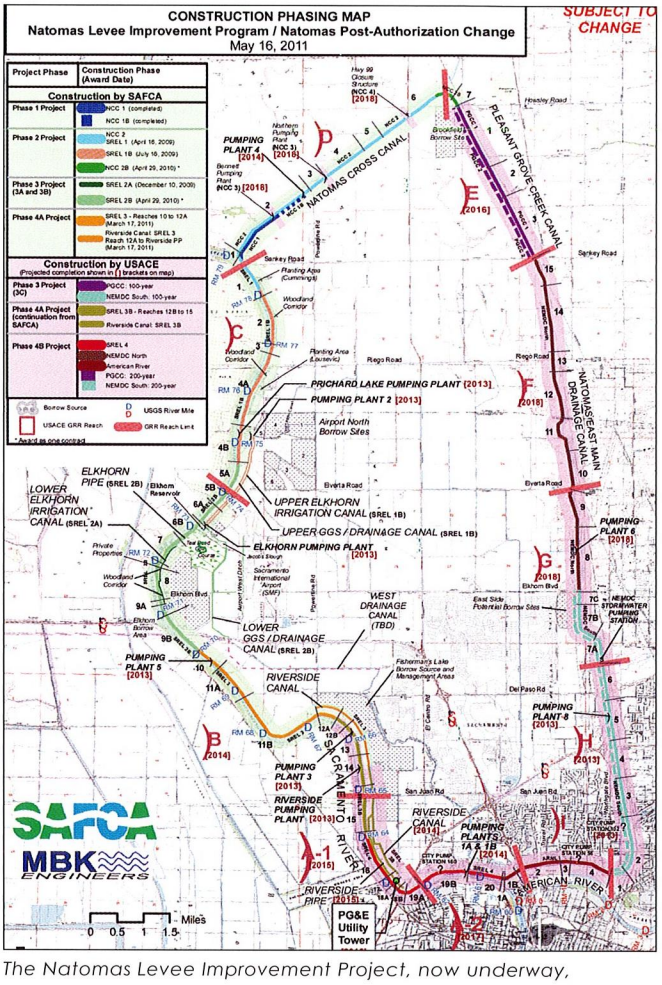
FACILITIES OVERVIEW TODAY

Levees

RD 1000's levee system consists of 42.6 miles of project levees encircling the district's fifty-five thousand acres. Project levees are those that are part of the 1,100 miles of federal levees in the Sacramento River Flood Control Project under the jurisdiction of the Corps of Engineers. The levee elevation ranges from thirty-nine to forty-four feet (USGS datum). In addition to the project levees, the district maintains approximately ten miles of non-project levees in the Pleasant Grove area, which it inspects and repairs on a regular basis throughout the year and patrols during periods of high water to safeguard against failure.

RD 1000 perimeter levees are undergoing the largest rehabilitation since their construction one hundred years ago. The $750 million Natomas Levee Improvement Project (NLIP), which began in 2007 and will continue until at least 2016, will provide the Natomas Basin with two-hundred-year flood protection. The project includes improvements to the entire perimeter levee system surrounding the district and a new "adjacent levee" for most of

Work on the Natomas Levee Improvement Project was moving quickly on July 25, 2011, after heavy spring rains.



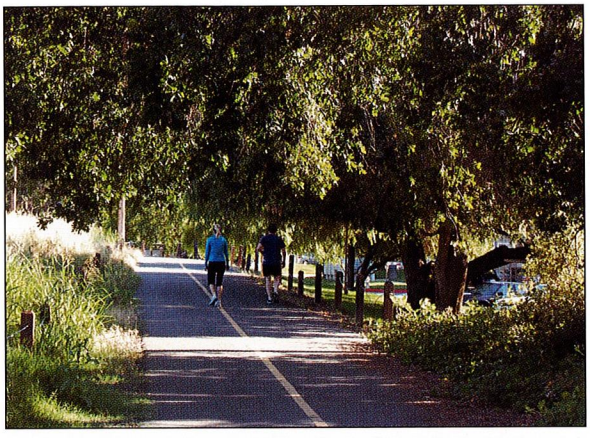
The Natomas Levee Improvement Project, now underway, is the largest rehabilitation project in RD 1000 since the levees were built nearly one hundred years ago. (Courtesy of SAFCA)

the Sacramento River along the Garden Highway. It will include slurry walls, wider levees, landside berms, relief wells, and environmental enhancements such as woodland corridors, wetlands, and a giant garter snake canal to mitigate for project impacts on wildlife habitat. In the northern part of Natomas, the existing levees are being raised as much as three to five feet. Work began in 2007 on the Natomas Cross Canal and is proceeding south along the Sacramento River. It is expected to be complete to Power Line Road by the end of 2012. The remaining levee modifications along the Sacramento River south of Power Line Road, the American River, Natomas East Main Drain Canal, and Pleasant Grove Creek Canal will be constructed by the Corps of Engineers and will take several more years to complete.

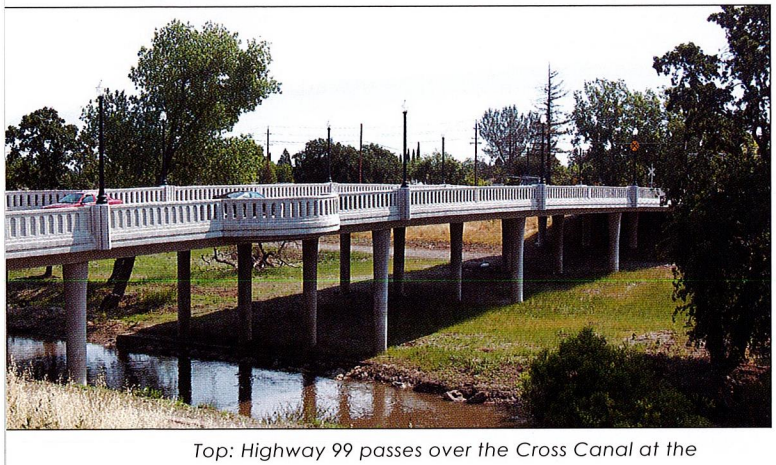
When the Natomas Levee Improvement Project is complete, the district will be responsible for maintenance of a significantly larger area of levees and berms. These new, larger levees will replace farmland that served as habitat for wildlife. While burrowing rodents pose a threat to levee integrity, that threat will have to be balanced with the need for an ecosystem that includes hawks who feed on rodents. SAFCA will maintain levee vegetation for three years to allow trees and native grasses to establish habitat. Hands-on maintenance will help establish the native grasses on the new levees, reducing the population of weeds that are less friendly to the ecosystem and do not provide the same root structure as native grasses. New criteria for levee maintenance will include long-term care for this new habitat.

Canals, Ditches, and Pumping Plants

The district operates and maintains a drainage system consisting of thirty miles of main drainage canals, about 150 miles of drainage ditches, and seven main pumping stations. The drainage system collects agricultural tailwater, stormwater, and drainage and delivers them to the pumping plants for disposal in the adjacent rivers and creeks. Development has replaced many of the small ditches with an urban storm drain system and detention basins, but most of the drainage eventually ends up in the district's main canals for pumping into the river.



The right bank of the Main Canal, which used to be a convenient disposal site for sediment removed from the canal, is now a popular bicycle/pedestrian path today.



Top: Highway 99 passes over the Cross Canal at the northern border of the district.

Bottom: The West El Camino Bridge crosses the Natomas East Main Drainage Canal, named Steelhead Creek by Natomas residents. The Western Pacific Railway tracks (now Western Union Pacific Railroad) that formed the east bank of the levee when it was built in 1912–1914 are still in use.

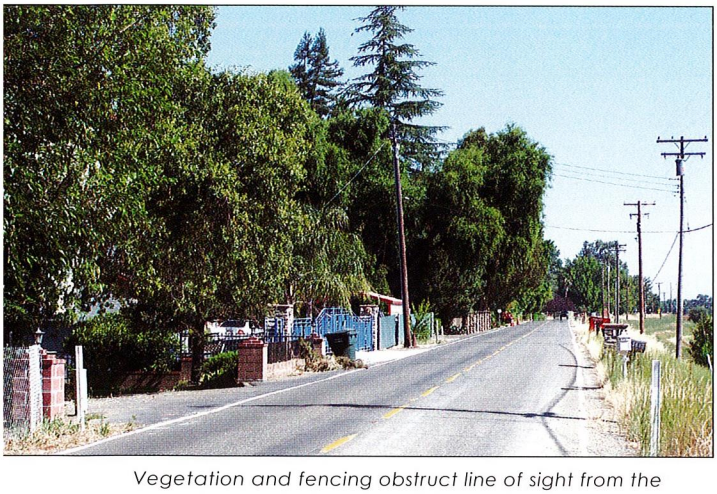
With urban development abutting the district's canals, there is a growing desire to use these open space corridors for hiking and biking trails. The district has worked with the City and County of Sacramento to accommodate these amenities where practical without compromising the flood control system. Agreements are in place providing that the owner of the trail (the City or the County) be responsible for operation and maintenance and assume all liability associated with its use. Experience has shown that these recreational amenities create safety hazards and constraints on the district's flood control maintenance activities. Also, during lean budget times, recreation funds at the City and County dwindle and maintenance of the trails may be deferred, further impacting the district's operations and maintenance responsibilities.

A new problem has emerged in the district's canals in the form of invasive plant species that threaten to clog the canals and block drainage. These include water hyacinth, coontail, and primrose. Whether they are introduced by urbanites through landscape plantings or from agriculture, these invasive species must be

treated annually with herbicide applications or the system will cease to function.

Garden Highway Waterside Parcels

The district has a unique section in Title 23 of the California Water Code entitled "Supplemental Standards for Control of Residential Encroachments in Reclamation District 1000." It allows for residential structures on the waterside of the Sacramento River levee along the Garden Highway. Through the years, the district and these waterside property owners have had a tenuous relationship as the district tries to balance the property owners' desire for privacy and security with its levee safety mission. Residents are drawn to this area because it abuts the river and provides a rural landscape in close proximity to downtown Sacramento. The district owns an easement to the low water mark in the Sacramento River, but fences, walls, gates, driveways, and landscaping have limited visibility and access to the waterside of the levee. Many of these encroachments have been permitted by the Central Valley Flood Protection Board (formerly the State Reclamation Board). During past high water events, residents protected belongings by moving them to high ground along the Garden Highway, which the district's patrollers also use to monitor the levees. With construction of the new "adjacent levee" under the Natomas Levee Improvement Project, some of these encroachments and patrolling conflicts will become less critical. However, the old Garden Highway levee is still an integral part of the flood protection system; the District, SAFCA, the Central Valley Flood Protection Board, and Corps of Engineers are working together to formulate policies for encroachments in light of the levee improvements now underway.



Vegetation and fencing obstruct line of sight from the Garden Highway to the Sacramento River.

Setting Assessments to Fund Maintenance and Operation

All reclamation districts operate under the California Water Code Division 15, Sections 50000 et seq., which governs the method by which valuations are set, as well as other aspects of district operation. The last valuation for properties in RD 1000 was performed in 1980.

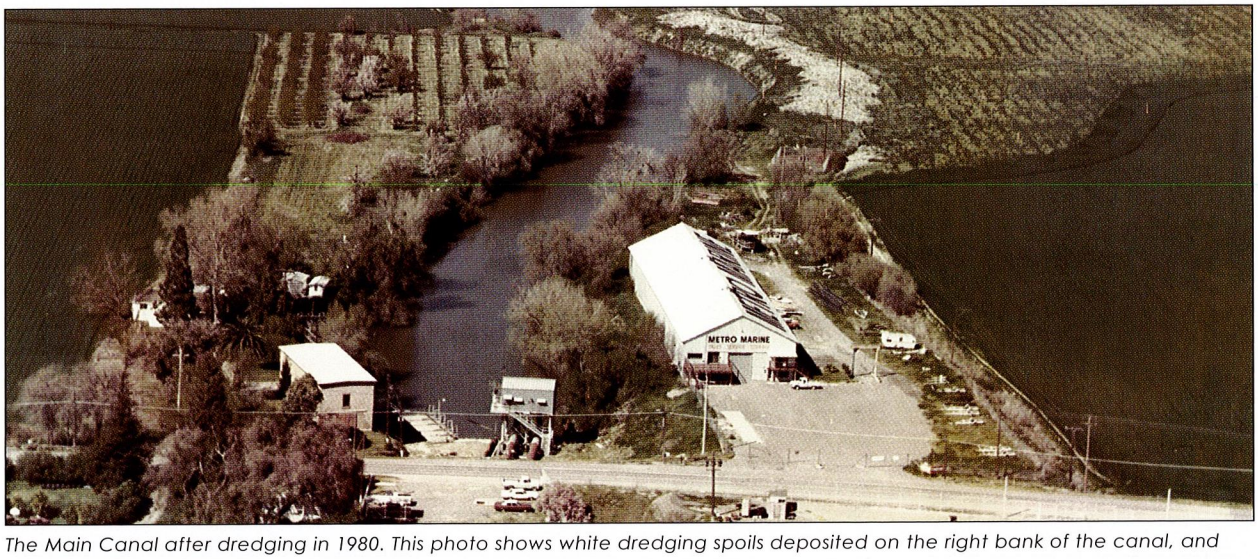
The District's Board of Trustees sets the assessment rate annually based on the operation and maintenance budget. The budget for fiscal year 2010–2011 was approximately $3.2 million. Assessments are apportioned to lots and parcels in proportion to the benefit they receive from RD 1000's operations. The basis for the assessments is described in an annual Reclamation District 1000 Assessment District Engineer's Report. Factors used to determine this relative benefit include parcel size, land use, elevation, and whether drainage is pumped by district facilities. Using these benefit factors and the rate set by the board, an annual Assessment Roll is created. All residential parcels of less than one acre pay a minimum assessment of $25 as pro-

vided by the Water Code.[2] As noted previously, both Sacramento and Sutter Counties include the district's assessment on the annual tax bills sent out to property owners.

Future funding and inevitable increases to the assessment rate to fund operation and maintenance will be more challenging. In 1997, California voters approved Proposition 218, amending the state constitution, with the effect of requiring that future increases in assessments must be approved by a vote of property owners in the district. This further solidifies the district's need to establish a relationship with the community so they understand and appreciate the district's critical role in protecting the lives and properties of those who live and work in Natomas.

RD 1000's challenges will include preserving habitat for an abundance of waterfowl and other wildlife that inhabit its canals and levee banks. Great egret and great blue heron hunt for fish; wood ducks rely on the open waterway as well as sheltered areas. Several hawk species such as the Swainson and white-tailed kite rely on trees near canals and levees for nesting and hunting.

Great Egret (Charlie Willard Photo)

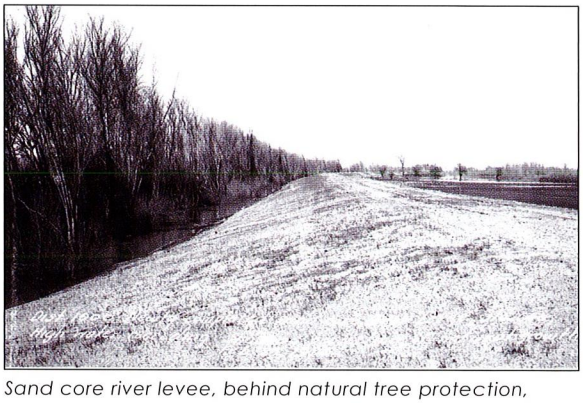


The Main Canal after dredging in 1980. This photo shows white dredging spoils deposited on the right bank of the canal, and was probably taken about a year after the dredging was complete. (RD1000 Collection)

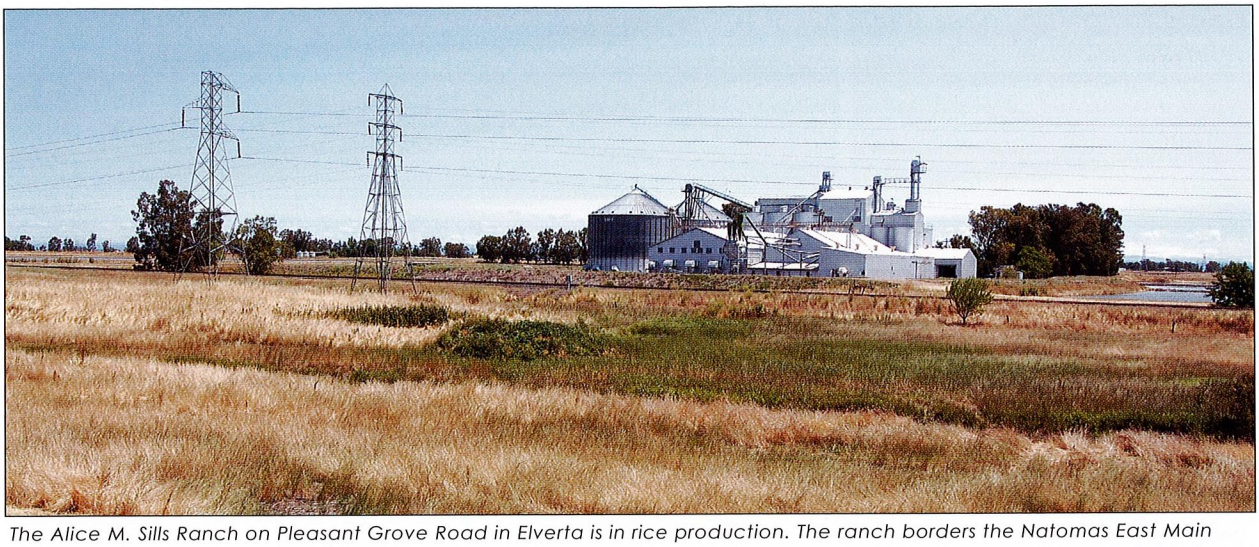
Left: Wood Duck (Charlie Willard Photo)
Top right: Great Blue Heron (Charlie Willard Photo)
Bottom right: White-Tailed Kite (Charlie Willard Photo)

RD 1000's Evolving Role

The photographer noted "natural tree protection" in this shot of a sand core river levee, February 17, 1914. In recent years, the Corps of Engineers' standards for levees require the removal of all trees and shrubs from the entire levee and fifteen feet on either side to improve visibility and access, and to address risks of tree roots creating seepage paths or possibly being uprooted in a flood, leaving a hole in the levee. RD 1000 and other flood control interests primarily in California have expressed their doubts about the risks posed by trees and other vegetation on the levee, especially in comparison to other risks for levee failure such as seepage, overtopping, or erosion. Studies are underway to determine what role vegetation plays in levee safety so that a reasonable approach can be forged balancing habitat values with levee safety goals. RD 1000 will be at the center of this debate because the Natomas Levee Improvement Project is the first flood control project to spend federal funds following the Corps' mandate to remove vegetation from levees.



Sand core river levee, behind natural tree protection, February 27, 1914. (RD 1000 Collection)



The Alice M. Sills Ranch on Pleasant Grove Road in Elverta is in rice production. The ranch borders the Natomas East Main Drain Canal.

Preparing for planting in Sutter County, 2011.

Joe Perry's Garden Highway Gardens produces crops for sale at farmers' markets and at his farm stand on El Centro Road.

The District has struck partnerships with other organizations sharing the Natomas landscape, such as the Natomas Basin Conservancy (NBC) and Natomas Central Mutual Water Company (NCMWC). Through informal agreements, the NBC will store excess runoff on its properties during extended periods of intense rainfall. The District and NBC share resources where possible such as access roads, gates, and drainage facilities. The District and the NCMWC have entered into a more formal arrangement that allows for the sharing of certain critical facilities allowing for the recirculation of water in the District's canals for use on agricultural properties, conserving water, and reducing the District's pumping costs. Recently the district, NBC, and NCMWC have partnered on security service for properties and facilities.

The Future

Despite the challenges facing the District as we move into our second century, our public safety mission remains our first commitment. In one hundred years, there has *never* been a levee failure in Natomas. The world saw the consequences of a catastrophic flood in an urban American setting in New Orleans in 2006. Our sole purpose and function is to monitor, operate, and maintain the levees and flood control infrastructure protecting the one hundred thousand people in the Natomas basin, ensuring that the system is ready for the coming flood season and for the next one hundred years. We always hope for the best, but we are prepared for the worst.

RD 1000 staff, 2011: (front row, from left) Paul Devereux, general manager/district engineer; Michael Blickle, district superintendent; Terrie Figueroa, district secretary/clerk of the board; Jose Ramirez, field crew; Jay Hendricks, field crew; (back row, from left) Umberto Gutierrez, field crew; Ronald Peterson, field crew; Tony DelCastillo, field crew; and Donald Caldwell, district foreman.

LEADERSHIP THROUGH THE CENTURY

Trustees

Frank H. Bennett	5-1911 to 1-1921
Newton Cleaveland	5-1911 to 7-1912
Emery Oliver	5-1911 to 4-1919
Paul K. Yost	7-1912 to 5-1914
Elwood M. MacKusick	5-1914 to 5-1915
Fred W. Kiesel	5-1915 to 12-1933
Eugene A. Boyd	9-1949 to 8-1979
Fred L. Martin	5-1921 to 12-1934
Thomas McCormack	4-1929 to 8-1949
George J. Meister	1-1935 to 9-1968
Robert G Pearson	12-1933 to 1938
Thomas B. Sills	8-1944 to 10-1970
Manuel Barandas	10-1968 to 10-1997
Daryl Lauppe	12-1975 to 11-1991
James F. Bennett	9-1955 to 11-1982
Lorris Lauppe	9-1955 to 11-1975
James Sopwith	12-1982 to 8-2003
Richard Willey	11-1970 to 11-1991
Daryl Lauppe	12-1975 to 11-1991
Grant Chappel	9-1979 to 1-1986
Leland Spangler	3-1986 to 5-1988
Bill Christophel	6-1988 to 2-2001
Tom Barandas	12-2003 to Present
Jon Chase	4-2001 to 7-2005
David Christophel	6-2001 to Present
Jonathon Cohen	11-1991 to 2-1998
Amy T. Dean	11-1996 to 2-2003
Thomas Gilbert	11-1993 to Present
Frederick Harris	5-1998 to Present
Norma Latham	11-1993 to 9-2001
Alan Lauppe	12-2003 to 9-2008
Jim Miller	11-2001 to Present
Mary Ose	1-1991 to 9-1996
John Shiels	12-2005 to Present
Pietro Saviotti	11-1997 to 3-1999
Jerome Smith	11-2008 to Present
Ray Tretheway	5-1999 to 4-2001

Secretary

Irving D. Gibson	1-1912 to 2-1912
Charles F. Metteer	2-1912 to 7-1913; 11-1918 to 12-1918; 5-1923 to 7-1947
John F. Downey	1-1955 to 6-1955
Bernard E. Gilmore	7-1955 to 12-1955
Robert Parker	6-1956 to 7-1959
John J. Reynolds	1-1961 to 6-1961
Marion W. Hanson	6-1961 to 12-1963
Kathryn Yockers	1-1965 to 4-1965
Louise Inderkum	5-1965 to 1-1985
Karoline S. Meyers	2-1985 to 2-1989
Terrie Figueroa	2-1989 to Present

Note: In the early days of the District's history, the positions of Attorney and Secretary were often filled by the same person.

Attorney

Devlin & Devlin	5-1911 to 5-1919
John T. Pigott	7-1913 to 11-1918; 12-1918 to 5-1923 (elected attorney and secretary 7-1919)
Downey, Brand, et al.	8-1947 to 2006
John F. Downey	8-1947 to 12-1978
George Bayse	1960s & 1970s
John Hamlyn	1970s
James M. Day	1-1979 to 9-2006
Day, Carter, Murphy LLP	
James M. Day	9-2006 to Present

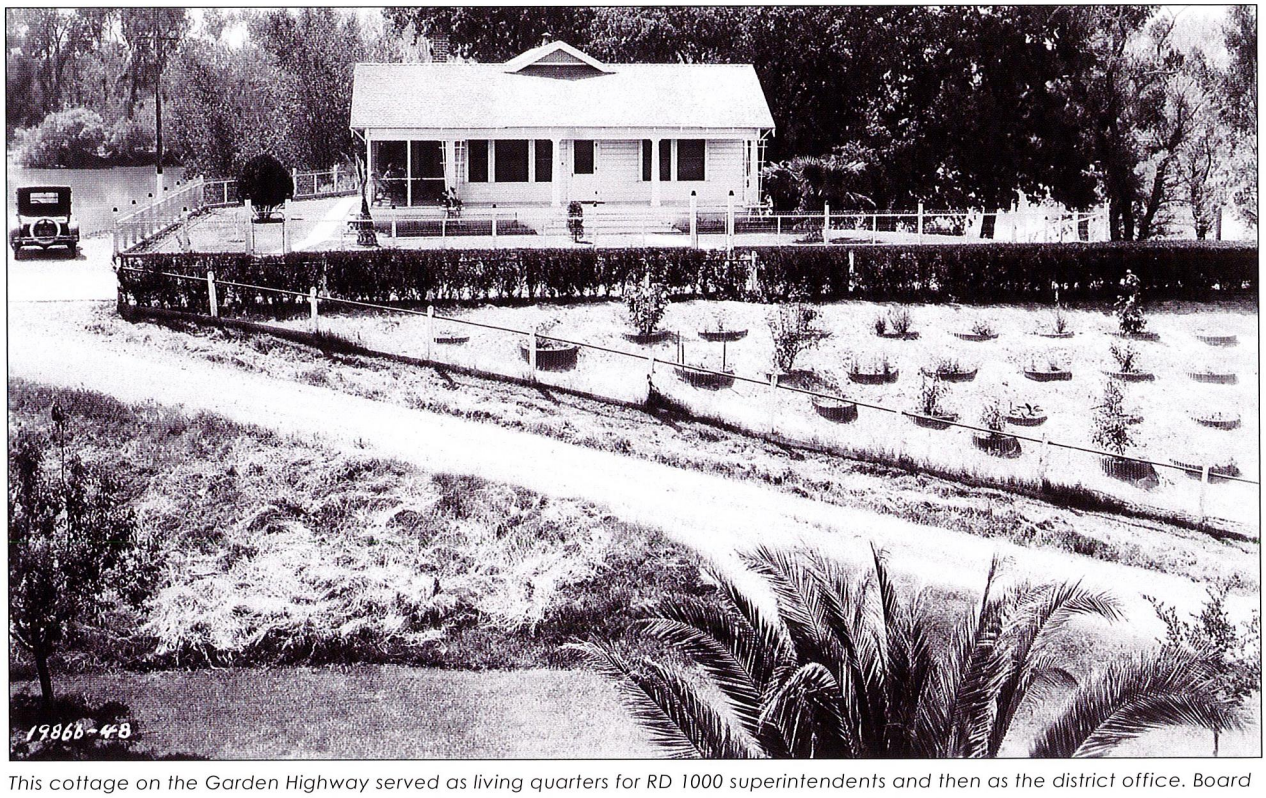
District Engineer

Norton Ware	1-1912 to 6-1912
Harry E. Croff, Acting	5-1912 to 9-1912; 6-1913 to 1-1914; 5-1924 to 5-1927
R.eginald G. Clifford	2-1914 to 5-1924

Hugh R. Edwards	5-1927 to 2-1928
John Taresh	2-1918 to 8-1932; Superintendent 8-1932 to 12-1939
Louis F. Vaile	1-1939 to 5-1950
Laugenour & Meikle, Consulting Engineers	2-1962 to 5-1976
Kenneth C. Laugenour, Kenneth Lerch, and Richard Jenness	
Tom Betts	3-1976 to 8-1984
J. N. Clifton	8-1984 to 12-2005
Paul T. Devereux	4-2006 to Present

Superintendent

George Manassero	6-1950 to 5-1955
P. J. Fitzpatrick	5-1955 to 8-1975
Wennberg	9-1975 to 4-1982
David Canoy	5-1982 to 7-1985
Thomas Redmond	8-1985 to 3-1986
William Falloon	4-1986 to 7-1990
Michael J. Blickle	8-1990 to Present



This cottage on the Garden Highway served as living quarters for RD 1000 superintendents and then as the district office. Board meetings have been held here since 1955. (Courtesy of the California History Room, California State Library, Sacramento, California)

Notes

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2. Robert Kelley, *Battling the Inland Sea: Floods, Public Policy, and the Sacramento Valley*, University of California Press, 1989, p. 37.

3. Kelley, p. 204.

4. Kelley, p. 277.

5. Antonia Castaneda et al., "Natomas Company, 1851–1984," unpublished manuscript, prepared under the direction of the Sacramento History Center, James E. Henley, executive director for Natomas Company, August 1984, p. 233.

6. Kelley, p. 282.

7. Kelley, p. 289.

8. United States, *Statutes at Large*, IX, chap. LXXXIV, 519–520.

9. Castaneda, p. 232.

10. Kelley, p. 48.

11. Castaneda, p. 234.

12. Kelley, pp. 60–61.

13. Ibid., p. 61.

14. William Hammond Hall, Report of the State Engineer to Legislature of California 23rd Session, Part III (Sacramento: 1880).

15. 27 stat. 507, codified 33 U.S.C. 661.

16. Ibid., p. 283.

17. Ibid., p. 289.

18. LAFCO Municipal Service Review and Sphere of Influence Update, Reclamation District No. 1000 (Natomas Basin), LAFCO 14-08, February 2010.

19. Kelley, p. 5.

20. Silsbee, p. 374.

21. Kelley, p. 203.

22. Yolo Causeway, photographic print, postcard, 1916, California State Library, California History Room, retrieved June 18, 2011 from http://sacramentohistory.org.

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1. Silsbee, p. 314.

2. This description of the Natoma Company is excerpted from *The Legacy of Natomas: A Company Story*, Ann Rhea and Ralph Rhea, produced in conjunction with the Folsom Historical Society for the Folsom History Museum, May 2003.

3. Castaneda, p. 245.

4. Center for Sacramento History, Natomas Collection, Report on American Basin Reclamation of Natomas Consolidated of California, October 15, 1910, Stephen E. Kieffer, pp. 2–3.

5. Ibid., p. 3.

6. Silsbee, p. 313.

7. Castaneda, p. 245.

8. Silsbee, p. 313.

9. Castaneda, p. 247.

10. Silsbee, pp. 309–310.

11. Extracted from Engineer Norton Ware's 1912 report to trustees of RD 1000, who presented it to the Sacramento County Board of Supervisors, RD 1000 Board Minutes, February 6, 1912, p. 58.

12. Center for Sacramento History, Natomas Collection, Natomas Consolidated, Report of J. G. White, 1907, pp. 40–41.

13. Ibid., pp. 43–45.

14. Castaneda, p. 242.

15. RD 1000 Board Minutes, May 18, 1912, pp. 141–49.

16. Silsbee, p. 372.

17. Castaneda, p. 253.

18. Ibid., p. 243.

19. Ibid., p. 244.

20. James Henley, ed., *Sacramento History Journal of the Sacramento County Historical Society*, vol. VI, no. 1, 2, 3 & 4, p. 199.

21. *Press Reference Library*, Western Edition, vol. II, International News Service, 1915, p. 400.

22. Silsbee, p. 373.

23. RD 1000 Board Minutes, 1912, vol. 1, third of three initial unnumbered pages.

24. William L. Willis, *History of Sacramento County*, Historic Record Co., 1913, p. 438.

25. Walter G. Reed, *History of Sacramento County, California With Biographical Sketches*, Historic Record Co., Los Angeles, CA, 1923, p. 510.

26. Willis, p. 438.

27. Castaneda, p. 246.

28. *History of the New California*, vol. 1, Lewis Publishing Company, 1905, p. 371.

29. "Flood Control and Reclamation in California" paper, annual meeting of National Drainage Congress, Cairo, Ill., January 20, 1916.

Chapter Three

1. *Sacramento Bee*, "Natomas Company Builds First Unit of New Road," July 28, 1925, p. 18, cols. 1–4.

2. Silsbee, vol. 7, pp. 373–74.

3. Ibid., p. 326; Castaneda, p. 254.

4. Castaneda, p. 249.

5. Silsbee, p. 418.

6. *Report and Plans for Reclaiming the Lands Within Reclamation District No. 1000 with Estimates of Cost of Construction also Cost of Maintenance, Operation and Incidental Expense*, Norton Ware, District Engineer, February 2, 1912, RD 1000 Board Minutes 1912, p. 1.

7. Silsbee, p. 422.

8. Ibid., p. 328.

9. Ware, *Report and Plans*, p. 12.

10. Castaneda, p. 254.

11. Silsbee, pp. 324–25.

12. Castaneda, p. 251.

13. Alice Artz, family history submitted to the Natomas Historical Society, p. 6.

14. Silsbee, pp. 326–27.

15. Ibid., pp. 358–59.

16. *Sacramento Bee*, July 28, 1925, p. 17, cols. 3–4.

Chapter Four

1. *Sacramento Bee*, July 28, 1925, p. 17, cols. 3–4.

2. Silsbee, p. 356.

3. Castaneda, p. 274.

4. Ibid., p. 273.

5. Oral history of Manuel Costa, interviewed by Ed Witter, Patty Gregory, and Charlie Duncan, September 21, 1989, held by the Natomas Historical Society, Sacramento, California, p. 16.

6. Portfolio, Natomas Land Reclamation District 1000, Natomas Company of California, Sacramento, Cal., California History Room, California State Library.

7. Castaneda, p. 274.

8. *Natomas News*, May–June 1911, Center for Sacramento History, Natomas Collection.

9. "Natomas District: One Big Family, Where the Neighbors Seemed More Like Aunts and Uncles than Neighbors" by Georgina M. "Jimmie" Miller, for History 299, Independent Research, Professor Shattuck, California State University Sacramento, December 18, 1985, transcribed for the Natomas Historical Society by Ed Witter, p. 10.

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11. *Sacramento Bee*, October 15, 1924, p. 17, cols. 1–2 and p. 20, col. 5.

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13. Oral history of Burton Lauppe, interviewed by Anne Ofsink, March 31, 2001, held by the Natomas Historical Society, Sacramento, California, p. 1.

14. Oral history of Burton Lauppe, p. 5.

15. RD 1000 Board Minutes, May 1940, p. 390.

16. Castaneda, p. 287.

17. Oral history of Burton Lauppe, p. 11.

18. Oral history of Virginia Bennett Harder, Interviewed by Anne Ofsink, March 31, 2001, held by Natomas Historical Society, Sacramento, California, p. 8.

19. Castaneda, p. 287.

20. Interview with David Christophel, Sacramento, California, June 22, 2011.

21. Oral history, Virginia Bennett Harder, p. 9.

22. Oral history, Manuel Costa, interviewed by Ed Witter, August 1989, held by the Natomas Historical Society, Sacramento, California, p. 6.

23. Ed Witter, Ed Witter Collection, Center for Sacramento History, commentary accompanying photo 1999-074-0036.

24. Interview with Tom Barandas, Sacramento California, June 3, 2011.

25. Interview with Joaquin Perriera, Sacramento, California, May 31, 2011.

26. Interview with Gene Inderkum, Sacramento, California, June 14, 2011.

27. Minutes, RD 1000 Board of Trustees, November 23, 1916, p. 117.

28. Castaneda, p. 292.

29. Silsbee, pp. 353–55.

30. Ibid., pp. 360–61.

31. Ibid., p. 354.

32. Oral History, Manuel Costa, August 1989, p. 6.

33. Interview with Tom Barandas.

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1. RD 1000 Board Minutes, February 18, 1921, p. 9.

2. RD 1000 Board Minutes, December 24, 1918, p. 84.

3. Board Minutes, May 22, 1922, Min. Bk., pp. 23–24.

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5. Interview with Mary Inderkum, May 19, 2011.

6. RD 1000 Board Minutes, December 29, 1937, p. 201.

7. RD 1000 Board Minutes, February 25, 1938, p. 13.

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10. RD 1000 Board Minutes, January 26, 1940, p. 333.

11. RD 1000 Board Minutes, March 28, 1940, p. 356.

12. RD 1000 Board Minutes, May 1, 1940, p. 38.

13. *Sacramento Bee*, December 28, 1955, p. 1, col. 7, 8.

14. Oral history of Phil "Fitz" Fitzpatrick, interviewed by Ed Witter, October 6, 1989, held by the Natomas Historical Society, pp. 22–23.

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4. RD 1000 Board Minutes, August 12, 1955, p. 3534.

5. RD 1000 Board Minutes, February 24, 1956, p. 3566.

6. RD 1000 Board Minutes, January 19, 1961, p. 4041.

7. 1992 Cal. Stats. Ch. 842, codified at Cal. Wat. Code § 50780 *et seq.* (Deering 2010).

8. RD 1000 Board Minutes, January 24, 1961, p. 4055.

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12. RD 1000 Board Minutes, December 10, 1965, p. 4588.

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17. RD 1000 Board Minutes, August 9, 1963, p. 4350.

18. RD 1000 Board Minutes, October 11, 1963, p. 4370.

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20. Interview with Jim Clifton, RD 1000 district engineer, retired, Sacramento, California, June 28, 2011.

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22. South Natomas Community Plan, p. 3, retrieved July 28, 2011, www.sacgp.org/documents/05_Part3.09_SouthNatomas.pdf.

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1. National Oceanic and Atmospheric Administration, retrieved July 28, 2011, http://www.hpc.ncep.noaa.gov/research/California_major_rains_files/Page368.htm.

2. Interview with Jim Clifton, Sacramento, California, June 28, 2011.

3. *Comstock's Magazine*, "Regional Focus: February 2011," retrieved July 6, 2011, http://www.comstocksmag.com/Archive/0211_RF_A-River-Runs-Through-It.aspx.

4. Sacramento Area Flood Control Agency, retrieved June 1, 2011, http://www.safca.org/.

5. Interview, David Christophel, June 22, 2011.

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1. Castaneda, p. 233.

2. Reclamation District 1000 Assessment District Engineer's Report, June 2011, fiscal year 2011–12, Engineer of Work: SCI Consulting Group, 4745 Mangels Boulevard, Fairfield, California.

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About the Author

Karen Wilson is a journalist and former magazine publisher and editor. She has written about the Natomas Levee Improvement Project for *N magazine*. She has also worked for an environmental agency in Sacramento. She lives in Newport, Oregon.


KOMATSU

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