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East Bay Municipal Utility District Oral History Series

Walter R. McLean

FROM PARDEE TO BUCKHORN: WATER RESOURCES ENGINEERING AND WATER POLICY IN THE EAST BAY MUNICIPAL UTILITY DISTRICT, 1927-1991

With an Introduction by
James V. Zeno

Interviews Conducted by
Ann Lage
in 1991

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Oakland Tribune
2/11/01

In Honor of
MCLEAN

WALTER R. MCLEAN, passed away peacefully at home on Thursday, February 8, 2001 surrounded by family, friends and devoted caregivers. He was 97. Born in Boderick, California on July 16, 1903, he jad been a resident of San Leandro since 1932.

He reached a milestone few achieve; he spent 53 years working for EBMUD. During forty of those years he was a supervising engineer involved in major projects that brought water to the Bay Area. He served another 12 years on the District's Board of Directors. One of his early challenges was working on the Pardee Dam where there now is a McLean Conference Hall commemorating his contributions. He often spoke of his affection for the District, saying that "he didn't know any place with such fine people." After retiring he continued his career as a consultant.

Mr. McLean left school at an early age to support his widowed mother but, as an adult, continued his education at the University of California Berkeley. Over his long career, he earned the esteem of his peers in the American Society of Engineers, American Public Work Association, East Bay Engineers Club, and was awarded a lifetime membership in the American Water Works Association.

Besides his work, "Mac" had other passions in his life. During the years his 3 sons were growing up, he was involved in many projects for the Boy Scouts of America anf their summer camp. In addition, Mr. McLean was active in San Leandro City affairs participating in the planning of the San Leandro Marina.

Walter is survived by his daughters Phyllis Click and Claudette Rogers, his sons Bruce McLean and James McLean. He also had 10 grandchildren and 5 great grandchildren. He was predeceased by his son Donald, killed during WWII, his son Dick and his wives Margaret and Lila. Three loving caretakers brought joy and comfort to his last years; Adona Celestial, Elizabeth Galo, and Jose Luzurgia. His last night on this earth was spent listening to some of his favorite music, singing, and eating a bowl of icecream.

He will be sorely missed by his numerous friends, colleagues, hunting buddies, community members, and extensive family.

Friends are invited to call at Santos Robinson Mortuary, 160 Estudillo Ave., San Leandro between 4:00 and 8:00 PM Monday, February 12.

Services are scheduled for 11 AM, Tuesday, February 13 at First Presbyterian Church of San Leandro, 180 Estudillo Ave. Interment will be private in Sacramento.

Contributions can be made in his memory to the Boy Scouts of America.

SANTOS-ROBINSON MORTUARY
SAN LEANDRO, CA
510-483-0123

Walter R. McLean, 1990

Photograph by Bordanaro & Zarcone

Cataloging information

McLEAN, Walter R. (b. 1903) Water resources engineer

From Pardee to Buckhorn: Water Resources Engineering and Water Policy in the East Bay Municipal Utility District, 1927-1991, 1993, ix, 330 pp.

Pioneer San Francisco family; youth in Sacramento, California; work conditions and construction techniques for H. M. Byllesby Company's El Dorado Hydroelectric Project, 1923-1927; civil engineer and projects manager for East Bay Municipal Utility District (EBMUD), 1927-1968: building Pardee Dam, Mokelumne Aqueducts, Bay Area water works, supervising construction of sewage disposal facilities, recreation areas, dam and aqueduct projects of 1950s-1960s; recollections of supervisors, coworkers, management policies at EBMUD; member, EBMUD board of directors, 1979-1990: water supply policies, water conservation projects, internal policies, board and district management; designing a Honduran shrimp farm and other work as a consulting engineer, 1970s-1980s.

Introduction by James V. Zeno.

Interviewed 1991 by Ann Lage for the East Bay Municipal Utility District Oral History Series. Regional Oral History Office, The Bancroft Library, University of California, Berkeley.

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INTRODUCTION--by James V. Zeno

Walter R. McLean ranks as one of the nation's foremost civil engineers specializing in water resources development.

His distinguished career embraces fifty-three years of dedicated service to the East Bay Municipal Utility District, plus fifteen years as a consultant to water related projects in the United States, South America, and Africa.

McLean's forty-one years on the engineering staff of EBMUD spanned the period 1927-1986, during which most of the foundation facilities of the water district were created. Among the projects bearing the McLean touch are the Pardee Dam; the First and Third Mokelumne Aqueducts; Upper San Leandro Reservoir and filter plant; Briones Dam; and the Lafayette Tunnel and Aqueduct. Indeed, as manager of both the Field Engineering Division and the Special Projects Construction Division, he was associated with or responsible for studies, design, construction, and development of all water and waste water facilities.

McLean faced mandatory retirement at age sixty-five from EBMUD in 1968. However, after completing his EBMUD employee status, McLean was neither "retired nor tired," as the reader will learn from this oral history treatise of the McLean Water Era. So, in 1969, McLean embarked on another career--this time in the private sector. He joined the civil engineering consulting firm Goslinger/McLean Associates, Inc., under the presidency of his son, Robert J. McLean.

From 1969 to 1991, his time was fully occupied on water projects on state and national levels plus participation in numerous volunteer events in the Bay Area.

He returned to EBMUD in the capacity of a public servant in 1979 after his election at the polls to the water district's board of directors. He was re-elected by the people twice and served three four-year terms. Combined with his forty-one years as a civil engineer district executive, this role as public servant rounded out his fifty-three years of service expertise to EBMUD.

As a Registered Professional Engineer (in California, Arizona, Nevada, Washington, and Oregon) McLean gained the high esteem of his professional peers. His other water resources membership credentials include:

Fellow, American Society of Civil Engineers (Life Member)
Consulting Engineers Association of California

Society of American Military Engineers
Past President, American Public Works Association (Life Member, Samuel Greeley Award)
American Water Works Association (Life Member)
California Water Resources Association
East Bay Engineers Club
Engineers Club of San Francisco
United States Committee on Large Dams

McLean's volunteer civil activities includes: board of directors, San Francisco Bay Area Council, Boy Scouts of America (presently, chairman of Properties Committee); Silver Beaver Award, Boy Scouts of America; Arthur Greulich Award, Camp Fire Girls of America; Society of California Pioneers; California Alumni Association, UC Berkeley; Commonwealth Club; Chairman of the San Leandro Shoreline Commission, whose feasibility studies led to creation of San Leandro Marina and Tony Lema Golf Course. McLean resides in San Leandro with his wife, Lila, where his other community services include: chairman, Board of Appeals; Cherry Festival board of directors; California Waterfowl Association; Ducks Unlimited; and numerous other organizations.

McLean still is an Izaak Walton devotee--his main hobby is hunting, and he is active in the administration of the Rich Island Duck Club and belongs to the Black Point Pheasant Club.

Walter Reginald McLean truly exemplifies the adage, "If you want to get a job done, give it to a busy man!"

James V. Zeno
Public Relations Consultant

March 1993
San Leandro, California

INTERVIEW HISTORY--by Ann Lage

Walter R. McLean's career in water resources engineering in California spans nearly three-quarters of a century. Fifty-three of those years were devoted to service to the East Bay Municipal Utility District [EBMUD]: from 1927 to 1968 as a civil engineer working on or managing a vast array of district projects, and, following his retirement, as a member of the district's board of directors from 1979-1991.

Shortly after Mr. McLean left the EBMUD board of directors, the district asked the Regional Oral History Office to conduct his oral history. Mr. McLean was an ideal candidate for an oral history memoir. At age eighty-eight, he had a remarkable memory and a raconteur's ease with the spoken word, recalling vividly his coworkers and details of dam, aqueduct, and tunnel construction from more than sixty years earlier.

At our initial session on a rare rainy day during an extended drought, Mr. McLean displayed his intense interest in current water policy by beginning his oral history with a discourse on the need for more water storage--the controversial Buckhorn dam project--in the East Bay. We then put current issues on hold and delved into the past for the next several of our ten interview sessions. Occasional interruptions for phone calls indicated that his interest in history coexists with a continuing involvement in the district's water supply and storage concerns.

Mr. McLean was born in 1903 in Sacramento. His father was member of a prominent San Francisco pioneer family, but after his death in 1907, McLean's mother struggled alone and with no financial resources to raise her son. McLean's story of his boyhood--how he dropped out of school at age fourteen to work full time, took care of his mother during her terminal illness, and put his life together after her death in 1921--is a compelling piece of social history, as well as an aid in understanding his subsequent life and career path.

He describes his assignments in the early and mid-twenties for the California State Highway Commission and H.M. Byllesby Company (predecessor to Pacific Gas and Electric Company) on survey parties, investigation teams, and dam construction in the Sierra Nevada and creates a picture of life in the field for engineering crews and construction workers. His detailed recollections of work on EBMUD's Pardee Dam and the first Mokelumne Aqueduct in the late twenties portray a bygone era in large dam construction.

In the 1930s and 1940s, Mr. McLean supervised district projects in the East Bay, including construction of the Orinda Filter Plant and a network of pipelines for water distribution. From 1945-1952 he was in charge of investigations and construction of the sewage collection and treatment facilities that ended the routine discharge of the area's raw sewage into San Francisco Bay.

In the late fifties and sixties, he participated in planning and building water facilities to accommodate projected population increases in the East Bay. As manager of the Special Projects Construction Division during these years, he oversaw construction of Camanche Dam, the Third Mokelumne Aqueduct, Briones Dam, the Lafayette Aqueduct and Tunnel, and the Walnut Creek Tunnel. His oral history recounts significant advances in construction techniques on these projects, as well as describing changes in district management policies and personnel during these years of growth and modernization.

Following his retirement in 1968 at the mandatory age of sixty-five, Mr. McLean built an active second career as an engineering consultant, serving as expert witness in lawsuits and advising on a variety of construction projects, from the BART tunnel in San Francisco to a shrimp farm in Honduras to a pipeline in Ghana. His consulting work continues to this day, at age eighty-nine.

In 1979 he was elected to the board of directors of the East Bay Municipal Water District. In the following twelve years, he brought to bear on board decisions his engineering expertise, his intensive knowledge of district facilities, and his firm belief that continued development of water resources projects is essential to California's future. In his oral history he speaks candidly and with conviction about the sometimes heated controversies regarding internal management issues, annexation decisions, and water supply and storage policies.

Mr. McLean was interviewed at his home in San Leandro on ten occasions from March to August 1991. The interview transcripts were lightly edited in this office for clarity and continuity and reviewed by Mr. McLean, who made some minor changes in wording and a few elaborations [noted by brackets]. In several instances during the interview, he had drawn hasty sketches to make clear design features and construction techniques he was describing. During the editing process he prepared, and we have included, several drawings to illustrate these sections of the transcript. Many of Mr. McLean's papers will be placed in the Water Resources Archive in O'Brien Hall at the University of California, Berkeley. The tapes of this oral history interview are in The Bancroft Library.

We are grateful to the East Bay Municipal Utility District for sponsoring this project. They have recognized the importance of preserving district history and documenting an important aspect of the history of water resources development, management, and policy issues in California.

For the introduction to this volume we want to thank James V. Zeno, public relations and media consultant who managed Mr. McLean's four election campaigns for the EBMUD Board of Directors.

The Regional Oral History Office was established in 1954 to record the lives of persons who have contributed significantly to the history of California and the West. One of its major areas of investigation has been the history of California's water resources; a listing of oral history interviews in this series follows. The office is a division of The Bancroft Library and is under the direction of Willa K. Baum.

Ann Lage
Interviewer/editor

June 15, 1993
Regional Oral History Office
The Bancfoft Library
University of California, Berkeley

June 1993

CALIFORNIA WATER RESOURCES

The following interviews have been completed by the Regional Oral History Office, a department of The Bancroft Library. The Office was established to tape record autobiographical interviews with persons who have contributed significantly to the development of the West. Transcripts of the interviews, typed, indexed, and bound, may be purchased at cost for deposit in research libraries.

Single Interview Volumes

Adams, Frank (1875-1967) Irrigation engineer, economist
Irrigation, Reclamation and Water Administration. 1959, 491 pp.

Banks, Harvey (b. 1910) Director, Dept. Water Resources
California Water Project, 1955-1961. 1967, 82 pp.

Downey, Stephen W. (1876-1958) Attorney
California Water and Power Attorney. 1957, 316 pp.

Durbrow, William (1886-1958) Manager, irrigation district
Irrigation District Leader. 1958, 213 pp.

Gianelli, William R. (b. 1919) Director, Dept. Water Resources
The California State Department of Water Resources, 1967-1973. 1986, 86 pp.

Harding, Sidney T. (1883-1969) Professor of Irrigation, UC Berkeley
A Life in Western Water Development. 1967, 524 pp.

Jones, Herbert (1880-1970)
California Government and Public Issues. 1958, 318 pp.

Lambert, Charles F. (1887-1959) Land promoter, irrigation district official
Sacramento Valley Irrigation and Land. 1957 376 pp.

Leedom, Sam R. (1896-1971) Newspaperman, water project administrator
California Water Development, 1930-1955. 1967, 83 pp.

Leopold, Luna B. (b. 1915)
Hydrology, Geomorphology, and Environmental Policy: U.S. Geological Survey, 1950-1972 and UC Berkeley, 1972-1987. 1993, 309 pp.

Mason, J. Rupert (1886-1959) Municipal bond broker
J. Rupert Mason on Single Tax, Irrigation Districts, and Municipal Bankruptcy. 1958, 372 pp.

McLean, Walter R. (b. 1903) Water resources engineer
From Pardee to Buckhorn: Water Resources Engineering and Water Policy in the East Bay Municipal Utility District, 1927-1991. 1993, 330 pp.

Robie, Ronald (b. 1937) Director, Dept. Water Resources
The California State Department of Water Resources, 1975-1983. 1989, 97 pp.

Taylor, Paul S. (1895-1984) Professor of Economics, specialist in reclamation
California Social Scientist. (Three volumes)
Volume I: Education, Field Research, and Family. 1973, 342 pp.
Volumes II and III: California Water and Agricultural Labor. 1975, 519 pp.

Multiple Interview Volumes

California Water Issues, 1950-1966. 1981, 458 pp.
(Goodwin Knight/Edmund G. Brown, Sr. Project)
Interviews with:
Edmund G. Brown, Sr. Attorney general, Governor of California
"The California Water Project: Personal Interest and Involvement in the Legislation, Public Support, and Construction, 1950-1966."
B. Abbott Goldberg Dep. Attorney General, Dep. Director, Dept. Water Resources
"Water Policy Issues in the Courts, 1950-1966."
Ralph M. Brody Attorney, manager of Westlands Water District
"Devising Legislation and Building Public Support for the California Water Project, 1950-1960; Brief History of the Westlands Water District."
William E. Warne Director, Dept. of Water Resources
"Administration of the Department of Water Resources, 1961-1966"
Paul R. Bonderson
"Executive Officer, Regional and State Water Pollution and Water Quality Control Boards, 1950-1966."

Save San Francisco Bay Association, 1961-1986. 1987, 220 pp.
Interviews with:
Barry Bunshoft, Esther Gulick, Catherine Kerr, Sylvia McLaughlin.

The San Francisco Bay Conservation and Development Commission, 1964-1973. 1986, 98 pp. (Reagan Era Project)
Interviews with:
Joseph E. Bodovitz, first executive director
Melvin Lane, first chairman
E. Clement Shute, Jr., first legal counsel representing the attorney general.

See also lists of interviews on Land-Use Planning and Sanitary Engineering in California.

1

BIOGRAPHICAL INFORMATION

[Na]me: Walter Reginald McLean

[D]ate of Birth: July 16, 1903

Place: Broderick, Yolo Co. California

[F]athers Name: Walter Reginald McLean

[O]ccupation: Plumbing Contractor

Birthplace: San Francisco May 14, 1881

Mothers Name: Sarah Jane Patterson

Occupation: Sales Lady Taunton Mass.

Spouse: Margaret E. McLean 1922-1970

Lila R. McLean 1972

children

Walter Donald McLean		1923	U.S. Air force Deceased
Phyllis Suzanne	"	1925	
Richaled Malcom	"	1926	Deceased
Robert James	"	1931	
Edward Bruce	"	1940	

Where did you grow up Sacramento California

Present Community San Leandro Since 1934

Education Sacramento J.C. - Civil
U.C. Berkeley Civil Engineering. Bus Ad

Occupation:

Consulting Engineer

Areas of Expertise:

Water Resources Projects
Waste Water "
Public Water Supply

Other ~~areas~~ Interests

Hunting - Fishing

Organizations

American Society of Civil Engrs Fellow
Life

PROLOGUE: THOUGHTS DURING A RAINSTORM IN A DROUGHT YEAR

[Interview 1: March 26, 1991]##[1]

[The first interview with Mr. McLean took place in March 1991 during a late-season rainstorm, which he was hopeful would mitigate the drought conditions. Before turning to historical matters, he spoke about water supply issues.]

Water Supply and Water Quality

McLean: The water year goes from October 1 to October 1. At the commencing of the water year, if we come up with 300,000 acre feet or more, then that's enough to carry us over into a normal year. It won't eliminate the drought completely, but it will give us a cushion for next year.

Lage: What if we don't have a normal year next year?

McLean: Well, then, of course, we will have to continue rationing. We're still in a drought. If they decide to take the American River water from the delta, that'll fill the local reservoirs. But when you use American River water out of the delta, you get into a lot of problems with turbidity and pollutants. That's the reason that you must put it into San Pablo and Upper San Leandro reservoirs, because they have filtration plants with sedimentation basins where you can treat the water from the delta source. You also put other organic material into the reservoirs, which takes a long time to eliminate when you return to the Mokelumne source. That's why the district shouldn't use the delta water if they can get by without it. The last time we used delta water was during the drought of '76, '77. It created a real problem. It took four or five years to really get the reservoirs back to normal with Mokelumne water.

[Another option would be to construct a treatment plant in the delta at the source of supply. This would require aeration

---

[1]This symbol (##) indicates that a tape or segment of a tape has begun or ended. For a guide to the tapes, see end of interview.

and large sediments. The plant would have to be large enough to treat at least 200 mgd (million gallons per day). This treated water could then be used at Orinda, Lafayette and the Walnut Creek filter plants, as well as the San Pablo, San Leandro and Briones reservoirs.

A treatment plant in the delta would be a very costly project requiring additional pumping, aeration, sedimentation and probably odor and taste control. It is much better to take the American River supply at the present proposed location on the Folsom South Canal and certainly less expensive, than in the delta.][1]

Lage: What happens to water quality if you use delta water? Does the water taste bad?

McLean: No, you get organic material with the turbidity. When you chlorinate, you create what they call trihelamethane, which is partly carcinogenic. This is one of the problems you create when you use delta water and then chlorinate that water because of the high pollution.

Lage: Do we not have to chlorinate the Mokelumne water?

McLean: Yes, you have to chlorinate because of public health regulations. But the Pardee Reservoir water, the water that comes from the Mokelumne River, has very low turbidity, practically zero, and the Orinda, Walnut Creek, Lafayette treatment plants have no sedimentation basins. The Mokelumne water is taken directly into those plants, and it's just as clear as crystal. The Mokelumne River water comes from a granitic watershed, and there is very little erosion. As a result, very little sedimentation comes into Pardee Reservoir. The water is extremely low in turbidity.

Lage: Tell me what turbidity is.

McLean: Well, turbidity is muddy water.

Lage: I see. Not pathogens?

McLean: No, the water is muddy from clays or soil that is in solution. It may occur during storms and in flood waters.

Lage: So that means they have sedimentation?

---

[1]Bracketed paragraphs added by Mr. McLean during editing process, 1/4/93.

McLean: That's right. When you get that in the local reservoirs, particularly local runoff that comes from streets and hillsides, it creates turbidity in the reservoir, and that's why we need a sedimentation basin at those treatment plants. Normally the Mokelumne water goes through filters directly into the system, with only a slight amount of chlorination. With the other reservoirs--San Pablo and Upper San Leandro--where you have turbidity, and it has to go through sedimentation basins, aeration, and the filters before it goes into the system, that generally requires a little more chlorine than with the Mokelumne water.

All of the water from the Mokelumne goes through the Walnut Creek, Lafayette, and Orinda filter plants. The Walnut Creek plant supplies all of San Ramon, Danville, and Walnut Creek. The Lafayette plant supplies Lafayette, Moraga, and Orinda.

Then the Orinda Filter Plant, which is our largest filter plant, producing around 200 million gallons a day of water, takes water directly off the Mokelumne Aqueduct, and that water goes directly into what we call the "aqueduct zone"--the west side of the hills. That's the zone that is below elevation three hundred, and it supplies everything from Richmond to San Leandro and a small portion of Hayward.

Lage: Now, what do San Pablo and San Leandro reservoirs supply?

McLean: The San Pablo and the Upper San Leandro, as a general rule during the peak summer, are only brought on-line in just very short periods of time to make up the excess daily demand in the aqueduct zone that Orinda can't supply. As a general rule, those plants really don't produce much water and are used only for make-up water. San Pablo and San Leandro reservoirs are more costly to operate because of the chemicals required to treat the water.

Lage: Oh, I see. And do they get Mokelumne water?

McLean: They can get Mokelumne water, but only by means of tunnels from upper San Leandro and San Pablo reservoirs.

Lage: Is that just local runoff, then?

McLean: That is local runoff plus surplus from the Mokelumne. Water can be diverted from the Mokelumne supply into both San Pablo and Upper San Leandro reservoirs. When consumption is low in the wintertime and the aqueducts are at full gravity flow, 200 mgd, the district has a pumping plant at Walnut Creek where we can increase the flow to 325 mgd. But the minute you push the button at Walnut Creek, you create a "load factor." If you only turn it on for one minute, you have created a load factor with PG&E [Pacific Gas and Electric], and you pay that for the entire year.

So you don't want to create this load factor unless you have to pump all the year. Normally there is no need to do any pumping for additional water. The three aqueducts will flow by gravity about 200 million gallons a day. During the wintertime, when consumption is low--say 160 mgd or less--the aqueducts are flowing at 200 mgd. So during the wintertime, if your demand is down, then you can put Mokelumne water into Upper San Leandro and into San Pablo. But you have to be careful, because if you get San Pablo and Upper San Leandro too full and then have heavy storms where there's a lot of runoff coming from the local watersheds, then you spill; you're wasting water. So it's a real balancing act. You have to do a lot guessing on the weather, etc. We have also had some lawsuits because of spill from both San Pablo and San Leandro reservoirs.

Lage: Who are the people who do that guessing?

McLean: Well, that is done by the Water Resources people and operations section. They are the ones responsible for operating the reservoirs and treatment plants. They have to be on the alert at all times. When I was talking to Wally Bishop the other day, they were putting water into San Pablo, and he told them, "Don't put in too much water, because we don't want to spill."

Lage: That would be terrible.

McLean: It's really all very interesting. Out at Willow Park in Castro Valley there's a golf course on San Leandro Creek, and we've had a law suit with René Viviani. He accused the district of filling Upper San Leandro Reservoir with Mokelumne water. Then in 1982 the local runoff from a series of heavy storms flooded him out and damaged the golf course. Many years ago on San Pablo Creek we had the same thing. People living along the creek had built terraces down close to the creek where they had a barbecue area, etc. San Pablo Reservoir had been filled with Mokelumne water, and then we got some heavy storms. San Pablo overflowed and washed out a lot of these improvised areas. The people wanted damages, because they accused us filling San Pablo with imported water "from the Mokelumne."

Lage: How did that come out?

McLean: The district paid some damages. So you have to be careful.

Rationale for Building Buckhorn Reservoir: Mitigating a Failure of the Aqueducts

McLean: As I say, it's a balancing act. In other words, when you have gravity flow, you like to fill the local reservoirs. That's one reason why the district needs to build Buckhorn Reservoir. We have Briones Reservoir, which is 567 feet elevation. We have to pump into that. We pump out of the aqueducts at Orinda and fill Briones Reservoir, which has a capacity of 63,000 acre feet.

Lage: Do you fill Briones before San Pablo?

McLean: It can be done in combination with San Pablo. The advantage of Briones Reservoir is that it is high enough in elevation so that if you have a failure of the aqueducts and have to shut everything off, then Briones Reservoir can supply the entire distribution system, not only the Walnut Creek Filter Plant but all the other facilities both east and west of the hills. Also, that's the only reservoir high enough to supply Lafayette, Moraga, Walnut Creek, and the San Ramon Valley--the area east of the hills.

Lage: Would that be used in the case of an earthquake also?

McLean: Yes, it could be. For instance, the Hayward fault goes through three of our tunnels: the Upper San Leandro, Claremont, and San Pablo tunnels. Many years ago, in 1931, we had a failure in the San Pablo tunnel. We had to go in and clean out the debris, and it took us a year to clean the tunnel and reline the area where the break occurred. You need reservoirs that are high enough to supply both east and west of the hills in case we had a serious earthquake that severed those three tunnels. Upper San Leandro, San Pablo, and the main supply that comes in from the Mokelumne comes through the Claremont tunnel. The Upper San Leandro tunnel comes through the hills right near the Oak Knoll Naval Hospital, where the tunnel comes from San Leandro Reservoir and serves the filter plant, which is just to the west of the Oak Knoll Hospital. The San Pablo tunnel comes from the San Pablo Reservoir; the west portal of it is in El Cerrito.

All of those tunnels are crossed by the Hayward fault. They were supposed to make a survey of the Claremont tunnel this year. Back in the sixties, when we did some work in the Claremont tunnel, we found the fault. When the tunnel was built we located the Hayward fault and put monuments in the tunnel on each side of the fault area, as I recall, about twelve or fifteen hundred feet into the tunnel from the west portal. And we found that the tunnel west of the fault had moved several inches north. In the bottom of the tunnel there are two brass monuments each side of the fault. Originally the tunnel was a tangent from portal to portal. When we surveyed the tunnel in the 1960s, we found that it had a true S curve, showing that the west portal of the tunnel had moved north about seven and a half inches.

Lage: But it didn't break?

McLean: No, it ruptured. It ruptured in the fault area. It didn't break, but it had exposed the reinforcing steel. This area was heavily reinforced when we built the tunnel. It was a very heavy reinforcement, and it had exposed the reinforcing steel. The tunnel itself was still intact. They were going to go in the tunnel and check the movement again this year. Our measurements show that the west side of the fault is moving north. This was in '62, and the tunnel was completed in 1929. That is thirty-three years, with seven and a half inches movement. [divides thirty-three years by seven and a half inches] It shows that it's moving about two hundredths of a foot every year. So it's now been from 1962 to 1991. [does more figuring] You multiply by twenty-nine, and that would show that it may have moved another 6 1/2 inches if the movement is uniform. If it has moved a half a foot since 1962, you may have a total movement of a little over a foot. So far it hasn't severed the tunnel. At San Pablo it actually crushed the tunnel, because where the failure occurred the tunnel was un-reinforced concrete. The failure actually crushed the tunnel; the crown and the roof had fallen in, and the sides were crushed.

San Pablo tunnel was plugged with the debris from the break. There was no water going through. We noticed this over a period of several years. The flow had kept decreasing yearly. Finally we went in to make an inspection. There was a shaft into the tunnel in Wildcat Creek in the Tilden Regional Park. The shaft goes down into the tunnel, and we put a hoist in the shaft so we could get into the tunnel. We tried to get to the break from the shaft, but the water was so deep that we couldn't get very far. We were able to get within about a thousand feet of the break. We finally went in from the west portal, and that took a long time, because we had to remove the outlet piping and everything.

We did a lot of extra work--a lot of grouting and repair work--while we were there. We spent a year on the repairs to the tunnel. We worked night and day, with three shifts a day, six days per week to clean that tunnel out. We lined two hundred feet with reinforced concrete where the break occurred and grouted several hundred feet of the original tunnel.

Lage: Let's finish this discussion, and then we have to go back to the old days. But you were explaining why we need the Buckhorn dam. Would that be another high elevation dam?

McLean: Yes. See, Buckhorn Dam is designed to be at elevation 760 [feet]. Water from the Lafayette Aqueduct would be pumped into Buckhorn Reservoir; that elevation is high enough to serve the area both east and west of the hills. It would contain 145,000 to 150,000 acre feet of water. With the other two reservoirs, Briones and Upper San Leandro, that would give us a capacity of over 200,000 acre feet. That amount of storage would be enough, with conservation, to provide a year's supply. This is in the event of a complete failure of all of the aqueducts across the delta. You would have nearly a year's supply of water that could serve both east and west of the hills by the means of Briones Reservoir and Buckhorn Reservoir.

Potential Failure of the Tunnels

Lage: What would we do if we had a failure of the tunnels?

McLean: Well, there you have two options. You have Chabot Reservoir, which is very small, San Leandro and San Pablo Reservoirs--and Buckhorn, if it is ever built. Chabot, San Pablo, and San Leandro would take care of the area west of the hills. The area east of the hills, you'd have to rely upon Briones Reservoir and Buckhorn. Briones is located east of the tunnel. Buckhorn Reservoir would supply both east and west of the hills through Chabot Reservoir. Also, if the aqueducts were intact, water could be put in both Briones and Buckhorn reservoirs. That could be done. You see, Chabot is a very small reservoir, but you could take water out of Chabot, chlorinate it, and then put it into the distribution system. There was no filtration plant when Chabot was in use; there were several Hyatt pressure filters for treating the water. Lake Chabot was built by Anthony Chabot in the 1880s, along with Temescal Reservoir, to supply the city of Oakland.

The treatment plants at both reservoirs had what was known as the Hyatt-type filter. They are a pressure filter--a big cylinder about eight feet in diameter and about twenty feet in length. They look like a big boiler, like a big sausage. Water comes in the top, and the cylinder is about half full of gravel and sand. Starting with a large gravel at the bottom, it gradually goes to a very small pea gravel at the top, and finally a foot or more of sand on top of that. That is the filter media. The collection pipes are at the bottom of the gravel. Basically, water comes in the top and goes out the bottom.

Lage: Goes through the sand and then the layers of gravel?

McLean: Yes. There were ten of these filters at Chabot. At Temescal there were five or six filters. And at Temescal there was a filter house on the north side of the dam. The water went out of a pipe at the base of the dam to the filter plant and into Oakland. That was in service when the utility district took over the old East Bay Water Company in 1929.

But to get back to what you asked: what would we do in an emergency? You'd have to look at the way the reservoirs are situated. Chabot is not connected by any tunnel to the system, but there is a pipeline out of Chabot that could be connected very rapidly to the system. And then we have the pipeline we built to supply the city of San Francisco with water from Lake Chabot.

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McLean: In case we had a failure of the tunnels and a complete loss of the Upper San Leandro, Claremont, and San Pablo tunnels, water from Chabot--even though it's at low elevation--could be put into the aqueduct zone. You need emergency pumps to serve the entire zone, because Chabot is at elevation 227, and that serves a large area. The capacity of Chabot is only 10,350 acre feet, but, water could be released from upper San Leandro Reservoir into Chabot, and then Chabot would have to be connected into the distribution system. That would mean some pipe work. So Chabot could be used in an emergency.

Now, Briones Reservoir is east of the Hayward fault. Briones would be used to supply water east of the hills in case of a failure of the tunnels. If all three tunnels failed, water from Briones would go through the Lafayette Tunnel, through the Lafayette Aqueduct, and through the Walnut Creek Tunnel to serve the area east of the hills. Briones has a capacity of 63,000 acre feet, and I think Chabot only has a capacity of 4,000 or 5,000. We also have Lafayette Reservoir, which is very small, 4,250 acre feet. It is at elevation 449 and could also be used to supply water east of the hills. These reservoirs would also serve the distribution system in the event of a failure of the aqueducts in the delta.

Lage: It sounds like the area east of the hills is better off.

McLean: That's right. That means that in the event of a failure of the tunnels, that water could go east, and the Chabot water could come west. That's the advantage of it. And also you could release water out of Upper San Leandro into Chabot. You have the capacity of Upper San Leandro, which is about 41,000 acre feet, and Chabot, which is 10,000; so you have 50 thousand acre feet that could be available to the local system. Then there is Lafayette and Briones, which could take care of the area east of the hills.

Lage: How long would the area west of the hills be able to be supplied with that water?

McLean: The mean daily consumption of the district is about 215 mgd, and the mean annual consumption of the district is about 240,000 acre feet. That means Chabot and Upper San Leandro supplies would only last for a short period.

If the aqueducts are in service, there is San Pablo and the Sobrante Filter Plant. You can take water out of San Pablo Reservoir through the Sobrante Filter Plant. San Pablo would supply Sobrante Filter Plant, which is about elevation 300. That could also supply the aqueduct zone. That's the area west of the hills. So you would have another 38,000 acre feet. Briones is 60,000 acre feet, San Pablo is around 38,000, Upper San Leandro is 41,000, Lafayette is about 4,000, and Chabot about 10,000. By going through the Sobrante Filter Plant, you could use San Pablo Reservoir on the north end of the system, Chabot at the south end of the system, plus storage in Upper San Leandro. Briones and Lafayette reservoirs would serve the area east of the hills. The Sobrante treatment plant is in operation. At Chabot you would have to make some pipe connections and maybe put in a pumping plant to serve the aqueduct zone. But that could be done in an emergency. Briones Reservoir doesn't need anything. Briones would supply both the Lafayette and Walnut Creek treatment plants.

Lage: Sounds better to live over on the east side.

McLean: Yes. You'd get 63,000 acre feet of water there, and that would feed directly into the system.

Buckhorn as an Emergency Facility

McLean: If you had a complete failure of the aqueducts by flooding of the islands, then the supply from Pardee Reservoir is cut off completely, and you'd have to rely upon local storage. The present capacity, which is about 155,000 acre feet, is only about one half of a year's supply. This is why you need at least double that amount of local storage, and this is why Buckhorn Reservoir is needed. The proposed Buckhorn Reservoir, at elevation 760, is high enough so that it can serve the system both east and west of the hills.

Lage: So you see it more as an emergency facility in case of a failure of the aqueducts than as a another way to expand the capacity?

McLean: That's right. Briones would be utilized only in an emergency and the same with Buckhorn. Buckhorn, because of its high elevation, you would fill and leave alone. It would have a very small drainage area, so there would be very little local runoff. Briones is the same. It has a very small drainage area, so it is not influenced by rains. They both get some rain water, but it's not enough to be concerned about flooding. Briones drains into San Pablo, and Buckhorn would drain into Upper San Leandro. Altogether there is nearly 200,000 acre feet of standby storage if Buckhorn is ever built. Buckhorn would have a capacity of 145,000 acre feet and Briones 60,000 acre feet. The reservoirs would remain full except for evaporation, which may normally be replaced by local runoff.

The other local reservoirs are used annually to take care of the peak summer demand. [referring to files] Briones is at elevation 576, Chabot is at 227, Lafayette is at 449, San Pablo is at 314, and Upper San Leandro is at 460. I don't think I have the elevation for the proposed Buckhorn. The elevation of the Walnut Creek tunnel is 390, and Briones is the only one high enough to get it through the Walnut Creek tunnel to serve the area over around San Ramon. That gives us 60,000 acre feet, which is not very much. That would last maybe six months serving Lafayette, Orinda, Walnut Creek, Danville, and San Ramon.

Chabot, as I said, is 227 feet. The aqueduct zone, of course, is around 300. You could get it into the lower elevations by gravity. But San Pablo will go into the aqueduct zone. Upper San Leandro, of course, goes in the aqueduct zone. To take care of the summer demands and emergencies, you need more storage. This is what we have emphasized. Unfortunately, there has been a lot of opposition to building Buckhorn Reservoir. They say that we don't need it. But you can't operate without storage.

I FAMILY AND EARLY LIFE IN SACRAMENTO

Scottish Roots: The Maclean Clan##

Lage: Let's turn now to family history and your own early history.

McLean: Here you are [shows a picture of the chief of the clan, Lord Charles MacLean]. His son, Sir Lacland Maclean, is now chief of the clan.

Lage: Duart Castle. And the chief of the clan spelled it Maclean.

McLean: That's correct; that is the correct spelling of our clan. By the way, I have met personally with him. In fact, all of my family have been to Duart Castle. Several years ago, my daughter was over there, then my sons went, and then my wife and I went. We visited the castle and met the chief of the Maclean clan, Sir Charles. We've corresponded ever since. The day that I went to the castle--well, when we arrived at the hotel where we were staying on the Isle of Mull, you can look right across the bay, and there's the castle. When I signed my name "McLean," they said, "Oh, you are a McLean. And where do you come from?" Well, we come from the United States, and they said, "Oh, for goodness sakes!" And they practically rolled out the red carpet for me. First question they asked, "Are you going to the castle?" And he looked out the window: "Yes, the chief is there today. The flag is up." See, that's how they tell whether the chief is in there.

So I drove up to the castle; my wife didn't want to go because she was a little tired, but I said, "Well, I'll go." So I drive up to the castle in my little car that I had rented in England. In going up there, there's a parking area, and then you go down a gravel path. Alongside this gravel path was a big rose garden, and here was a fellow in a tweed coat, tweed pants, an old tweed cap, and an old shirt on open to the waist. I said, "By gosh, that looks like Sir Charles, the chief of the clan." And here he was with a mower, mowing the grass. I thought, "Maybe if I speak to him and say 'Hello, Chief!' he'd think I was crazy; he's probably the gardener." I went on down to the castle, and, of course, when you go there they take you all through the castle and show you everything. It was his niece that took me through the castle. When we got all through, I said, "Where's the Chief?" And she said, "I think he's up at the rose garden." [chuckles]

So I went back up and introduced myself. He said, "Oh, Walter, I'm so glad to see you," and he recognized my name. He said, "Your son and daughter-in-law were here just a couple of years ago." I said, "That's right." "Oh," he says, "come on down." So down we go to the family part of the castle. Well, we sat there talking for two or three hours. They have a book where you sign your name, and he said, "Of course, you have to sign your name." He comes with the book and says, "Here was when your son and daughter-in-law were here." And then he says, "Now, come on, we're going to go and meet Lady Elizabeth Maclean and have some little rolls and tea." And here she was, running the tea shop. They have a tea shop, and she was hostess. We sat down there and talked for another hour. That was my experience at the castle. Now my daughter is going back again this year. Unfortunately, the chief died last year, but his son is now chief of the clan. Of course, I'm a member of the clan. On my birthday and other occasions I get a nice note from him.

Lage: He keeps track of people who have come to the castle?

McLean: Yes. Now, there are two clans. There are two clans. One is the clan of Duart and the other is the clan Lockbruie. The Lockbruie were apparently cousins or something, and they spell their name Mclain, where the Duart clan is Maclean. Somewhere along the line--in coming to America or something else--they dropped the 'a', and it's just signed McLean; that's the way my family always signed it.

[tape pause]

Mother's Family in Early California

Lage: Let's talk about your family coming to California. This takes us back to the Gold Rush.

McLean: Yes. Bruce is sending down the complete data on this. He has it down exact.

Lage: We'll hold off on that early history, then. Should we start today, then, with your parents and your birth? Let's do that.

McLean: Yes, we can do that. My mother was a Patterson. My mother, Sarah Jane, was a Patterson, and my father was a McLean. Both families came to California early. My grandfather Patterson was born in Begger, Scotland. They came to Taunton, Massachusetts, where he married my grandmother, Sarah Dean. They were married in Taunton, Massachusetts. My mother was born in Taunton, Massachusetts, which is fairly close to Boston. One of my uncles, I believe, was born in Scotland.

In 1862, Grandpa Patterson came to Sacramento by boat on the Sacramento River from San Francisco. There was no transcontinental railroad at that time. He was a master mechanic, or a machinist, who had learned his trade, I guess, as an apprentice in the shipyards of Glasgow. Apparently he had come to Massachusetts to work on the early railroads back there, and then he came to California in 1862 to the machine shops, or the railroad shops, in Sacramento to work for the Central Pacific Railroad. He built a home in what we call Broderick [California]. Now the post office name is Washington, but it used to go by the name of Broderick. That's over in Yolo County, just across the river from Sacramento. He built the family home there. When the transcontinental railroad was completed, my grandmother came by transcontinental railroad with six children, two girls and four boys. In fact, it must have taken four or five days, because railroads were pretty slow in those days. They settled in the home in Broderick, or in Washington. I was born in that home on July 16, 1903.

McLean Family History

[The following section was written by Mr. McLean after consultation with his son Bruce, who is the family historian]

McLean: On my father's side, my great-grandfather, Edward McLean, was born in 1807 in Hudson, Columbia County, New York, the son of Peter and Mary McLean. Prior to his fourteenth birthday he moved to New York City, where he became a member of the Johns Street M. E. Church. Both of his parents were devout Methodists.

In 1830, Edward McLean was married to Elizabeth Ann Lewis, the daughter of Richard A. Lewis, a well-known and highly respected merchant in New York City. Edward McLean became a prominent merchant in New York City, associated with Throckmorton and Stewart. Apparently he accumulated considerable wealth, as at one time the family was said to have had a large mansion with five servants. The New York City directory of 1844-45 shows "Edward McLean, manufacturing, 375 Broadway," and "Mrs. Edward McLean, milliner, 375 Broadway." The 1849-50 directory shows "Mrs. Edward McLean, milliner," at 375 Broadway. Apparently Edward McLean was then in California.

When the news of the discovery of gold in California reached New York City in 1949, Edward McLean decided to leave for California. He was to take with him the most modern French equipment for crushing the gold-bearing ore. This equipment was unlike any of the equipment then in use in the California gold fields. Booking passage on the *SS Falcon* from New York City to the Isthmus of Panama, Edward McLean departed in 1849 for Panama, taking with him the ore-crushing equipment, which he planned to either sell or lease to the mining companies in California. Upon arriving at the Isthmus of Panama, where he planned to travel by muleback to the Pacific side, he learned that the mining equipment was too large and heavy to be transported across the isthmus by muleback. So he proceeded across the isthmus while the ore-crushing equipment continued by boat around the Horn to California. Edward arrived in San Francisco on February 28, 1849, on the Pacific Mail *SS California*, which was the first ship to arrive in San Francisco Bay following the discovery of gold.

Apparently Edward's wife, Elizabeth, and my grandfather, Theodore, arrived in San Francisco in 1852. They had crossed the Isthmus of Panama on muleback. While crossing the isthmus, Elizabeth contracted yellow fever, from which she really never recovered. This would lead to her early death at age 59 while visiting her daughter, Emily Tripp, in Massachusetts on August 28, 1871. Her remains were returned to California by her husband, Edward. She is buried at Cypress Lawn Cemetery in San Francisco beside her husband and other members of her family.

Rasmussen's ship arrivals states that Miss A. McLean (Emily A.), Miss C. McLean (Caroline), and L. McLean (Alfred?) arrived in San Francisco on April 1, 1852, on the steamer Fremont. They had traveled by the steamer around the Horn and arrived about two weeks after their mother and brother, Theodore. Their mother, Elizabeth, felt that the trip across the isthmus would be too strenuous and dangerous, so she had insisted that they take the longer but safer route around the Horn. She put them under the care of the captain of the ship to assure their safe passage to

PEDIGREE CHART

CHART NO. 1

DATE

NAME OF PERSON SUBMITTING CHART

STREET ADDRESS

CITY STATE

NO. 1 ON THIS CHART IS THE SAME PERSON AS NO. ____ ON CHART NO. ____

1 Walter Reginald McLean
BORN 16 Jul 1903
WHERE Broderick, Ca.
WHEN MARRIED 23 Sep 1922
DIED
WHERE

NAME OF HUSBAND OR WIFE
Margarette E. Sherman

2 Walter Reginald McLean
BORN 14 May 1881
WHERE S.F., Ca.
WHEN MARRIED 12 May 1902
DIED 25 Dec 1907
WHERE Sacramento, Ca.

3 Sarah Jane Patterson
BORN 28 Aug 1869
WHERE Taunton, Mass
DIED 2 Feb 1921
WHERE Sacramento, Ca.

4 Edward Theodore McLean
BORN 1849
WHERE New York
WHEN MARRIED
DIED 27 Nov 1928
WHERE S.F., Ca

5 Martha J. Harrup
BORN 18 Feb 1847
WHERE Rhode Island
DIED 19 Nov 1928
WHERE S.F., Ca.

6 Robert Patterson
BORN 22 May 1832
WHERE Biggar. Scotland
WHEN MARRIED 1856
DIED Taunton, Mass
WHERE 1895 Sacramento, Ca.

7 Sarah Dean
BORN 9 Jul 1836
WHERE Glascow, Ca.
DIED 1900
WHERE Sacramento, Ca.

8 Edward McLean
BORN 1807
WHERE Hudson, N.Y.
WHEN MARRIED
DIED 8 Aug 1891
WHERE S.F., Cal

9 Elizabeth Lewis
BORN
WHERE New York
DIED 1887
WHERE New York

10
BORN
WHERE
WHEN MARRIED
DIED
WHERE

11
BORN
WHERE
DIED
WHERE

12 James Patterson
BORN 14 Sep 1802
WHERE Coulter, Scotland.
WHEN MARRIED
DIED 21 Feb 1871
WHERE , Scotland.

13 Agnes Forbes
BORN 2 Oct 1802
WHERE Biggar, Scotland
DIED 21 Mar 1869
WHERE , Scotland

14
BORN
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WHEN MARRIED
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15
BORN
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16 Charles Edward McLean
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GIVE HERE NAME OF RECORD OR BOOK WHERE THIS INFORMATION WAS OBTAINED. REFER TO NAMES BY NUMBER

Family Group Report
For: ______________________________________(ID=____)
Date Prepared: __________

Name: McLean, Edward T (ID=__)
Born: 2/1848 Where: New York
Died: 11/27/1928 Where: ____________________
Remarks: Age at Death- 79 yrs 9 mo
Cause- Acterio Scelerosis

Father: ____________________ (ID=___
Born: __________ Died: __________
Mother: ____________________ (ID=___
Born: __________ Died: __________

Spouse: McLean, Martha J (ID=___)
Born: 2/18/1847 Where: Rhode Island
Married: 1868-1869
Died: 11/19/1928 Where: San Francisco
Remarks: Age Death- 80 yrs 9 mo 1 day
Cause- Phuemonia

Father: Harrup (ID=___
Born: __________ Died: __________
Mother: ____________________ (ID=___
Born: __________ Died: __________

Spouse: ____________________ (ID=____)
Born: __________ Where: ____________________
Married: __________ to: __________
Died: __________ Where: ____________________
Remarks: ____

Father: ____________________ (ID=___
Born: __________ Died: __________
Mother: ____________________ (ID=___
Born: __________ Died: __________

M/F	Child's NAME	Birth DATE/PLACE	Death DATE/PLACE	Last MARRIED/SPOUSE
1.	Edward (ID=___; Parent ID=____)	D: 10/1/1869 P: S.F. Ca.	D: 11/16/1929 P: S.F., Ca.	Annie Fromholt (Spouse ID=
2.	Clarance (ID=___; Parent ID=____)	D: 9/7/1870 P: Belmont, Ca.	D: 5/11/1960 P: Santa Cruz, Ca.	(Spouse ID=
3.	Minnie A. (ID=___; Parent ID=____)	D: 9/2/1870 P: S.F. Ca.	D: 8/4/1941 P: S.F., Ca.	Willet (Spouse ID=
4.	Robert A (ID=___; Parent ID=____)	D: 3/10/1874 P: S.F. Ca.	D: 6/1/1950 P: S.F. Ca.	Crawford. (Spouse ID=
5.	Walter R (ID=___; Parent ID=____)	D: 9/14/1881 P: S.F., Ca.	D: 12/25/1957 P: Sacramento, Ca.	Patterson (Spouse ID=
6.	Frank (ID=___; Parent ID=____)	D: P: S.F., Ca.	D: P:	(Spouse ID=

Residence Information

From: _________ To: __________ Phone: ___-___-____
Address: __________________________,____________________________ City: _____________ State: ____ Z/C: ____

San Francisco. When they arrived in San Francisco, the local newspaper remarked about the arrival of Mr. and Mrs. Edward McLean's two beautiful daughters from New York city. Caroline was nineteen and Emily eighteen when they arrived in San Francisco.

The San Francisco city directory of 1850 shows that Edward McLean owned a restaurant on Langley Lane. In 1852 the directory indicates that he owned a boarding house on Front Street. It was at this house that he and his wife would entertain such notable persons as Timothy G. Phelps and Leland Stanford. Both men would become close friends of the McLeans. They also would become close friends with General Vallejo, the former Mexican governor of California. The McLean family and the girls would spend many days at the Vallejo hacienda at Sonoma.

The McLean girls all married prominent California men. Caroline married William W. Chipman, who was the attorney for the Peraltas, the owners of a large Spanish grant that covered the East Bay. William W. Chipman and Gideon Augibach purchased the peninsula of Alameda from the Peraltas for $14,000. When W. W. Chipman passed away, Caroline married John W. Dwinelle, a prominent author, politician, mayor of Oakland, state legislator, and regent of the University of California. Dwinelle Hall at UC Berkeley is named after him.

Josephine Amelia married Timothy Guy Phelps. The family home was at San Carlos, where they had a dairy farm covering hundreds of acres from San Francisco Bay to the crest of the hills. Timothy G. Phelps served as a state senator in the 9th, 10th, 11th, and 12th sessions. He also served in the state assembly during the 8th and 31st sessions. He was a representative for the State of California in the U.S. Congress from 1861 through 1863. He was also nominated as the Republican candidate for governor of California in 1875. He served on the Board of Regents of the University of California from 1880 until his death on June 11, 1899.

Amanda Amelia married Charles Swasey on December 24, 1858, in San Francisco. Charles S. Swasey, aged 22, arrived in San Francisco on February 28, 1852, on *SS Comet* from his home in Newburyport, Massachusetts. He spend most of his life in public service, in the U.S. Mint as assistant cashier and a similar position in the U.S. Subtreasury. He also served as assistant cashier of the U.S. Custom House. Charles and Amanda lived most of their lives in San Francisco, where they celebrated their fiftieth wedding anniversary on December 24, 1908, with their many friends and relatives. Charles was a well-known painter, which was his leisure-time hobby. He has many murals in public buildings as well as pictures which he gave to friends and relatives.

Emily A. McLean, the second child, born to Edward and Elizabeth McLean in 1834 in New York City, apparently never came west to California. She was married to a Mr. Tripp. They were living in Fairhaven, Massachusetts, when her mother, Elizabeth, visited her and died on August 28, 1871. Emily Tripp died about 1931 at Fairhaven, Massachusetts.

Virginia Arbella McLean was born in 1848 in New York City, the seventh child of Elizabeth and Edward McLean. She was married to Joseph M. Lord on December 25, 1873, in San Francisco. Because she was so young when her mother and the other McLean girls came to California, she is not mentioned in the ship's manifest of arrivals, as the custom in those days was not to show small children traveling with their parents.

Eugenie Hortense Nannette McLean was the ninth and last child born to Elizabeth and Edward McLean. She was born in 1859 in San Francisco, the only one of the children to be born in California. She was married to Horace Haws, Jr., a prominent attorney in San Francisco. They lived most of their lives in the Redwood City area, and their family donated the land upon which the Redwood Civic Center was built. Howard Haws, Jr., died December 19, 1894, and Eugenie married John Bernard Schroeder, who was a very wealthy man. He owned Schroeder's Cafe at 240 Front Street, San Francisco, where it is still located today.

My grandfather Edward Theodore McLean was born in New York City in 1847. He came to San Francisco in 1852 when he was five years old, and he spent most of his life in that area and the near vicinity. He was married to Martha J. Harrop from Lippet, Rhode Island, on December 2, 1867. They had six children: five boys and a girl, Minnie, the eldest of the family. My father, Walter Reginald, was born May 14, 1881, in San Francisco. My father was the fifth child from this marriage.

During my grandfather's lifetime he was employed as a printer, a clerk, and an inspector at the U.S. appraiser's store. At the time of the 1906 earthquake he owned a drayage business at the foot of Market Street. The earthquake destroyed his warehouse and killed his stock of horses. Following the earthquake, he moved to Sacramento, where he continued in the drayage business. He remained only a short time in Sacramento and was back in San Francisco by 1915, where they lived in the Mission district at 761 17th Street. Upon the death of his sister, Josephine Phelps, he received the sum of $100,000, and he bought a home and moved to 910 Chula Vista Avenue in Burlingame. Martha, his wife, died of pneumonia on November 19, 1928. While attending the funeral on November 20, 1928, Edward collapsed, and he died on November 27, 1928. Both are buried at Cypress Lawn in San Francisco.

Parents' Marriage and Father's Early Death

My father, Walter Reginald McLean, was born in San Francisco on May 14, 1881, the fifth child of Edward T. and Martha J. McLean. The San Francisco city directory for 1901 shows Walter R. McLean working as a plumber for a W. C. Clifford at 849 Valencia Street in San Francisco. On May 26, 1902, Walter married Sarah Jane Patterson Fiske, the daughter of Robert Patterson of Alameda, California. My father was twenty-one years old at the time of their marriage, and my mother was a divorcee aged thirty-three years.

My mother was born in Taunton, Massachusetts, on August 28, 1869. She came to Sacramento with her mother and brothers after the transcontinental railroad was completed to California. Apparently she was married to a Fred Fiske at an early age. He was much older than my mother, and the marriage only lasted a short time.

I was born July 16, 1903, in the house that grandfather Patterson had built in Broderick, California, in 1872. My mother named me Reginald after my father's middle name. After my father died, my mother added the name Walter.

My father, after marriage to my mother, became a very successful plumbing contractor, owning both a business on 4th and J streets in Sacramento and in Dunsmuir, Siskiyou County, California. My father had the plumbing contract for the first buildings at the University of California at Davis. It was while he was working on this job that he fell from a scaffolding and was seriously injured. While being treated for his injuries, it was discovered that he had spinal meningitis. At that time it was terminal, and he died on December 25, 1907. I was four years old at that time.

Because of the strong religious beliefs of my father's family, the difference in the age between my father and my mother, and she being a divorcee, we were never welcomed into the family. Up to the time that my mother became seriously ill in 1920, we religiously made the trip each year from Sacramento to San Francisco to visit our relatives. We would visit with Uncle Ed and Aunt Annie McLean, see my grandfather and grandmother for a short time, and be told by the others that they would be out of town. Uncle Robert and Uncle Clarence both had children my age, but during the many years that my mother and I went to visit, I never saw one of my cousins. I never met Uncle Robert's or Uncle Clarence's wives during their lifetime. After my grandparents died, Uncle Robert McLean was the executor of their estate. I was an heir through my father, and at that time I got to see Uncle Robert.

[end of written section]

Mother's Work and Terminal Illness##

Lage: You were the only child?

McLean: That's right. My mother was a housekeeper, didn't have any skills. From then on she worked as a housekeeper. She never married again. The only time she came close to getting married was apparently through correspondence. She'd never met the man, and I can't even remember his name, but she had a proposal of marriage from a very wealthy man in the Philippine Islands. It was of course frowned on by my family for her to marry someone who had just corresponded by pictures. But it happened that very close friends of ours, Harry and May Crevelling--he had gone to the Philippines as a superintendent for the government on the building of the fortifications in the Corregidor Islands. They had gone to the Philippines sometime around 1909 or 1910. These friends of ours--I always called them aunt and uncle, but they were not really related--someway or other had become acquainted with this very wealthy landowner, I guess a millionaire.

Lage: Was he an American who settled there?

McLean: He was American, and he had investments--large holdings and everything--over there. He was unmarried. My mother was at that time in her late thirties. He sent money for my mother and me to come over, and they were to be married.

Lage: That was quite an adventure.

McLean: Yes, it was. We went to the Philippines. We left here, as I recall, on the first of August of 1912 and went over on a Japanese boat; it was known as *Chyo Maru*. It took us thirty days to get over there. We stopped at Honolulu, Nagasaki, Kobe, Shanghai, and

Hong Kong; we stayed two or three days in Hong Kong. Then we took a smaller boat to the Philippines. When we got to the Philippines, this man whom my mother was to marry had been in a very, very serious automobile accident, and he was paralyzed and crippled; he was completely paralyzed.

In the meantime--it was very interesting, because they were to be married shortly after we had arrived--my mother had ordered the wedding dress from a Philippine tailor. My family still has that wedding dress. She had ordered the dress to be made by a tailor over there so that she'd have it when we got there, and they were to be married immediately. Well, when we got there, this lady--I call her my aunt, Aunt May--broke the news to my mother that this man was hopelessly crippled. Apparently she had visited him, and he was under very intensive care. He would never be physically able to get around or anything else. Of course, my mother was broken-hearted for all this to happen.

Some way or other, why, they finally decided to call off the wedding. So there she was with all the new clothes and the new wedding gown and everything else. She was devastated. There was a small settlement made; I don't know what it was, but my mother did receive, I know, enough money to get back to the United States. He had paid for our passage over, and we had looked forward to living in the Philippines for many years to come. So there she was, left with nothing, you might say.

We left the Philippines sometime along in early November in 1912, because we had Thanksgiving aboard the ship. We came back on the transport *Logan*; it was a U.S.S. transport ship. Harry Crevelling was working for the government and was able to get passage for my mother and me back to San Francisco by means of this transport. We arrived sometime around the first of December. My mother was in kind of a difficult position, because she'd gone to the Philippines with the intention of marrying, and now she had to start all over again.

Before we went to the Philippines she had worked for my uncle Alex Patterson, who owned a couple of butcher shops in Sacramento--had a big butcher shop in Oak Park. He had lost his wife a year or so before and had one child, a boy, the same as my mother. Apparently, he had talked my mother into keeping house for him. He had a large house in Oak Park, and we lived there. This was a large enough house that my mother took in room-and-boarders, which was quite common in those days. I think we had two or three who lived in this house. It was a big house on a big piece of property.

We had a barn, and he used to keep horses. In those days, the delivery of meat and everything was by horse and cart, or really a horse and wagon; it was kind of a little butcher wagon. We had a hired man who used to come every day and take care of the yard, milk the cow, take care of the horses when the horses had to be taken care of, put hay in the barn, and everything else. I know that there was a surplus of milk, because I had a little milk delivery route. I had a little wagon that I would pull around. My mother used to put the surplus milk in a little bucket that lard came in; it would hold about a half gallon of milk. I used to deliver maybe a half dozen of those around the neighborhood at five cents for each one of these buckets full of milk. We lived there until we went to the Philippines.

Lage: Was that a fairly comfortable life?

McLean: Oh, yes. That was very good. After we came back from the Philippines, my mother went to work for a Mr. Hill. He had two children at that time, Virginia and Herbert. Herbert was the eldest, and Virginia was in my class at school. My mother worked for Mr. Hill for, oh, two or three years.

Lage: As a housekeeper?

McLean: Yes, as a housekeeper. But we didn't live with them. At that time my mother was renting a small place where she and I lived. She used to walk up there to the house, which was just a short distance. And then I used to have dinner with them at night. We'd have breakfast at home, and she'd go up there and make the beds, do the washing, clean the house, and fix dinner for Mr. Hill and the two children. I would go up and have dinner with them at night. After she finished the dishes and everything, why, we'd go home to our own place.

Mr. Hill finally married--and this must have been about 1919--and they moved from there to another house. My mother then worked as a saleslady for women's undergarments. It was called, as I remember, the Leona Garment Company, and I think they were located back East. She used to have a kind of one-piece garment. It served as a brassiere, underskirt, and panties, and I think they called it a three-piece. She developed a little business on that.

Lage: Did she go to people's homes, or did she have a little store?

McLean: She'd go to people's homes and sell them directly. She had a fairly wealthy clientele; they'd buy three or four of these at one time.

Lage: Did she enjoy this kind of work?

McLean: Yes, she enjoyed it because it gave her more time at home. During this period of time, when she used to carry one of these satchels around with her, with her garments--this must have been about late 1919 or early 1920--she began complaining about a pain in her side. I don't think she had, to my knowledge, ever been to a doctor, because she was always very healthy, all during her life. But I finally talked her into going to a Dr. Wells.

Lage: How old were you about this time?

McLean: Well, I guess I was sixteen. I was working, because I quit going to school when I was fourteen. I happened to know Dr. Wells because I was classmates with his sons in school, and they lived just a short distance from us. She finally consented to go and see Dr. Wells. Well, Dr. Wells told me that my mother apparently had a very serious illness, and he sent her to a Dr. June Harris downtown. I went down with her; I took her down there. And she was diagnosed as having cancer of the uterus at that time. While my mother was in a room putting on her clothes, the doctor said, "Walter, your mother is not going to live very long." He said, "You'd just as well steel yourself to this, because she could last two or three months, or she could last longer than that. But you're going to have to understand that she can no longer work, and she's going to have to go to the hospital quite frequently."

Lage: Did he tell her this as well?

McLean: No, no. She was never told.

Lage: Oh, my goodness! That's an interesting way of handling that.

McLean: Well, in those days, I guess you didn't do that. She was never told, and she always believed that she would be well.

Lage: So you had to keep up her spirits?

McLean: Yes, that's right.

Lage: That must have been awfully hard as a sixteen year-old.

McLean: Well, I'll tell you, it was tough, believe it or not.

Lage: Not just caring for her, but being the emotional support.

McLean: She was home for a while; I cared for her for a while at home. Then she used to go down to my cousin's in Vallejo. She would go down there, and she'd stay for maybe a week or a couple of weeks, or something like that. My uncle Alex had an automobile, and we'd take her down in the automobile, and then we'd go down and get her. But she really started to go downhill, and in the last five months or so, why, I finally had to put her in the hospital, because I couldn't care for her any longer, and there was no way that I could get any help. Well, I did; before she had to go to the hospital, I did. In fact, it was a girl that I later married. I got her to come over and clean house and be there with my mother.

Lage: While you were working?

McLean: While I was working. But finally she got to the point where she just had to have care constantly, and I put her in the White Hospital in Sacramento. I forget what it was, but it might have been fifty or seventy-five dollars a week. She was in the hospital, I guess, for two or three months before she finally passed away, and I had to borrow money from my Uncle George, my mother's brother; I borrowed two hundred dollars from him to pay hospital bills and so on and so forth, which I had to pay weekly.

Lage: Were they very well off, any of these relatives?

McLean: Well, Uncle Alex was. The ones in Oakland were very well off.

Lage: But you didn't have a close enough tie to get some financial help?

McLean: Even my grandparents and my aunts and uncles here in San Francisco really never accepted my mother because, going back to the old Presbyterian days of the church, they were very much against my father marrying a divorcee. That was a stigma in those days. Although we used to visit them once a year, and this is one duty we had that my mother always insisted on--that we come and see my grandparents and the other relatives.

Lage: Even after your father died?

McLean: After my father died, yes. We would make the pilgrimage [chuckles], if you want to call it that, to San Francisco. Come down by train--

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McLean: We would stay with Uncle Ed and Aunt Annie. Now, Uncle Ed and Aunt Annie were much more friendly to my mother and me than the rest of the family.

Lage: Was Ed your father's brother?

McLean: He was my father's brother, yes. He was a painting contractor; they were all in the contracting business. Uncle Robert was a general contractor; he always used to buy Pierce Arrow automobiles. His wife was Catholic.

Lage: That probably wasn't looked upon too favorably, either.

McLean: Do you know that all during my life I never met her? She refused to see my mother or me. Uncle Robert later became very, very friendly to me, but my mother had died by that time. Every time we would come down and try to see Uncle Robert and Aunt--I can't remember her name--they always had an excuse, that they were going out or she had some other engagement, something like that. And for my entire life, I never met her.

Lage: I would think that your father's family wouldn't have accepted her because she was Catholic. Did that happen at all?

McLean: No, apparently it did not. My grandparents were very strict Presbyterians. But they did accept me as the offspring of their son, and they did accept my mother. We'd come and see them, and we'd come and see Uncle Clarence and his wife, and Uncle Ed; we'd always stay with Uncle Ed. We'd come down and stay for two or three days and try to see all of them. But Uncle Robert and his wife, why--. Even after my mother died, none of them attended the funeral. The only ones who attended the funeral were my mother's folks, the Pattersons.

Lage: Did you write to them during the period of her illness, or did you kind of lose touch?

McLean: No, no. I often thought afterwards about the struggle I'd had, and how I had to borrow money from Uncle George to keep my mother in the hospital and all of that. And then I had bills that had to be paid after she died, but I went to the bank and borrowed money. I went to what was then the American Trust Company; it's now Wells Fargo. I went in there as a youngster of seventeen. I said, "I've just got to have money, because I'm not making enough money to pay for expenses." By gosh if the manager of the bank didn't give me a note, and it took me two or three years to pay off that money.

Lage: Do you know what he considered when he gave you that loan?

McLean: I don't know what he looked at, except just my face, I guess, and my honesty. I had to borrow after my mother passed away; why, there were bills and everything else. I didn't want to go back to Uncle George, because I had already borrowed two hundred dollars from him. Uncle Alex never offered, and had a big butcher business and slaughterhouse. None of them of ever offered to give me--.

This is how I put my life together.

Lage: Did you have any bitterness about the fact that you had these --?

McLean: No, no, no, I didn't. No. I made all the funeral--. My mother had a life insurance policy, one of these policies that I don't think you see anymore, where the agent used to come around every week and collect fifty cents or a dollar, or something like that. I think my mother had an insurance policy of--it couldn't have been more than five hundred dollars. Of course, that was quite a bit. It was enough to pay most of the funeral expenses. She was buried where my father is. My grandparents bought a big family plot where all the children could be placed when they died. In fact, I was talking to my cousin the other day about it. He was going to go up and get information from the headstones for the Patterson family; it was a big city cemetery in Sacramento. This was Grandpa Patterson, and he bought this big family plot, and my mother and father and many of the family are all buried there.

I sold most of the furniture for fifty dollars, and I went to live with people by the name of Jacksons. They had a boy just about my age.

Lage: You boarded with them?

McLean: I boarded and roomed with them. The boy and I, George, shared a bed together. Fact is, his father had made a large bedroom downstairs. It was a two-story house, a basement and then the upper story. It was a big, high basement, and he fixed a large room down there. Of course, in those days we didn't have a telephone or radio or anything else, you know. We shared this room together. I lived with them until I was married to Margaret Sherman.

Lage: How was your mental outlook? Did this adversity get you down?

McLean: No. It didn't bother me in the least. I was very much interested in working and, as I said, I was very much interested in going to school. This was one of the things that bugged me; I wanted to get more education.

Recollections of Youth and Family in Sacramento

Lage: Tell me a little bit more about what your mother was like before her illness.

McLean: She was a very wonderful, caring person. She thought of my welfare constantly. Gosh, she just was one of the finest persons that you would want for a mother. She never forgot my father. This is one thing I always remember. Every Sunday we took the street car down to the cemetery. In those days in Sacramento you lived near a street car. We would get on the street car and go with a bouquet of roses to put on my father's grave. This rented house that we lived in had lots of roses. Of course, roses are very common in Sacramento. This was one of the things that I had to do--take care of the lawns. There were big lawns, and, my gosh, instead of being able to get out and play with the rest of the kids, I had to cut the lawns when I was going to school and when I was working, and in those days we worked until Saturday noontime.

Lage: So you didn't have much free time?

McLean: I didn't have much time, and I had to take care of the lawns. Then there were two big palm trees in the front of the house that I had to cut. There were roses all around this house. Of course roses bloom all summer in Sacramento. Every Sunday, right on the dot at about nine o'clock, my mother got up and got all dressed up, and I got dressed up, believe it or not--necktie and everything else. And she, with her bunch of roses, went to my father's grave and put a bunch a roses on the grave.

Lage: Did she talk to you about your father?

McLean: Not very much, no. Not very much, so I knew very little about him. From the cemetery we would go over to the old house in Washington--or Broderick--where my Uncle John and Aunt Lizzie were living, and we would have Sunday dinner. We'd walk across the bridge, take the streetcar down to where it stopped, near the Southern Pacific station, then walk across the bridge and over to the old home and have Sunday dinner. And then walk back again, take the street car, and go home. This happened every Sunday of my life while my mother was alive and before she went to the hospital.

Lage: You had a real routine. You really didn't have free time.

McLean: Now, we never went to church, but she was very religious. In other words, Sunday was a day of Sabbath, and you recognized that; you didn't play cards, you didn't do this, and you didn't do that.

Lage: But you didn't go to church? Did she say why she didn't go to church?

McLean: I did go to Sunday school. And in going to Sunday school I got into a Boy Scout troop that was run by the minister of the Methodist church in Oak Park. But going to Sunday school didn't keep me from going with my mother to the cemetery every Sunday. After I got out of Sunday school, which was about eleven o'clock in the morning--of course I was all dressed up, and she was all dressed up in her finery and everything--off to the cemetery we would go with a bunch of roses or a bunch of flowers.

Lage: Did you accept this as a ritual?

McLean: Yes, I accepted it. I'll never forget, because Sunday morning was a special breakfast. You'll laugh at this, but baked beans was a special Sunday morning breakfast. We'd have a big dish of baked beans, or we'd have a piece of salmon. My Uncle John used to be both a fisherman and a market hunter. They used to catch salmon in the Sacramento River; they kept nets in the Sacramento River. In those days they couldn't sell what they called the salmon bellies; that's the piece that's the sides of the salmon. They'd cut these off in big slabs, and my mother used to salt them down in a crock. This would keep indefinitely, as long as it was kept down under the salt water. So once in a while, when we didn't have the baked beans, she'd pull out a chunk of this salmon belly and wash it in fresh water, steam it for Sunday morning breakfast, and we'd have that with a cream and egg sauce. That would be Sunday morning breakfast, with toast and the creamed salmon with egg sauce. So there were two Sunday morning breakfasts. We'd either have baked beans, or we'd have salmon.

II ON-THE-JOB TRAINING: FROM DELIVERY BOY TO ENGINEER, 1915-1924

Dropping Out of School in Seventh Grade to Support Family

Lage: Now, you left school in seventh grade. Was that because you needed more money?

McLean: That's right, because my mother wasn't making enough money.

Lage: Even before she was ill?

McLean: That's right. She wasn't making enough money to pay our rent and our food and buy clothes and everything else. Of course, I was growing up in those days. I remember paying fifty dollars for an overcoat one time.

Lage: That seems incredibly expensive!

McLean: Yes, and I had that coat for years, I can remember. While I was going to school, there was an Italian shoemaker in Oak Park. In those days if somebody had a pair of shoes to be fixed, a delivery boy would pick them up and take them to the shoemaker, and then he'd deliver them again. That was the standard way of doing things. So I became his delivery boy. I got to use a bicycle, which was a big deal in those days. The bicycle had a little basket on the front and a little basket on the back. He'd give me the address, and I'd ride around to the house, pick up the shoes, and bring them in to be fixed. When I got out of school at three or three-thirty in the afternoon, I'd go over to the shoemaker and get the bicycle, deliver the shoes, and maybe pick up a pair to be fixed. I did that for, oh, two or three years.

Then one summer during school vacation I got the opportunity to go to work for the Blueprint Company in Sacramento. For that I was paid the whole sum of five dollars a week. I'd get a gold five dollar piece, and that was for a week's work.

Lage: Was that pretty good money?

McLean: Oh, that was good money in those days, you know. They'd always give it to me on Saturdays. Well, that would allow me to go to the shows and do everything else that I wanted to do. Then when the war came along [World War I], why, these different men went off to war, and they closed the Blueprint Company. This is when I went to work for the State Highway Commission.

Lage: Was this full-time employment?

McLean: Yes, that was full time.

Lage: There was no compunction against hiring someone as young as you?

McLean: No.

Lage: No laws against dropping out of school?

McLean: No, there were no laws against it. I think I was fourteen years old, something like that.

Lage: Did your mother encourage you or hope that you could go back to school at some time?

McLean: I don't think it ever became a subject. But I felt the lack of it. As soon as I could go to night school--I think I spent half my life going to night school.

Lage: Was that after your mother died?

McLean: That was after my mother died, yes, at the old high school at 16th and J.

With the State Highway Commission, 1917-1923

McLean: My mother died in '21, and I was working for the state highway since 1917, when I was fourteen years old.

Lage: Had your job changed from delivery boy?

McLean: Yes, I got into doing a little different type of work there. As I was telling you earlier, after my mother died, Allen [J.] Wagner kind of took me under his care.

Lage: Now, tell about Allen Wagner, because we didn't talk about him on the tape. What was his position?

McLean: He was the office engineer for the State Highway Commission, and I was directly under him. When my mother died in March of 1921, Allen said that I should get out and learn a little more about engineering. Of course, I'd been in a room where they were all engineers, and I saw a lot of drafting going on. The fact is, I got so that I was doing a little bit of drafting myself.

Lage: Did they train you little?

McLean: They were training me. They were training me to index and do a lot of other things. Allen took me under his wing and encouraged me to get into this and also encouraged me to go to night school and get mathematics.

1921 Survey Party in Lassen County

McLean: When my mother died in '21, Allen decided that I should go out in the field party, survey party, and that's when I went to Lassen County with a survey party. That was in April of 1921.

Lage: So this would have been surveying for a highway that was under construction?

McLean: Yes, and we were also surveying for a location for a new highway from Red Bluff via Susanville to the Nevada state line, over the Fredonyer Pass and down through Susanville to a place by the name of Doyle, which was on the Nevada state line. I spent the entire summer there.

Lage: What kind of work did they have you doing?

McLean: I started out as what we called a stake puncher. [chuckles] Then it finally got so I was rodman on the level crew, under a fellow by the name of Carl Kinyon. Carl was the chief of the level party, and I was rodman on the level party. Carl Kinyon later worked for me on Pardee Dam and in Oakland.

Lage: You're going to have to tell me what rodman on the level party is.

McLean: As rodman, you hold a rod. You take the profiles or the cross sections for road surfaces. You have a rod that is six and one-half feet, and when you extend it, it goes up to thirteen feet or so--what they call a level rod. This is how you take profiles and cross sections of what the topography of the road is going to be.

Lage: Were you a young person who was very good at doing what he was told?

McLean: Oh, yes.

Lage: Or were you the sort who asked a lot of questions? What do you remember?

McLean: Well, I was there to learn. And, of course, I wanted to learn all I could about it and asked questions. I got so that I knew how they put the notes in the field books. We had a fellow in the office who would plot all this up on drawings. In those days everybody would participate in reading the notes, or what you call reducing notes. In the field you just take the notes and write them down in the field book. Then you have to convert those to elevation, and we used to do this at night or on weekends. The field books would be passed around to different ones that were working on the crew, and we would reduce the notes. I got so that I knew how to take field notes and how to reduce them. I also learned to plot the notes on paper, and then even to how to work out what we called the traverses from the survey notes. I got so that I could do all that.

Life in Construction Camps: Tents, Meals, Baths, Dances##

Lage: Tell me about your living and working conditions during this summer in Lassen County.

McLean: Our first camp was at a construction site at a place known as Devil's Corral on the Susan River. That was near the Fredonyer Pass, on the road between Red Bluff and Susanville. We had a large party there. The chief of party was a fellow by the name of Mr. Sites. I think we had fourteen men altogether on the party. We stayed at a large construction camp, what they called a day-labor camp at that time, where a lot of the work was being done by the State Highway Commission itself. They had some trucks from World War I, and they had a large mess hall. We stayed at that camp for probably about a month and a half or two months.

After we had finished the work from Devil's Corral down to a distance of about four or five miles above Susanville, we moved our camp down to an orchard on the east side of Susanville. Then we set up our own camp.

Lage: With just your crew?

McLean: Yes. We had a cook, a lady by the name of Mrs. Beaver. She did the cooking for us. We had a big cook tent, and we all ate in the cook tent. The chief of party, Mr. Sites--his wife stayed with him, and then we had about four other tents for the rest of the party and one tent for an office. We camped there, I guess, for another couple of months, until we had worked down the valley, going down to Doyle.

The next camp we had was at Janesville, and there we camped in some open ground to the west of the town. From that point we surveyed down to the town of Doyle, which is supposed to be right close to the Nevada line. That's where we ended our work for that year. It was late in the fall; the weather was getting pretty nasty, and we'd had snow two or three times. So we disbanded the party, and I was sent back to Sacramento to work in the main office that winter.

Lage: What was living in these camps like?

McLean: Oh, it was pretty primitive. Each one of us, of course, had a cot, and there were three of us to a tent. The tents were about twelve by eighteen, twelve by twenty, something like that. In one corner we had a big stove. That was to keep us warm, because it used to get pretty cold up there.

Lage: Were you on a tent platform, or you were on the ground?

McLean: At the camp at Devil's Corral we had wooden platforms. At the camps at Susanville and down at Janesville, as I recall, we just had dirt floors; we didn't have any planks. And we had to do our own moving. When it came time to move camp, why, we would all pitch in. Everyone would pitch in. We had a big truck that we used to travel in, and we piled everything in there. Of course, the first thing that we erected would be the cook tent.

Lage: Most important.

McLean: Yes, that was important, to get the cook tent up. And there was quite a bit to move, because she had a wood stove for cooking, and then she had a bunch of benches that we had to move.

Lage: Did she have a lot of heavy cast-iron cooking equipment?

McLean: Well, yes. She had a big array of pots and pans and everything else. Then we had water buckets. You have to remember, we didn't have any ice in those days. We had one of these coolers that we used to hang up outdoors.

Lage: What was that like?

McLean: Well, it was a screen cooler with burlap over the sides, and then there was a pan that you would fill with water. The water would drip down over the burlap and keep it cool.

Lage: It must have gotten pretty hot during the days there.

McLean: Yes, you bet it did. It got hot up there. But the interesting part about it was that most of our staples would come from the division office in Redding. They would make a delivery to us maybe twice a month. Most of the stuff that came to us in those days was in large quantities: a hundred pound sack of potatoes, a hundred pound sack of sugar, a hundred pound sack of flour. We'd get a hold of one of these whole rounds of cheese. Our fresh meats, eggs, and milk the chief of party would buy locally. He had a petty cash account, and he would buy the fresh food. But he was limited as to what he could pay for things. One of the interesting parts about it was that to buy beef, to stay within what he was supposed to, he had to buy either a front quarter or a hind quarter, something like that. Well, of course, you can imagine--even fourteen or sixteen men or seventeen men trying to eat a quarter of a beef within the time before it began to get a little green.

Lage: I should think so, with no refrigeration.

McLean: The first thing that would happen, of course, is that we'd eat all the steaks that we could. Then we'd get down to roast. Then, finally, we'd get down to stews. Not having any refrigeration, by the time we got down to that, why, the stew meat would begin to get a little bit green. But we survived.

Lage: Was there a lot of grumbling and complaining, or was that just what went with the territory?

McLean: No, no. We were all pretty young, you know. We took it in our stride. To get a bath--when we were in Susanville, in those days every barbershop had a bathtub or a couple of bathtubs, you know. If you wanted to take a bath, you'd go into Susanville and go to a barbershop. I think for fifty cents you'd get a Saturday night bath. That would last you all week. We were working in the summertime down in Doyle, and the Susan River flows down through that area. It'd be in the middle of the afternoon on the way back to camp, and we'd peel our clothes off and go into the Susan River with a bar of soap. That was our bath. We didn't have to try to devise something when we were at Janesville, because at Janesville there wasn't anything. There was just a stage stop there, and I don't recall even a store.

But, as I say, we were a young bunch of fellows. We were all in our late teens or early twenties, and we survived. One of the instances I remember, we were living in the back of this family place. It was kind of a ranch with an orchard, and there used to be chickens running all around our camp; we had chickens all around the place. The sage hen season opened on September 1.

Lage: What season?

McLean: Sage hen, sage grouse they call it. They're wild birds. We had seen lots of them all over the area, but up towards Ravensdale, which is about fifteen or twenty miles north of Susanville, that was a big area. So when the season opened, several of us decided to go hunting. We had our shotguns with us. We decided to go sage hen hunting, and I guess we killed a dozen sage hens.

Later we were all sitting around one of these tubs out in front of the camp, picking the sage grouse. Mrs. Beaver was going to cook them for dinner that night. It was a Sunday, the only time we had a chance to go out, and all these chickens were all running around. We had a fellow by the name of Pat Greer, and Carl Kinyon says to him, "Pat, if you grab one of those chickens, I'll wring his neck, and we'll pick them." So Pat reached out and grabbed one of the chickens and handed it over to Carl. Carl wrung its neck, and we picked the chicken. Mrs. Beaver, the cook, was of course quite naive. When we sat down to eat, she had these great big platters of hot food ready, and she sat down with us. She says, "You know, I can't understand. Among all those birds, there was one that was all white meat." And she says, "I can't understand this." The guys looked at each other and snickered a little bit--polite, you know. We never told her that it was one of the chickens that ran around in the yard where we were staying.

Lage: What kind of men were you were working with? They were young, you say. What kind of an education did they have?

McLean: There were three of them that were taking engineering at the University of California, and the other fellows mostly, I guess, had started with the highway commission as rodmen, chainmen. The instrument man on the location party was named Van Rosenthal. The head of the level party was called by the name of Carl Kinyon. We were all happy-go-lucky young fellows in those days. We had really a lot of fun together. We used to take in all the dances, you know.

Lage: In the local communities?

McLean: In the local communities, in Susanville, Janesville, and all the little communities around. In those days they used to have an orchestra that would play at each one of the places. Of course, in most of the places about all they had was a schoolhouse. They'd line all the chairs up against the wall, and they would usually start about seven o'clock. We would dance all night. You went home at sunup. Every night they'd play at a different place. They would play at Janesville or at Doyle or at one of the other places around, and everybody just followed the dance band around to the different communities. None of us had an automobile, and to get to the dances we used take the survey wagon. Somebody would drive it. There no windshields or anything else on it. It was a World War I aviation truck. In the back part there were seats along the side where we would sit. There was room enough for about three or four fellows in front, with a driver and a couple of other fellows sitting alongside him. We used to take that darned thing around to the dances, down to Janesville and other places. Sometimes it was cold riding.

Lage: Would they be on Saturday nights?

McLean: Yes, the dances were always on Saturday nights. All of the local belles or gals would show up, you know.

Lage: They were probably glad to have you fellows along.

McLean: Yes. We were the only single men around. We never missed a dance. And then on Sunday they used to have baseball games. We made up a ball team of the fellows in the party, and we'd go around on Sunday and play at all the little towns around the valley--play the local group, you know. It was a lot of fun.

Lage: I'm amazed at how vivid your memories seem. This is seventy years ago. Right?

McLean: Yes, 1921, seventy years ago.

Lage: You do have quite a memory. Have there been things through the years that helped you remember, like pictures and whatnot? Or does your memory usually go right back to that event?

McLean: Probably the latter. I think it's just the fact that I have remembered. I think I remember those things better than I remember something more recent. I used to have some pictures of the men on the field party. I don't know if I can even find them among all my pictures back here.

Return to Sacramento: Night School and Marriage to Margaret Sherman##

McLean: We finally completed all of the survey work to the California-Nevada border in mid-September 1921, and that's where the job ended. They were going to disband the survey party and send the members to different parties to spend the winter. I kept up correspondence with Allen Wagner all during the time I was in Lassen County, telling him what I was doing. He then told me he would arrange for a transfer to bring me back to Sacramento, because one of my aims was to get back to Sacramento so that I could work in the office and go back to school at night. So he got the transfer for me, and I came back to the headquarters in Sacramento, under him again. There, as a kind of an apprentice, I learned to do drafting. If I remember right, I think I was getting about $125 a month as a junior draftsman.

Lage: Was that a fairly substantial wage at the time?

McLean: That was a good wage in those days. And then I started back to night school. I guess I went to night school until 1923. Well, I was there in Sacramento until 1923. I came back in '21 and worked for two years in the office.

Lage: What was Mr. Wagner like? Did he have a family of his own?

McLean: Oh, yes, he had a family of his own. He had a couple of boys and a couple of girls, as I recall. He and a fellow by the name of Mr. Bean, who was a draftsman that I worked under, taught me all that I knew about drafting and engineering calculations. Then I was married to Margaret Sherman in '22.

Lage: How old were you then?

McLean: I was nineteen. [chuckles] But I was much older than my age.

Lage: Yes, I can imagine! Had your wife had more chance for education?

McLean: No. She had graduated from grade school, from a little country school fourteen miles above Placerville. To go to high school in those days she would have had to live in Placerville, but there was no place for her to go to high school. So her education ended after grade school

Lage: It wasn't uncommon, I'm sure.

McLean: It wasn't uncommon in those days, because she lived on an apple ranch fourteen miles above Placerville.

Instrument Man on El Dorado Hydroelectric Project, 1923

McLean: Margaret's brother, Roy Sherman, who had been married to a girl in Nevada City, had gone to work for the Western States Gas and Electric Company. They were building the El Dorado Hydroelectric Project. Roy and his wife were living on the project, and the engineer in charge of all of the surveying work on this particular project was a fellow by the name of Fred Hoskins. Fred Hoskins had known my wife and had known her aunt and uncle when she had lived with them. Roy told me they were looking for more engineers to come and work on the project.

Lage: Could you call yourself an engineer by now?

McLean: Well, I guess I could, to a certain extent. At least a surveyor, anyway. I got in touch with Fred Hoskins, and with my background --having surveying and having worked there in the office in Sacramento--why, I just fell right into a job as an instrument man, which paid $175 a month, which was big money in those days. I was only getting $125 from the state at that time, in the office, and I wanted to get in the field and get on construction.

So I took the offer that Fred gave me, and up we went to live with my wife's folks, because their home was right alongside the forebay dam project. In fact, it was being built within walking distance of their home. We lived with them all the time that I was working there. I fell right into the swing of things. And because I had done all this office work and everything, why, I got in and worked extra time when there was work to be done.

Lage: You worked extra time with the paperwork?

McLean: With the paperwork at nights, you know, plotting cross sections and all that sort of thing, because the other fellows had never experienced this, and I was lucky enough to have done a lot of this. The next thing I know, Bob [A. D.] Edmonston (who later became state engineer) was looking for an assistant on the construction of the Caples Lake dam and spillway. At that time we called it Twin Lakes. He propositioned me into going up with him.

Lage: This is after El Dorado was finished?

McLean: No, this was still part of the total project. This was in July 1923. I had been on the lower part of the project--the forebay dam, the penstock, and powerhouse--from April to July, when Bob talked me into going to Twin Lakes to work as assistant to Mr. Loughland, one of the top engineers. Bob said, "How soon can you get ready?" [chuckles] And I said, "Well, I guess I'll pack a suitcase, and away I'll go. I'll have to take a bedroll along with me." "Well," he said, "I'll come and pick you up tomorrow."

Lage: You had to be ready to go on this job!

McLean: Yes, that's right. The next day George Loughland comes down with his automobile and gets me, and I left the work there with Fred Hoskins. I guess Fred had recommended me for the job; I don't know. But off I went to Twin Lakes. I guess it was about the middle of July, because they were just getting underway with the construction because snow had been so late that year. I reported to Bob at Twin Lakes and stayed until that job was finished. We finally left there in a snowstorm on October 22, 1923.

By that time the forebay project had been finished, but they were still working on the powerhouse. I went back to the headquarters about fourteen miles above Placerville, and I went back into the office to prepare all of what was called the federal filing drawings. In those days, when you finished a project you made basically what we call today "as-built" drawings. In those days they were called federal filing drawings, because the project was licensed by the Federal Power Commission. It depicted all the drawings of the project--that is, the dams, the pen stocks, the pipelines, storage reservoirs, etc. All of these drawings went to the Federal Power Commission in Washington, D.C., and were filed there as final drawings. I was put in the office to make these federal filing drawings. I worked all winter on that. In the meantime, Bob was down at the powerhouse and finished up the powerhouse.

Investigating Echo Lake Dam, 1924##

McLean: The following summer--this is '24--after the snow had cleared off of the mountains in May, the Byllesby Company wanted to investigate the feasibility of raising the dam at Echo Lake.

Lage: And did the same company have the rights?

McLean: Yes, they had the water rights to Echo. The parent company had a couple of names. It was known as the Byllesby Engineering and Management Corporation, and it was also known as the H. M. Byllesby Company. The Western States Gas and Electric Company was a subsidiary of the Byllesby Engineering and Management Corporation. When I first went up there on the El Dorado project, it was under Western States, but the parent company was the Byllesby Engineering and Management Corporation. So the following spring or the early summer of '24, they wanted to investigate the raising of the dam at Echo Lake.

Lage: Tell me a little bit about that.

McLean: The first dam was built by an early hydraulic mining company for mining near Placerville. Echo Lake originally drained into Tahoe Lake valley and into Lake Tahoe. Echo Lake is on the crest of the Sierras. Apparently an early hydraulic mining company that did the hydraulic mining in the area of Placerville saw the potential of damming Echo Lake, raising the water level, and diverting it over into the drainage area of the south fork of the American River. This must have been done during the 1870s or 1880s, when hydraulic mining was permitted. It was a very small dam, and they built a tunnel through the ridge into the south fork of the American River drainage and diverted the water to the Highway 50 side. Instead of draining into Lake Tahoe, they diverted the water over to where it now flows, into the south fork of the American. The water then was diverted out of the south fork of the American at Kyburz and into a ditch that followed pretty much the way the highway follows the river, down to where they used it for the hydraulic mining around Placerville.

Lage: They measured how much water they took out of Echo, and then they could take that same amount--

McLean: That's right. Water rights law permitted the diversion of water from one drainage basin to another for beneficial use. It went into this tunnel, and then into the river. Then they built a diversion dam at Kyburz, right there at Kyburz, and diverted the water into an earthen ditch known as the El Dorado Canal. Apparently it was dug by hand; it was a very small ditch.

When Western States Gas and Electric came into being, and they wanted to build the El Dorado Hydroelectric Project, they needed the water supply from the ditch, but the ditch was then serving the city of Placerville as a water supply. There was a reservoir above the city of Placerville which was the terminus of the ditch. I can't tell you now whether the ditch was then owned by El Dorado Irrigation District or not; I don't know when the El Dorado Irrigation District even came into being. But I do know that the Western States Gas and Electric Company apparently bought out the water rights and the rights to this ditch before they started the El Dorado project, because when we built the forebay dam, which is the terminus of this ditch, we had to put in a diversion work to divert the water out of the forebay dam for the city of Placerville. The city had the right for sixteen hundred miner's inches.[1]

So then the Western States Gas and Electric Company built a new dam at Kyburz, and the diversion ditch that went from Kyburz down to the forebay dam, which was around twenty-five miles in length, we lined with concrete. That ditch discharged into the forebay dam, about fourteen miles above Placerville; that was for the powerhouse. From the powerhouse we built the wood-stake pipeline, the surge tank, and then the penstock that went down to the powerhouse, plus the powerhouse itself. That was all part of the El Dorado project, which today belongs to PG&E [Pacific Gas & Electric Company]; PG&E bought out Western States Gas and Electric Company.

Lage: But the Echo Lake part was a very small part of all this?

McLean: Yes. This is when we went back in 1924 to decide whether it was feasible to raise the dam at Echo Lake.

Lage: Now, how many feet were you thinking of raising the dam?

McLean: I think it was about ten feet. That would have meant building a dam above the existing dam There are two lakes there, an upper and lower, and it would have flooded both the lakes. There would have been one large lake if the dam had been raised. It would have been a pretty big undertaking. Evidently--costwise and everything else--they decided it wasn't feasible, so it was never

[1]A miner's inch is equal to a square inch of water flowing from a wooden diversion box that is inserted into a larger ditch or stream. It is equal to one-fortieth of a cubic foot/second of flowing water.

done. Raising the dam would have increased the capacity of the lake, and apparently there wasn't sufficient runoff or snow melt to justify the cost.

Lage: But the water is still diverted the same way?

McLean: The water is still diverted the same way; they still divert water out of Echo Lake into this tunnel. And then there are also two other lakes that discharged into the south fork in the American River above Kyburz. There's the Twin Lakes dam and the Silver Lake Dam, both still a part of this whole El Dorado hydroelectric project.

Lage: Do you remember what it was like in 1924 at Echo Lake? There's an Echo Lake oral history project, so I'd like you to add to that with your picture of what it was like.

McLean: Well, it was pretty primitive. There were a few cabins around the lake, all on the south side. I haven't been there since I left there in '24.

Lage: Did you camp there for a while?

McLean: Yes, we camped there for three to four weeks.

Lage: And there were a few cabins?

McLean: Yes, there were some cabins, and there was that boys' camp up on the upper lake.

Lage: Well, raising that lake ten feet really would have played havoc with those cabins.

McLean: It also would have flooded out the boys' camp. I'll never forget when we came up to the boys' camp with the survey party; I was at the head of them, because I was running the party. Boy, that camp director came raring out of the building, "What are you doing here?" I said, "We're carrying out a survey to raise the lake." He said, "Raise the lake? That's going to flood us out!" I said, "Well, I'm only following orders." But he was going to throw us off the property. Of course, it would have flooded them if the lake level were raised. The only cabins that were there--I think there were four or five of them that went on the south side of the lake, and they were quite high above the water. At the upper lake was only this boys' camp; I forget the name of it now. I think it's now a Boy Scout camp.

Lage: Well, it was, and now it's been done away with. On the lower lake there is a very old log cabin, and it's built way up the granite slabs. It was the first cabin, we were told, and it was built up there because the owner had been told that the water was eventually going to come up right to the foot of his cabin.

McLean: Well, there were four or five cabins along the south shore. They were built quite high, up in the timber.

Lage: They might have been told about these plans to raise the lake.

McLean: And then on the north side was the trail that went over to what we called Medley Lakes.

Lage: Now that's called the Aloha lake; it's been flooded into one lake.

McLean: Those lakes are also part of the original project that is now Pacific Gas & Electric Company. But the only thing that was in the upper lake up there was this boys' camp. They had a lodge and quite an establishment there. That was all that was on the upper lake; there wasn't anything else. As I say, I'll never forget, because when we came around and onto the property, we were following what we call the "flow line." But Echo, as I said previously, was apparently a part of the old hydraulic mining that was down in the late 1800s, and then apparently it became the water supply to Placerville. Also at that same time, there was a dam put in at Silver Lake, and that water drains into the south fork of the American, the same as when we built the Twin Lakes dam. That also goes into the south fork of the American.

Plum and Alder Creek Siphons: Dealing with Migrating Deer

McLean: Well, then, when the Western States Gas and Electric came along, who they purchased all this from, I don't know. Those records would probably be available at PG&E. But Western States purchased all of these facilities. To provide sufficient water for the new powerhouse, the Western States Gas and Electric Company reconstructed the ditch. It was realigned and enlarged to carry 120 cfs--cubic feet per second. It was a big ditch, a big, deep ditch.

Lage: But not covered? It was open?

McLean: It was open. And then we put in what was known as the Plum Creek and the Alder Creek siphons. They're two large steel siphons. There's a siphon that goes across Plum Creek and also another siphon that goes across Alder Creek. Those, as I recall, were about ten foot in diameter. They were big pipes, and they were on piers. They'd go down into the bottom of the canyon and come back to the ditch on the opposite side.

Lage: Now, what are they for?

McLean: They're the continuation of the ditch. The ditch was open, and then, rather than going way around where Plum Creek and Alder Creek come into the south Fork of the American, they built these siphons across the creek. We went down and across the creek and back up again. Now, this is what was very interesting. I don't know whether it still is today, but at that time there was an annual migration of deer from down on the south side of the south fork in the American River. From all of that area down around Kirkwood and up around Twin Lakes there was a tremendous migration of deer that used to come down and cross the south fork of the American River. This deer herd wintered around Georgetown in the oak forest where there was very little snow. It was a very large migration. When there was an earthen ditch, the deer were able to get down in the ditch, cross, and come out again. When we got the first snow--I guess it was late October, early November--the migration of the deer started. They had been in the habit of crossing in the earthen ditch and coming out again. But now that the ditch was lined with concrete, the deer got in the ditch and they found that they couldn't get out.

Well, the ditch is about seven feet deep. The first thing that happened was that they were carried by the flowing water downstream, and they began to pile up against the grizzlies at the siphon. A grizzly is a series of bars about four inches apart, vertical, at the upper end of both the Alder Creek and the Plum Creek site. Boy, did we have a mess on our hands. Fish and Game was up there, and here were hundreds of deer, and they put crews out there and tried to get them out of the ditch. They tried to lasso them and pull them out of the ditch and everything else. There were just too many of them; they couldn't do it. Well, as I recall there were several hundred deer killed in that ditch that winter, at both Alder Creek and Plum Creek. First they tried to haul them down to Placerville and give them to the various charities and hospitals and everything else down there. But there was so many of them, they couldn't. So finally they piled them up in big stacks, put oil on them, and burned the carcasses.

I should have said at the beginning that when they built the ditch, we knew where these paths of migration were. And they built bridges, thinking that the deer would go across the bridge like anybody else would. But the deer wouldn't pay any attention to the bridges; they'd always been used to going down into the water and climbing up the other side. So this didn't work. That is why we had all these dead deer piled up against the grizzlies.

The State Fish and Game Department required that they fence this ditch. I think they fenced over eight miles of ditch with a ten-foot-high fence along on each side of the ditch. They left it open where the bridges were. I suppose that fence still exists today; I haven't seen the ditch except once in a while where you can see it from the highway.

III A CLOSER LOOK AT WATER PROJECTS OF THE EARLY TWENTIES

The El Dorado Project: Penstock, Surge Tank, Wood Stove Pipeline for a High-Head Power Plant

[Interview 2: April 3, 1991]##

Lage: We had talked last time about early experiences, and we had gotten up to the early twenties. I wanted you to talk in more detail about the El Dorado Hydroelectric Project, because it sounds like sort of a typical, interesting project of its time.

McLean: The El Dorado Project--I went to work in 1923. This was being built by the Western States Gas and Electric Company, which was a subsidiary of the H. M. Byllesby Company of Chicago. I went up there employed as the chief of party on the construction of the El Dorado development.

Lage: Now, what does "chief of party" mean?

McLean: Chief of party was being in charge of the field parties, either field parties or a field party, that did the surveying and the engineering on the dam, what was known as the forebay dam, and the pipeline construction and the penstock construction. I had probably three field parties that I was in charge of. One party was assigned to the dam, the building of the embankment for the earth-filled dam. And the other one was on the penstock. The penstock is the pipeline that goes into the powerhouse that turns the pelton wheels and the generator. This was one of the highest-head plants in California at the time it was built. The total head was nineteen hundred and ninety-odd feet; as I recall, it was about nineteen hundred ninety-five feet, which is a very high-head plant.

Lage: What does that mean?

McLean: Well, what this means is, it's the total static head from the forebay, the forebay to the center line of the pelton wheels in the powerhouse. This is what drives the big powerhouse wheels, the generator. The pipeline that led from the powerhouse down to the surge tanks--the surge tank is at the head of what we call the penstock. This is to prevent a failure of the pipeline in case of the pelton wheel shutting off suddenly, or stoppage of flow, which puts a surge back through the pipeline. This surge tank was nineteen foot in diameter, and was on a support 297 feet in the air. It's a very high surge tank.

Lage: And it allows the water to rush up into the tank?

McLean: Yes, the water goes up into that. There's water in this tank all the time, at the level of the water in the forebay, and it remains that way all the time that the powerhouse is in operation. But when you shut down the wheels in the powerhouse, then the water surges up in this tank and sometimes will overflow. Sometimes it will overflow.

Lage: Like a safety valve.

McLean: Yes, well, you'd call it a safety valve. When this plant was built, it was one of the--if not the--highest-head plants in California. It's a very high-head plant. For that reason, it uses--I don't recall the amount of water, but the amount of water is small in comparison to low-head plants, where you have a greater quantity of water.

Lage: To get the same amount of electricity.

McLean: The nozzles for the pelton wheels, there are two of them. If I remember correctly, I think they were ten inches in diameter. Let me show you a couple of the pictures of it.

Lage: Okay. I think we should mention that you have a photo album that's really very complete.[1]

McLean: I have some pictures of it. [looks through pictures]

Lage: Were these pictures you took yourself?

McLean: Yes, some of these I took myself. There's the wood-stave pipeline.

Lage: So, it's a pipe that's made of wood?

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[1]Mr. McLean plans to donate this photo album to The Bancroft Library.

McLean: Yes, the pipeline from the forebay to the surge tank was wood-stave pipe. This is sixty inches in diameter with wood-stave pipe.

Lage: Was wood-stave pipe used much after this?

McLean: Oh, probably not so much. Indeed, at that time it was used on a number of plants. The California and Oregon Power Company had a project up in southern Oregon that they used it on. This is the surge tank. See, that's the surge tank there. The head on that was--well, the height of that is 297 feet high and 19 foot diameter. That's what I said, see?

Lage: Good memory!

McLean: And this is the powerhouse. You can see the penstocks coming down the powerhouse. The penstocks divide up here, and they go into the powerhouse.

Lage: Now, they were steel, were they not?

McLean: Those, oh, yes. They're very heavy steel. See, here it is, right there. This is riveted steel, and it's on arms here that it can move for expansion. There's an expansion joint located in there, and it can move. These are what we call "rocker arms" down there. There are large concrete anchors, and the expansion joint is between the anchors.

Lage: Was there any new technology used because of the height of the head?

McLean: No. The pipe for the penstock was manufactured by the W. K. Kellogg Company people back east. I'm not sure where their factory was. When we were testing the line in 1923, the penstock broke under the powerhouse. Here's the break right here. That occurred on December 26, 1923; this broke under the transformer deck of the powerhouse.

Lage: That's a dramatic break.

McLean: Yes, it was really some excitement. Well, here's the powerhouse; I thought I had a picture here of where it--. It goes under the transformer deck, and of course it didn't do any damage to the powerhouse. See? This is what we call a transformer deck. All the transformers are set up on here; they weren't there at that time. This line here broke, and it went up against the bottom of the deck. You can imagine, a 1900 foot head against this concrete deck here. It washed timbers and whatever was under the deck, plus a field office, into the river.

Lage: Now, how did people react to that kind of an accident?

McLean: Well, you can't do anything. You can just shut the line down, that's all. We had to stop the flow of water at the forebay butterfly valve and let the pipeline and penstock drain.

The interesting part about it was that this plant was supposed to be in operation on the first of January, 1924. And there was a penalty on this pipe here; everything was supposed to be okay, you know. When this broke, we immediately wired back to the Kellogg people to fabricate another piece of pipe like the one that broke and to get it out here. They had to manufacture it. To get it out here they sent it by American Express on a passenger train, because of the penalty, you see. I forget what the penalty was, but it was probably three or four hundred dollars a day or even more.

So they sent it out in an express car on a train. At that time there was a train that they could take to Camino, above Placerville, and then we picked it up there and took it down the road and put it in the penstock. But it took us--oh, I think we were delayed about a couple of months before we could put the plant in operation. In the midsummer of 1927 PG&E bought out all of the Byllesby interest in California. They now operate this hydroelectric plant. It's still one of their main plants.

Lage: Is it also used for water supply?

McLean: All of the water from the El Dorado Canal is for hydroelectric generation except for the water supply for the city of Placerville. The total cost of the project at that time was about $20 million. That was the total cost.

Lage: Sounds pretty hefty; was it?

McLean: Well, that was a large project at that time. That project today would probably cost at least twenty times that amount. I would imagine four or five hundred million or something like that to build a project like that today.

In addition to this part of the project there was also twenty-three and one-half miles of canal that takes out of the south fork of the American River at Kyburz. It was a diversion dam at Kyburz, and the canal follows somewhat along Highway 50, except the canal is on the south side of the river. You can see it from different points of Highway 50. Then that goes into the forebay dam and from the forebay dam, of course, into the pipeline, the penstock, to the powerhouse.

In addition to that, we built what is now called the Caples Lake Dam, and that was for storage. The Caples Lake Dam was a part of the project and also Silver Lake, which was also a part of the water rights that they purchased that included Silver Lake and also Echo Lake.

The Caples Lake Dam: Unique Gunite Core Construction

McLean: I told you last time that I went to work in March of 1923 on the forebay dam. In mid-year Bob Edmonston, who was then the project engineer at Twin Lakes [Caples Lakes], wanted me there as his assistant at Twin Lakes when they were building the Twin Lakes dam. I believe it was around the first part of July, because they opened up the camp on the fourth of July, that I reported to Bob. Mr. Loughland, the assistant chief engineer for Byllesby, took me to Twin Lakes, where I reported to Bob on the construction of the Twin Lakes dam along about the middle of July of 1923. The dam was finished in October of that year. We built the dam, and there was a spillway. Then we had to realign the road, because at that time Highway 88 went across the stream by a bridge; it crossed from the south fork of the stream that fed Caples Lake to the north side, and we had to build the road across the top of the dam.

Lage: Wasn't that sort of an engineering feat?

McLean: Oh, yes. Well, it was all a big job; it was. We realigned the road, because the road at that time had previously crossed the old stream--that is, the stream that was where the dam site was.

Lage: Was this another earth-filled dam?

McLean: Well, this was a unique dam. Normally, earth-filled dams are built of clay, or have clay cores. But we didn't have any clay at this site because of the granitic geology; in that country it's all granite. We only had a decomposed granite similar to sand to build the dam out of. In order to have an impervious core, to prevent the water from leaking through the embankment, we put in what was known as a core curtain. The dam foundation was granite; the dam was excavated down to bedrock. Then, starting from a concrete foundation, we built up a core with four inches of gunite. Gunite is a sand cement mixture that is fed in through a nozzle by air pressure. We built that core, which made an impervious core, and I have some pictures showing the gunite core. They put a backup form for this core, and then they'd shoot one side of it; they'd shoot two and one-half inches on one side. And then they'd take the form off and shoot the other inch and one-half. That formed the impervious layer. The gunite core is supported by the decomposed granite embankment of the dam.

Lage: Was that a new technology?

McLean: That was a new technology; I have never seen or read of that method being done previously. Apparently it was very, very successful.

Lage: You must have been learning on the job a great deal.

McLean: I sure was. Well, here. You can see the core here. See this core?

Lage: Oh, yes, right down the middle. It looks sort of like a cement wall.

McLean: It is; that's what it is. It's a cement wall, but it's only four inches thick.

Lage: And that gives stability?

McLean: That provides the impervious core.

Lage: Otherwise, the water would seep through the dam?

McLean: Let me draw you a picture. [chuckles] I can't talk unless I draw pictures.

Lage: Well, you're a true engineer--you need to draw. [See following page.]

[tape pause]

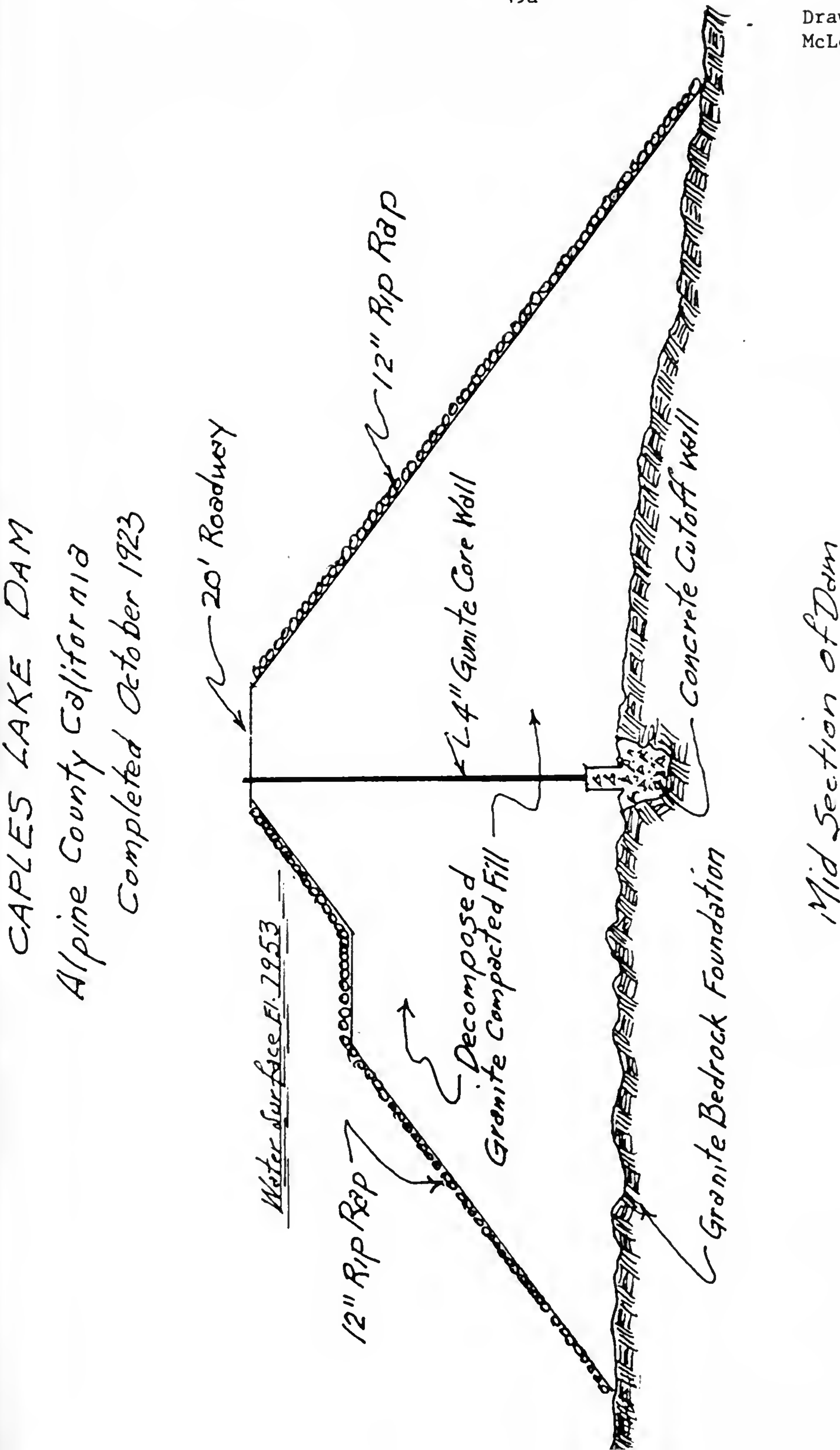
McLean: This was very unique. In fact, that's one of the things--and I'll also mention some more--that was very unique. Some of the things we did on that job at Caples Lake were rather unique.

Normally, on an earth-filled dam--I'll draw it so you can see it. [begins to draw] We'll say this is the upstream face, and here's your downstream face. Here's your foundation in here, like this. Normally, on an earth-filled dam, you have what we call a clay core, and this clay core comes in like this and like this.

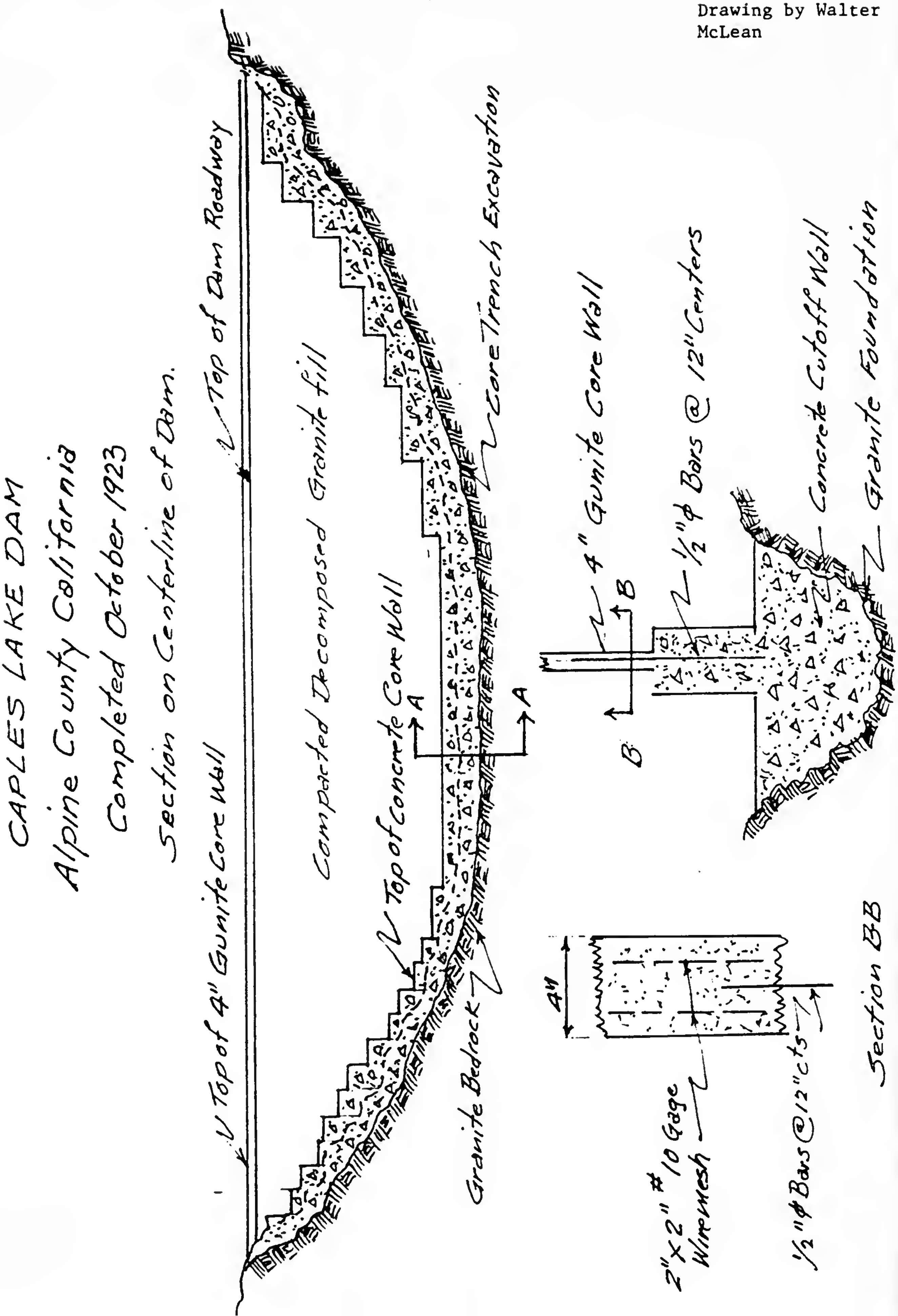
Lage: A triangular shape.

McLean: That's what we call a clay core. This is impervious. Now, any dam that you build will leak. I don't care whether it's concrete

Drawing by Walter McLean



Drawing by Walter McLean



or whether it is earth-filled or whatever it happens to be. Say here's your water surface here [drawing]. And then we put what we call a drainage blanket in like this. And then we put a drainage blanket in here, like this. And then we bring this drainage blanket out, like that. The reason for that is to keep from saturating the clay core, to avoid a failure. So we have what we call a friatic line that comes through like this, and it'll come through the clay core. But as soon as it comes to the drainage blanket, your friatic line, your hydraulic gradient, drops and drains out here so that you always have a little flow of water coming out down here.

Now, in the case of the Twin Lakes dam we did the same thing this way. [begins sketching] Here again we had a dam like this. But in the center, this was a solid granite foundation down here. We went down in here, and we put in a concrete foundation, like this. We put in what we call a cut-off trench. And then we built this like that. And then we had this gunite core that comes up through the dam like this.

Lage: Just a wall, straight.

McLean: It's a wall; a concrete wall is what it is. It's a concrete wall. This was four inches thick. Now, here is a situation where this material, you have to remember, was more like a sand. It's granitic--decomposed granite. We compacted this, but this would always be saturated with water. Down at the bottom here, we put in a gravel blanket. So what happens is that here's your water level up on this side, and your water level perks through to here, but there's a barrier. Now, if there is any seepage through this or anything else, it would drain down through this into this here and then drain out.

Lage: I see, drain down on the river side, the downstream side.

McLean: Yes, down through this. That's right, because this is more or less pervious. It's just like a sand. And this was very unique.

Lage: Do you know who thought of the idea?

McLean: This apparently was developed by the engineers back in Chicago. But, this was because we didn't have any clay; there was no clay available in that country. And I have never seen another dam built like this; I don't know of any.

Lage: It looks like this water, backing up and coming through the granite side, would put a lot of pressure--

McLean: What is the purpose of this, and what is the purpose of that? The purpose of this embankment in that is to support this wall.

Lage: Oh, I see. So, the wall is doing all the work.

McLean: The gunite wall is doing all the work, see. And that is also the purpose of the clay core. What you've done, you're building an impervious blanket in here, but this here is supported. Now, today we have what we call zoned dams, and these are composed of various materials, but basically there is enough weight to support this clay core.

Lage: That four inch wall did a lot of work.

McLean: Yes. This is about one hundred twenty-five feet high. Remember, this is just a four-inch wall that is just standing up there. If it were standing up by itself it would have no support; it would fail.

Lage: Even without the water pressure?

McLean: Yes, that's right. So, what they did was put this in. See, because construction materials were limited on this site, the material we had for concrete we manufactured. We actually had a quarry, and we had a big crushing plant. We quarried the granite out of the hillside. We blasted that out of the hillside and brought it down the hillside, where it went through a crushing plant where we made concrete aggregate and actually made our own sand. Construction materials were limited, and the result of it was that we had to make do. And this was why the engineers came up with this particular method. We had a small concrete dam, which we called a spillway dam, that was located over on one of the south arms, but that only took a comparatively small quantity of aggregate.

Lage: They weren't building the large concrete dams at that time, were they?

McLean: Well, we were limited. To have built a concrete dam there would have required a large amount of concrete. To produce the aggregate for concrete--even today, the working time is very limited due to the weather. It's nearly ten thousand feet elevation. [looking at pictures] We had snow there in September, when the dam was being built. This is October, see; the dam was completed, and here's the road across the dam. They hadn't finished everything, but here's the road across the dam.

Lage: Did the road put extra pressure on that dam?

McLean: No, no. That wouldn't bother it in the least, no.

Lage: Did the granite tend to wash away over the years?

McLean: No, because we place riprap; it is large rock. On the face of all earth-fill dams you place the rock like this to prevent any water erosion. Usually on an earth-filled dam you have a three- or a four-foot blanket of rock, what we call riprap. That's to protect your upstream and downstream faces of the dam. Here you can see it was snowing. We had snow there in September. October 5, here's snow then. We got out of there in a big snowstorm on October 22. Let me show you the other dam, the concrete spillway dam. I've got a picture of it here somewhere. Here it is. This was taken on the 12th. This is what we call the spillway. This is over on the Kirkwood side, although it drains into the same stream. But, you see, this was just a small concrete, arched dam. This section is low to permit the lake to spill. In other words, if the water in the lake gets to this height, it'll spill. This is the spillway, and the flow comes down this creek here and then flows down into the other stream below the dam. This is a very small dam. They did have a little earth fill on this side and a little rock fill on that side, but that was over on the south end of the lake, around the other side. But, this photo shows the finishing off of the dam. This is the top of the dam, right here, and--well, you can see the riprap.

All of this work was done with what we call Bucyrus steam shovels and Mack trucks. Most all of these were large Mack trucks, and they hauled the material up on the dam, and it was compacted. Then, we put the riprap on the upstream face and downstream face.

Wood-Fired Steam Shovels

Lage: What kind of steam shovels, did you say?

McLean: They were Bucyrus steam shovels.

Lage: Is that a company name?

McLean: That's a manufacturer's name, yes. They had one-cubic-yard buckets, and they were fired by wood. See the boiler here? And over here there's a stack of wood; see the stack of wood behind them?

Lage: So, you had to be feeding the fire under the steam boiler all the time?

McLean: Yes, that's right. They had a fireman who rode the cab back here. The operator was up here, and the fireman was back here.

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McLean: See this stack of wood back here? The fireman had a little place back along here; here it is right there, see? And he kept feeding the wood from here. They also had a regular crew of wood cutters on this job. They had a whole crew that were out cutting down trees. The timber at this elevation is lodgepole pine and silver fir. The wood was all green, but apparently it burned all right in the fire box of the boiler.

Lage: There must have been a lot of smoke coming out of that.

McLean: Well, there was. You see, they have a spark arrestor on top of the stack to keep the sparks from setting fires. They had regular wood cutters, and each crew was out there in the basin and up in the woods around there, cutting firewood for these shovels. I've forgotten how many we had, but I think we had three or four shovels down in the borrow pit.

Lage: Now, what was the borrow pit?

McLean: The borrow pit was where they obtained the material for the dam. The material came out of the bottom of the old lake. And we had these shovels down there in what was known as the borrow pit.

Lage: You were borrowing--?

McLean: That's where they obtained the material for the fill in the dam. They would excavate the material and load it into trucks. Then the trucks would travel up on the dam and dump the material. A bulldozer on the dam would spread it. Then we had a big tractor unit that would compact the material.

Lage: Were other people taking pictures as well? Or did you have a particular interest?

McLean: Yes. Some of these pictures were taken by a photographer who was with the company. But they wouldn't come up there all the time; they'd only come up there occasionally, maybe once every couple of weeks or something like that.

Wages, Hours, Food on a Round-the-Clock Project

Lage: Now, what would have been your job in all of this construction?

McLean: Well, my job was assistant to Bob Edmonston, the project engineer. Then they had a superintendent, whose name was Levinson. He was the one in charge of the project. I had a fellow working with me by the name of Tate, and then Bob was the project engineer. Our job was to keep track of the quantities to pay and do all the engineering. The work was done by the Byllesby people. The Byllesby people were basically the contractors, but the work was being done for the Western States Gas and Electric Company. In order to pay the contractors, we had to determine the quantity of work performed monthly. We had to measure how many linear feet or square feet of core wall, how much material was placed in the dam, how much concrete was placed in the auxiliary spillway dam. Every month we'd prepare what was known as an estimate. That was an estimate of all the items that they were paid for. My job also was to check the elevations--that is, to get the elevations not only for the dam but also for the auxiliary dam--the concrete dam--so that they could build the forms and everything else.

In those days we worked twenty-four hours a day. They had three shifts there. They had lights over the dam and the construction camp.

Lage: What kind of lights would they have had?

McLean: They were electric lights. We had a large generating plant that supplied all the electricity for the camp. The lights were strung over the top of the dam.

Lage: You worked twenty-four hours a day?

McLean: Oh, yes. Well, they had two ten-hour shifts. In those days we worked ten hours a day. There would be two hours between each shift, and in between shifts they would grease--what they call grease--and service the equipment. That would mean they would gas up the trucks, and on the steam shovels they go through and grease them and everything else. One shift started at eight and worked a straight ten hours, with an hour off for lunch. So that would be eight o'clock in the morning until six at night, I guess it would be. And then eight at night until six in the morning. That's how you put in the ten-hour shifts. We did that on all the jobs; we did that on the [El Dorado] forebay dam, on the Twin Lakes dam, the powerhouse, etc. See, we only had, actually, from around July 1 until October. You had July, August, September; so you had about three months.

Lage: To do the whole thing?

McLean: To do all the construction work. That meant that you had to work every minute. We didn't work Sundays, but we worked Saturdays. Saturdays were straight through.

Lage: And was this all regular pay? There was no overtime for working Saturday, or such?

McLean: Oh, yes. I believe the operating engineers were unionized at that time, even then. They got two hours of overtime; they made big wages. The operating engineers got time and a half on weekdays and double time on Saturdays.

Lage: Can you estimate their hourly wage?

McLean: As I remember, the operating engineers were getting $6 per hour, common labor was 50 cents per hour, and board was $1.50 per day.

Lage: The operating engineers were the ones who operated the equipment?

McLean: They were the ones who operated the equipment, yes. They operated the compressors; they operated the generators and the steam shovels. I don't know about the trucks; they didn't operate the trucks, I think. I don't know whether truck drivers were paid overtime or not. But I do know that the steam shovel operators were paid overtime.

We had more than a thousand men working on this job. They had a large mess hall and a big tent camp. We all lived in tents. I think the laborers got fifty cents an hour, a big wage in those days.

Lage: Was that considered a good wage?

McLean: Oh, yes. In other words, they were paid basically five dollars a day, six days a week--which was thirty dollars. Multiply that by nine weeks. And then I think they were only charged a dollar and a half a day for board and room. I don't think it was more than that. But, boy, the food--. They had a whole group of cooks and bakers. They baked all their own bread and made all their own pies and cakes and desserts. There was always beef, pork, lamb, and veal weekly.

Keeping the Men on the Job: Camp Followers and Good Food

Lage: Was the food good?

McLean: Yes. At the camps in those days they had good food, because they wanted to keep the men on the job. You have to remember, we were isolated. The nearest town was Markleeville, and that was twenty-five or thirty miles away, near Nevada. You got up there, and there was no place to go. [chuckles] Now, turn that tape recorder off a minute, and--.

Lage: Oh, come on! Let's put the interesting stuff on.

McLean: Oh, no, no.

Lage: [tape pause] Let's record it, and you can take it out later if you need to.

McLean: Okay, we can do that. There was a camp over near this auxiliary dam, where there was--I think they had six girls over there. Of course, it was a regular route over there, you might say. These fellows who were working there at the camp would go over, and the girls would take care of them all during this construction, see?

Lage: They must have been pretty busy.

McLean: They were busy. [laughter] But they were there the whole summer.

Lage: Was that sort of standard in that isolated--?

McLean: In construction camps, yes, believe it or not. Down at this other camp--.

Lage: Now, the company didn't provide that, did they?

McLean: No, no. No, no.

Lage: Private enterprise on the part of the women?

McLean: Yes. They came from Nevada. Both years that they worked up there, why, they would camp at the same place. I don't know how they got their water; I guess they got it out of the lake. They stayed there the whole summer that we were there. Now, at the other camp--

Lage: Down at El Dorado?

McLean: Down at El Dorado, down at the forebay camp--. In those days the men were paid in cash. They wouldn't pay by check; they paid cash. We got paid by check--that is, the engineers--because we were on a permanent payroll. But the fellows who worked by the day, the paymaster--they had what they call a paymaster, the same way at Twin Lakes--would come up twice a month, on the first of the month and on the fifteenth of the month, with a big bundle of cash. Every man would line up in front of the office of the paymaster--that is, the shift that was off at that time--the paymaster would pay them off in cash, and they'd sign a slip to say that they had received their wages. Down at the forebay camp, there used to be two automobiles full of girls who would come in on payday. They would let the girls off at the tent camp--you know, this was a big tent camp--and each one of the girls would get into a tent, see, and then they'd take on these fellows. The fellows would line up in front of the tent, and they'd go in and pay their money. Every once in a while the superintendent--he'd kind of turn his back most of the time, but once in a while he would give them a time to leave the camp. There were usually four or five girls. This was a large tent camp, as there were more than a thousand men living there. The girls would scatter like chickens in this tent camp, and each one of them would get in a tent. And as soon as they got in a tent, why, the fellows would line up for their turn.

Lage: This was just sort of an accepted thing at that time?

McLean: Yes, this was accepted at construction camps at that time. They had the same thing at Pardee when it was under construction. Then the girls were at Campo Seco. Today, of course, you don't see so much of that. First of all, today you don't have the large construction camps the way you did in those days. At Pardee there were two little communities right nearby. Jackson was one, and Jackson was wide open. This was during the Prohibition days. You could buy liquor all during Prohibition at the Pioneer bar and other places in Jackson. They never closed.

Lage: So it was just like Prohibition wasn't going on in Jackson?

McLean: Yes, just like there was no Prohibition. I don't know how they got by.

Lage: It wasn't a hidden--

McLean: Well, yes. And over in Jackson there were two or three houses of prostitutes over there. Then in the little town of Campo Seco there was--the boys used to call it the Green House or something like that. There was a house there, up on the hill, and I think there was five or six girls in that house. Those were all within walking distance. Jackson wasn't so close, but both were within walking distance of the camp. And you have to remember that at Pardee there were a couple thousand workers at the camp; it was a big camp. Again, in those days, they paid by cash.

Lage: Did the fellows keep their cash much over the summer?

McLean: Why, I don't know, I suppose so. I don't know.

Lage: Were there problems with theft in the camps?

McLean: There was no place for them to cash a check, see. You have to remember that automobiles were not as prevalent then as they are today. Most of these fellows came in through hiring halls. In those days Sacramento and Stockton had what they call labor hiring halls. If you wanted men for your construction camp you would call up Murray and Ready in Sacramento and say, "I want three or four carpenters, I want so many laborers, and I want so many workers," or something like that. And they would round them up and take them by bus up to the job.

Lage: It's reminiscent of agricultural day labor now.

McLean: Pretty much the same as agricultural labor. In other words, these people were actually labor contractors, you might call them. If you wanted laborers or cement workers or somebody like that, why, you'd call Murray and Ready. There were also three or four other agencies. You'd call them up and say, "Send me up x number of laborers for tomorrow," or the next day, or something like that, see? In those days I think they used to pay a dollar a head. In other words, for every man that they sent up for the job, the contractor would then pay a dollar for that particular fellow.

Lage: Pay to the labor contractor?

McLean: Yes, to the hiring group--to Murray and Ready. Then they would deduct that dollar from the worker's first paycheck. All the workers were paid by cash. When it came payday, they had a paymaster who would have enough cash to take care of the payroll for that period. As the men came off work, they would line up, the paymaster would give them the amount of cash for the number of days worked, and they would have the men sign a slip for their wages. The only persons who received checks were those who were on the permanent work force. In those days most all permanent employees were paid by the month. If I remember correctly, I think that in those days they were paying the day laborers every two weeks, on the fifteenth and the first of each month.

And, of course, many times men didn't work full time. The work was too tough or too hard, or something like that, and they didn't want to stay. So they would work only maybe four or five days. There was always enough cash on hand so that they could pay those fellows who didn't stay for a long period of time. They used to have a big safe in the office where they kept all the cash. And if a worker was laid off, then they could pay him off in cash. This ia why I told you that the girls knew when it was pay day.

Lage: When to come!

McLean: And of course, like I was telling you, in what we call the forebay camp--the forebay and the pipeline camp--why, they would always hit the camp on the evening of payday.

Lage: But in the other camp they were there all the time?

McLean: In the other camp, Twin Lakes, they were there all the time. [laughter] They spent the summer with them. Now, I don't know about the ditch camp--we had what we called the ditch camps--I suppose they probably hit the ditch camps the same as they did the other camps.

Lage: Now, what kind of background did the workers have?

McLean: There were carpenters, and most of them belonged to carpenters' unions. And the riggers; the riggers where those men who worked on the high lines. And then you had electricians.

Lage: What were the high lines?

McLean: The high lines were like on Pardee, where we had so much rigging for the chutes, counterbalances, and lights in the area. Those men were working on cables in the air, hanging the lights and doing all of what we call the high line work. They were skilled. Most all of those fellows belonged to the riggers' union. Carpenters belonged to the carpenters' union. The concrete workers, the laborers, didn't belong to any union.

And then you had the cooks and bakers, waiters, and dishwashers. They had a full mess hall crew at the Twin Lakes camp, and even at the forebay camp they had bakers. But at the Twin Lakes camp they had a large ice-making plant. They had a large walk-in refrigerator where they kept all their meats, butter, eggs, and perishables, including chickens and even turkeys. They had a large crew at the Twin Lakes camp. They were working all the time. Breakfast for the day shift would be usually at seven or seven-thirty in the morning. We had another meal at noon, and our dinner was usually about five-thirty at night. Then they had to have breakfast for the crew that went on at six o'clock in the morning. That crew ate with us at noon, and they didn't get off shift until after five o'clock; so it was at six o'clock, again, that they ate. They had to feed the crew that was starting the next shift, and then there was a midnight meal. And there was another one when that crew came off in the morning. They had a big kitchen crew. The bakers, of course, only worked eight hours a day. But they baked all the cakes, all the pies, all the biscuits, and all the rolls.

Lage: And they were trained, it sounds like.

McLean: Oh, yes. They were a regular bakery outfit, and they had their own bakery. That is, they had a place that was separate from anything else.

Lage: Were they a contracting firm that came and baked--?

McLean: No, no. They were part of the whole operation. They came under the superintendent. You don't see those anymore. Today we do not have the large construction camps.

In later camps, like down at Boulder, when they built the Boulder Dam or the Hoover Dam--whatever you want to call it; we always called it Boulder--they actually had a contractor that came in and did all this. They just contracted for the camp, and they contracted for all the cooking and everything else. But what I'm talking about, back in the twenties, when there were other projects being built (I was only on just this one project and then at Pardee), those were the days of the big construction camps. They had some two thousand workers at these camps, and they were big camps. And the contractors--it was Atkinson Construction Company at Pardee--why, they were used to setting up these camps. They had a man who was in charge of doing this type of work. They had been doing it for many years.

Lage: Nothing to do with engineering?

McLean: Nothing to do with engineering.

Preliminary Work on the California Water Project, 1924-1925

Lage: Let's move on so we can get you to East Bay MUD [Municipal Utility District].

McLean: All right. Let's cover what happened next. When I completed the work up at Twin Lakes, I went back to the main construction office of the H. M. Byllesby Company, fourteen miles above Placerville. I worked that winter at the office.

Lage: I think we covered this.

McLean: Yes, we've covered that. The next year I went back with Fred Hoskins to do the final engineering work, what we call the final field work, at Twin Lakes. But prior to that we had stopped at Echo to investigate raising the lake level. That was finished in August of 1924. Bob Edmonston, after completing the powerhouse, went to Sacramento with what is now the State Division of Water Resources, where he became the assistant engineer to Paul Bailey. Paul Bailey was the state engineer, and Bob became his assistant. And at that time they were getting started on what was known as the California Water Project. I was employed there as a junior hydraulic engineer and worked on what we call flood plain studies and flow of California streams. One thing that I worked on was a report on economic aspects of a salt water barrier at Carquinez Straits.

Lage: They were doing all this sort of preliminary work?

McLean: This was the start of the California Water Project. This is when the state got started on the project. This was when they were doing the original field work on the Shasta and Oroville Dam sites and a number of those other dam sites in the state. We were also looking at the canal locations in the San Joaquin Valley. I worked with Bob on that until November, 1925, when we finished most of the work on it. That was a little over a year that I was there in Sacramento. We were in the Forum Building and then also in the Plaza Building. A lot of this work was done with a small group of us over in the Plaza Building.

Investigations of the Middle Fork of the Feather River, 1925-1927

McLean: The work we were doing in those days was limited by appropriations from the state legislature, and we were just about finished with the assignments that we had at that time--to get out all of the studies that we had on the California Aqueduct and the rest of the work--so I knew that work was running out. I received a call from a fellow by the name of Ben Painter, who had been on the El Dorado project with me, except that he had been on what was known as the El Dorado ditch. He wanted to know if I would come to Oroville and be his assistant on the investigation of the middle fork of the Feather River. It was the first of November of 1925 that I went up to Oroville and we started the surveys. I worked in the office, doing all of the office work. We had a field party that was to locate the alignment for a power line that went from the middle fork of the Feather River at Bidwell Bar down to Manteca. This was the location for transmission lines.

Lage: You were trying to find the best routes for transmission lines?

McLean: Yes.

Lage: How did that work? That sounds intriguing.

McLean: Well, that was done during the winter of 1925.

Lage: How did they find the best one?

McLean: You use the U.S. Geological Survey topographic maps, and you try to find an area where you're somewhat below the main timberline and not getting down into agricultural land. We sort of followed the base of the foothills through more or less unsettled land. It was mostly open grazing land, where a right of way would be the least expensive. And we were to tie into a power line east of Manteca. That was for a proposed powerhouse at Bidwell Bar.

Lage: Were there permits and things that you had to get, or is that something of the more recent--?

McLean: At that time, no, because this was just a preliminary location that we were mapping. Of course, when you get into it later, then you have to purchase easements from the various property owners. We were just trying to locate a tentative route and prepare maps for the location. As I recall, the length of that line was about 125 miles. It was quite a distance. Of course, my work was all in the office. I was doing all the calculations and computations and drawing the maps in the office. We plotted the location on maps, so that we had a whole series of maps.

Lage: You were not going through the brush?

McLean: I wasn't in the field. I would get out once in a while with a field party, but I didn't spend too much time in the field. After we finished the transmission line locations, we disbanded the field parties for the winter.

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McLean: The following spring, when we would get the field parties in the middle fork of the Feather River canyon, the first thing we had to do was to establish some elevations for proposed pipelines and powerhouse locations. Our assignment was to investigate the hydroelectric potential of the middle fork of the Feather. The Feather River, from Portola down to Bidwell Bar, falls four thousand feet in elevation in forty miles. There is also a large quantity of water flowing in the river, so it makes an excellent hydroelectric development.

Survey Parties in Remote Countryside

McLean: First we had to establish elevations through the canyon, because this was all virgin country. We started--one instrument man, a rodman, and a helper, with a couple of burros, and they put their packs on with food and personal gear, etc. One party started up the middle fork of the Feather River from a bench mark. It was a U.S. Geological Survey bench mark on the Western Pacific Railroad where the middle fork of the Feather empties into the north fork. That party started up the south side of the river to run levels at about midway between the river and the top of the canyon, where we would be coming through with survey parties to pick up these elevations. They were to establish bench marks through the river. We started another party going down the river with the same complements, you might say, of an instrument man, a rodman, a helper, and a couple of burros with their bedrolls and their cooking equipment. We started them down the river from a bench mark that was at the east portal of the tunnel, where the Western Pacific Railroad crosses between the north fork and the middle fork. They eventually met about midway between Portola and Bidwell Bar.

They were setting bench marks--elevation marks--all the way down the river. While they were working in the river, we had a survey party consisting of ten men surveying Gold Lake, Jamison Lake, Wade Lake, Bushy Lake, and a group of lakes whose water rights the Byllesby people had bought from early mining companies. These lakes all drain into the middle fork of the Feather River.

Lage: [looking at map] These lakes are right near Quincy.

McLean: Yes, right near Quincy, because we stayed at the Feather River Inn and at the Gold Lake Lodge. These lakes were used in the early days to supply water for hydraulic mining. This was the hydraulic mining that was done down in the middle fork area. They had put little dams in these; there were half a dozen. Well, there was Gold Lake, Wade, Bushy, Jamison, Sardine; I think there were six or seven small lakes up there. The first thing they wanted to know about was whether the elevations could be raised and what the size and the capacity were. So the first field party that I had up in the canyon at that time, why, we stayed at the Feather River Inn. Later, when we worked up at Gold Lake, we stayed at the Gold Lake Lodge.

Lage: How many people would be staying there?

McLean: We had a transit and level party for a total of ten men. When we finished at Gold Lake, we started in the middle fork canyon. That was the summer of 1926. In the fall of '26 we moved the camp down to Bidwell Bar, and we stayed at Bidwell Bar. We also had a camp on the south fork of the Feather River. I was living in Oroville then.

At that time we surveyed what was known as the Bidwell Bar Reservoir. It was proposed to build a dam at the Bidwell Bar site. We spent the months of October, November, and part of December on the south fork and the middle fork near Oroville. We spent those months in those two camps. Finally we disbanded the parties just before Christmas; the fellows all wanted to go home for Christmas. Ben Painter and I worked all winter in the office in Oroville on computations and preparing maps of the summer's work.

Lage: Did you have your family up there?

McLean: Oh, yes, I had my family; I moved them up there in that year, in '26. We lived on Bird Street in Oroville. Ben and I worked all winter on all the notes that we'd taken during the summer, working up all the drawings, and making out the reports and everything. When the snow was off of the mountains the following year--well, let me back up a minute to the summer and fall of '26. That summer we also started at a reservoir site on the river--that is, a proposed small diversion dam on the river--and we worked down the river to what was known as Bald Rock Canyon. We surveyed three powerhouse sites in that area and then finally finished up at Bidwell Bar.

After we left Gold Lake and that area, we went down into the river and started down the canyon. There we had camps at Hartman Bar and at Bald Rock, at what we called Cascade. Then we had another camp at Bidwell Bar and one at South Fork. In those days we had to move with a pack train, because all of this country was uninhabited, basically. We had a pack train camp there, and the packer would come into our camp once a week with supplies. We had a cook who cooked for us. I had fourteen men on the party there. We worked the entire river canyon, starting at a dam site named

Clio at the upper end of the river, downstream from the town of Portola. We worked the entire river, down to Bidwell Bar.

Lage: What were you doing when you say you were surveying?

McLean: Well, we were surveying for sites for pipelines or conduits and penstocks and the powerhouse site.

Lage: Just looking at all the alternative sites?

McLean: Yes. In other words, there would be a diversion dam in the river, and you'd have a pipeline leading out of that, and then you'd have a penstock and a powerhouse. Because of the quantity of water in the river and because of the fall that you had from the upper end down to Bidwell Bar, there were sites for at least three powerhouses in the river.

Lage: So you would have accepted three smaller rather than one big?

McLean: No. A four thousand foot head is a high head, which would require a long conduit and stronger penstocks. Normally you have a pipeline, a penstock, and a powerhouse. Then you divert the water up below the powerhouse and, again, you have a pipeline, a penstock, and a powerhouse. And then you come down to Bidwell Bar, and you have another penstock. So on and so forth. We were surveying all of these sites. And every time we had finished at the powerhouse site, we'd move camp. In other words, in the forty miles I think the first one went from Clio down to, as I recall, Cascade. The next one was at Bald Rock, where we had a tunnel through Bald Rock to the head of the penstock. The next site was at Bidwell Bar, where we had another reservoir and a powerhouse.

We spent the entire summer, after we had finished the work we had at Gold Lake, Wade, Jamison, Bushy, and all the smaller lakes. Then we moved over in the main part of the river. Because by that time the parties had completed setting the bench marks, and we had elevation bench marks to work by. Then we started the crew down the river, and that's where we spent the entire summer of 1926--in the river, where we were supplied by pack train. One place we stayed at, Hartman Bar, there had been a camp there, so we utilized those facilities. There were some cabins, a cookhouse, and a mess hall. We utilized them all. But the remainder of the camps, we had to have our own tents and cook shack. At Cascade we were on the north side of the river, and we set up a tent camp there where we would get our supplies by road.

Frenchie the Cook and His Replacement

Lage: So you were involved in all the setting up of camps on this investigation?

McLean: That's right. This was with Ben Painter. I have to tell you about an instance. When we had finished the powerhouse site at Cascade, we moved over to the north side of the river. And there we set up camp near a gasoline service station and kind of a little store. They had a little quick-lunch counter and some supplies. We moved with the pack train, and the cook, Frenchie, always went along with us. The cook always went with the pack train; they always had a horse for him to ride. He moved with them because he had to set up camp and get his cook shack set up so that when the fellows finished at night, why, he had something to eat for them.

Well, when we finished at Cascade, we climbed out of the river up to where our new camp was on the north side of the river. Everybody was just tired, and we expected to have a big supper ready for us. And there was the cook, dead drunk on his bed, and nothing to eat. It happened that the man who ran the service station was bootlegging. I suppose he gave Frenchie a drink, and one drink led to another. He was dead drunk. Well, I told the woman at the service station, "Now, look. Your husband is responsible for this, and I've got a hungry bunch of fellows here. You better get in and fix something to eat for these men. Because they've got to have something to eat tonight, and they're going to need some breakfast. Now, you get in there and get going on this." So she fixed it up.

Lage: You had the supplies?

McLean: Yes. And she prepared supper and then cooked breakfast. We had to start down the river the next day. Well, the next morning, I could see that Frenchie wasn't going to make it.

Lage: Wasn't ready to take off on the horse?

McLean: He wasn't. [chuckles] So I had to get on the telephone to Marysville to one of the hiring places there, Murray and Ready. I said, "I'm going to pour this cook on the automobile stage." In those days, there was a stage that ran from Marysville to Quincy. There were also stages that ran from La Porte to Marysville on the south side of the middle fork. So I stayed in camp, and I put Frenchie on the stage going down. I told Murray and Ready, "You've got to get me a cook up here, because I've got to have a cook." The following day, here comes the cook from Marysville.

So then we're okay. He stayed, and then we finished at Bald Rock and went on to Bidwell Bar. There we worked on the south fork and also the Bidwell Bar reservoir site that winter. And that finished up.

1927 Survey of Grizzly Valley

McLean: We disbanded the survey parties, and the following summer [1927] we went back to Portola, because we then were to survey the Grizzly Valley reservoir site, what they now call Davis Reservoir. We stayed at Portola. There were two little hotels there, and we stayed at one hotel. And we spent the summer surveying Grizzly Valley--what is now Davis Lake, which was built by the state. But at that time we called it Grizzly Valley, and we surveyed that for a potential source of storage.

This was a big lumbering area. Here's Feather Falls [looking at map]. When we were working in there, all of this country was being logged out, every bit of it. We had one of our base camps down from La Porte. We had our pack camp there. This was the summer of 1927. We went to Portola, as I recall, about the first of May, and it was about August, I think, when we finally finished everything.

Lage: Did anything come of those Feather River investigations?

McLean: Not a thing. They've never done anything about it. In fact, if I'm not mistaken, I think a part or maybe all of that middle fork was put in the so-called Wild Rivers Act. I don't know.

PG&E Purchase of H. M. Byllesby Company's California Interests

McLean: But while we were there that summer of 1927, the Byllesby people--that is, the H. M. Byllesby Company of Byllesby Engineering and Management Corporation--sold out all of their power interest. This included the Western States Gas and Electric Company, Coast Counties' Gas and Electric, and a lot of other subsidiaries it owned in California. They sold their holdings to the Pacific Gas and Electric Company. And sometime--I don't remember whether it was July or August--I was told that the next checks that we would receive would be from PG&E. From then on, all the expenses and everything else--hotel bills, restaurant bills--went into the PG&E office in San Francisco.

Lage: So, that happened in the middle of your job?

McLean: Yes. Well, it was nearing the end of the investigation. When this was all finished, I took all the final reports and drawings to the PG&E office in San Francisco. We disbanded the field parties and paid all the men. Clive Steele was the chief engineer at that time.

Lage: We did talk a little bit about this.

McLean: PG&E offered me less money, and I wouldn't go to work for them. I went over and went to work for the East Bay Municipal Utility District [EBMUD] for the same amount of money. [chuckles] So, on October 4, 1927, I went to work for the utility district.

Lage: Right. Now we've got you to East Bay MUD.

IV FIRST JOB WITH EAST BAY MUD: THE MOKELUMNE AQUEDUCT AND PARDEE DAM, 1927-1930

Inspecting Concrete Work on the Aqueduct

McLean: The first job I had with East Bay MUD, then, was--. I reported to Mr. John S. Longwell, who was a division engineer in Stockton, and then to Mr. Barnes, who was the resident engineer on schedule F. Schedule F was the section of the aqueduct which went from the west portal of the Pardee Tunnel down to, I believe, what they call Jack Tone Road, just east of the city of Stockton. That was about twenty to twenty-eight miles. I was the inspector for all the concrete work on that schedule for all the pier supports and all of the anchors and structures. There was a lot of concrete, because Schedule F was in pretty rugged terrain, and it required a lot of anchors and structures. The main contractor, the contractor for the entire project, was Twohy Brothers and J. F. Shea Company.

The entire aqueduct, the eighty-two miles of aqueduct from the Pardee Tunnel to the Walnut Creek Tunnel was under one contractor, Twohy and Shea. The pipe for that job was manufactured in Berkeley, by Berkeley Steel Tank and Pipe Company.

Lage: How did they happen to assign you to this job? Had you had particular experience with respect to concrete structures?

McLean: Yes. In my early career with the State Highway Commission I had worked in the testing laboratory in Sacramento for a couple of years, and I was very familiar with concrete testing and the mixing of concrete. So I was a very good candidate for the concrete inspection work.

The concrete work on this particular section was subcontracted to a man by the name of Jim Lappin. Twohy and Shea were what we call the general contractors. I don't know whether those words fit in your vocabulary or not, but a general contractor is one that takes on the entire project for x number of million dollars. Then he can subcontract out various sections of the principal contract. The pipe work was subcontracted to Newport News Shipbuilding Company.

Lage: That seems far afield from shipbuilding, but maybe it's not.

McLean: Yes. The plates were shipped by boat to Berkeley, and the pipe was fabricated at the Steel Tank and Pipe Company in Berkeley. Newport News Shipbuilding Company, located on the East Coast somewhere began the rolling and machining of the plates. A new technique was involved, and it was necessary to train operators for this type of work. The pipe was fabricated at the Steel Tank and Pipe Company in Berkeley. The pipe was made in sections, having a lying length of thirty feet, with an average wall thickness of seven-sixteenths, dependent on the pressure head. The pipe was dipped in melted asphalt and tar and wrapped with asbestos felt paper. After the pipe was made in thirty-foot lengths it was put on barges and taken to the port of Stockton by barge, where it was picked up by special trucks. They were Mack trucks with a dolly. There thirty-foot sections of pipe were put on these trucks and hauled to the job, where they were unloaded. They hauled three sections of pipe per load, two sections on the lower part and then one section on top of the two.

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McLean: Bob Conyes was the one who contracted for the hauling of the pipe from the Berkeley Steel Company to the job. He had an entire fleet of these trucks with the pipe dollies. He must have had ten trucks or more. We finished the pipe laying for the entire aqueduct in March of 1928.[1]

Lage: Am I right that your job was to see that the contractors were doing their job?

McLean: My job was to see that the concrete structures were built according to plans and specifications, that we had a good quality concrete, and that the structures were sound. This included the anchors, the piers, the air valve structures, the blow-off structures, and all the concrete structures on that particular portion of the aqueduct--Schedule F, which was the last section to be built. The district had rented a house in the little town of

[1]See "Welding of the Big 'M' Aqueduct," by W. R. McLean, speech to the American Welding Society, 3-14-66, in McLean Papers, The Bancroft Library.

Camanche, and that was the headquarters for myself and the fellows who worked on Schedule F. There was Mr. Barnes, the resident engineer, myself, a fellow who was a rivet inspector, and the field party of surveyors who worked there. There were about six or seven of us who worked out of the Camanche office.

Lage: No families were there?

McLean: The only one who had a family there was Whitey Williams, the rivet inspector. He and his wife had a tent that was alongside our office. His wife lived there, but the rest of us didn't have our families. As for eating, we boarded with a farm family located about a mile from the town of Camanche. We would have breakfast and dinner there, and they'd pack a lunch for us out on the job. I was there from October until, oh, I think about the first of March.

Lage: Did you have any problems with the contractors?

McLean: No. The interesting part about it was that Jim Lappin, who was the contractor on the concrete work--his sister had been my English teacher at school. He lived in Sacramento. They had a family home on N Street, across from the state capital building. He had two sisters, and they were both schoolteachers. His sister--and I've been trying to think of her name, but I've forgotten--was the English teacher when I went to school in Oak Park. So I knew the family.

Anyway, I think we finished up there about the first of March, and then I went into the Stockton office for part of March and the month of April. They were, of course, finishing the final quantities and estimates for the aqueduct. Mr. Longwell was there, and there was Bill Trahern, Sam Cutler, and Lars Netland. Anyway, they were finishing up the final reports in the Stockton office, and I went in and finished the final report on the work that I'd done on the concrete work.

Transfer to Pardee Dam

McLean: On the first of May, 1928, Sam Cutler, Bill Trahern, and myself reported to Pardee to Mr. E. L. Macdonald, who was the resident engineer. Mr. C. E. Grunsky was the division engineer. We reported to them to work on the Pardee Dam. And at that time Pardee was just getting really started. The contractor was working in the bottom of the river, excavating the foundation for the dam. Bill and Sam were to work in the office. I was in the field, and my first work was on concrete inspection, when they started pouring the first concrete for the foundation of the dam.

Lage: Who was the contractor out at Pardee?

McLean: The contractor on that was Atkinson Construction Company. And that was composed of Guy F. Atkinson; his nephew, Lynn Atkinson; and Bill Kettlewell. They called it Atkinson Construction Company, but they put it together and called it Atconco. They were the main contractor. There was a large construction camp for the workers and housing for key personnel and their families.

Lage: A big construction camp for the workers?

McLean: Yes. They had also set up a gravel plant in the river near Camanche. That's where they mined the gravel for the dam, from the gold dredger tailings. Then they constructed an aerial tramway for transporting the gravel from the pit to the bunkers at the concrete mixing plant.

I think the contract for the dam was awarded sometime in 1926. And of course they had to set up their plant, they had to set up the camp, and they had to build a tramway. They had a tramway for hauling the gravel from Camanche, from the Camanche gravel pit. At one time all that area below Camanche, where the Camanche reservoir is now, was a large dredger tailing area. Fact is, when we were working in there on the aqueduct in '27, why, they had some gold dredgers working then in the river, mining gold.

The first work I had at Pardee was on concrete inspection on the dam. We finally got started pouring concrete sometime in May or June of 1928. We were getting ready to build the spillway, and then Macdonald, who was the resident engineer, put me over in charge of the spillway. I took over all the work on the spillway and did very little work, except occasionally, on the dam. I finished up the spillway and then, I guess, went back over to the dam, and we finished up the dam and all that by May of 1930, when I was transferred down to the Lafayette Dam.

Accident at Dedication for the Aqueduct

[Interview 3: April 17, 1991]##

McLean: I recall an incident after the construction on the aqueduct had been completed and the last pipe was laid. The last section of pipe was laid just out west of the town of Wallace. They had all the dignitaries there, people from the main office, Arthur P. Davis, and Mr. Longwell, and the board of directors. They had movie cameras there and took pictures of the last section of pipe laid. One of the incidents that I remember was the day before the ceremony was to take place, and I believe it was around March 28, 1928. We went up there and had the final section of pipe that was to be laid. It wasn't in the ground; it was on what we call concrete bents.

Lage: Bents?

McLean: Yes. There are places on the number-one aqueduct where there was a swale or something like that, and the pipe was set on concrete bents. See, most of the pipe is buried, and this was a place where we could put the pipe and set it in place, and they could take all the pictures and break the champagne and everything else. Anyway, the day before we had fitted this piece of pipe so that it would slide right into place. When the day came and everybody was all assembled there, the crane went over and picked this piece of pipe up. What you do with a section of pipe? You set one end in place and then you lower it down. Lo and behold, one of the poor fellows--and I felt sorry for him--who was one of the crew that was working there to set the piece of pipe in place, was more interested in movie cameras than anything else. He, unfortunately, got his two fingers in between where the pipe was coming down, and it sheared off two fingers of his hand, just like that, you know. The poor guy, there he was with all the cameras and everything else. Paying attention to them, he forgot that when the pipe comes down, it's just like a pair of scissors, you know. And here are his two fingers, and it cut them off, right at the knuckles.

Lage: And was this very obvious to all the dignitaries?

McLean: Oh, absolutely. Yes. Those that were standing right there knew right away because, God, the blood started spouting and everything else. Of course, we had to bind it up right away and rush him off to the doctor. But the poor guy. He'd been there the day before, practicing.

Personnel at Pardee: From Photographer to Concrete Technologist to Gold Diggers

McLean: Anyway, the pipe was laid, and that was the end of it. Then, of course, I spent about a month in the office down in Stockton working up a lot of the final stuff that I had and made a report. Then, as I said, Bill Trahern and I reported to Pardee on the first of May. My family was living in El Dorado at the time. Bill and I lived in what we called the single men's quarters. The contractors had a big camp at Pardee. I guess the contractor must have employed at maximum between fifteen hundred to two thousand workmen. And then the district--I guess we had fifty or sixty people there, because there was work going on on the dam. There was work going on in the Pardee Tunnel, and there was also work going on at the Jackson Creek Spillway. That was over at the north end of the reservoir. When I got there, I was assigned to work on the dam as the concrete inspector.

Lage: So you were inspecting the work of the contractor?

McLean: That's right. Inspecting the work of the contractor. Bill went to work in the office, with Sam Cutler and a fellow by the name of Frank Harlow. Mr. Grunsky was the division engineer, and E. L. Macdonald was the resident engineer. Howard Reed was the accountant. Then we had two or three--Art Murray, Fran Sandretto, and several other fellows who were working in the office. They had odd jobs. The photographer was a fellow by the name of Ham Johnson.

Lage: Was Johnson was a full-time photographer?

McLean: Yes, he was a full-time photographer. He had a studio there where he took pictures, and they were developed there on the job.

Lage: Was this to document it historically?

McLean: Oh, yes. There have to be photographs. They should have a complete photographic file there, from the time that the first work started. He set up certain points that he photographed at regular intervals to show the progress of the work. He was there from the beginning of the work, when they first started working in the canyon. He was there until we had the final picture of the group on the dam and everything. Then we had a fellow by the name of Lewis Tuthill with the concrete. He was concrete technologist. We had a lab. His job was to test the cement and the aggregate and also to test the concrete that went into the dam.

Lage: Were you working with him? As the concrete inspector?

McLean: Well, yes. Well, I worked under Macdonald, but of course we took samples. When I arrived there they were cleaning up the foundation. The cleanup of the foundation was very interesting, because when you get down to what we call the bedrock, why, of course that's where the gold was. In the days of the final cleanup there was quite a scramble among the workers down there to look for gold. And some of them did get some nuggets out of the bottom when we were down on the bedrock. That was before we poured in concrete. Some of them found some little nuggets. Fact is, I think I found a little flake about the size of the end of my finger, and I had it in a little vial for many, many years. I don't know what's become of it.

That was with the cleanup; we were down at the base of the dam, right in the bottom of the river. See, the river was diverted. They had constructed a large flume that would carry the full flow of the river. That was located on the north side, what we called the north abutment, right in the bottom of the river. This diverted the river so we could get down and clean the bedrock and get ready for pouring the concrete.

Mining and Hauling Aggregate for Concrete

McLean: The contractor, to get the aggregate for the dam, went downstream to the gravel beds at Camanche, which is now under the Camanche Lake. Those were all what we called dredged tailings. There had been dredgers working down there many years before. And fact is, when we were working on the aqueduct, there was a dredger still working in the Camanche area for gold. The contractor went there and set up a plant where they mined the aggregate for the dam, and then they had what they call a high line with buckets that would supply the bins for the concrete mixers with the aggregate.

Lage: Is this a cable that would carry it up?

McLean: These were large bins. This was a continual bucket line. They had one-cubic-yard buckets that would travel on this cable, and they had high line towers all along--I think it was about three or four miles in length--that came from the classification plant. The classification plant separated the aggregate into four sizes. The contractor had four concrete mixers under these bins, and then they had conveyer belts that fed the aggregate to the mixers. They were five-cubic-yard Smith mixers. From there the concrete went by gravity in a chute to the base of the dam, where it was hoisted up a tower. From there it went out through what we call counterbalances to get the aggregate on the dam. During the process down at the gravel plant there was a fellow (I've forgotten his name) who was an old miner from El Dorado; I knew him from the town of El Dorado. He got the concession from Atkinson to recover the gold during the gravel mining process.

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McLean: He recovered a lot of gold, some very fine gold and nuggets. He also recovered a lot of coins. He recovered a lot of foreign coins, and he also recovered enough American gold coins to make up four sets--that is, of twenty, ten, five, and two and one-half gold pieces. He made up these sets and gave one to each of the partners and to the contractor, and he had one himself. He also found Masonic lodge pins, Peruvian coins, Brazilian coins, English coins, a lot of lead buckshot, bullets, and everything else. He had several kegs, what we called nail kegs, full of this lead that they'd recovered out of the river. He was there the entire time during the construction. He actually made, well, I wouldn't say made a fortune, but he made a very good living out of recovering the gold from the gravel.

When the job was finished, all of that plant was dismantled. Years ago when I went to Pardee, you could still see some of the towers standing that they didn't take down.

Lage: Towers for the cable?

McLean: For the cables, yes. It was somewhat about like these towers that you now have at the ski lifts, except of course they were wood towers. Just about the same thing. It was a continuous cable that just kept going like that continuously. These buckets went along, and they went underneath the bins down at the gravel plant. They were filled, and then away they'd go. And when they got up to the bins, depending upon the size of the aggregate that they were hauling--. They hauled sand and then had a 3/8-inch to a 1 1/2-inch aggregate, and then a 1 1/2-inch to 2 1/2-inch aggregate, and then what we called boulders. There were large boulders about the size of a small football.

Here's a sample of a core taken out of the concrete in the dam.

Lage: Now, this one's beautifully shaped.

McLean: Yes. That was a diamond core sample taken out of the concrete.

Lage: To check the quality of the dam?

McLean: Yes. That's from the concrete in the dam, from a sample core that was taken out of the dam. Anyway, as the buckets would go over the bins, they would trip, drop their aggregate, and then they'd just keep right on going. These buckets were spaced about, oh, I guess on an area about one hundred feet apart on the cable line. From there, down the base of the bin, there were conveyor belts that fed the mixers. They were five-yard Smith mixers.

The cement was also in bulk, and it came from a cement manufacturing plant at San Andreas. And fact is, the cement plant at San Andreas was built to supply Pardee Dam. There was roughly 620,000 cubic yards of concrete in Pardee, and that doesn't include the grouting, the spillway, the tunnel, and all of those things.

Lage: Just the dam itself.

McLean: So they actually set up a cement plant at San Andreas. I don't know whether that's in operation anymore, but they actually set up a plant to manufacture cement at San Andreas. That operated the entire time the dam was under construction. That cement used to come into Pardee by railroad; this spur was built to supply the dam. There was a railroad that ran to San Andreas. I don't suppose it's in operation anymore. All of the supplies--that is, the equipment, the materials, and everything that went into the dam--came in by railroad. The cement came in by bulk, although they did have a lot of it in sacks. A lot of it came in sacks for emergency, but they had a cement bin that was all bulk. The railroad cars came in and dumped right into this bin.

Lage: How much of the concrete is cement, and how much of it is aggregate?

McLean: Well, I think that we averaged about four sacks--four cubic feet--of cement per cubic yard of concrete. Let's say you've got 620,000 cubic yards. [does some figuring] Times four, that would be 2,480,000 sacks of cement. But that does not include the grouting, the spillway, the powerhouse; it doesn't include the Jackson Creek Spillway, the tunnel, and all that, which probably would amount to, oh, maybe another million bags of cement total. Altogether you could probably figure that there was in the neighborhood of three million or more sacks of cement used at the time that those structures were built. So that was a big operation in those days.

Of course, we used trucks on the construction of the dam for hauling, but you didn't have the transportation in trucks then that you have today. The pipe on the aqueduct was all hauled by truck, but you take the transport of other than small articles and things like that that came into Pardee, and everything came in by rail. The turbines, the generators, all the big valves, the transformers, and all the equipment that came for the powerhouse all came by train.

The High Line

McLean: Then it was handled by high line to the powerhouse. There was a high line that went across the dam.

Lage: Is this another overhead cable?

McLean: They had a north and a south tower. There were cables that came off of those. There was an electric hoist, and they would pick up large equipment--the big valves and pipe and all--from the railroad cars that came to the dam. They would haul that all over the dam and lower it into place into the powerhouse or wherever they were working.

The train came over the canyon, of course, and the hoist was along the edge of the railroad track, on the south abutment. The mixing plant was below. When it came to dumping the cement out of hopper-bottom cars, it dumped directly into the cement bin. Now, if the load was on a flat car--like the generators for the powerhouse, or the turbines for the powerhouse, and the transformers and all the heavy equipment that weighed several tons--they would put a flat car right underneath the high line, and they'd drop the hook down there. The riggers would get the slings around it, and they'd lift it out and just run it right over the top of the powerhouse and lower it into place.

A lot of that equipment came from the East. The generators, I believe, came from the East Coast. The transformers were also manufactured in the East, and they came by train on up to Valley Springs, and then from Valley Springs they were taken right to the dam. That was quite common in those days because, as I say, we didn't have the transcontinental truck transportation that you have today. All the big equipment and everything that came in there all came by railroad.

Atkinson Construction Company, Contractors on the Pardee Job

Lage: You make it sound like such a smooth operation, and it was such a giant project. Did you have good management to do this?

McLean: Oh, yes.

Lage: Tell me something about the managers and supervisors.

Mclean: There were the three partners that formed what was known as the Atkinson Construction Company. There was Guy F. Atkinson, Bill Kettlewell, and Lynn Atkinson. Guy F. was the elder. He was an old-time railroad contractor. In those days, most of the big contractors had been railroad contractors.

Lage: So they helped build railroads?

McLean: They had built railroads, yes. Even when we were working up at Devil's Corral and up on that road at Susanville, a lot of the work was done with what we called horses and fresnos. I don't know whether you know what a fresno is.

Lage: I've heard the term.

McLean: A fresno scraper was a scraper or dirt scoop that was usually pulled by two or more horses. This was before the days of bulldozers and carryalls. When you pulled it, it would fill up, and it would hold about a yard of dirt. When he got ready to trip it, the operator--the guy who was walking behind the team--would just lift it up a little bit, and it would automatically dump itself. Then they'd turn around and come back and get another load.

Lage: But that wasn't used on Pardee? That was earlier?

McLean: No, that wasn't used on Pardee. On Pardee we had big equipment. We had steam shovels and dump trucks.

Lage: Was the equipment new at the time, or was it used in railroad building?

McLean: Well, most of it was new. These contractors had been on Coolidge Dam in Arizona. All the high line equipment had come up from Coolidge.

Getting back to the partnership, at the time Pardee was built, this was one of the largest dams, or the highest dam, in the United States.

Lage: That's what I've read, the highest dam.

McLean: Yes, the highest dam and the greatest quantity of concrete. In other words, 620,000 cubic yards of concrete in the dam was the largest dam that had ever been built in the United States. This was followed by many, many others after that. But it was the highest dam. It was only exceeded after that by the Diablo Dam in Washington and Boulder Dam in Arizona.

This was a large contract, and in order to get bonding, what they call bonding capacity--when an agency like the district [EBMUD] lets a contract for the work, the contractor has to put up what we call a performance bond. The performance bond usually costs one and one-half percent of the contract price. I don't recall what it was then, but it meant that he had to be able to bond himself for a percentage of the job. And this was a big job; it was a big contract. So in order to get bonding capacity, you enter into joint ventures. Down at Boulder, there was a joint venture between six companies. There was Kaiser, Morris and Knudsen, Bechtel, and other big contractors, in order to get enough bonding capacity to build the job. One single contractor didn't have enough financial standing to obtain bonds to bid the project.

Lage: Did Atkinson do the same thing?

McLean: Yes. It was Guy F. Atkinson, Bill Kettlewell, and Lynn Atkinson who were independent contractors on their own. Bill was an old railroad contractor, Guy F. was an old railroad contractor, and I think Lynn had done some paving work or something like that. So they formed what was known as Atkinson Construction Company, later known as Atconco. This was a big operation. And that was for the construction of the dam; construction began moving. Later on, there was not only the dam, but the tunnel was under construction at the same time. I don't know whether Guy F. and Lynn or whether all three of them had been on Coolidge, which was a small dam down in Arizona.

Lage: Much smaller than Pardee?

McLean: Yes, much smaller than Pardee. They had been down on the Coolidge Dam there, and most of the rigging equipment--the towers, all of the high-line equipment, the elephant trunks, and all of those had been used at Coolidge, and they came from Coolidge. All the rest of the equipment--that is, the shovels and everything else that they used on the dam--was new. They had a big shovel on the spillway.

Drilling and Shooting

McLean: Then we had rigged down in the bottom when they were cleaning up the bottom--because, you see, when they started excavating the sides of the foundations for the abutments, they would drill holes all up the side. Then they'd shoot them [with dynamite], and all the debris--earth, rocks, and everything--would come down in the bottom of the river. They had steam shovels there with trucks to haul the material to a waste dump. That's how they excavated all the foundation for the dam, drill and shoot.

They would usually shoot twice a day. They would shoot at noontime, and then they'd shoot at five o'clock in the afternoon. They didn't change shifts at noontime, but the workmen were out of the bottom and wouldn't be there with flying debris. If you were there, why, you had to get under a truck or under a shovel or something like that, and then they would blast. It'd all go down in the river, and you'd go to work with the steam shovels, haul it out, and haul that downriver to get rid of it. Then, after they had cleaned all that off, they were back up again in the afternoon with air drills, drilling more holes to shoot. Then at five o'clock, when everybody was out of the river again, they'd blow a siren to warn everybody to get out, and then they'd shoot.

Dangers and Deaths of Workers

Lage: How dangerous was this job for the workers?

McLean: Well, it was pretty dangerous in those days. I believe eleven people were killed on that job. The largest group of them was killed on a truck. They used to take the men back and forth to work down in the bottom. There was a very steep road that went down into the canyon from the south abutment. You see, from the top down to the canyon was about six hundred feet in depth. In the morning they would take some of the workmen into the bottom of the canyon on the flatbed truck, take them out for lunch, and back after lunch. This was when they were working on the foundation in the bottom.

They had a Model T Ford. A Model T Ford didn't have gear shifts the way we have them. It was foot pedals that you pushed for shifting gears. Well, they were taking a load of these fellows down into the canyon after lunch one day. I guess they had fifteen or twenty of them on the back of this truck, and a lot of them sat with their legs hanging over the side; it was just a flatbed. Well, the truck got away from them, and it went down into the canyon.

Lage: Lost its brakes?

McLean: Apparently the brakes failed. Most of them came out all right, but I think there were six or seven killed.

Lage: Was there anything done to take notice of these deaths?

McLean: Oh, yes, sure, because there was the Industrial Accident Commission; they were on the job right away to investigate. They conducted a full investigation.

Lage: That was a government agency?

McLean: Yes, that's both federal and state. After they investigated the accident, I don't know what they did about it at that time, whether they changed to another type of truck or what happened.

Then another accident happened, and fact is, I was there at the time it happened. They were cleaning up in the bottom of the river--I told you about the gold that was found--and a lot of the workmen that we had on the job in those days were Mexican. There were a lot of Mexican workers. I think I've told you previously that when you wanted men for jobs like that it was through employment agencies. There was several of them in Stockton. Most of the laborers that were on the job were Mexican.

Lage: I'm surprised it was that early on. Were they Mexicans from Mexico?

McLean: I suppose so, most of them. Very few of them could speak English. The concrete foreman on the job--Whitey, and I forget the other fellow's name--could speak Spanish quite well. That's how they handled these fellows. Now, the carpenters were all skilled, and most of those were Americans. Same way with the high-line riggers; that was a pretty special job, high-line rigging, you know. These guys were up there five or six hundred feet in the air when it'd come to setting the towers and getting the cables for the lights. You see, they had lights over the top of this because they operated night and day. They had this whole thing lit up with overhead lights. The riggers, every one of them, were skilled workers. They had to be, because, boy, you were up there all by yourself on those cables.

Lage: Where did they develop their skills? What kind of training did they have?

McLean: A lot of those fellows came up from Coolidge. Fact is, the superintendent, I believe, came from Coolidge. Ed Whipple was his name. He was the general superintendent. The concrete superintendent was a little short fellow named Jack Broughton, and then the head rigger was the fellow we called Whitey. He also had come from Coolidge.

Lage: And the carpenters?

McLean: The carpenter superintendent was Ernie Stokes. They had a lot of carpenters. They must have had forty or fifty carpenters or even more. And they were all white, every one of them. Some of those fellows had their families there, and some of them didn't. The contractor set up a family camp. They had their families on the job.

Lage: You were about to tell me about another accident, and I think I diverted you from it.

McLean: Oh, yes. The other accident that happened when I was on the job involved one of these Mexican workers. We had two towers; we had twin towers going up to hoist concrete. These buckets used to go up and down, and they would hold five yards of concrete. They'd hoist that up to the top, and it automatically dumped itself. When it got to the top there was a trip, and it dumped the concrete into a hopper. Then there was a workman at the hopper who fed the concrete into a chute--counter balances we called the concrete chutes. Then the concrete would go down chutes into the elephant trunks and on to the dam, where the concrete was being placed in the dam. The elephant trunks were short metal pipes, twelve inches in diameter, suspended from the counter balance. The tower was enclosed on the outside with forms. There was a form around the tower to keep the concrete out of the tower. Later on, when the tower was dismantled, this hole was filled with concrete.

What happened, and we never knew why, was that one of the Mexican workmen placing the concrete, and this was during the day, stuck his head inside the tower form. Down came the bucket skip and just took his head off. That was something that should never have happened. It all happened before anyone could stop him.

One other fellow was killed when we were working on the back slope of the dam. We were just about finished, and there were walkways suspended at the back slope of the dam where they had to clean concrete. The powerhouse was at the base of the dam; this was about three hundred feet below where they were working. Right up close to the top of the dam this fellow was working with a crew, cleaning the concrete. For some reason or other he lost his step, and he went down the slope, and he landed on the foundation for the powerhouse, where all the reinforcing steel was sticking out of the concrete. That fall killed him.

There were one or two other accidents on the job. The total number of workmen killed was between nine and eleven. I think the maximum was about eleven.

Lage: Was it your feeling that they did what they could to keep the danger level down?

McLean: Yes. You see, they were inspected frequently by the Industrial Accident Commission about safety practice, and of course they had safety signs all over. Everybody wore a hard hat; you were required to wear a hard hat. Of course, there were lots of things: concrete would spill, you know, and boulders would fall that you sometimes had to duck to keep from being hit.

Lage: Did you yourself get in some of these dangerous areas? Did you have to walk the high areas?

McLean: Oh, yes, you bet. We had to get around to every one of them. That was our job. You just had to be careful wherever you were. None of the district fellows was ever hurt.

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McLean: For the type of construction job that Pardee was, and the time frame, I don't think the number of men killed on that job was anything unusual. That was somewhat accepted. Today it would not be accepted.

Pardee as the Guinea Pig for Other Big Dams

McLean: Furthermore, the type of concrete construction at that time was far different than is in use today. No longer do we have these high lines and all of this rigging in the air that they had at Pardee. On Boulder Dam there was a tremendous transformation from the methods used at Pardee.

Lage: You mean just from Pardee to Boulder there was a great change? That was only a couple of years.

McLean: That's right. There was a tremendous change. At Boulder, to place the concrete they used five-cubic-yard bottom-dumped buckets. They had a head tower and a tail tower parallel over the dam. The tail tower was a moving tower on rails that moved back and forth at right angles to the dam, and then they had this large cableway that operated from the towers over the top of the dam. They had a large mixing plant, and the mixing plant discharged the concrete into big buckets. These buckets were picked up by this high line and conveyed out over the dam and dropped into place on the dam where it was poured. The sections of concrete that were poured on Boulder were much smaller; they divided the concrete into smaller sections.

At Pardee, we started out with 150-foot blocks at the base of the dam. Then we changed down to 75-foot blocks, and up near the top of the dam it was 37 1/2-foot blocks. Also, we developed what they call a very high heat of hydration due to the curing of the cement. We generated some very high temperatures in the dam, and as a result of these high temperatures we had cracks occurring not only in the 150-foot blocks but also in the 75-foot blocks. At Boulder, they divided the entire dam into, I believe, 25-foot blocks.

Lage: To control the heat?

McLean: Not only to control the heat, but also to control the cracking. At Boulder, they developed the first method for cooling the concrete. They had a refrigeration plant, and they placed cooling pipes in the base of every block of concrete that was poured, just like in a refrigerator. They pumped coolant through the pipes to reduce the heat of hydration in the concrete. Later on, when they went to Shasta--the same contractors (six companies) who built Boulder Dam went to Shasta--they took a lot of the equipment from Boulder to Shasta. At Shasta, instead of going to the refrigeration system, they used the practice that is now being done in most mass concrete dams. Instead of using water for mixing, they used ice cubes; they mixed the concrete with ice cubes. That reduces the temperature of the concrete when it goes onto the dam so that you don't get into the high heat of hydration. Also, today they have developed a low-heat cement. This is a cement that has a pozzolana material in it so that the cement doesn't generate the high temperatures that occurred on Pardee Dam.

Lage: You say they learned a lot at Pardee. Was it really a direct learning experience, so people referred to Pardee as an example?

McLean: Absolutely. Because Pardee was the largest dam ever constructed at that time and also the highest dam, everybody, including the U.S. Bureau of Reclamation, was watching it. Louis Tuthill, who was the concrete technician at Pardee, went to Boulder Dam and later was with the U.S. Bureau of Reclamation. He was later in charge of the bureau laboratory in Denver, Colorado, and he carried with him a lot of the technology that we had learned at Pardee regarding temperatures in mass concrete, shrinkage, the grouting of the joints, and the grouting of the cracks.

We had to go in later, after the heat of hydration in the dam had settled down to a constant, uniform temperature. During the placing of the concrete in the dam we set thermocouples in the concrete in order to monitor the temperature of the concrete. We also had thermocouples set in the concrete in the inspection gallery that we observed for a long period of time. At the beginning we had temperatures up to 140 degrees. This caused severe shrinkage and cracking in the concrete, particularly in the 150- and 75-foot blocks of cement. The result was that we later had to go in and drill holes where this cracking had occurred and grout the cracks. During construction we had left grout pipes in the construction joints to take care of the normal expansion. Those joints were grouted after the temperature in the dam was constant. We had to wait until the heat of hydration had settled down to the point where it was uniform. Then we went with crews and grouted all of these joints--not only grouted the regular construction joints, but we drilled holes in the concrete and grouted the cracks that had occurred as a result of the shrinkage of the concrete.

At Boulder Dam they eliminated a lot of that by using the refrigeration systems to pre-cool the concrete when it was placed in the dam, although they did grout the joints. They also used the smaller blocks at Shasta. The construction crew--Frank Crowe, Bert Goodenough, and a lot of the fellows who had been on Boulder--went to Shasta. It was the same six companies or some of the principals of the six companies on Boulder who were the contractors on Shasta. A lot of the equipment and some of the construction crews who were on Boulder went to Shasta. The refrigeration method was new at that time, but we had learned at Pardee that we had to do something about the heat to control the shrinkage, because that was the real answer to shrinkage, particularly on large mass concrete dams like Boulder, Pardee, Shasta, Bonneville, and all the big dams that were later built up on the Columbia River. Mike Miller, who was a very close friend of mine and who had been on Boulder, also went to Bonneville. Kaiser was on Bonneville. A lot of the technology they learned on Pardee was carried to Boulder, and then from Boulder to Shasta to Bonneville, followed by a lot of the other big dams on the Columbia River.

Lage: Did Atkinson Company go on along to any of the dams?

McLean: Atkinson went to Diablo Dam in Washington, and I believe they were on some of the other Columbia River dams. They were not on Bonneville or Grand Coulee. Grand Coulee was the six companies. Kaiser built Grand Coulee, and Mike Miller went to Grand Coulee and then to Bonneville; I believe Mike was at the two of them. And then about that time, World War II started. Kaiser then went into the shipbuilding business, as you recall, and Mike Miller went down to the shipyards in Portland. He was with Kaiser.

Kaiser was on both Bonneville and Grand Coulee. The real answer to all of this came from Louis Tuthill, who was the concrete technologist on Pardee, who later went to the Bureau of Reclamation. And of course a lot of these big dams--Boulder, Shasta, Bonneville, Grand Coulee, and all those, were done by the Bureau of Reclamation.

Recalling Early District Managers and Supervisors

Lage: I understood that a lot of people came to East Bay MUD from the Reclamation Service.

McLean: Yes, you're absolutely correct. After the first dam was built by the Bureau in Arizona, the Roosevelt Dam on the Salt River, there was apparently a reorganization in the Bureau back in Denver. The U.S. Reclamation Service became the U.S. Bureau of Reclamation. Arthur P. Davis then was the director. He left and came to the district, and along with him came Frank W. Hanna, who became chief of design for the district; Jim Munn, who was the construction engineer; a man by the name of Cone, who was an electrical engineer; and Lyman Wilbur.

Lage: Was it also a Reclamation dam?

McLean: No.

Ed Driggs came from the Bureau of Reclamation, and then Robert C. Kennedy and Thaddeus Hague, who were design engineers, came from Exchequer Dam in the Fresno area. We had also J. S. Longwell. He was a division engineer and later became chief engineer and general manager. He came from the bureau and had been on the Mendota Project.

Lage: Hanna was general manager when Arthur P. Davis left for the irrigation project in Russia?

McLean: That's correct, yes.

Lage: Did you work closely enough with these men to tell about their styles?

McLean: Oh, yes. Absolutely.

Lage: Did you see much of Arthur P. Davis?

McLean: Yes. Mr. Davis used to visit the project when we were constructing the aqueduct and Pardee. Mr. Munn would come up at least once a week.

Lage: Mr. Munn was construction engineer?

McLean: Mr. Munn was the construction engineer, and he would come up to Pardee. Well, even when were building the aqueduct you could figure that he would be on the job at least once a week. He had a chauffeur; they had a big Lincoln. Herbert Nelson--Herbie--I knew very well. In fact, I played golf with him in later years. If it was an inspection check, why, there would be Mr. Munn and maybe Mr. Hanna. Generally, it was Mr. Munn all by himself.

The interesting part about this that I look back on is that those fellows always--and I guess this goes back to the Bureau of Reclamation--came out on the job with a business suit on and a shirt, a necktie, and a hat. Even Mr. Longwell, when Longwell was division engineer and I was working under him, was always dressed in a business suit. Nowadays you see these men out on construction jobs, and they'll be in any ordinary clothes. It was always very interesting to see; even when they were watching the concrete on the dam or something else, we were pouring concrete, laying the pipe, or digging the trench, why, here they'd be out there with a business suit on.

Lage: That is interesting, and arriving with the chauffeur.

McLean: And arriving with the chauffeur, yes. Herbie Nelson would drive the Lincoln. Of course, the camp at Pardee had been built long before construction started. And we had the lodge there, and of course we had a cook house and dining room for the single men and visitors. They'd come and stay overnight on the job. Arthur P. Davis used to come quite frequently. Dr. [George C.] Pardee would come occasionally, but you wouldn't see him very much. Other directors would also visit the project.

Lage: Would they come and talk to men like yourself, on the job?

McLean: Yes, they'd come and talk to you, wanting to know how things were going. On Pardee they were usually accompanied by Mr. Macdonald, who was the resident engineer. It got so we knew every one of them. They'd come on the job, shake hands with you, and want to know how things were going. Very friendly, very down-to-earth type of people. I got to know every one of them.

The directors we would see once in a while. There was Dr. Pardee; he was quite elderly and didn't get out too much. Then we would see the other directors once in a while. The attorneys, very seldom. The construction group, from Mr. Davis on down, were frequent visitors to the work, not only to the aqueduct but also to Pardee and all of the facilities up there.

Lage: Did they set a certain tone when you were there?

McLean: Yes, I think so. I think we respected them very highly. They were very intelligent people and usually would ask questions about how the work was going. Generally they were very friendly. I got so that I knew every one of them, and there wasn't one who ever had a derogatory word to say. They got to be very friendly, and I think most of the fellows on the job knew them and liked them quite well. They were very interested in the work. We also saw on occasion old Bill Mulholland, who was from Los Angeles. He visited the job on occasion, and also Michael O'Shaughnessey, who was the chief engineer for the Hetch-Hetchy water. Bill Mulholland, you know, built the Los Angeles aqueduct.

Lage: And I think I read that he had been on the consulting board for East Bay MUD.

McLean: He had been on the Consulting Board of Engineers for Pardee Dam as well as was Mr. [George W.] Goethals. Bill Mulholland and Goethals were the consultants for EBMUD on Pardee Dam.

Lage: Here's a great picture of the towers that you were telling me about.

McLean: Yes. This doesn't show all of the tower. We had twenty-seven of these elephant trunks for placing the concrete hanging in the air at one time.

Lage: Twenty-seven of these?

McLean: You can see a lot of them hanging in the air there, but it isn't anywhere near the number later on. See them? These are what you call counterbalances.

Lage: We're looking at page thirty-eight of the book, <u>Its Name was M.U.D</u> [John Wesley Noble, Oakland, California, 1970].

McLean: The concrete was hoisted up in the skip buckets to the tower hopper. If they were pouring concrete over in this side, the concrete came up in the skips, it was emptied into the tower hopper, and then it went down through the chute on the counterbalances to the elephant trunk. The reason they called them counterbalances was because of this block of concrete here at the opposite end intended to balance the concrete in the chute.

The concrete would flow down the chutes on the counter balances, into the elephant trunks, and onto the dam.

Lage: What an elaborate mechanism! And this was a new arrangement, or did it come from Coolidge Dam?

McLean: That came from Coolidge. This equipment, the towers and everything else, came from Coolidge.

Lage: But this is what was changed when they went to Boulder?

McLean: Yes. At Boulder Dam, and also on all future masonry dam construction, they went to 5-cubic-yard bottom dump buckets for the concrete placement. This picture [page 37] shows the flood that we had in 1928.

Lage: Did that interfere with the construction?

McLean: Oh, it sure did. It washed steam shovels and everything else out of the bottom.

Lage: What happened there? The flume wasn't operating?

McLean: Well, they didn't have the diversion in at that time, and it just cleaned everything out of the bottom of the river. I think the flow was about thirty thousand feet per second.

Day Laborers: Changes in Work from Pardee to Boulder

Lage: Now we're looking at page 39.

McLean: Yes. This is the contractor's camp over here, and this was the family camp, these houses all along here.

Lage: Did you live in the family camp for a while?

McLean: No. The district constructed a family camp for us southeast of the district's office and permanent quarters.

Lage: These were for the contractor's workers?

McLean: That was for the workers, yes.

Lage: Did many of the workers--"day-laborers" shall we call them?--bring families?

McLean: No. The ones who brought their families were the concrete superintendent, the rigging superintendent, and the general superintendent, Whipple.

Lage: The higher level.

McLean: The higher level of fellows. And then there were a few others. Oh, I think some clerical staff in the office, and I don't know about the cooks and those folks. But some of the more permanent staff lived in the family quarters. I think they had quarters for maybe forty or fifty families, something like that.

Lage: Did these workers that you mentioned who were primarily Mexican, stay on the job the whole time, or did they come and go?

McLean: If you would keep one of them for a month, you were lucky. I think their wages then, as I recall, were fifty cents an hour, four dollars a day.

Lage: And what did that compare with at that time?

McLean: Well, that was a good wage in those days for laborers. That was a fair wage for them. And I think for their board and room they paid $1.25. They had to furnish their own bedrolls, as we call them. Anybody going to a construction job in those days would carry a bedroll. In the sleeping quarters they would have four cots to a tent, and they had mattresses. Of course, three meals a day, and they were good meals. I think, if I remember right, the employment agencies used to charge about five dollars a head for the Mexican laborers. The contractor paid that to the employment agencies.

Lage: So the workers cleared $2.75 a day? They were paid $4, and then they had to pay $1.25 for their room and board.

McLean: That's right. However, many times the 12 midnight to 8 a.m. shift worked overtime two or more hours.

We always used to say about Whitey--he was one of the concrete foremen on the concrete-placing crews; I think each crew had about twenty of these laborers--that Whitey had three crews. He had one coming, one going, and one working. [laughter] There was a big turnover. I don't think many of them stayed more than a matter of a few days.

Lage: Oh, really? That fast. So you didn't really even train them?

McLean: No. Men were plentiful in those days.

Lage: Was that because the work was so hard, do you think?

McLean: Well, yes. You had to wear boots; they wear these short boots. It was very hard work. They were in the concrete, and they had to shovel, and they were working night and day shifts. At Boulder Dam they used the internal vibrators so that placing the concrete there was much easier than at Pardee.

Lage: What were the internal vibrators substituted for at Pardee?

McLean: Well, at Pardee we didn't have vibrators. Vibrators had not been developed at that time for mass concrete. Vibrators were a hand-held unit. Some of them had a little gasoline motor, and then there was a long tube that had an eccentric cable in it. This thing would vibrate to as much as five thousand vibrations a minute, and when you put that in the concrete, why, the concrete would just flatten out like nothing. At Pardee, this concrete came down out of the elephant trunks, and it piled up. And remember, there were eight-inch boulders in the concrete, and the workers had to be constantly at it with their shovels to keep the concrete homogenous. Once you got a pile of concrete that was three or four feet high, it was all right. However, the workmen had to be watching constantly to see that the gravel did not cause a cluster.

You didn't have to really do much about it then except to just keep it flowing. And then you kept this elephant trunk moving. You had a rope on it where you could pull it around and keep the concrete moving. You didn't want to have a rock pocket, where it was all large rocks and no cement grout.

Once you began to get a pile of concrete, then it wasn't too hard. These fellows were working around with their shovels to make sure that it was flowing uniformly. In an eight-hour shift they would pour five thousand yards of concrete. The need for the workmen was to place the concrete properly.

Lage: Hard, physical work.

McLean: When they got to Boulder and were dumping it with the buckets, then there would be four or five workmen who had these vibrators. They'd just place these vibrators into a bucketload of concrete on the dam, and the concrete would flatten out. There was a tremendous transition between the method that we used at Pardee and the method at Boulder and then Shasta and then on to Grand Coulee and all those other dams. Pardee was the guinea pig of the big construction dams.

Lage: That makes it very interesting.

McLean: With the technology that we had, we completely changed from one method over to another method. Now major concrete dams are just--there's nothing to them anymore.

Lage: The technology has been developed. Did you get down to Boulder to observe the changes, or did you just hear about them?

McLean: Well, I never got there during the construction. That's another story.

Organizing by Railroad Divisions and Schedules##

Lage: How about E. L. Macdonald?

McLean: Macdonald was a resident engineer. Let's go back a minute. They had divided the aqueducts and Pardee up into what they call divisions. This was quite common, and I think it comes from the old railroad construction days--you remember, a lot of the engineers on the big construction jobs started out as railroad engineers--and for a railroad, you had a division engineer. Then from the division engineer you had the chief engineer, or something like that. This is probably due more to transportation than anything else; in other words, a division had a certain area to travel. The first work on the aqueduct was divided into divisions. There was, I think, the Oakland division--I didn't have much to do with that--that took in the Claremont Tunnel and the Wildcat and Sequoia aqueducts. Those were the two. The Claremont Tunnel came through the Berkeley hills, and then there were two aqueducts that went north and south from there. That was one division.

The next division was the Lafayette division, which took in the Lafayette Tunnel, the Lafayette Aqueduct, the aqueduct to Upper San Leandro Dam, the Lafayette Pumping Plant, the Lafayette Dam, and the Walnut Creek Tunnel. That was under a man by the name of [George] Sturgeon, who was the division engineer.

Then the next division was the central division. That was under John Longwell, and that office was in Stockton. That was all of the aqueducts; it took in the entire aqueduct from the east portal of the Walnut Creek Tunnel to the west portal of the Pardee Tunnel. It took in three river crossings.

The eastern division was Mr. C. E. Grunsky, and his headquarters were at Pardee.

Under the division engineers you had resident engineers. The aqueduct was divided into, I think, three schedules. Macdonald had the aqueduct from the Walnut Creek Tunnel to the beginning of Schedule F. That took in schedule D and E; that was all under Macdonald. The schedule that I worked on, Schedule F, was from Jack Tone Road to the west portal of Pardee Tunnel. Mr. Barnes was the resident engineer on all of Schedule F.

Macdonald's work was finished before Schedule F, and he was transferred to the eastern division as resident engineer on Pardee Dam Spillway and Powerhouse. Schedule F was the last schedule to be finished. That was the most rugged; it was up hill and down dale. Mr. Barnes was in charge of that, and I was the one on the concrete construction.

When Macdonald finished his work on the aqueduct, he was moved to Pardee as the resident engineer there. His work was Pardee Dam and then the spillway. There was another man, Mr. Lane, who was the resident engineer for the Pardee Tunnel and the Jackson Creek Spillway. Mr. Macdonald and Mr. Lane were two resident engineers under C. E. Grunsky. Macdonald had been transferred from the aqueduct; he had been on the early aqueduct work. He moved to Pardee and later became the maintenance engineer in charge of the entire--what later became the Mokelumne Division, which included Pardee and the operation of the aqueducts, the Bixler Pumping Plant, and the Walnut Creek Pumping Plant.

Influence of Supervisors Macdonald, Longwell, and Edmonston

Lage: What was Macdonald like to work for?

McLean: Oh, a great guy. He was a Scotsman, just like myself, and just a great guy to work for. Tough, a hard-boiled worker, he demanded loyalty from his associates but was an excellent personality and a great guy to work with.

Lage: Did you learn from your supervisors on Pardee, as models for you when you became a supervisor? Did you model on anybody, or was it just based on your personality?

McLean: Yes. I think three of the greatest fellows I've ever worked for have been Bob Edmonston, whom I worked for in the early days of the State Division of Water Resources and on the El Dorado Project; John Longwell, whom I admired greatly, one of the finest fellows I've ever worked for; and I think the other was E. L. Macdonald. They were great men.

Lage: Were there particular things about their--?

McLean: Well, they were good disciplinarians, let's put it that way. They demanded high quality work, and they demanded good, concise reports. I think my career, if you want to put it that way, was greatly enhanced by having worked for those three people. They are the outstanding people, I think, whom I have ever worked for in my life.

Lage: Can you remember any particular incidents that might show how they managed a difficult situation?

McLean: I can say this much: they were always on the job. It didn't make any difference, particularly with Macdonald, night or day. Why, Mac would call you up at night and tell you, "Well, we're going down on the dam tonight and take a look at things, see how things are going." And you didn't say, "Well, gee, I'm too tired. I don't think I can do it." You said, "Yes, sir. I'll be right there." We never considered the time; it was our job, and mutually we were interested to see that it was being done correctly.

When I was working for John Longwell in Oakland, it wasn't anything unusual to go out over a job on Saturday or Sunday. There were many occasions when we would spend several hours visiting work in progress.

Lage: A lot of devotion to the work.

McLean: Yes. All of them were very devoted to the work. One of the things I remember that they taught me was to write concise reports and keep a diary. Bob Edmonston was a great report writer. He always used to tell me, "Mac, if there is nothing else that you can learn to do as an engineer, learn to write a good, concise report." That was his thing. He was a prolific writer; he wrote many of the state reports. He was a great believer in reports. Mr. Longwell was a great believer in reports and diaries. He kept a good diary; that's why I have all these diaries on my bookshelves.

Lage: Tell me about these diaries. Were they diaries of your work?

McLean: Yes. They were both for work and the daily events that occurred. When I first came to the district from Pardee in the thirties, I started a diary. I threw a lot of those away, which I should never have done, but I do have all of them since 1944.

See, here's August 3. [reads from diary] "Went to Alameda about 10 a.m. Crew paving over trench along Buena Vista Avenue. Finished trench over twelve-inch pipe. Met the city engineer of Alameda at Central Avenue. He had a couple of complaints about the curb and sidewalk."

Lage: So these would be notes that you'd use to do your reports later, was that the idea?

McLean: Yes.

Lage: Was that standard procedure for engineers, or was that something Mr. Longwell did?

McLean: Well, I don't think it was standard procedure, but I learned this from Bob Edmonston and mostly from Macdonald--Macdonald and Longwell. Longwell was a great one for reports, and he was the one who told me to start learning to keep a good diary, keep good records. Later on, as I got in the consulting business and kept a diary--for the past fifteen years I've served as an expert witness on large construction job litigation, and these diaries have been the reference for records.

Lage: In what way?

McLean: Well, to be able to take this into court and quote from the diary that an event occurred on such and such a day. There isn't anything that impresses a judge or an attorney more than to look at a diary.

Lage: I can see that.

McLean: And as I say, I had them going back to the thirties, but I said, "Oh, what the heck. Nobody wants to bother with these." And I threw them away. When I cleaned out my office when I retired from the district, I just kept some of the later ones.

Lage: Well, you still have a nice collection.

McLean: Oh, yes.

Lage: '44 through '90.

McLean: I have one now in my drawer. Every day I record telephone calls and any event that may have occurred during the day, including weather and temperature.

Family Living in the Construction Camp

Lage: I think when we started out today you were going to tell me about places you've lived. Tell me about the living conditions while you were working on Pardee.

McLean: A lot of these fellows were single. Macdonald had his family there, and they lived in a house. Grunsky and Bolton had houses. George and Lucia Colby, myself and Marge, Barney and Libby Pleoger, Kelsey Doll and his wife, and Jim and Mary Kimball--we had families there at Pardee.

Lage: They built you some family quarters?

McLean: Yes. They went to southeast at a fairly level place there among the pine trees, and they built a tent camp for those of us who had families. These were large tents. Each tent was about sixteen by twenty-four. There was room enough for us to have a bed and a couple of cots. Of course, I had a couple of youngsters, so we had a couple of cots for them.

Lage: You had tent platforms, I assume.

McLean: There were platforms, screened sides, a front and back door, electric lights, and we had a fly over the tent to keep it cool in the summer. They had boards up to about a three foot height and then screening for about another couple of feet. It gave us a good-sized room. And in that we had a wood stove for heat. We had a place where we could have a three-burner electric plate, a portable oven for what little baking you wanted to do, a sink with running water, and then a place for a bed and a place for a dining room table. For the youngsters we had a couple of cots. George Colby had a little girl, Barney Pleoger had a little girl, and I had a boy and a girl. Kelsey Doll and Jim Kimball didn't have any children.

For a toilet and shower there was a community shower, toilets for men, toilets for women, and urinals for the men. We had a good-sized shower place. They fixed these up for us in midyear of '28. I moved my family, and we lived there in camp until I went down to the Lafayette in May of 1930. They were very comfortable. It was comfortable living. Fortunately, the families got along well together. We were all working together, and everybody got along well. The women got along quite well. They would go off shopping together in Lodi or Stockton.

We used to get our groceries from Pliler and Lillie; in fact, the store is still there. A deliveryman would come into camp and take orders from the women for groceries. They would deliver two or three times a week, with a big basket of groceries--meat, vegetables, etc.. We didn't have any refrigeration. We really didn't need it because of being able to get fresh stuff regularly, you know. I think I did make a little cooler that I hung outside, where we'd keep the milk. The nights were usually pretty cool there. The days were quite warm, but the nights were cool.

Lage: Did your wife find it difficult going?

McLean: No, she didn't mind it. Of course, she had been camping with me before, you know. When we were on the El Dorado job, she camped all summer with me. In 1924, when we were at Echo Lake and Twin Lakes, we lived in tents. So she didn't mind it. And when we went to Pardee, there were a lot of women there. They got together and had their little teas, or whatever you want to call it, to pass the time. They rather enjoyed it. My oldest son, Don, started school in Valley Springs. There were quite a few youngsters in the camp who went into Valley Springs to school, and they hauled them in there to start first grade.

Lage: Did they have a bus for them?

McLean: Yes. They had a bus. The contractor had run a bus in for the ones in his family, and then they picked up--I think there was Edmund Macdonald, and George Colby's daughter and my oldest son, Don. I don't know, there were three or four of them out at the district camp who went to school in Valley Springs. We all had a good time. Of course, we men were working most of the time, you know.

Lage: Six days a week?

McLean: We worked six days a week. Once in a while, during hot summer weather, why, the gals would fix up lunches, and we'd take the kids and go down the river, down below Camanche, and go swimming and have a picnic lunch and a barbecue at night. We survived. Everybody got along well and survived the ordeal of living in a construction camp for two years.

At Christmas, of course we didn't have the facilities for cooking turkeys. At Thanksgiving and Christmas the contractor supplied all of those in the tent camp with a big turkey, completely roasted, with all the giblets and gravy and stuffing and everything. It'd come up in a big pan, you know. So we could have a Thanksgiving with a turkey dinner. We were all young in those days, and the little hardships didn't bother us. We enjoyed it. I think those were some of the real better years.

Lage: Yes. It sounds adventuresome.

McLean: We had a lot of fun. We worked hard, but we enjoyed the work.

Mishap and Potential Disaster, April 1930

Lage: In the MUD book they mentioned a mishap that threatened the flooding of the Pardee Tunnel before the tunnel was complete [page 44]. Apparently you were an observer of this. It would have caused months of delay to the Pardee Tunnel and supplying water to the East Bay cities.

McLean: [looks through book] Let's see if I can identify it here. There's John Longwell.

Lage: And they said this was during a drought, which I thought was interesting.

McLean: Let me see here. [reads book] Oh, yes. I'll tell you about that, yes. This occurred, I think, in March or April of 1930, when we were working on the powerhouse. That winter we had had a very heavy snowpack, and we got a heavy rain on the snowpack that caused a large flood below in the river. The tunnel was not complete, and the spillway wasn't finished. The lake started to rise, as I mentioned here, and we had to open two 72-inch sluiceways and two 42-inch sluiceways. We opened everything to try to keep the water level in Pardee Reservoir down, but the water kept rising. So then we decided to open the two 72-inch penstocks. Those were basically the penstocks for the powerhouse. None of the equipment was in place, and all there were on those penstocks were the 72-inch butterfly valves, and they had just a hand-operating mechanism for opening and closing them. Well, we opened the first one, and we got that one opened all right, with a full flow coming out the pipe. Then as we started to open the other one, apparently it created a vacuum behind the valve. The valve closed instantaneously. It snapped the 3-inch-thick penstock pipe. The butterfly valve, the operating mechanism, etc., were blown about two hundred feet down river. So we had four 72-inch pipes flowing plus two 42-inch pipes.

We later recovered the butterfly valve, but we were never able to find the mechanism. Where the mechanism went, I don't know. It must be down in Camanche Reservoir by now.

In order to stop the flow later on, when we were ready to put the valve back on the penstock, we had to go into the gate tower on the top of the dam and lower what they call the caterpillar or the Broome gates. The gate got down just about twelve inches from closing, and then all of a sudden, with the rush of water that was flowing, it snapped the Broome gate down and nearly tipped the crane over that was handling it on top of the dam. We finally got it closed and repaired, but we had some scary moments for a while.

Fortunately we were able to stop the flow of water. That is, we let the water run for several days and were able to control it so that we could lower the reservoir water level, and we didn't flood the tunnel or the spillway.

As I said, when the valve blew off I was standing up on the dam, right here. It just shook that whole dam. You could feel the tremendous shock when it slammed shut.

Lage: Do you recall any other moments like that in the building of the dam?

McLean: No, there are none that I can think of. Of course, we had lots of things that I suppose we more or less accepted as being routine that I could probably come up with, but I can't think of any now as dramatic as this.

Layoff and Rehire at EBMUD##

Lage: When the job at Pardee ended, you were no longer with the district. Then what happened?

McLean: My work at Pardee was pretty well complete after we had set the scroll cases for the turbines and the generators. About all that was left at that time was to complete the powerhouse--that is, the superstructure of the powerhouse--and to install the transformers and electrical equipment. We began to disband the crews at Pardee. The surveyors--some of them were local--left. Roy Heston, who was the chief of party, had joined the U.S. Army Air Force. Bill Trahern and Sam Cutler were transferred to Oakland. Barney Pleoger was transferred to Oakland. Howard Reed went to Oakland; he was the accountant. Most of the work being complete, most of the fellows were laid off or transferred. I was transferred to Lafayette because there was still a little work left to be done. We were doing some repair work on the Lafayette

Aqueduct. And then there was work on the work out on the Upper San Leandro Pipeline, going to San Leandro Reservoir. And we had a road and a bridge to be built out at the San Leandro Reservoir.

So I went to the Lafayette office in May of 1930 to basically take charge of the Lafayette office under Mr. Sturgeon. As I said, that involved a lot of maintenance work that was being done on the Lafayette Aqueduct. The pumping plant was operating, supplying water to Upper San Leandro Reservoir.

Finally, in a further consolidation, they decided to close the Lafayette offices--this was in the first part of December of 1930--and move the personnel from the Lafayette office to Stockton. The maintenance crews would still remain in Lafayette. But my work was complete, and there was no further use for my services, so Mr. Sturgeon told me that I would be terminated as of the first of January 1931. I think I had about a month's vacation salary coming, and I had relatives and a brother-in-law and a sister-in-law in Sacramento, so we decided to move to Sacramento. During December I finished up my reports. Fact is, I was living in a district house at the base of Lafayette dam.

We decided to move to Sacramento, so we went up there and spent weekends with my brother-in-law. Finally we found a house that we could rent in Sacramento, so before Christmas of 1930 we moved to Sacramento to look for work there. This was during the Depression, and jobs were not that easy to find. I had hoped to get work with Bob Edmonston in Sacramento with the State Department of Water Resources, but they did not have an opening, and they weren't hiring anyone.

In March of 1931 I decided to seek work at Boulder Dam, which was just getting started. Mike Miller was there, Bert Goodenough was there, and Frank Crowe, who was the construction superintendent for the six companies, were all at Boulder Dam. I had talked to Frank Crowe, and he told me that if I was interested to come down and they'd put me to work on Boulder. Well, of course I wanted to get on Boulder.

Lage: Yes, I bet that was an exciting opportunity.

McLean: Yes. And I looked forward to getting on that job. It was in March of 1931 that I had come to the district office. I had talked to Mr. Longwell over the telephone, and he was going to give me a letter of recommendation to Frank Crowe at Boulder. So I stopped in at the Oakland office, and he had the letter ready for me. I was en route for Las Vegas and Boulder. And he asked me, "Are you in a hurry to go down there?" And I said, "Well, no. I'm not in any particular hurry." He said, "I've got a little job up on Dingee Reservoir, and I'd like to have you stay and spend a few days up there, inspecting the outlet works and looking after it while it is being built."

I had friends living in Oakland, Sam and Dee Cutler, who had been at Pardee with me. I called up Dee and said, "Can I board and room with you for a couple of weeks or more while I am on the work at Dingee?" She said, "Sure." Of course, I had my own car, so didn't even go back to Sacramento. The next day I reported to Longwell and went to the job there, and I was there for, oh, I guess about three weeks or so. I would go home on weekends to Sacramento.

While I was on this job, John Longwell came up one afternoon and said, "I want to talk to you. We've got a rush job to build a pipeline to serve the city of San Francisco. It is to go from [Lake] Chabot to connect to a San Francisco pipeline at San Lorenzo." And he said, "I want you to get the field parties and get some people together right away and start the work on the location for this pipeline, because we've got to rush this." Well, I got hold of a fellow I knew by the name of Art Green, who had been an old surveyor with the East Bay Water Company, and a fellow by the name of Whitney Hodgkins. I put together a crew of about eight or ten men, and we started the surveys on this pipeline to go to meet the San Francisco line. We worked night and day, Saturdays and Sundays, as San Francisco was short of water. Well, from then on it seemed there was just one thing after another.

Lage: And you never got to Boulder?

McLean: I never got to Boulder.

Lage: Were you disappointed that you never got to Boulder?

McLean: In a way, yes, but I then began to get into the bigger projects. The next job was repairs to the Upper San Leandro Tunnel and the San Pablo Tunnel. Then it was the repairs to the San Pablo Dam, then the Orinda Filter Plant. Then it was the Crockett pipeline. Before I knew it, I was involved and had a large staff. Then came the waste water project in 1945, after World War II. It was just one project after another.

Lage: You didn't have time to regret that you didn't get to the big dam.

McLean: I didn't have time to regret it.

V THE DEPRESSION AND WORLD WAR II ERAS AT EAST BAY MUD

Building a Supply Line to Serve San Francisco, 1932

[Interview 4: April 25, 1991]##

Lage: Last time we finished up with Pardee, more or less, and you told how you thought you'd go to Boulder; but you instead came back to East Bay MUD, and they found one job after another for you.

McLean: Yes.

Lage: And we quickly reviewed some of the jobs you were assigned to. I wondered if there were any special challenges on these jobs or something we should discuss about them.

McLean: Well, we talked about Dingee, and that was a rather small dam.

Lage: Yes.

McLean: I think an important one was the urgency of building the pipeline for the water supply of San Francisco. San Francisco was urgently in need of water, and they had not completed the Hetch Hetchy project, particularly the tunnels in the Livermore hills--what we called the Foothill tunnels. They ran into a lot of problems on the Foothill tunnels, especially with serpentine.

Lage: Just because they were in a different geologic environment?

McLean: Yes. Well, coming through the Foothill tunnels you get into the coastal formations, which are a completely new geologic formation. Not like the Sierras, being an ancient formation where you have hard rock. You run into these sedimentary deposits in the Foothill tunnels, and serpentine was quite prevalent, particularly in the Livermore hills. It is not at all uncommon to find serpentine throughout these areas. That is what causes slides from road cuts and other types of excavation. They had run into a lot of problems in the Foothill tunnels and were unable to complete the Hetch Hetchy project on schedule. They had applied to the district for water, and that was the reason for building the pipeline from Chabot down to San Lorenzo to serve the various consumers along the peninsula and also the city of San Francisco. That was so urgent that in order to get the work done, gosh, we practically worked night and day to get the pipe in. I guess it was completed in the fall of 1932. I think we started it along in midsummer, and it was completed late that fall.

Lage: And was your role on that to supervise the construction?

McLean: My work on that was doing the engineering. The pipe work was all done by district forces. There was a welded steel pipe twenty-four inches in diameter, as I recall. My work was the surveying, setting the grades--the field parties that I had were setting the grades--and then inspecting the welding and the pipe laying and everything else on the installation of the pipeline.

Lage: Is that pipeline still in use?

McLean: Oh, yes. It's very much still in use, not to serve San Francisco, but it now serves San Lorenzo and that area which is within the district. That pipeline is very much in use, although it is now connected to what we call the Wildcat Aqueduct. It's connected into the main distribution system instead of being connected to Chabot. See, originally the source of the supply was Chabot, but now it is connected to the main distribution system, what we call an aqueduct zone. When there's enough Mokelumne water, it receives water through the Wildcat Aqueduct from the Orinda Filter Plant. When the use was high it would receive water from the Upper San Leandro Filter Plant from San Leandro Reservoir.

Following that job, why, I guess the next job that we got into was the repairs to the San Pablo Tunnel, which took about a year. Following that, I think there came annexations of Castro Valley and some of those areas. I got into quite a little bit of that work on new installations out there.

Construction of the Orinda Filter Plant, 1934

McLean: The next big job that we had was in '34, when we started construction of the Orinda Filter Plant. That was started in midyear of 1934. Up until the Orinda Filter Plant was constructed there were only two major filter plants serving the district. One was the San Pablo Filter Plant that received water from San Pablo Reservoir, and the other was the Upper San Leandro Filter Plant that received water from the Upper San Leandro Reservoir. We still had the water coming through the Claremont Tunnel, which was the main Mokelumne River supply from Pardee, but there was no filter plant. The water coming from Pardee was of such a low turbidity that we really didn't need a filter plant. The water was chlorinated at what we called the Claremont lab. It was the facility at the west end of the Claremont Tunnel. There was a small amount of chlorine added to the Pardee water, and the water was fed directly from the Mokelumne Aqueduct through the Lafayette Aqueduct and through the Walnut Creek Tunnel into the Wildcat and Sequoia aqueducts--they run north and south--from the west portal of the Claremont Tunnel. There was no filter plant. In 1934, after the plans were complete, we started with construction of the Orinda Filter Plant, and that was all done by district forces.

Lage: Why was the filter plant needed?

McLean: During the wintertime sometimes you do get a little turbidity from the Mokelumne River water due to runoff. Actually, it's more during the spring runoff. The water gets a little murky, and sometimes it's a little difficult to draw the water off through the Pardee outlet tower, where you can get the clear water--that is, get low turbidity. So there was justification for a filter plant. Finally, after all the plans were complete, construction was started early in 1934 on the Orinda Filter Plant, which then would receive water directly out of the aqueducts from the Lafayette Tunnel. We built the filter plant right at the junction of the west portal of the Lafayette Tunnel and the east portal of the Claremont Tunnel. The water would flow out of the Lafayette Tunnel, through the filter plant, and back into the tunnel into the system. And it was an ideal location for the filter plant. Construction was started on that, as I said, in early 1934, and it was all done by district forces. George Hunter was the superintendent, and then we had two or three foremen on the job. We had a force of probably one hundred or more people working on the filter plant construction--carpenters, concrete workers, reinforcing steel workers.

Lage: Was it unusual to use district forces for these bigger projects?

McLean: Yes, it was a little unusual, and it's never been done since that time. Major work of that type today you would contract out by bid. These [employees] were really carryovers from the old East Bay Water Company. George Hunter was an old East Bay Water Company man, and most of the fellows were. We did hire the steel foreman--that is, for fabricating the reinforcing steel. He was new; he came aboard. But the carpenter foreman, the labor foreman, and other people had been with East Bay Water Company. All of the pipe work and everything was done entirely by district forces.

Lage: And what was your role on that?

McLean: I was the resident engineer or project engineer, whatever you want to call it. I had a force of surveyors and engineers. Whitney Hodgkins, Blair Bjornson, and John Luthin were my office engineers and inspectors on the job.

Lage: Did being project engineer mean you were in charge of--?

McLean: I was in charge of the engineering and inspection work. I was the project engineer. George Hunter was the superintendent on the job for the district, and Ed Taylor was the general foreman.

Lage: Did that make you in charge of designing the plant?

McLean: No. The design was done by Bill Trahern, head of the design team. I was basically on the construction, to oversee the construction.

Lage: It seems like your jobs are getting more and more supervisorial.

McLean: That's right, yes. My role became more, as you say, supervisorial as project engineer on projects.

Lage: Were you a hands-on supervisor?

McLean: Just about that, yes. We had to inspect the concrete, even though it was done by district forces. We inspected the concrete and checked the plans, checked the forms, the reinforcing steel, and everything else to make sure they complied with the drawings.

We had an office in an old ranch house on the property that the district had acquired. There had been a family orchard there, and there were some pears and apples and other fruit. The ranch house was about a five-room house, and I had one room for my office, George Hunter had another room for his office, and then I had a big room--I guess it was a living room/dining room--for my office force, the three or four fellows who were working with me. Of course we had to have room for surveyors once in a while, because the surveyors had to set elevations for forms and grade stakes for the pipelines, etc.

Further Thoughts on the Design and Construction of the Orinda Filter Plant##

Lage: We want to talk a little bit more about the Orinda Filter Plant. We talked about it earlier, but I just found out that it has been declared an historic landmark. And you were in charge of construction? Do you have any remembrances about either the design of it or the construction?

McLean: The Orinda Filter Plant is located at the confluence of the Lafayette Tunnel and the Claremont Tunnel. Prior to the time of construction of the plant, the water from the Mokelumne system emitted into the local distribution system of the East Bay Water Company through the Claremont Tunnel. The raw water going into the system--we had what we called a screening basin at the confluence of the two tunnels, which is actually on San Pablo Creek. And the Mokelumne water was screened before it went into the Claremont Tunnel.

Lage: Would this have been a fine screen?

McLean: Yes. These were fine screens to take out leaves and so on. The water was not filtered. The water came directly from Pardee Reservoir into the distribution system. At the west portal of the Claremont Tunnel is what we call the Claremont lab. But that was actually a chlorination station where we chlorinated the raw water from the Mokelumne. A very small amount was added before it went into the distribution system. During the early thirties, district staff prepared the design for the Orinda Filter Plant. The filter plant was supposed to take Mokelumne water directly from the Lafayette Aqueduct, go through the filter plant, and then from the filter plant return the water back into the Claremont Tunnel.

Lage: When you say they did the design, was this the architectural design?

McLean: Yes. Well, the architect was Daniels. I can't remember his first name now. Paul Daniels, who was an old East Bay Water Company man, was head of the Land Department for the district. His brother did the architecture for the building. It was a kind of a Spanish mission-type architecture.

The overall system, that is the overall filter plant, was designed by Bill Trahern and Thaddeus Hague. The construction was done entirely by district forces under George Hunter. George Hunter was the superintendent of construction. I was the engineer in charge of the construction, and I had engineers working with me. Blair Bjornson was one. Art Green and the survey parties were the ones that were in charge of laying out all the grades and the elevations and everything.

The site for the filter plant was an old ranch, a pear ranch that was located along San Pablo Creek. The plant more or less extended in a north-south direction. Construction was started about midsummer, late spring, or early summer of 1934. For our office we used the old ranch house located on the site at the southerly end of the site. That was our construction office.

Lage: Did that ranch date back to pretty early times?

McLean: Yes. That had been a very early ranch there. Apparently they had raised pears, and as I recall there was some other fruit there--plums, or something like that. Of course, we had to clear the site and grade the site when we went out there, and then we set up all the construction facilities. We had a mixing plant where we mixed the concrete. All the reinforcement steel was fabricated on the site, all the forms. The waste molds for the architecture work--the waste mold is when you make up these molds for the architectural features. We set up a plant on that. Ed Taylor was actually the foreman on the job, although George Hunter was the superintendent in charge of construction. Ed Taylor was the project superintendent. After the plant was completed he later took over as the chief operator for the plant.

Anyway, all of the work was done by district forces, and I guess at one time we probably had, oh, I imagine over one hundred men working on the project. We had the carpenters who built the forms, the steel workers who fabricated the steel, the concrete workers who poured the concrete, and all the rest of it. And then of course we had the equipment for excavating for the basins.

Lage: Was there anything new in the design of the filter plant?

McLean: Well, it was a design that was similar to what you call the rapid-sand filter type of plant. Probably some of the features that were unique to it that hadn't been used before were the pipes in the filter beds. At that time, we all used copper pipe. As I recall, it was two-inch copper pipe in the bottom of the filter beds. Those later were changed. I think now they use the ceramic collection system in the base of the beds. Those copper pipes were in place for many, many years, and I think it was along in the sixties that we went in and replaced the copper pipes with the ceramic collection system.

The collection pipes are in the bottom of the filter bed. There are holes in the bottom of the pipes. You have your collection pipes all across the bottom of the filter beds. Then at that time you had a layer of coarse gravel. That gravel gradually gets finer, and then at the top you have a layer of a couple of feet of specially graded sand.

Lage: So about half of the tank is filled with various levels of graded sand?

McLean: About half of it is filled with sand and gravel. And the sand, we had to have a certain fineness to it. The sand was obtained from down at Monterey; it was what we call the Monterey Beach sand. Fact is, I went down to Monterey at the time that we were getting ready to put the sand in the beds and stayed down there at the plant for several days while we were loading the material to make sure that it met the specifications for the beds. The gravel was obtained from the gravel beds in the Pleasanton-Livermore area. There we had to have a certain grading of it. At the bottom was the very coarse, and then it was gradually finer up to--I think the smallest was three-eighths-inch in diameter.

Lage: What kinds of things did this filter out?

McLean: Well, it filters out all the silt and of course any material that comes down. Sometimes in the wintertime, when you begin to get a lot of turbidity in the water, you get a lot of silt.

When we built them originally, the Walnut Creek, the Lafayette, and the Orinda plants did not have any sedimentation basins, and they did not have any reclaim basins. Just recently out at Orinda, about two years ago we put in reclaim basins. Now at Orinda they are adding what we call an osmosis plant, which, when it is finished, will eliminate the need for chlorinating the water and everything else. That is being added to the plant.

Lage: Is that a trend now?

McLean: Yes. This is a new trend because some people--I don't know whether they're allergic to chlorine, but there are many times I even notice myself here, maybe in the morning. I can turn on the faucet in the kitchen to get a drink of water, and I can get a slight smell of chlorine. And some people object to the chlorine, and that's why they go out and buy bottled water. But it's ridiculous buying bottled water because in buying bottled water you're not getting a water that's any more pure or anything else than the East Bay District water.

Lage: Anything else that you remember about the Orinda plant?

McLean: [laughter] I remember one thing. When we were ready to put the plant in operation--as I had mentioned, they had this little screening process in there. San Pablo Creek at one time used to contain sea-run steelheads [trout] from the Bay into San Pablo Reservoir. And those were of course landlocked in San Pablo Reservoir when the San Pablo Dam was built. San Pablo Creek runs right alongside of the Orinda Filter Plant; the easterly boundary of the plant is San Pablo Creek. Well, evidently we used to release water every once in a while from the screening basins. We used to release this water down into San Pablo Creek. And of course with all this fresh water and everything, why, I guess the steelhead used to come up San Pablo Creek. And they got in the screening basin.

Well, when the Orinda Filter Plant was put into operation, the water that formerly was going through the screening basin into the Claremont Tunnel was shut off and diverted into the filter plant. And of course this dried up the screening basin. Lo and behold, when we dried up the screening basin, why, here was a couple of washtubs full of steelhead trout. So we had to collect all those steelhead trout, put them in buckets, and go dump them into San Pablo Creek. I remember that quite well. I don't know how many pounds of steelhead we took out of the screening basin and dragged up and turned loose in the San Pablo Creek, but there was a lot of them. That was in 1935, when we placed the plant in operation.

But building the filter plant went very well; it was a good job.

Lage: And you didn't use outside contractors?

McLean: No. There were no outside contractors; it was all done by district forces.

Lage: Was there a reason for that?

McLean: Well, that was sort of the trend of that time. See, the East Bay Water Company at that time had done a lot of their own construction work. That is, the building of tanks and reservoirs and a lot of things like that had all been done by forces of the East Bay Water Company. And when the district took over the East Bay Water Company, they virtually took over all the personnel that was working for the district at that time.

Lage: Were they pretty good quality?

McLean: They were good men. They were good men. We had a lot of good carpenters. The steel benders, as we call them, the steel reinforcing crew, were hired for the particular job because the district never really had much occasion where you use large quantities of steel. But these engineers that I had, Whitney Hodgkins, Blair Bjornson, and I can't think of his name--Whitney Hodgkins was a good steel detailer, and we detailed all the steel for the crew. We did all that, and we also detailed all the piping and everything else. It worked out very well.

Rush Job on Pipeline to Crockett Sugar Refinery, 1935##

McLean: One day Mr. Longwell came on the job--this was along about August or September of 1935--and says, "I've got a job for you to do." I said, "Well, what is it?" He said, "We've got an urgent rush job to provide water supply for the Crockett sugar refinery." He said, "I want you to get crews together right away. We've got to get a location, we've got to get right-of-way, pipe fabrication, and everything else to get going on this pipeline out to Crockett."

Well, we started in Richmond, and then we followed the highway partially, the old state route, which was Highway 80 at that time. We followed that where possible, paralleling it--not in the right-of-way, but paralleling it. A lot of the property was owned by Standard Oil, the first part going over what they used to call Standard Oil Hill. That's where you left Richmond; the old highway went up over the hill where all the Standard Oil storage tanks were.

Lage: Isn't it similar to the route today?

McLean: Yes, but about a mile west of the new freeway. When we got to Pinole and the Giant Power property, we cut off and went through the Tormey property. All of it was a 25-foot right-of-way. Then I put together another crew, a crew of engineers and surveyors. I also had a fellow by the name of Ted Tronough, who had been a private engineer, but he didn't have much work; this was during the Depression. I hired him to prepare the right-of-way maps. Then I had hired another fellow by the name by the name of Denny Driggs, who did all the mapping work--that is, prepared the plans and profiles for the pipeline. And then I had another fellow by the name of Cliff Smith, who later became a superintendent with the district. Cliff had been a steel pipe man; he'd been with U.S. Steel for a long time as a pipe detailer. He was the one who computed all of the angles and pipe specials for fabricating the pipe. This was another pipe construction project that was done entirely by district forces--that is, the pipe installation was all done by district forces. Roy Paul was the superintendent for the district.

It was a rush job. The sugar company was operating, and they needed the water and needed it urgently. This was another job where we worked night and day, Saturdays and Sundays. I set up an office on the second floor of the San Pablo Filter Plant. There was a large space there. We got all of the equipment and the survey parties. Art Green headed the survey parties. We had two survey parties working, particularly on the alignment and the grades. The steel pipe was fabricated down at the U.S. Steel plant in South San Francisco. We prepared all the drawings for the shop specials, which were the curves needed for the pipeline. Construction was started in late fall of '35 and completed in '36.

Lage: And that was a pretty good record?

McLean: Oh, yes. We really rushed that project. And it also included construction of a pre-stressed concrete reservoir. It is known as the Crockett Reservoir. It was a million-gallon reservoir that we constructed on the hill above Crockett for storage for the water for the Crockett Sugar Company. Then in order to get to the Crockett sugar plant we went across the water on some pile bents and into the sugar company, where we connected directly to their water service. If I'm not mistaken, I think the water was turned into that line sometime in 1936.

Lage: Did it serve any of the homes around there?

McLean: No, not at that time. This pipeline was built exclusively for the sugar company and paid for by them. Now that pipeline serves as the main supply not only to Crockett but also for Pinole, Rodeo, Tormey, and all of those areas out there. That is the main pipeline that goes out to that area. Later on those towns were annexed to the district. You see, Pinole was basically owned and operated by the Hercules Powder Company, and the old town of Tormey had been the Selby Smelting Company.

Lage: They were factory towns?

McLean: Yes. There used to be a large smelting facility where they smelted ore; I think it was mostly lead and other ores. That's where they produced a lot of lead. Selby lead was well known for lead shot, etc. Tormey was built for the workers, and the town of Pinole was basically for the workers of the Hercules Powder Company. Rodeo was a Union Oil town.

Lage: What kind of powder?

McLean: Well, they made blasting powder. I think most of the powder they made at that time was dynamite and blasting powders. They used to finish it in large metal kegs. The people who lived in Pinole generally worked for Hercules Powder. There were powder magazines and manufacturing facilities for producing the powder and dynamite. The pipeline went through their property in the town of Pinole and then paralleled the highway on the powder company property. Then we had to cross the highway, and we went through the Tormey estate property. What was known as the Tormey estate was the Union Oil Company. The oil storage tanks, office, and plant were on the Tormey estate. After we got past Pinole, we cut across the open country, with the pipeline over the hills, over to the Crockett Reservoir, and then down the hill from the Crockett Reservoir to the sugar company's water service.

Using Work Projects Administration Workers in Pipeline Construction

Lage: Were you using any WPA [Works Projects Administration] workers on these projects?

McLean: No. At that time we were not.

Lage: At all? Or not just on these jobs?

McLean: No. The WPA workers came into being just about after this particular work. We did a lot of work with WPA.

Lage: Any you did yourself?

McLean: Well, yes. They had a lot of WPA workers. We put in some large-sized pipelines. One, as I recall, was along Bancroft Avenue in San Leandro. That was a thirty-six-inch line. And then we built a couple of pre-stressed concrete reservoirs with WPA labor. One was the Pleasant Hill Reservoir. We also used WPA labor on some smaller pipelines.

Lage: Did you supervise any of these works?

McLean: Yes, particularly on the reservoirs. I had inspectors on the reservoirs; I had resident engineers. By then my organization had begun to expand. I had not only all the field parties but also an office staff. I think about that time my title had become supervising civil engineer. I began to accumulate a force of quite a few people.

Lage: Now, did all this supervising come naturally to you? Or did you think about the best way to supervise your staff? What kind of a supervisor were you?

McLean: I began to go out to the University of California Extension, and I began taking several business courses. I took six courses in business administration and related subjects. Then I acquired a secretary for doing all the correspondence and routine work. Gradually the district began to get into contract work, and all of that became my responsibility. That was when the district started contracting for a lot of new development work, particularly pre-stressed concrete reservoirs and pipelines. North Reservoir came into being at that time.

Lage: We're still in the thirties, then.

McLean: Yes. It was in the thirties that we started construction on some of the local reservoirs.

Lage: Is there any more to say about using the WPA and what kind of workers they were? Were they mainly laborers, or did you have to hire--?

McLean: It was all labor. The Pleasant Hill Reservoir was one of the last jobs we did with WPA, and we did have carpenters, concrete workers, and steel workers who were WPA. World War II had just started, and that was the end of the WPA work.

Lage: Were they local people mostly?

McLean: Most of them were local people, yes. On the pipeline work we did have WPA welders, and we had concrete workers who did concrete work. On the thirty-six-inch pipeline that came along Bancroft Avenue, I believe we used WPA welders. We had a full crew on that pipeline that was supervised by district personnel.

Lage: Were you doing work that you wouldn't have been able to do if you didn't have the WPA workers?

McLean: No. This was work that was necessary. This was an expansion of the distribution facilities at that time. We used WPA labor on that. We did a large amount of work with WPA forces.

Lage: Did you find any difference in quality of their labor?

McLean: No. We did do a pipeline that came down through Emeryville. That was a large pipeline that was done with WPA labor. The one problem that I think we had with WPA labor was the number of crews they would have in order to give everyone work. As I recall, they used to schedule them so that a crew would work maybe three days a week, and then another crew would come on the job. There was a lot of rotation of people on the job.

Lage: Was this to give more people work?

McLean: Yes, it was to give more people work. It might be another week or so before you'd get the first crew in rotation back again. One of the comical things that happened was in Emeryville, when we were crossing some of the main streets there. You'd have a flagman to check the traffic, and one day the district superintendent on that job happened to go back over the job, and here was one of these WPA fellows still back there at a street that we'd passed a week before, still back there flagging the traffic. They told the superintendent, Kirk Thomas, "You'd better go back and get that fellow," because the main operation was way ahead of him.

Lage: How about CCC [Civilian Conservation Corps]?

McLean: Yes. Of course the CCC has been used on trail work in the district and throughout the watershed, where they had them clearing trails, clearing brush, cleaning up, burning, and doing a lot of work on the reservoir watersheds. That came under the land department and under the rangers for the district. I never had anything to do with that.

Wartime Service with the District##

McLean: During the war we didn't have much work. Things were quiet except for a service pipeline to Treasure Island and to Vallejo to serve Mare Island and the shipyards. And of course during the war a lot of the engineers within the district were very much in demand to go into the armed forces.

Lage: Into the Corps of Engineer?

McLean: Well, into the Army Corps of Engineers and into the Navy Seabees, the construction corp of the navy. The first instance I had of that was that right after the war commenced, in January 1942, I received a call from Frank Bonner, president of the San Francisco Section, American Society of Civil Engineers, to meet in San Francisco with Colonel Keller of the U.S. Army Corps of Engineers. Bill Trahern and I went over there on a Saturday morning for an interview with this colonel. He was pretty blunt. He said, "I'm not going to mince any words. I'm here to offer you a commission in the U.S. Army Corps of Engineers. You will a receive a commission as captain of the engineers. Monday morning you are to report to the Presidio for a physical examination."

Lage: Didn't give you much time.

McLean: He said, "You will get your orders to go back to Fort Belvoir, Virginia, Monday morning. We'll expect you back there next week." I said, "My gosh!" Bill and I expressed the same thing, that it was impossible to do that in this short of time. "Well," he said, "we need people right now. If you want the commission, there it is." He said, "I'll write out the orders for you right now." Well, we turned that down. There were a couple of fellows there who I don't think were employed at that time, and they accepted the commission. They were free and could go.

I guess it was the following summer--it would have been 1942--that I received another call from the Corps of Engineers to come to their office. They had an office in Oakland at that time. Again they offered me a commission as captain in the Corps of Engineers, and that one was to go to the South Pacific war zone. Well, I turned that one down.

In the meantime, two or three of the engineers from the district had left and joined the armed forces. Joe Decosta went into the Corps of Engineers, and there were one or two others who left to go into the corps. Things began to quiet down in the district, and there wasn't too much going on. Finally, I guess it was in the fall of 1942, I made applications to the U.S. Navy construction battalions, the Seabees of the navy.

Lage: So you decided to take the initiative?

McLean: Yes.

Lage: Was there some reason for the navy over the army?

McLean: Well, yes. I thought that the Seabees would be a much better deal than the Corps of Engineers. The Seabees were going mostly into the Pacific, although a lot of them went into the European theater. I kind of had more of an affinity for the navy rather than for the army.

So anyway, I made the application, and lo and behold, I think it was in January of the following year, which would have been '43, I received a notice to come over and take the physical examination. I went to the office in San Francisco and was given a commission as senior lieutenant in the Seabees. I was to report to the Seabee base in Norfolk, Virginia. My next step, of course, was to get a clearance from the district to go. So I went to Mr. Longwell, who was then the chief engineer and general manager. "John," I said, "I've been accepted as a lieutenant senior grade in the Navy Seabees. Can I get a clearance from the district to go?" The district was considered a war industry because we were serving water to Mare Island in Vallejo and to Treasure Island.

Oh, by the way, the service to Mare Island was taken from the Crockett pipeline that we had built in 1935. Mare Island needed water, so we served it through a pipeline that went across the Carquinez Bridge, and at the base of the Carquinez Bridge--that is, at one of the piers, we connected onto the pipeline that the sugar company had had across the bridge at that time. Then there were connections made over on the other side for Vallejo to get water to the Mare Island Naval Shipyard. We were also serving water to Terminal Island near Stockton, and also the big U.S. Army base at Camp Stoneman in Pittsburgh. We served them water during the war from the number-one Mokelumne aqueduct. That was a large army base. Also the Port Chicago ammunition base was served off the aqueduct.

Lage: So you were going way out of the district's area?

McLean: That's right. And then we also served water to Treasure Island from Oakland. We connected onto a pipeline for them on the Bay Bridge.

Lage: Did you have to build a pipeline out there?

McLean: Yes, they put a pipeline on the bridge out to Treasure Island, to the navy base at Treasure Island.

Anyway, I went to Mr. Longwell to get permission to leave for my acceptance into the navy, and he hit the ceiling. He said, "I'm not going to permit you to go." I said, "Oh, come on. Everybody else is gone; why can't I go?" He said, "Look. We've lost enough fellows now; Joe Decosta is gone and several other engineers. We've got to have somebody here. I won't approve your going."

Lage: How old were you at this time?

McLean: I was thirty nine; I would have been forty in July. I wanted to go. I really regret to this day that I didn't participate. However, I participated in a different way here, by all the work that the district did to serve these facilities. I participated in that I guess I provided service to the war effort shipyards, etc. I would have liked to have had the experience of being in the armed forces. I look back on it, and the kids say, "Oh, well, Dad, you did your share." But at the same time, I think I would have enjoyed maybe a year or two years in the service. One fellow I knew, Fred Early, went to the European theater and participated in the landings and the occupation in Germany. I don't know which direction I would have gone, maybe the South Pacific, or maybe not. Fred Early went in about the same time that I would have. He was a large contractor in San Francisco and a very close friend of mine. He served entirely in the European theater.

Well, anyway, I was turned down by Mr. Longwell, so I had to write a letter to the navy declining the commission.

Lage: Did you have some hard feelings?

McLean: Yes, I did. I had some hard feelings. My wife at that time, Marge, urged me to go. She said, "I think it will do you good." But unfortunately we had our son, Edward Bruce, who was born in 1940. He was only three.

Son's Service in Army Air Force and Death

McLean: My oldest son, Walter Donald, had gone into the air force. That's him right there. [indicates photograph]

Lage: And you lost him, didn't you?

McLean: Yes. We lost him in '45, after the war in Europe was over. He was still in college when I tried to enlist, but he had enlisted in the air force and had been commissioned. They left him in college until the following year, until 1943. War was declared in 'December of '41. He joined the air force in '42, and they didn't call him to active duty until '44. He was basically in the air force at UC Berkeley for about two years before they called him for active duty.

Lage: That's surprising.

McLean: Yes. They left him in college the entire time. I told him after war was declared, "Now, look. Don't rush into this, but don't wait to be drafted. If you wait to be drafted you're going to be a foot soldier out in trenches or some other thing like that. Take your choice now of what you want to do and enlist. Then you will have your choice of the service that you want to select." At that time the air force was gung-ho, you know. For young fellows to be in the air force, that was the greatest thing ever. So they were recruiting at UC Berkeley; he was at UC Berkeley.

Lage: Did he see active service?

McLean: Absolutely. He flew sixty-nine combat missions in the Italian war theater. Oh, yes. We have his log. They flew the Brenner Pass [in the Alps between Austria and Italy]. They called the Brenner Pass the milk run. The squadron would start out every morning and bomb the Brenner Pass on a daily routine. They also participated in the raids on the Polesti oil fields. He went overseas, as I recall, in August of '44. They called him in '44, because he went to Missoula, Montana, for pre-flight training in February of '44. He graduated at Pecos, Texas, from the B-25 bombing school there in '44. He went overseas in August of '44, and was killed after the war ended in 1945.

They were training fellows who had never had any night flying, and he was acting as copilot to one of these fellows. All the B-25s in his squadron were going to fly into North Africa, then to the Azores, then across the Atlantic to South America, and then home. They were going to fly all the B-25 planes back to the U.S.A. They were training some of these pilots who had come to the squadron and had never done any night flying. His squadron was located on one of the islands just off of the Italian mainland.

When the plane took off, it exploded in the air over the Adriatic just after it got off the runway. Both of them were killed. He was buried temporarily in a cemetery in Italy, and then later his remains were brought over to San Bruno.

So his sequence was that he had enlisted in '42 when he was in college, right after war was declared on December 7, 1941. He enlisted in the U.S. Air Force; that's when it was the U.S. Army Air Force. He remained in college a little over a year. He was called up for active duty in '44. He went from Missoula, Montana, down to southern California, from southern California over to Pecos, Texas, and graduated from Pecos, Texas, in the spring of 1944. He and Margaret Jones were married in '44, right after he graduated from Pecos, Texas, and they went to Virginia. Then he went overseas in August of '44, flew sixty-nine combat missions, and was killed just around two or three days after his twenty-third birthday, June 27, 1945.

Lage: The air force gave you a lot of information on how it happened and everything?

McLean: Yes. There were some thoughts that it might have been sabotage. They weren't sure. But those B-25s were the twin engine light bombers. They were very fast, light bombers, and they were a very volatile plane from what I have been told. If you didn't handle them just right, why--. They were fast. They were not like the big B-52s. The B-25s had a crew of five, I believe--a pilot, copilot, tail gunner, another gunner, and then a bombardier. They were pretty hot little planes. They also carried a good-sized load of bombs. He was killed in June of '45, after the war was over.

Lage: That's sad, after the war was over--. He was a very handsome boy.

Wartime Precautions

McLean: Getting back to my career, I was refused the commission. I was a little disappointed. Things were pretty quiet at the district.

Lage: In the book you've loaned me, I read about security precautions and a fear of sabotage.

McLean: Yes. The army required us to do a number of things to protect the district's facilities against sabotage. We had a large number of steel tanks in the system. Those had always been painted aluminum on the outside and were visible from the air. The army required us to paint those tanks a dark green so that they wouldn't be quite as conspicuous among the hills. We had security guards on the filter plants and patrols on the aqueducts and reservoirs. The district was required to take a lot of precautions because of sabotage.

Lage: Was there a sense of fear in the atmosphere?

McLean: Well, it was a sense of concern, I think, to be very watchful about the district's facilities. The government had cautioned us, particularly after the bombing of Pearl Harbor, to be on the alert for sabotage. Right after war was declared we had two or three sessions with the U.S. Army. I remember one or two of them were held at the Grand Lake Theater [in Oakland], where they brought out a lot of the key personnel from the district and also from other agencies, and they cautioned us about sabotage. At that time, I guess, they were thinking that there could be some invasions into the Bay Area and particularly the California coast. We had a number of lectures by people from the army and the navy both as to what to look for, what places might be the most vulnerable, and what precautions to take.

As a result, the district did take a lot of precautionary measures. There were a lot of things done to protect the most vulnerable district facilities. We fenced properties that were not fenced previously. We also had patrols on the dams and reservoirs where sabotage could occur, particularly along the aqueducts; they increased the patrols along the aqueducts.

Increased Use of Outside Contractors during Postwar Years

Lage: But you yourself, you mentioned, were not really busy.

McLean: No. Construction slacked off pretty quickly. We completed most of the construction work that we had going on, but we did very little construction work during that time because of the fact that material was hard to obtain. You couldn't get material for pipe, you couldn't get steel or building materials. This pretty well ended the construction work that had been done by district forces. And I think this became the period of transition, because after the war a lot of the district forces had been depleted, and from then on we began doing more and more contract work.

Lage: Rather than rehire so many back?

McLean: That's right. I think probably during that time some of them had retired. I think this was the turning point from the time the district had been doing a lot of work with their own forces to where we began to contract work. And, of course, during the war there also emerged a lot of contractors who had been doing contract work for the government. They became available, then, for local civilian work.

Lage: Do you have some feeling about which is the better system?

McLean: It is difficult to judge. During the time that the district did this work, they certainly had very good crews. I think the contract work that we later got into, particularly on these larger projects, brought to the district a different organization. They had worked for the government during the war years, particularly those who were solely heavy construction. These contractors had done a lot of work on the army bases and other facilities. They had very efficient organizations, and they participated in some of our projects, particularly when we began to get into the waste water project. They brought to the district, then, a different organization entirely; they were operating on a profit basis.

Lage: Did it change the way things were done?

McLean: Yes, it did. There was a transition, a very definite transition.

Lage: What did you see that was different about the daily work or the way a project was carried out?

McLean: At that time Castro Valley was annexed into the district, Pleasant Hill, Orinda, Lafayette, and Walnut Creek were all annexed to the district after the war. This involved pipelines and reservoirs to serve them. The contractors were organized a little different than the district force, with different classifications of labor and workmen. And then their goals were, I believe, much higher. They had to bid for the work. They were more efficient. There were strict requirements according to the contract to accomplish the work within a specified time.

Lage: So work might have been done more efficiently?

McLean: Well, you probably could say it was more efficient, yes. They were well organized. They had been doing a lot of work, as I said, on army bases and all types of work for the army and navy. They brought to the district a background of experience that was needed at that time, because the district was in a period of expansion.

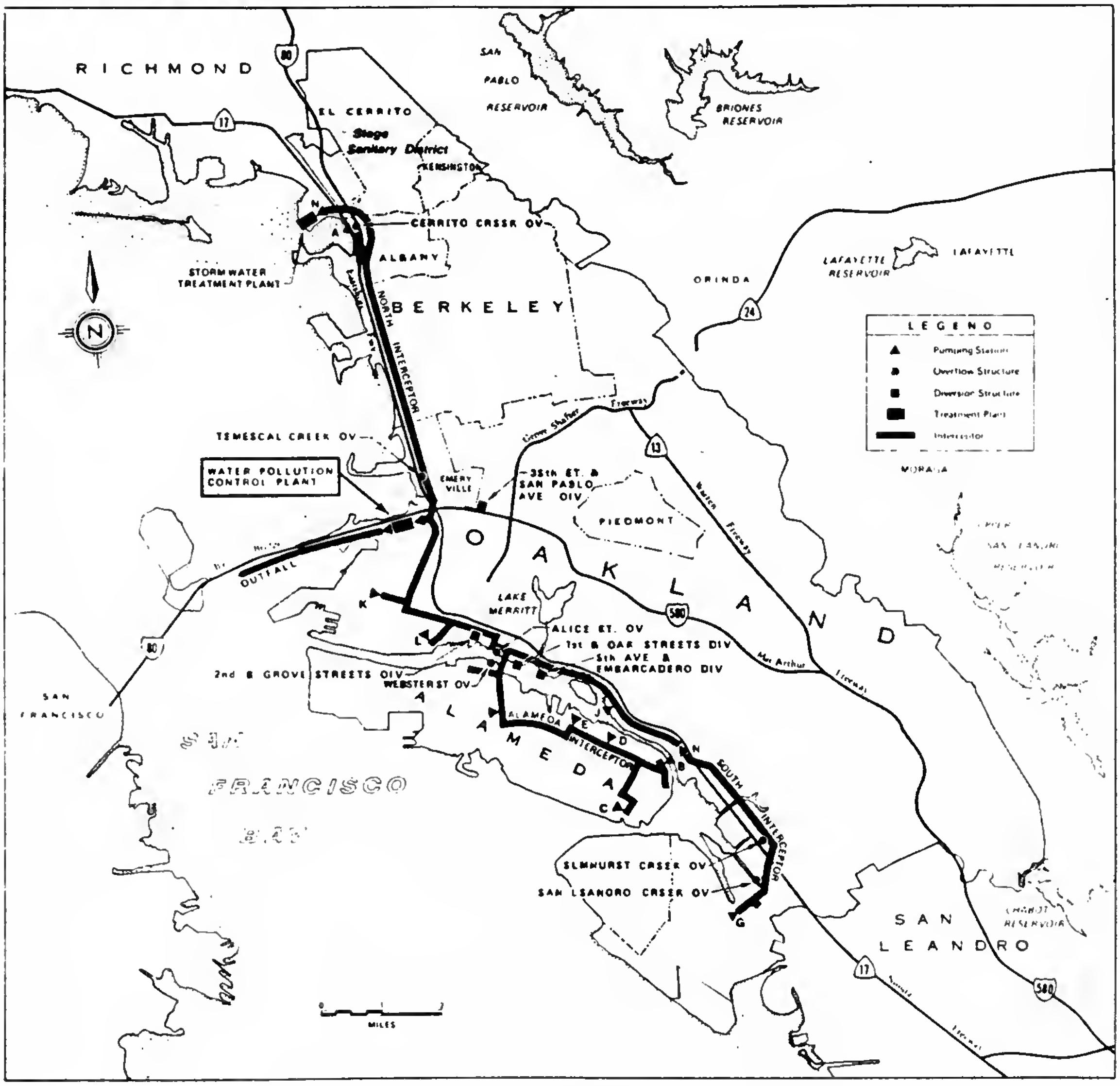
Lage: So the profit motive seemed to--.

McLean: That's right, the profit motive, and this has pretty much continued to this day. Anything now that's over a thousand feet of pipeline is to be contracted out. Anything less than a thousand feet in the way of pipes is done by district forces. Most structures are done by contract.

EBMUD Fact Sheet
April 1985

WASTEWATER SYSTEM

Special District 1, a separate district within EBMUD but administered by the same Board of Directors, was established in 1944 and operates as the Wastewater Department of the Utility District. It treats the domestic, commercial and industrial wastewater of an 83-square-mile area that includes the cities of Alameda, Albany, Berkeley, Emeryville, Oakland, Piedmont and Stege Sanitary District, which includes El Cerrito, Kensington and part of Richmond. Population served by the Wastewater System is 572,000.



WASTEWATER SYSTEM SERVICE AREA

Collection

The Wastewater System operates 21.6 miles of reinforced concrete interceptors, which are sewer pipes that range from 12 inches to 9 feet in diameter. These interceptors parallel the East Bay shoreline from El Cerrito to a point near the Oakland International Airport, and cross over onto Alameda as well. The interceptors collect wastewater from approximately 1,800 miles of sewers owned and operated by the cities listed above.

Eleven pumping stations, ranging in capacity from 1.5 to 14 million gallons a day (MGD), lift wastewater into the interceptors from portions of the Alameda, Albany and Oakland city collection systems and from the Stege Sanitary District. One 57 MGD pumping station relifts the flow in the East Oakland section of the south interceptor.

VI CONSTRUCTING THE SEWAGE DISPOSAL FACILITIES, 1945-1952

Raw Sewage Discharge along East Bay Shore##

McLean: After the war, as far as the history of the district is concerned, the first monumental project was the formation of Special District 1. This was brought about as a result of what we called the Hyde, Rawn, Grey Report. Professor Charles Gilman Hyde was professor of sanitary engineering at the University of California. Harold Grey was the head of the Mosquito Abatement District for Alameda County. Mr. Rawn was head of the Los Angeles County Sanitation District. At that time, as I recall, there were twenty-seven outfall sewers discharging raw sewage into the San Francisco Bay.

Lage: Right into the edge of the bay?

McLean: Right into the edge of the bay. They discharged right at tidewater, right at the shoreline.

Lage: It's incredible to think of it.

McLean: If you ever drove along the Eastshore Freeway at that time with an offshore wind blowing inshore, why, the stench was just terrible.

Lage: How did people put up with it for so long?

McLean: Well, that was the mode of life in those days, with all of those large sanitary sewers--and they were large ones. University Avenue, Adeline Street, Temescal, and Fruitvale were some of the larger ones. I don't remember all of them, but the survey party got into them all and gauged them to determine the flow. All the fecal matter, toilet paper, condoms, and everything else were all out on the beach along the shoreline. You had them clear out to Richmond and the Richmond inner harbor. The Richmond inner harbor was just nothing more than a big sewage lagoon. And then going south there was Elmhurst, and another big one was the Adeline Street one that discharged out along the shore at the beginning of the Bay Bridge, right out at the toll plaza.

Lage: Yes. People probably smelled that pretty good when the Bay Bridge was built.

McLean: The Adeline outfall discharged alongside the Bay Bridge. The Hyde, Rawn, Grey report was published about 1944, during the war. This was a big, thick book. I believe I gave my copy of that to the UC library. But anyway, this precipitated the formation of Special District 1.

Lage: I understood that East Bay MUD didn't really want to get into the sewage business. Would that be something that you would be aware of?

McLean: That is correct. I think the board of directors was very reluctant to get into the waste water problems. But there was enough pressure brought on them by the citizens that the district was the most logical agency to carry out the project.

Lage: Did you and your coworkers feel that way, or did you side with the board of directors?

McLean: Well, it was decided by the board of directors; however, we were enthusiastic about the project because it meant a lot of engineering design and construction.

Lage: But were these kinds of policy issues discussed among the employees, by yourselves?

McLean: Very rarely. Once in a while we'd get down to it on a staff level. We'd have a staff meeting every Monday, and we'd get some of these things that would come down to the staff level. We were told about them, but we were never participants in that sense. It was decided by the board. There were five board members at that time, and they were really pressured. There was a big outcry at that time to do something about this raw sewage discharge into the bay, particularly the smell. If the Eastshore Freeway had not been constructed, people would never have been aware of it.

Lage: They weren't trying to save the bay; they just didn't like that smell, is that right?

McLean: I think that was it. It wasn't a case of polluting or trying to save the bay; it was a fact that people suddenly had become aware of these sewers that were discharging raw sewage into the bay.

Lage: Did the sewage go into the creek and then into the bay? Or they did just happened to be--?

McLean: No. The pipes went out and discharged right at the shoreline.

Lage: But they followed some of the creeks?

McLean: Well, some were named after the creeks. The Temescal was named after Temescal Creek. University Avenue was the University Avenue sewer. All of these sewers were large-diameter pipes that collected the sewage from homes, commercial buildings, UC Berkeley, etc., within each drainage area.

Ashby Avenue was a large sewer. There was University Avenue, Ashby, Temescal, Adeline, and then going south there was Lakeshore, Elmhurst Creek, and a lot of others. These were all large sewers, five, six foot in diameter. And those sewers were just flowing out into the bay. The Hyde, Rawn, Grey Report had all the information on the outfall sewers and the discharges, the quantities that were flowing into the bay. The Bay Bridge was completed in '36, and people traveled along the Eastshore Freeway going north instead of going along San Pablo Avenue the way we used to go. People became aware of these discharges on the Eastshore Freeway. I'll tell you, the smell was overwhelming. You would come along there on a hot summer day, and you wanted to put a clothespin on your nose.

In the other direction, on Lakeshore, where a couple of large outfalls discharged down to Broadway, they were never noticed, because people were not down there. And they were some large ones: Lakeshore, Grand Avenue was a big one, there was one at the foot of Broadway, there was Elmhurst Creek, and there were a many others out in that direction that discharged into San Leandro Bay. But people didn't get to see them because they were discharging into the estuary, and people were not aware of them. The ones they noticed were those big ones at Adeline, Temescal, Ashby Avenue, and University Avenue. You could see those when you traveled along the Eastshore Freeway.

This precipitated people to do something about these, to take care of these discharges and get them into a waste water treatment plant. And at that time treatment plants were beginning to be built in many of the smaller cities. At the time the Special District was formed it was supposed to take in Richmond on the north and San Leandro on the south. Well, it happened that Richmond elected to go their own way, and San Leandro elected to go on their own. Each of these cities built their separate plants. So when you got into the real mechanics of all this, certain areas were brought in, and certain areas were left out.

Originally the Hyde, Rawn, Grey Report took in all the waste water flow from Richmond to San Leandro, including Alameda, which had to be brought into the system by people across the estuary at Webster Street.

The district board of directors was very reluctant to take on anything more than the water supply. They figured that the water supply was all they wanted to handle, and they didn't want to get into the waste water business. But pressure was brought upon them to take on the waste water end of it, and that's when they formed Special District 1.

Staffing Special District 1

Lage: And you had some role in the work for Special District 1?

McLean: Yes. At that time there wasn't much work going on, so I was shifted over on Special District 1. A new organization was formed entirely; I was divorced, basically, from the MUD part of it. That's when I formed all the field forces and project engineers for Special District 1. This included all the field parties, all the inspectors, and the engineers to carry out the field investigations, treatment plant location, location of the interceptor pipes, and float studies for the outfall sewer location.

Lage: This involved a lot of hiring.

McLean: Yes. Darrell Root became head of design, and I became head of all the investigations and construction management. Darrell and I worked together. Mr. Kennedy, who had been assistant chief engineer and assistant general manager, was put in charge of us; my supervisor was Kennedy. Then we commenced all the investigations for Special District 1.

Lage: Now, for this project you had different problems?

McLean: Oh, yes. Oh, you bet we did.

Lage: Were there things you had to learn? How did you go about it?

McLean: No, it was general engineering. We had to study the drainage areas to determine the flow from the various drainage areas, which went into the sizing of the interceptors. Then we started on the location of the interceptors. We had to construct interceptors running north to take in Albany.

Lage: When you say interceptors, what do you mean?

McLean: The purpose of the interceptors was to intercept all of the outfalls that then were discharging into the bay water.

Lage: You had the basic system; you just had to capture it before it got to the bay?

McLean: That's right, we had the basic system. We knew where the outfalls were. You see, outfalls are constructed to take in what we call drainage areas. All of the sewers that flow from all homes and commercial establishments had to be intercepted, and the flow diverted into the treatment plant and then into the outfall. Our job was to collect the flow from all of the existing outfalls. First we had to locate the interceptors within public streets or, where it wasn't possible in public streets, across private land in order to intercept all of these main outfalls as close to their discharge point as possible. You didn't want to get any individual sewers into the main interceptors. The purpose was to intercept all of the big outfalls nearest the discharge point. So we had to try to follow a location along some area where we could get at virtually the end of the outfall pipe. We couldn't go out into the bay, but we tried to get as close to that location as we could.

Then I had to have an office for my office force, and of course I had several field parties. In conjunction with this, we had to search for locations where we could have a suitable area not only for the treatment plant but also for the outfall from each treatment plant. We studied three of those. We studied one near in the racetrack in Albany, another one in the San Leandro area, and then the area where the main plant is now located.

Lage: Which is?

McLean: Near the east approach to the Bay Bridge.

Lage: Did you have outside consultants on this?

McLean: Yes. We had two outside consultants on it. We had Mr. Tom Veatch from Black and Veatch in Kansas City, and we also had Mr. Sam Greeley from Greeley and Hanson in Chicago. Mr. Veatch was the man I worked with. His specialty was construction. Mr. Greeley was on design, and he worked with Darrell Root. Darrell was the head of design, and Mr. Greeley knew most of the criteria regarding the design of the treatment plant. Mr. Veatch was more cognizant on the interceptor locations and the various studies we did on those, and also on the outfall. I had a lot of contact with Mr. Veatch, and Darrell Root was in contact with Mr. Greeley.

They both would come out on the projects quite frequently. I began to accumulate a pretty good-sized force of people. We had two or three survey parties in the field.

Determining Outfall Location with Float Studies of Bay Currents

McLean: We spent pretty nearly a year on the float studies in San Francisco Bay for the location of the outfalls from the treatment plant sites.

Lage: How did that go?

McLean: Well, on the studies for the outfalls we had possible areas that we felt were probable locations, and we were studying the currents in the bay for the directions that the outflow from the proposed locations would go. The purpose was to locate an outfall where the discharge from the outfall itself would be dispersed rapidly in the bay and carried out the Golden Gate into the ocean. We carried out these studies for nearly a year, in which we had a boat that operated on the bay, and we fabricated a number of floats. We had six-foot floats, three-foot floats, and then we had bottle floats. The six-foot floats had a vein on the bottom; they were weighted so that about two feet or more of the float would be above the surface of the water, and the remainder of the float would be down below the water. What we were trying to do was to get not only the surface currents but also currents below the surface so we could tell which direction the effluence would go.

We had reference points along the shore, like the stack of some building or some other object that was visible, which we knew the coordinate of, and then we'd have some other point that we could see. We had these points along the shore that we used for triangulation. We had a crew of four on the boat, two instrument men, a chief of party, and the boat operator. We followed these floats, sometimes for several hours. If there was one of the six-foot floats that was traveling in a particular direction, we would pick that one out and start following it. We would follow whatever direction it went over a period of ten to twelve hours. Then, by using two sextants, we would take readings off these reference points at shore as we followed the floats. By that we could plot our positions, you see. We would follow the float around and get the time and what the tide level was at that time. We would follow this float until we were sure it was headed out towards the Gate, and then we would leave it. Many times we would follow it pretty nearly to the Golden Gate Bridge if it looked like it was headed in that direction.

Lage: Did you get out in the boat?

McLean: Yes. I went out on the boat several times. We kept this up for a year. I don't know how many hundred floats we put out at that time, and then we put bottle floats out. In other words, the procedure was that we wanted to get a certain tide at a certain time during the day. They might start out at six o'clock in the morning, and they would usually turn maybe two or three of these six-foot floats loose, and then four or five of the three-foot floats, and maybe ten of the bottle floats.

Lage: They just tell you the surface currents?

McLean: Yes. They were just floating high. They had a little flag on them, and inside the bottle--of course we had a cork on it--but inside the bottle was a self-stamped postal card note. And it said, "If you find this bottle, please mark the location of where you found it, the date, and the time of day that you found it." And we did get some of those back. This gave us a record of surface material. In other words, if there was any surface material that came out of the outfall--that is, floating material, which you very rarely see today--then this would give us an idea of where this might land on a tide and a time of day.

We worked at that for a year, and then of course in the office I had to have a man plotting this. We made up maps of the prospective locations of the outfall--as I said, one in the Albany area, another one in San Leandro, and the main one that we have comes out near Treasure Island. It soon became obvious after a lot of studies that we had made of the Albany site and the San Leandro site that these were not good locations.

Lage: The outflow didn't go out into the ocean?

McLean: As I recall, in San Leandro Bay the floats just went back and forth in the estuary; they never got out the estuary. We also found that to be true in the South Bay below Candlestick Point. The floats never got out of the bay. They just kept going back and forth on the tide. This indicated to us that these were not satisfactory locations for an outfall. And at the Albany one we found that to be true also--that unless you went out to the deep-water channel there was no way you could ever get the material out of the bay.

So this was the reason for choosing the location off of Treasure Island, where we finally constructed the final outfall from the present treatment plant. These were very interesting studies.

Lage: They seem like they would be, and might have other uses as well.

McLean: Well, yes. They indicated to us the surface water currents, what the underwater currents were doing, and which direction they were going.

Lage: Once you decided on the one that was chosen, did you have to get permits and all?

McLean: Oh, yes, of course you went through all the permits.

Lage: Through the Army Corps of Engineers?

McLean: Yes, all of that, and also the State Department of Water Quality Control.

Lage: Was there any problem with that?

McLean: No, because our studies had been very thorough. Of course, that was all handled through Darrell Root; I didn't get into that. How far out we would go became a part of design. Well, we went out as far as we could; we went out to deep water. As I recall, the outfall is located in somewhere around fifty feet of water just off of Treasure Island. And it has proven very satisfactory. I don't think there have ever been any problems regarding the discharge from the outfall.

Lage: It's treated by the time it's out there?

McLean: Oh, yes. It's all treated now; of course it's all treated. But these studies were very interesting

Locating Sewer Line Interceptors

McLean: Then the location of the interceptors was another real interesting problem. We had to get, as I said, out as close as we possibly could to the end of the outfall coming from the city sewers. We followed the railroad tracks north of University Avenue out to Albany.

Lage: So you were on the land side--the east side--of the freeway?

McLean: That's right, yes. Then south of University Avenue we were along the Aquatic Park, and then from the treatment plant north we followed the Eastshore Freeway. We were on the east side of the Eastshore Freeway, and that really created some problems. But we had to get there in order to intercept the Temescal Creek outfall.

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McLean: The Temescal Creek one is right north of the old Judson Steel Company. In fact, it comes through the property of the Judson Steel Company.

Lage: Now, where is that?

McLean: That's just north of the Bay Bridge interchange. We came out of the treatment plant and then followed through vacant Santa Fe property. South of the Judson Steel Company is all Santa Fe property. Then we followed the Eastshore Freeway on the east side, alongside the highway. Of course, there we had to get a permit from the state (now Caltrans), which required certain restrictions. We were in the shoulder area; we were not under the pavement. Of course we had to have equipment along the freeway to carry on the installation of the pipe. We worked along there from south of the Judson Steel Company on north to where the Aquatic Park is, a distance of maybe a mile. This was all tunnel; it was all tunneled underneath the shoulder because we couldn't open cut it. We had to tunnel.

Lage: A little extra work.

McLean: Oh, it was. It created some real problems, and then the contractor had to quit work at four o'clock in the afternoon because of the restrictions that the Caltrans put on.

Problems with Sandfill under the Eastshore Freeway: Breastboarding the Headworks

McLean: The interesting part about it--the land in there was all sand-filled; it was put in hydraulically to make the bed of the highway, and we ran into what we called running ground. In this tunneling operation, the material would run in at the tunnel heading, and we had to breast board the headworks. When you're working like that, you keep boarding up the part that you're excavating to keep it from running in on the tunnel. We had quite a time on that.

That was one of the most difficult operations on the entire north interceptor, and that's a large interceptor. It is ninety-six inches in diameter. It's a large pipe, and it required a large tunnel. You could drive along the shoulder, along the edge of the pavement of the freeway, and you could see the progress of the work by the settlement of the shoulder. The shoulder was settling on the surface as the tunnel progressed. That was done by Stolte, a local contractor. They did a good job. They had a portion of the south interceptor, and then they also had a large portion of the north interceptor.

Lage: So you were overseeing and seeing that they performed to specifications?

McLean: Yes. A fellow by the name of Bob Murdoch was my resident engineer on that project.

Treatment Plant and Pumping Plants

Lage: Did you also oversee building the treatment plant?

McLean: Oh, yes. I was in charge of all that work--the treatment plant and everything else, yes. Yes, I was in charge of the entire project. I don't recall how many men I had, but a lot of work was going on at one time. I had a project office for the north interceptor, one for the south interceptor, one for the treatment plant, and another for the work in Alameda. We had the Alameda interceptor and the estuary crossing, which was a large project.

Lage: Yes, I would think so. Did you go under the estuary?

McLean: Oh, yes. We went under the estuary with two pipes, east of the Posey highway tube. As I remember, we had a 42-inch pipe and a 60-inch pipe that went from Alameda under the estuary. It crossed just east of Jack London Square in Oakland, at Webster Street. That was quite an operation. The south interceptor was installed in First Street; it followed the railroad tracks on First Street. That was all difficult construction work. It was deep, and we had to use sheet piles to protect the railroad tracks and other structures.

All of these operations were going on at the same time. We had the north and south interceptor, the outfall sewer, the treatment plant, the Fruitvale pumping plant, and we also had the Albany pumping plant.

Lage: It didn't all work by gravity?

McLean: No. To get the flow from the airport into the south interceptor, we had to construct a pumping plant at Fruitvale. Then in Albany we had another pumping plant to collect the various sewers there to get the flow from them into the north interceptor. Then in Alameda there is a pumping plant to get the flow from Alameda across the estuary and into the south interceptor in Oakland.

Installing the Outfall Sewer Line and Connecting the Interceptors

Lage: And then you had the outfall pipe.

McLean: Then we had the sewer outfall which we installed, and that was a large operation in itself, because that's a 96-inch pipe. The pipe installation was all done with the use of divers. Healy Tibbets was the contractor on that project. We had to use divers for putting the pipe together. I had to have a diver for inspecting the installation. We had to have our own boat; we bought a boat. I had a boat operator to take the inspectors back and forth on the boat.

Lage: Did you have your own staff doing the diving, or did you have people you hired?

McLean: We had our own diver. I had a diver on my staff. We used him later also on the estuary crossing. The outfall paralleled the Bay Bridge, so we used the piers on the Bay Bridge for setting the grades for the pipe trench. I had to have a man with a level instrument on the Bay Bridge piers who could give the elevation for the grade of the trench and also the elevation for the grade of the pipe from the piers of the Bay Bridge. We had to have the boat because you had to get these fellows out on the piers, and you also had to have the diver on the diving rig. The contractor had the derrick barge where they did the excavating and the pipe laying. We had to have our personnel there all the time the contractor was working. I had a diver and a helper, a level man, and the project engineer.

Lage: These are all new directions, I'd say.

McLean: Yes. I had the diver and his helper to get out, and then I had an inspector in addition. Then I had to have an instrument man on the piers of the Bay Bridge to give them grades for the trench and the pipe.

Lage: My, it did get complicated. How did that finally get finished? How long were you on the job?

McLean: The first projects were let, oh, I guess somewhere around '46 or '47. The entire project was completed and dedicated in '52.

Lage: Any hitches? Did it all work as you expected?

McLean: Oh, it sure did. It worked perfectly. Well, we found one or two little bugs in it, but they didn't affect it very much. It functioned right from the day that we began operations. After everything was ready, then the big job was cutting the existing outfall into the interceptors. There were twenty-seven of them. We had a separate contract for doing that work. The grade of the interceptor was designed in such a way that we could cut them in very easily. And we left manholes over the connections so that you could get into them. But in order to cut them in we started at the lower end, near the treatment plant, and worked out, because we wanted to have it dry when we were cutting these in; we didn't want to be swimming in sewage when we started in.

That was a big operation. That was the last thing we did, to bring all those into the interceptors, and the treatment plants were started. The project was dedicated in the spring of '52.

VII GROWTH AND EXPANSION, 1950s-1960s

Planning for Growth: the 1958 Bond Issue

[Interview 5, May 8, 1991]##

Lage: Last time we finished talking about the sewage facilities. Now let's turn to the work of the district during the fifties and the sixties. That was a period of growth in the Bay Area and for the district. And I think you're about to break into a story here about planning for growth.

[The following section was added by Mr. McLean during the editing process.]

McLean: During the 1950s, studies were made and growth projected into the year 2000, and it was recognized that the existing aqueducts and storage facilities would not be adequate to meet the demand consumption. Additional storage was needed on the Mokelumne River to meet both the needs of East Bay MUD, the Woodbridge Irrigation District, riparian water users, and river losses to the ground water table.

A high dam was proposed at the Middle Bar Site and also a dam at the Camanche site. A third aqueduct was needed of sufficient size and capacity to meet our water rights of 325 mgd from the Mokelumne River--a second Walnut Creek tunnel, a Lafayette aqueduct, and a Lafayette tunnel to meet the 325 mgd. A storage reservoir was needed for the growth east of the hills in the Walnut Creek, San Ramon, and Danville areas (the Briones site within the San Pablo drainage area). A filter plant was also needed for this area, and a site was chosen just east of the Walnut Creek tunnel. In order to provide for the growth eastward along Highway 80 in the Sobrante, Pinole, Rodeo, and Crockett areas, a new filter plant was needed to meet the projected consumption in that area.

It was also recognized during this period that the true historical supply from the Mokelumne River would not be sufficient to serve the needs of the district beyond the year 2000. Accordingly, a search was commenced to obtain a supplementary supply that was equal in quality to the Mokelumne. The American River was selected as that source. It was finally decided, and the following facilities were selected and a $252 million bond issue put to a vote of the people within the district in June 1958 for the ten-year program.

The facilities included in the bond issue were: Camanche Dam, a 432,000-acre-foot reservoir to provide storage for Woodbridge Irrigation District, fish releases, riparian water uses, and river losses; a third Mokelumne aqueduct, 87 1/2 inches in diameter; a second Walnut Creek tunnel; a second Lafayette aqueduct; a second Lafayette tunnel; Briones Dam, capacity 60,000 acre feet at elevation 576 to provide terminal storage for the Danville/San Ramon area; Briones pumping plant; Danville pumping plant and aqueduct; Walnut Creek, Lafayette, and Sobrante filter plants.

The $252 million bond issue was passed with a large majority, and work on the design and construction of the new facilities was started immediately. Kaiser engineers were retained to design the Briones Dam, and Bechtel Company engineers were retained to design and administer the Camanche Dam contract. The design of the third Mokelumne aqueduct and all the other facilities, including the contract administration, was handled by district personnel. All work on the bond issue was completed in 1968.

In 1970 the U.S. Bureau of Reclamation was searching for contractors to purchase the water that would be impounded by the proposed Auburn Dam on the American River. At that time the district signed a contract with the bureau for 150,000 acre feet (134 mgd) to be delivered at a turn-out point on the Folsom South Canal. To date, the district has not utilized this additional supply, although they have paid the bureau $260,000 annually on this contract.

[end of added material]

Population Growth, Annexations, New Pipelines

Lage: Wouldn't it be useful to talk a little bit about how the plans were made that led to the bond issue and how the people in the community responded to the idea that we had to plan for growth?

McLean: Yes. Well, the planning really started right after the war, in 1945. During the war there had been a large influx of people into the district. I believe it was also about this time that there were a lot of annexations to the district. I've kind of forgotten just when Walnut Creek and the San Ramon Valley came into the district, but Pleasant Hill was annexed to the district about this time. And I also believe it was during this time that the Walnut Creek and the San Ramon Valley and all that area was annexed to the district. You see, originally the district boundary was along the west hills which started with Richmond. Pinole and Sobrante and those areas were not in the original district. It was Richmond, El Cerrito, Berkeley, Piedmont, Oakland, San Leandro, and those areas. Castro Valley was annexed in the forties, and San Lorenzo came after that.

Lage: And Hayward didn't want to be a part of the district?

McLean: Well, Hayward at one time was to be a part of the district, but they finally formed their own water company and got water from the city of San Francisco. A couple of times they were either asked or they wanted to come into the district, and then they turned it down. They got into some arguments with the district and how it was to be. They wanted to remain independent. There were a lot of Portuguese farmers there who didn't want to be mixed up with the district. They were on the city council, and they wanted to stay independent. The result was that they finally obtained a water supply from the city of San Francisco. But originally Hayward was to be a part of the district. I don't know whether they've regretted it since, but I think they probably have, because the district has had a much more stable water supply than the city of San Francisco, particularly in this drought year where they're being rationed, I believe, about fifty percent, where the district only has fifteen percent.

But immediately after the war there was a tremendous expansion.

Lage: And was your job involved with planning for this?

McLean: Yes. The entire engineering staff was involved in planning for all of this expansion. Not only were a lot of contracts awarded for pipelines, but after the annexations occurred we were putting pipelines into all those areas. The Pinole-Rodeo area, all that area in north Richmond--when we had installed the twenty-four-inch pipeline to the Crockett Sugar Refinery, why, this served as an excellent line to serve all those areas and still is in use today. So there was a large expansion out to the north.

Of course, during the war there had been a large influx of people to work in the shipyards and related industries. More and more people had come into the area, and the district boundaries were expanded. We then reached into the area east of the hills and Moraga, Orinda--well, Orinda had become part of the district at the time we built the Orinda Filter Plant. We took over the old Orinda Water Company [in 1934]. And of course the pipes and storage reservoirs were replaced, because most of them were too small to serve consumers and provide adequate fire protection.

Then Moraga came into the district [1948], and finally Walnut Creek [1952] and the San Ramon Valley [1958] became a part of the district, and the district extended its boundaries to the hills and valleys to the east, over toward Mount Diablo and including all of Walnut Creek. At the same time Walnut Creek was served by the California Water Service Company that had the filter plant out at Baypoint and the Chenery Reservoir. Water was pumped from the bay into the reservoir. The city of Walnut Creek formed an assessment district, issued bonds to buy out the old water company, California Water Service Company, and were annexed to the district. And, of course, the addition of all this area again precipitated a lot of planning for facilities to serve that area.

Lage: Was any of this controversial within our district? Did people say, "No, we don't want to annex new areas," or, "We don't want to grow"? For instance, today the idea of growth and increased water supply creates a lot of controversy.

McLean: Oh, no, no. Everybody wanted to join the district because of the water quality. That is, all of the communities around here wanted to annex to the district. Castro Valley was a small community, and they wanted to annex.

Lage: Did they approach the district, or did the district approach them?

McLean: Well, most all of them approached the district. Castro Valley was a group of small chicken farms. Castro Valley was comprised of one- and two-acre chicken farms, and I guess some even larger parcels. During the war, when meat was short, we used to go out to Castro Valley, and we could buy chickens for a dollar and a quarter a piece. We'd maybe buy a dozen chickens at one time.

Lage: Did they pick the feathers off for you?

McLean: You had to pick the feathers off and clean the chickens. You just bought them on the hoof, you might say. Of course we had meat rationing during the war, and you couldn't get much meat. Chickens were cheap. Most all of Castro Valley was served by wells. Everybody there had wells and tanks for their water supply.

Lage: When did that begin to change?

McLean: This changed right after the war, when Castro Valley came into the district.

Lage: But it wasn't the chicken farmers who wanted to come into the district, I would think. Was it being developed?

McLean: Well, it was the people living there, and Castro Valley then was being developed. There was a lot of building going on there. Also during this time we annexed the Fairview district, which is in the city of Hayward.

Lage: So your growth was partly annexation, but it was partly development in the older area?

McLean: That's right. That is correct, yes.

Lage: What did all this growth mean to you as a district employee?

McLean: During the war very little work was available except for those facilities directly connected to army or naval bases, shipyards, and related industries. Immediately following the war there was a tremendous expansion throughout the district. Between the years 1945 and 1955 was probably the greatest period of development that the district has ever and will ever see. My engineering staff doubled and quadrupled several times. I had several field offices, with a staff at all the major projects as well as several personnel at the main office. They were busy times, and I think we all enjoyed it.

Lage: What was your particular job at this time?

McLean: Right after the war, the first thing I got assigned to was the waste water project; we began all the studies on that. And when that project began to more or less reach a finish, then I got into the future planning for water supply.

Lage: Was it partly water supply but also how to supply these new developments with pipelines?

McLean: Well, yes. And then in addition to that we began to contract for a lot of work. In other words, as I said, Castro Valley came into the district, and the Fairview district. We had a tremendous number of contracts, and I had men--engineers--as inspectors; we were building reservoirs. We built the north reservoir, we built the south reservoir, and we built a lot of--not only distribution reservoirs but the Danville Pumping Plant, the pipelines out in the Danville area. We were expanding in all directions.

Lage: So it was really a busy time?

McLean: It was a busy time. I don't know how many men I had, but I had a large group of not only surveyors but also inspectors, engineers, and personnel on all the different projects. And then I had a pretty good-sized office force; I think I had five or six men in the office who were keeping track of the contracts and progress payments. Of course, in addition to this came the waste water project. We were involved in the waste water project where we started all the studies for the interceptors and outfall and then into the construction of the project.

Need for Additional Water Supply

McLean: And finally, after we'd had all this expansion, during this time was when we recognized we were going to need additional water. We recognized that our supply of 200 million gallons a day which we then had rights to on the Mokelumne would not be sufficient to carry on into the future for Walnut Creek and all of this area that was then being annexed or brought within the boundaries of the district. So then we went to the mountain counties, Amador and Calaveras counties, and negotiated with them to obtain another 1.25 million gallons a day. This would bring our entitlement water rights from the Mokelumne to 325 million gallons a day.

Lage: Now, did you pay the counties for that?

McLean: We paid each of the counties for the additional water rights. We paid each one of the counties, as I recall, $2.5 million. I don't recall exactly, but it was sometime in the late forties or early fifties.

Before too long we realized that the additional water we had obtained from the Mokelumne was still not going to be enough. We knew we couldn't get any more water out of the Mokelumne, so we began to look elsewhere for additional water. This is when we signed the contract with the U.S. Bureau of Reclamation for the American River water.

Lage: Do you remember the date on that?

McLean: This came in 1970 [December 22, 1970].

Lage: What was the Ultimate Mokelumne River Project?

McLean: The Ultimate Mokelumne River Project was the bond issue of '58. In other words, we recognized that we were going to need another larger aqueduct. The first and second aqueducts were not capable of delivering the 325 million gallons. The number one aqueduct with a gravity flow is only capable of delivering 41 million gallons a day to the system; the number two, 54 million gallons; and the number three, 107 million. Now, if you operate the pumps at the Walnut Creek Pumping Plant on the number one and the number two, that increases your flow on the number one to 67 million gallons a day and on the number two to 87 million; that adds up to 154 million gallons per day. Now, when EBMUD acquired the additional supply from the mountain counties, that then gave us the entitlement of 125 million gallons more. So the gravity flow of the three aqueducts is 202 mgd, but the pump flow increases the capacity up to 326, which is the full capacity of the aqueducts.

Well, studies of the Mokelumne River have indicated that the true historical flow of the Mokelumne is only in the neighborhood of about 215 million gallons a day. Now, there are times during the year that you can take a flow of 325 mgd, but if you take the overall flow annually over a long period of time, the true historical flow is only equal to about 750 thousand acre-feet, which must provide for all prior rights on the river plus losses.

Lage: So this was all looked at?

McLean: Yes. We were studying all this, and we recognized that by the year 2000 we were not going to have sufficient water for the district.

Lage: Projecting the growth of the area?

McLean: That's due to the growth of the area--that is, with the boundaries as they now exist. When Walnut Creek and San Ramon Valley and those areas came into the district, we changed the boundaries. We moved the boundaries out to the area east of the hills, along the eastern ridge of the San Ramon Valley. We moved the boundaries from the East Bay hills out to the hills east of Walnut Creek.

With the growth that was taking place within the district at that time, we recognized that the true historical flow of the district would be only equal to about 241 thousand acre feet a year, or somewhere in the neighborhood of a little over 215 million gallons a day. We would never be able to realize our 325 million which we had rights to.

Lage: So you had rights to more than you were able to get?

McLean: We had rights for more than what the true historical yield of the river would be when you take into account the prior water rights of the mountain counties, Woodbridge, etc.

Lage: Does this mean that you would take up all that water? What would be left in the river?

McLean: Well, there's still water left in the river. Because you have to recognize that we still have to supply Woodbridge Irrigation District, and the mountain counties get their entitlement. They get their entitlement first from the river, then Woodbridge and the riparian owners along the stream get theirs, and we get what's left. This is what creates what we call the true historical flow.

In other words, records of the Mokelumne probably go back to the early 1900s. And what you do is average out the flow over all these years, and then from that average you take out the prior rights that have to be recognized--the decrees that we have with the city of Lodi and with the Woodbridge Irrigation District. You have to take those entitlements out, as well as the mountain counties--Calaveras and Amador counties--and the riparian rights along the river and also the river losses. You take those out, and then what is left--

Lage: Or you leave them in, we could say.

McLean: Well, you leave them in, yes. That's what I mean. You leave them in, and then what water is left, that's what you get. When you do all of this, then the true historical flow cuts the district's dependable supply to 215 mgd or 241,000 acre feet, although we say, "We've got rights to 325 million." But you can't get them.

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McLean: The district, East Bay MUD, has water rights of 325 million gallons a day, which amounts to 364 thousand acre feet, from the Mokelumne River. However, the safe historical yield, with present storage facilities, is only about 241 thousand acre feet per year, which I believe amounts to 215 mgd. Let me work that down, and

I'll tell you what that amounts to in millions of gallons a day. [gets out his calculator]

An Aside on Slide Rules and Calculators

Lage: Did you used to have a slide rule that you'd whip out instead of this calculator?

McLean: Yes. [laughter] Here's my old slide rule, right here.

Lage: You don't get much use of it now, I bet. Calculators must have pretty well replaced the slide rule.

McLean: That's right.

Lage: I never did learn how to use one of these.

McLean: Well, here. It's really easy to read. Let me show you how you do it. Let's say you want to multiply--well, let's take an easy one. Two times four. You put them one over the other, and then you run up on this just to four. And what do you get? You get eight, don't you?

Lage: Oh, right underneath here. I see.

McLean: Yes.

Lage: Now wait a minute here. You line up the two and the four.

McLean: Yes. This is your index number. This is on your C scale. You use your C D scales for--you can also go up above here, but those are all log logs and--oh, this has got all kinds of hydraulic stuff on it.

Lage: Is this a special one for your field?

McLean: This is normally used for hydraulics. You can use either scale--this one here, or you can use this one over here. See, they both read the same. It's a C D scale.

Lage: You have to know what unit you end up in.

McLean: Yes. That's right. And you have to memorize decimal points in your head and all that. I did hundreds of jobs with a slide rule in hydraulics. That's what we used in those days before we got the present calculators.

Lage: When did you switch over to calculators? Do you remember?

McLean: Oh, twenty years ago, I guess. These small calculators came into being about, oh, twenty years ago.

Lage: They're easier to carry around.

McLean: Oh, yes. Much easier to carry around. I've got two or three. Here's a little bit of a one right here that I can put in my pocket. You know, it's amazing the many functions they can perform.

Lage: Do you use the scientific calculators?

McLean: Oh, yes. They're all over at the San Francisco office. All my sines and cosines and logarithms tables are over at the office. Years ago, why, we used to carry a whole library of books around. I've got a logarithms book that's about two inches thick, when we used to logarithms for many of our engineering calculations.

Lage: You'd have to use your slide rule plus this whole array of books?

McLean: Yes.

Lage: And now all of that is on one little chip.

McLean: Now you have this little calculator, and you've got all your functions.

Lage: Did any of the old-time engineers have trouble switching over? Did any of them refuse to give up their slide rules?

McLean: No. Well, I think a lot of them continued using slide rules as a check.

Lage: They were not sure the calculator was working?

McLean: Lots of times, you know, it's what you have been accustomed to using. Fact is, slide rules are quite fast. Most of the time you are dealing in round numbers. Of course nowadays we deal with three or four decimal points on these calculators. But with a slide rule, you dealt with round numbers. For instance, if you wanted horsepower--horsepower is qwh[1] divided by 550 [brake horse power]. Well, you take a slide rule, and you can work that pretty fast, where with the calculator you've got to go through several

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[1]q = cubic feet of water; w = 62.5 pounds, the weight of a cubic foot of water; h = height in feet.

motions. Now, we'll say that q is maybe 500, water is 62.5, and then your head we'll say is 1500. 500 times 62.5 times 1500. Divide by 550. That's equal to about 852 horsepower.

Lage: I can see that's a little easier than punching in the numbers.

McLean: That's right, and that's why slide rules are fast for hydraulic calculations. If you wanted to know velocity in pipes or open channels, a slide rule is very fast. Let's go through that same problem again using the calculator. I said 500 times 62.5 times 1500. And then I said divide that by 550. Well, you get--I said 852, didn't I? Well, here it comes out to 852.27273.

Lage: But you don't need that precision?

McLean: No. You don't need all that. If you're working on that kind of a problem, a slide rule is faster.

Lage: Well, we certainly got diverted, but I thought that your retrospective on slide rules would be interesting.

Building the Pardee Recreation Area

Lage: What other projects did you work on during the fifties?

McLean: During this period of time is when we planned and built the Pardee recreation area.

Lage: Tell me about that, because that was a new type of project for the district. How did you learn about what was necessary in a recreation area?

McLean: At that time there was pressure brought by the fishermen of California to open up the district's reservoirs for fishing. Previously, because of health reasons, we didn't want any bodily contact, not only on our local reservoirs but on the main storage reservoirs. But there was considerable agitation by the people in the mountain counties and by fishermen in Sacramento to open up Pardee Reservoir for recreation. I don't recall whether there was an act of legislation, but finally we got a grant from the state. First, of course, we went through the planning stage as to where we could build a recreation area. There was a very excellent area on the north arm of Pardee Reservoir, the Jackson Creek area.

Lage: And were you in charge of this investigation?

McLean: I was in charge of that, yes. We went ahead with plans for a large concrete boat ramp and sanitary facilities--that is, to dispose of campground sanitary waste from toilets, etc.

Lage: Did you bring in outside people who had had experience in the recreation end of this, or was that necessary?

McLean: Yes. I don't just recall who they were, but we had talked to a number of people who were familiar with planning recreation facilities. We visited recreation areas that had been built. I went to Cachuma Reservoir [on the San Ynez River in Santa Barbara County], where they had a similar operation, and then I visited a couple more. There was one in the San Joaquin Valley which was a water supply reservoir, and we visited that to study what provisions they had for launching the number of boats, what fees were charged, what sanitary facilities you had to have, the number of toilets, and water supply requirements. I had a small group on that in the planning stage, drawing the plans and preparing the specifications. Finally we got funding from the state. I don't recall the agency, but it was one of the agencies where they fund a certain percentage of these projects. That was built some time in the fifties.

Lage: I think it was in '57, or '58, that it was designed.

McLean: Yes. It was done along in there. That is correct.

Lage: Were you in charge of the building also?

McLean: Yes. I was in charge of work, but all of the construction was by contract.

Managing Recreation on Reservoirs: Sanitary Considerations##

Lage: That was the first recreation area for the district?

McLean: Yes. This is what opened up recreation, I guess, in the three local reservoirs--Chabot, San Pablo, Lafayette, and later Camanche.

Lage: The district went into recreation not too happily, I understand.

McLean: That is correct. This was opposed by, I would say, Joe DeCosta, who later became the chief engineer.

Lage: What was his objection, do you think?

McLean: Well, sanitary. He wanted to keep the reservoirs from being polluted by human contact. That was the real basis of it.

Lage: Was that a standard response among the water people?

McLean: That was standard among the water people, yes. Joe was a sanitary engineer. He had taken sanitary engineering at UC Berkeley. He had gone to high school down in one of the little towns in the San Joaquin Valley and had come to the University of California and had taken sanitary engineering. The professor of sanitary engineering was Professor Hyde. These old-time sanitary engineers were very, very aware of pollution of reservoirs. They didn't want to see any bodily contact or any public use of public water reservoirs because of pollution. They resisted for many, many, many years, and, fact is, the district had a police force that would arrest anybody trespassing on the drainage area of San Pablo Reservoir, Upper San Leandro Reservoir, Chabot. People used to sneak in once in a while and go fishing and hunting. Bill Jordan was chief of the district's rangers.

Lage: Especially with those great trout that you have told me about at the San Pablo Reservoir.

McLean: Yes, that's right.

Lage: But fishing was illegal?

McLean: It was illegal, yes. It was mostly because of the pollution problem.

Lage: Did you have a feeling about it at the time?

McLean: No, I didn't have much feeling about it. Of course, I didn't have much to do with the reservoirs because I was more on the engineering construction projects.

Lage: How was Joe DeCosta as chief engineer?

McLean: Joe was good; he was all right. Joe was a good chief engineer. We got along well with Joe. Bill Trahern and I, Thaddeus Hague, and the group that worked directly with Joe, why, we got along very good. We had a good rapport. He was a good chief engineer.

Building the recreation facilities at Pardee precipitated the opening of San Pablo. And then we had not only construction of facilities of San Pablo but also construction of facilities at Lafayette Reservoir. Of course, Lafayette Reservoir has become one of the real recreation areas for Lafayette and that area. Today there are hundreds of people who use it daily.

Lage: Has there been any problem of pollution?

McLean: No. Well, I think they have had some problems, but I think they have finally educated people to prevent any pollution.

Lage: There's no swimming allowed?

McLean: No swimming, that's right. No bodily contact. That's one of the provisions. I'm sure that once in a while they do a little swimming. I'm sure of that, because I don't think you can stop them. That's the reason we had to put these floats for boat landings and install toilets, particularly around San Pablo but even at Pardee, where we've had to have chemical toilets. And we have boat patrols. At Pardee they actually have a boat patrol that travels around the reservoir to check on the fishermen.

It was really an undertaking which the district had never been faced with before. It was a new era for the district, going into these recreation facilities. When Camanche Reservoir was built, we also constructed the facilities for Camanche. That happened after I retired. They formed a park board, and then they had leases for various concessionaires. That has become a real big operation, because they now have the problem of the permanent trailer homes. People have gone there and actually put in these big trailer homes. Some of the people are living there year round, and they've had to have agreements with them that they're only there for six months. That has precipitated a lot of problems.

The operation of Chabot Reservoir has been turned over to the East Bay Regional Park Board. That is a complete year-round operation, and it's heavily used. San Pablo is only open from April 1 to October or November 1 and is operated by concessionaires. Lafayette Reservoir is open year round, and that's operated by the district. Lafayette has been a tremendous recreation area for people in the Walnut Creek-Lafayette area.

Feasibility Study of the Middle Bar Project, 1950s##

Lage: You talked about a feasibility study of the Middle Bar Project. What would that be?

McLean: That went on, I guess, right after we had finished the Pardee recreation area.

Lage: That was '54 to '57, according to my notes.

McLean: Yes. I worked with Orin Harder and Francis Blanchard on that. We carried out a feasibility study on the construction of a high dam for a reservoir at the head waters of Pardee Reservoir.

Lage: What was the reason for that?

McLean: To control the full flow of the Mokelumne River. You see, we've had maximum flows in the Mokelumne River of over 1,000,000 acre feet annually. Pardee holds about 210,000 acre feet. Camanche holds about 420,000.

Lage: You didn't have Camanche then?

McLean: Camanche had not been built then. We were looking at Middle Bar in lieu of Camanche. What we wanted to do was to provide additional storage on the river to control the flow of the river and to provide enough water for the downstream irrigation interests and the riparian owners on the river so that we wouldn't have to provide that storage in Pardee. That would free our water from Pardee for use in our distribution system.

Lage: I see. So this would serve the same function as Camanche later did?

McLean: That's right. The Middle Bar Project called for a low dam at Camanche. To regulate the flow in the river below Pardee, we would build a smaller dam at Camanche. This was all in the planning studies. We had studied a high dam at Camanche and a high dam at Middle Bar, and then we studied a low dam at Camanche.

The reason for the low dam at Camanche was that if you stored the maximum amount in the high Middle Bar reservoir, then you could keep Pardee full most of the time, and you could have had maximum power generation at Pardee. That meant the release of a large quantity of water daily into the river. And to control that flow, when you are releasing water into a river from a powerhouse, you have a high fluctuation in the water level in the river. In other words, you have surges in the river. Hydropower in California operates on a demand basis. We worked with PG&E on this, and we also had Mr. Longwell, who had been formerly the chief engineer and general manager, as our consultant. We also retained a power consultant, an electrical engineer. He lived over on the peninsula near Burlingame. The reason for the small dam below Pardee was to regulate the amount of water flowing in the river so that you wouldn't have large surges.

Lage: So you could use it for power but still keep the river under control?

McLean: Yes. With the Middle Bar you would have had a much greater potential for power generation at both Pardee and Middle Bar. PG&E at that time did not use steam as the base of the load. What they normally do today, they have their steam plants on the base of the power load, which is a certain number of kilowatts per day. Then when your lighting demand comes on at night, or during the summer when you have a pumping demand by the farmers, for instance, then they call on the hydroplants. They bring the hydroplants on at any time of the day or night. Whenever the demand increases above what their normal base load is, they call on the hydroplants.

The advantage of the hydroplant is that the minute you turn the water on, you've got electricity. The reason they keep the steam plant operating on what they call the base of the load all the time is that you don't have to shut down your boilers and then start them up again. It takes a long time to fire a boiler. So you keep your steam plants on the base of the load all of the time, like the nuclear plant that they have at Diablo now. When you begin to get peak demands, then you call on your hydroplants. You pull whatever hydroplant you need to take care of what your load may be.

Well, what this does, when you're releasing water in the stream, like at Pardee, you get surges in the river. There might be a difference of between fifteen and twenty feet of the water going down the river. This creates a real problem all along the river, particularly with the farmers who are taking water. It creates problems in the river because the river can be way low, and then all of a sudden when you turn on your hydroplant, why, you've got a full stream flowing. So the purpose of a small reservoir downstream from Pardee is to regulate the flow in the river. You have a pool there into which you discharge your water, but the water going out [from the lower dam] can be at a constant flow. Along with any dam that you built at Middle Bar, and having Pardee already in existence, you needed a small dam with maybe 100,000 acre feet capacity or something like that downstream from Pardee.

Rejection of Plan for a High Dam at Middle Bar

Lage: Now, why was that combination not decided on? Middle Bar was not built. Had you recommended it?

McLean: Yes, we recommended it; it was certainly recommended by--well, I don't know whether I should get into that.

Lage: I think it sounds interesting.

McLean: The original plan was to build a high Middle Bar and then a smaller dam downstream. But if we built a high Middle Bar dam, it meant that the electric power plant of the PG&E would be inundated.

Lage: It would be flooded?

McLean: The existing electric plant would be flooded. And it meant that we would have to negotiate with PG&E. We had talked to them about it. And it meant that we had to give them a block of power, or that we had to locate the powerhouse in another location. There were several schemes studied, but they had to be compensated for the loss of the power at that plant, whether the plant was put at another location or whether you would give them an equal amount of power out of the Pardee plant or something like that.

Well, we wrote a report on this, and I had made some contacts with PG&E. Of course, PG&E was agreeable as long as they were compensated. Our report recommended that we build the high Middle Bar and that we build a smaller dam at Camanche of 100,000 or 150,000 acre feet, which didn't involve all the dikes that we had to build as a result of the high dam at Camanche. There also were some problems here, some seepage problems. If you built the high dam at Camanche, you had to take care of the seepage problems. Anyway, Mr. Breuner, who was the president of the board, apparently did not want to go through all the negotiations with PG&E.

Lage: Did it look as if it was going to be a long negotiation?

McLean: Well, it looked like there might be a lot of problems in that. All of our studies were turned over to the Bechtel Corporation for a review, which I had recommended and which was good.

Lage: Because they might be the contractors or just to get an outside opinion?

McLean: They were power people, and we wanted a second look at the project. Originally, Bechtel had approved the project. They reviewed our report, and they agreed that it was feasible. They felt that the project was a feasible project and that it was cost-effective; they recommended it. Well, then came the issue of going to PG&E and negotiating with PG&E regarding the electric power plant.

Lage: Would PG&E end up getting more power?

McLean: No. They would have been compensated; we had a formula. This is why we had this electrical engineer. We brought him into the picture because of the electric power plant and PG&E. He was an expert on these matters. He had represented power companies at the Public Utilities Commission. He was very cognizant of compensating and what you would do in a situation like this. This is not anything new; it has been done in many, many other instances where you have to take an old plant out and relocate it. And because PG&E had water rights, all of these things had to be taken into consideration. They had rights to this power, and they had rights to the generation of power by the use of the water from the Mokelumne. Well, their plant would have been under two or three hundred feet of water.

Lage: Was the plant above the Pardee dam, then?

McLean: The plant is above the Pardee dam. Right now the tail water of Pardee comes up pretty close to the power plant. Well, if you go in and build another dam, the Middle Bar site, five hundred and some odd feet high, then the PG&E electric plant would be under five hundred feet of water. Now, there were various ways to take care of that. One thing, you could just locate the pipeline for the plant downstream below the new dam and build a new power plant, or you could build a new power plant within the confines of the dam, utilizing the head that they have, and have an independent power plant. Or you could compensate them for the loss in power that they normally generate on that plant, and you generate more power in the new plant.

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Lage: You were saying that Bechtel looked at it and originally thought it was a good idea.

McLean: Yes. Bechtel looked at it, and they approved our report. They went over our report very thoroughly regarding the cost-benefit ratio, and they approved it. But as I say--and I don't know the full story and am only quoting what little bit I know--evidently Mr. Breuner, who was then president of the board, or McFarland, who was the general manager, did not want to go through all the negotiations with PG&E to build this project. As a result, Bechtel reversed themselves on it and said "no" on the project. Consequently, we didn't go ahead with it.

Lage: Did you hear some of the story on what happened?

McLean: Well, I heard some of the story, but I didn't get all of it. And I'm only quoting from what I know, but I do know that on the first report that Bechtel came out with they accepted our report and said the project was feasible, with a good cost-benefit ratio. I never saw what their final report was, but I heard that it was turned down. And then they recommended the high dam at Camanche.

The High Dam at Camanche

Geological Problems with the Site

Lage: You also had put forth the high dam at Camanche as an alternative?

McLean: That's right. They recommended the high dam at Camanche, and we were very skeptical about that for several reasons. One was the seepage losses in the reservoir itself. There was an aquifer that we knew was under the reservoir that would create problems with the higher dam at Camanche.

Lage: So some of the water would sink right down into the aquifer?

McLean: That's right. After the dam was built we got into some real problems. One of the first problems that came up was that we had a serious leak in dike number one.

Lage: Now, what were the dikes?

McLean: You see, the site for the reservoir was surrounded by a perimeter of hills, and the dam was built in a narrow section. The high dam created a problem which the lower dam did not. The high dam created problems where these valleys that went up toward the reservoir had to have dikes, which were small dams. Some of them are around one hundred feet or more high, and along the south side of the so-called reservoir we built a continual string of what we call dikes, or dams; they're small dams. Well, shortly after the reservoir was first built we ran into a serious leakage in dike number one, and we had to drain the reservoir very rapidly. The seepage coming out of the dike was beginning to show a brown color. This indicated that there was erosion taking place under the foundation of the dike. We were afraid that we would have a failure.

Lage: And what is downstream from these dikes?

McLean: A failure of dike number one would flood the town of Lockford, farmland, and could reach the city of Lodi. The damage could be in the millions of dollars.

Efforts to Prevent Dam Failure, 1966

McLean: This also was coupled with a very high phreatic line in the main dam itself.

Lage: What's that?

McLean: This shows that there was uplift pressure beginning to occur at the base of the main dam. So we had to drain the dam immediately, and we drained it by every means that we could. We opened all the outlets and drained the reservoir. Two things we had to do. Number one, on the main dam we had to put in a drainage system and relief wells. On the dike, we had to put in what we call a slurry trench. This was a seal to seal the dike. What this meant was that we had to go along the toe of the number one dike and dig a large, deep trench. We kept the trench filled with a slurry mixture of bentonite and water; we used bentonite as the slurry trench. Bentonite is a very heavy material that has a high specific gravity; although it is fluid, it has a much higher specific gravity than water. We had to construct this cutoff down to bedrock and then tie that in with the core of the dike so that we stopped the leakage.

Lage: When something unanticipated happens like that, or maybe anticipated--.

McLean: Well, this was the one thing that we were afraid of right in the beginning, because the early geological studies that we had made of the reservoir showed that there was a gravel aquifer under the base of the reservoir. It indicated that we could get some serious seepage in the reservoir. We didn't go down with deep cut-off walls in the dam; when the dam was constructed, the plans had not called for deep cut-off walls. Consequently, as the reservoir filled, instruments in the dam began to show that there was a very high phreatic line within the main dam. The only remedy to lower that is to put in relief wells. We put a whole series of wells along the base of the dam, at the downstream toe of the dam. These wells were twenty inches in diameter and went down into the foundation of the dam. Then we had to put drainage pipes along to convey this water to the river to relieve the water pressure under the base of the dam. Had this water pressure increased, there could have been uplift pressure on the base of the dam, and we could have had a failure of the dam.

The Decision to Build Camanche

Lage: And these were problems that you more or less anticipated?

McLean: That's right.

Lage: So how did the decision get made to build a high dam at Camanche?

McLean: They were intent upon building the Camanche Dam. I was never entirely involved. I felt that the better project was the high Middle Bar Dam and the smaller dam at Camanche, which wouldn't have created these problems.

Lage: But I'm thinking now of your role as an engineer and employee. You put forth your recommendations. Are you in on any of the discussions about the decisions? Or do you just kind of retire from the decision?

McLean: I wasn't in on the final decision.

Lage: What about other staff people above you? Your supervisor?

McLean: My supervisor at that time was Joe DeCosta. And he was the one who took part in all the decisions.

Lage: Did he agree with you?

McLean: Well, I don't think he agreed with me, no. I think he took the Bechtel opinions, and I don't think he agreed with me and with some of the geological studies that we had made. At that time they had pretty well committed themselves to building Camanche Dam.

Lage: And just didn't look at the things that didn't support this choice?

McLean: Bechtel became the engineer on the dam. And although it was in my budget, I didn't have anything really to do with the construction of the dam, although I did go up there once in a while. But they put Orin Harder on it, and he reported directly to my chief, who was Joe DeCosta.

Lage: So Bechtel ended up building the dam and running into these problems?

McLean: That's right.

Lage: And they hadn't anticipated them?

McLean: They were the engineers. I forget who the contractor was, but it was contracted out, and they became the engineer on the job.

Lage: And then when the repairs and changes had to be made--.

McLean: I had to do the repairs.

Lage: Bechtel didn't come back to do them?

McLean: No. It took a period of time; I don't know, it took a couple of years to fill the reservoir. Bechtel was gone by then. They had an office and everything else, and they were gone. It took a couple of years to fill Camanche, but when Camanche filled, then we got the problems. It was really serious; we could have had a failure.

Serious Fear of A Failure of the Dam

Lage: Do you remember any specifics of when the problems were discovered and how people reacted?

McLean: I would have to go back into the records.

Lage: I was just thinking about your memories, anecdotal things.

McLean: Well, it was at least a couple of years after the dam was built that it filled.

Lage: Did everyone see the urgency of it as you did?

McLean: Oh, absolutely, sure. Everybody knew, because here was dike number one--. See, all of these dikes seeped water. There's no dam in the world that was ever built that doesn't seep water. You have relief wells, and you have drainage systems. What happened was that the seepage water from this number one dike, which is just south and east of the main dam, began to show dirt, and the flow was increasing. We began to recognize right then that we had a problem, that if this continued it could erode the dike. Also, over at the main dam we recognized that we were beginning to get a high water table on the downstream toe of the dam, and we had to do something about it. We have instruments in these dams--not in the dikes but in the main dam--that indicated we were getting a very high phreatic line in the dam itself.

Lage: So that means within the dam the water is coming up?

McLean: That's right, high water pressure on the base of the dam.

Lage: Or is it beneath the dam?

McLean: Beneath the dam, yes. We were getting high pressures under the dam. To prevent a failure, we immediately drained the reservoir. That cost us a tremendous amount of money because we lost all that water. The reservoir had been virtually full, and we had to waste all the water in the reservoir.

Lage: Is that kind of thing kept quiet, or is it announced?

McLean: It was kept quiet, I can tell you that. We had it right up to our ears, you might say, because we could have had a failure in that dam.

Lage: And that would be dangerous for the downstream area?

McLean: Oh, it would have washed everything out downstream. Imagine if you turned loose 400,000 acre-feet down that stream; why, you'd have really had a mess. It was serious. It was real serious.

Lage: So the cities downstream, you don't go and tell them you've had this problem?

McLean: No. We didn't tell anybody about the problem. We recognized it, and as soon as we recognized it the order was given to drain the reservoir, and we did. We drained the reservoir immediately, and we immediately went to work on the relief wells on the downstream toe of the dam and also on the dike.

Digging Relief Wells and Slurry Trench

Lage: When you say the downstream toe, I'm not sure--.

McLean: That's the downstream toe of the dam.

Lage: What exactly does that mean?

McLean: Well, let me draw you a little sketch. That's the best way to explain it.

Lage: Okay, let's look at the sketch [see following page].

McLean: In an earth-filled dam or a dike, particularly in the dam itself--
Lage: Is this an earth-filled dam?

McLean: Yes. They're both earth-filled dams. You have a dam that looks like this. We'll say this is your foundation down here. In the center of this dam you have a clay core that looks like this.

Lage: This is the top of the dam.

McLean: This is the top of the dam, yes. This is the crest. And you have a core that looks like this that goes usually up the top. This is what you call the shell.

Lage: What's the shell made of?

McLean: The shell generally is rolled material. This is clay.

Lage: Is that from local materials?

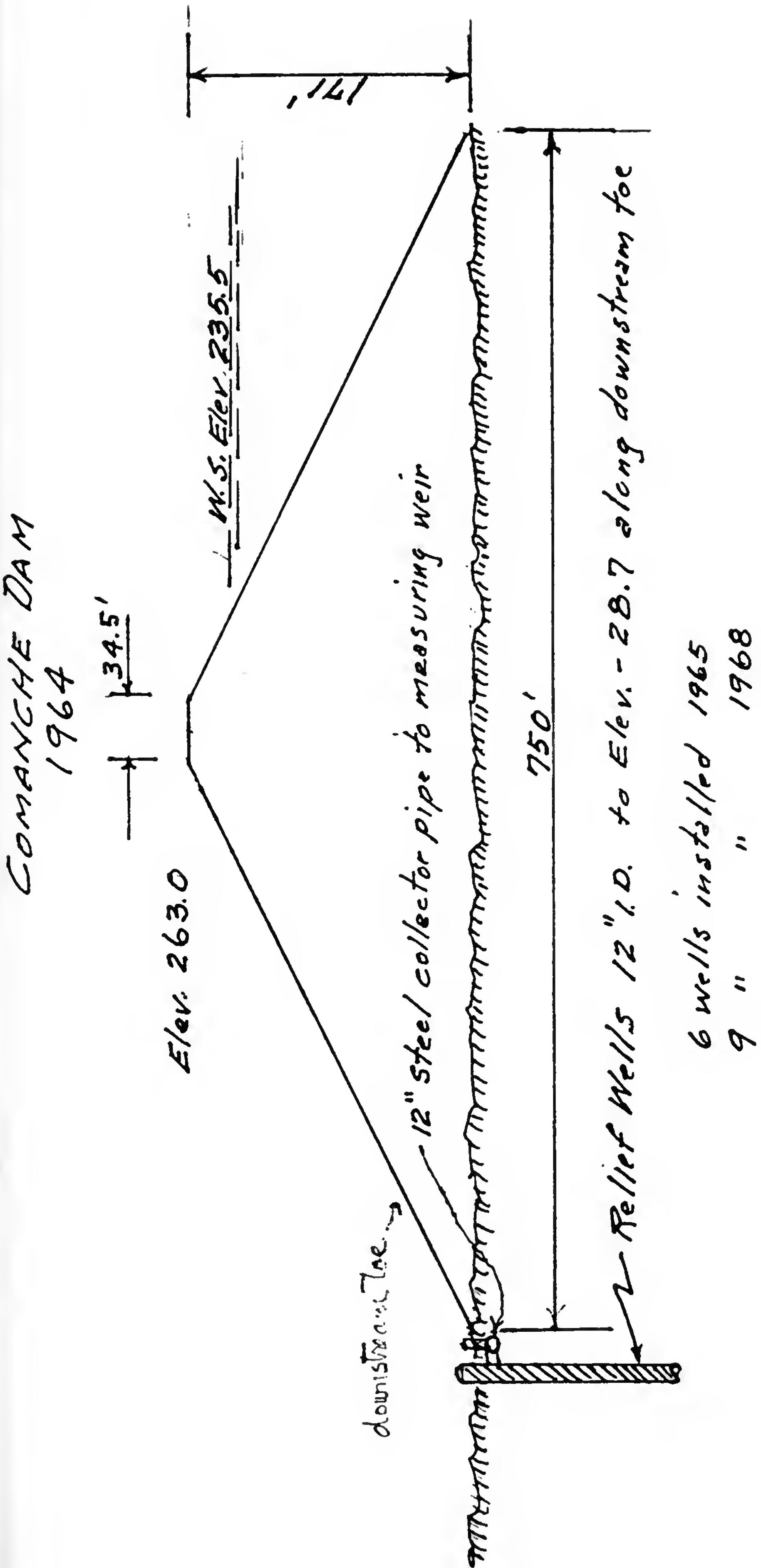
McLean: Yes. From local materials. Generally it can be gravel, or it can be mixed material, conglomerate material. Then on the upstream face you have what is known as riprap. This is for water and wave protection.

Lage: This is the reservoir over here?

McLean: This is the reservoir; this is the water in here. We'll say that your water is up to here. Now, normally your hydraulic gradient, or your phreatic line or whatever you want to call it, comes through like this. On the back of this you have what is known as a drainage system composed of a fine material, sand, and graded gravel, and this is your drainage system. This comes out here, like this. In other words, this drainage system comes out like that. When you get seepage through a dam it will go through this clay core, although it is supposed to be impervious. Generally you'll get a little drop off your line, like that. And then this seepage that comes through this core will drop down and go into the drainage system and waste into the main stream.

Lage: And then you see it come out over on this side?

Drawing by Walter McLean



McLean: Oh, yes. Oh, sure. You measure the seepage behind it. And that's what indicated to us that we were getting some serious seepage through the dam.

Lage: But you expect some of this?

McLean: Yes. Normally, you expect this. You have instruments in the dam that measure this pressure. What we found in here was that the pressures were an increase of pressure in here--

Lage: Underneath?

McLean: --underneath the base of the dam due to leakage, or whatever it was, down in this area.

Lage: Below the dam itself?

McLean: That's right. Below the dam itself. And this causes serious concerns about what we call uplift pressures on the toe of the dam.

Lage: Is this the toe?

McLean: This is what we call the toe, right here. This is the toe of the dam, the downstream toe of the dam. When you begin to get pressures under here, you begin to worry about the stability of the dam itself. You're not supposed to get them. This system is supposed to relieve that. So what we had to do was go in and put wells down in here, like this, way down. We went way down.

Lage: So this is in front of the dam under the river that comes out of it?

McLean: This is on the downstream toe part of the dam. This is the reservoir. We put in these relief wells. We put in a whole string of them along the base of the dam, and the purpose of that was to get below the foundation of the dam and relieve the pressure under the base of the dam.

Lage: Did you put more under here?

McLean: We put a whole string of the wells along the base of the dam, and these became, basically, what we call artesian wells. In other words, the water flows out of these pipes and relieves the pressure under the base of the dam.

Lage: So it flows from underground and comes out of these relief wells?

McLean: That is correct. And that lowered this pressure under the dam. Then we connected these relief wells into a drain pipe. We laid a pipe along there, and we connected all the wells. Now we measure the quantity of water that's coming out of these relief wells so that we can determine if it's increasing, decreasing, or staying the same. We know, then, from the instruments in the dam, that these relief wells are doing the job of relieving the pressure under the base of the dam.

Lage: Is this something that continues to be a concern?

McLean: Well, no. You watch it constantly. Once we installed the relief system it relieved the pressure. Had it continued, the dam could have failed.

Lage: You would have had upward thrust?

McLean: That's right. There was a possibility of failure in the dam. The relief wells basically took away that danger. And by monitoring the flow and seeing that these relief wells are open and flowing, the dam will remain stable.

Now let's look at dike number two. Let me draw a picture of the dike for you [see following page]. Here we have the same foundation situation, like this. And we have a so-called dike in here, built the same as the dam.

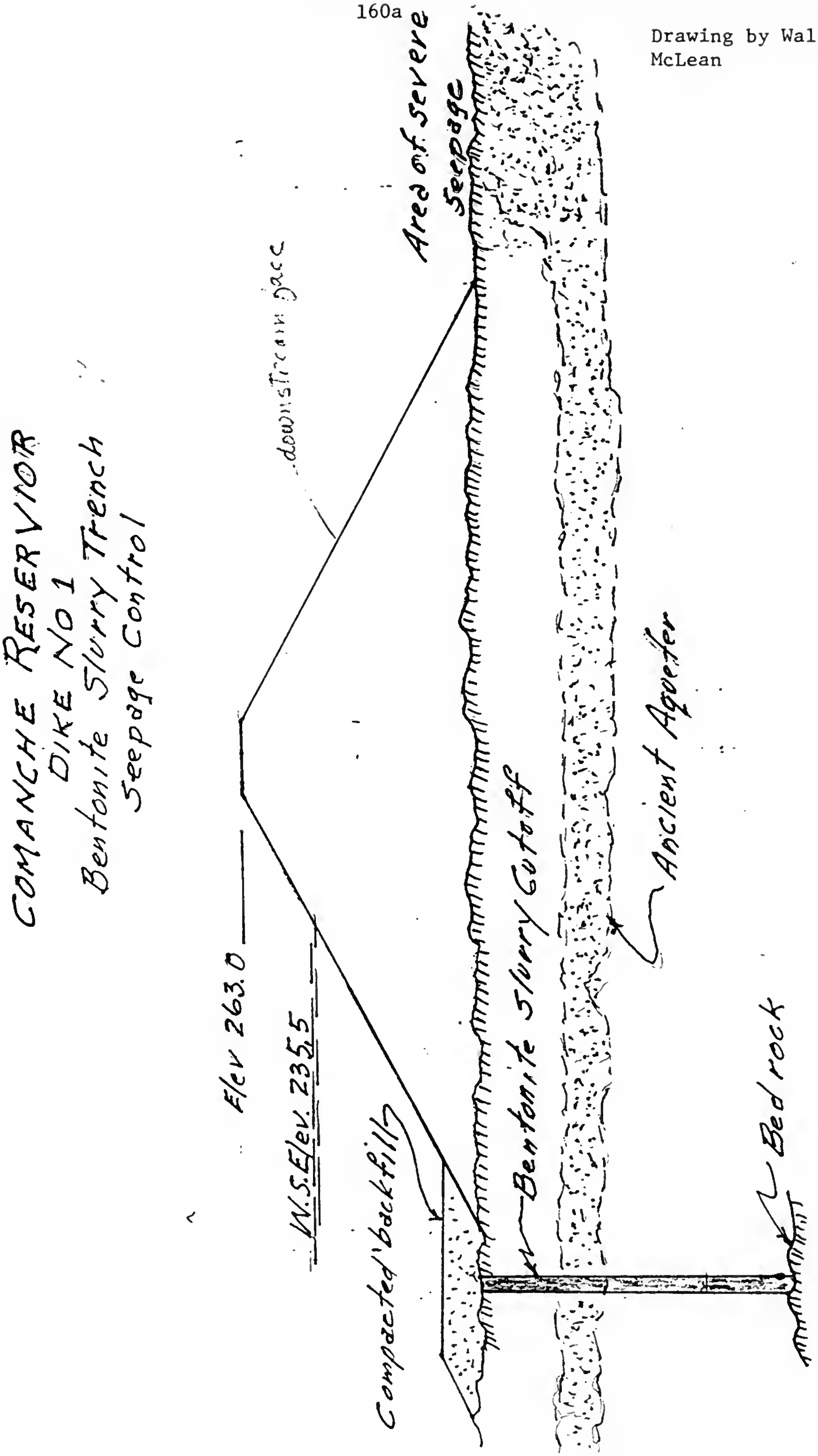
Lage: Just a small dam, basically.

McLean: Yes, a small dam. Under the downstream toe of the dam, again we had a drainage system--in other words, a place for seepage water to drain. [refers to diagram] Here's the reservoir, over here, and this is the downstream face. We had a drainage system here.

We noticed that the water that came through this drainage system was beginning to become turbid. The flow was increasing, and it was getting to be turbid. We were worried about the increased turbidity and flow and what could be done to correct it. We knew there was an aquifer under the base of the dike that was causing the problem. Because this dam foundation had never completely gone down to bedrock, we decided that the only way we could stop the seepage was to install a bentonite slurry trench to bedrock at the upstream toe of the dam. We excavated a slurry trench along the toe of the dam down to bedrock with a large trench. The trench was kept filled with slurry during excavation, and the slurry connected to the clay core in the dam.

Lage: This is behind the dam, on the reservoir side?

Drawing by Walter McLean



McLean: This is upstream, on the reservoir side. And this is why we had to drain the reservoir in order to get in there and work on it. We had to completely drain the reservoir.

Lage: And the main dam, you didn't do anything on the reservoir side?

McLean: No. We couldn't get into it because there was water there. But the dike was dry because, you see, the base of the dikes are higher than the base of the dam.

Lage: What do you call--?

McLean: This was a slurry trench in which you use bentonite. It's a very fine clay material mixed with water. I guess it's about fifty percent water, fifty percent clay. But the specific gravity of it is much heavier than water. It comes from down in the southern California area, in the Bakersfield area, where they have big fields of this bentonite. It's a very fine colloidal clay. This was mixed in a plant on site. In some places we had to go down one hundred feet or more with a dragline. You keep the trench full of slurry at all times. It's heavy enough to support the trench sides. We had a trench that was about six to eight feet wide. We used a large dragline. This dragbucket was about sixty inches wide. In order to keep the sides from slopping in we had to dig this material out, and we'd cast that material to one side up on the upstream face. We'd cast the excavated material out, and we kept the trench constantly full of slurry at all times, up to the surface.

In order to stop that seepage through the base of the dam we had to plug it on the upstream face. That meant that we had to drain all the water out of the reservoir--all that we could--so that we could get to the upstream toe of the dike. And then we installed this slurry trench.

Lage: The slurry is impervious to the water?

McLean: Yes. Once it solidifies, then it is impervious; it's just like you installed a concrete cutoff wall. This is common practice in dams where sometimes they're founded on gravel. And fact is, had this been done at the time the dike was constructed, we would have never had the problem. We knew this aquifer existed. I wouldn't say Bechtel ignored it, but they virtually ignored it and said it wasn't necessary to put in a cutoff wall. We had to waste about 400,000 acre feet of water, and at a cost of even $10 an acre foot that would be $4 million.

Lage: Even though you had pointed it out?

McLean: Yes. We knew about it. Berney Gordon, who was our geologist, knew that this aquifer existed.

Lage: I would think you'd have more control over your contractor, to tell them, "What are you doing about the aquifer?"

McLean: Well, no. When you have a contract, you have to specify that you're going to do these things. The contractor doesn't know anything about it. In other words, he does what the plans and specification show, and if you don't show a cut-off in your specifications, he doesn't put it in his costs.

Lage: So the district should have put it in?

McLean: The district should have indicated a cutoff wall. We should have done this, because we knew there were problems. And it should have been provided for in the original contract. We did not. We went ahead and let the reservoir fill up, and then when the reservoir was nearly full, we recognized that we had problems at the main dam and at dike number one. Then this required remedial measures, which we had to do and do them damn fast, because we were very concerned about failures.

Lage: You must have been kind of upset with the failure of the district to follow through on things that your first investigation had brought up.

McLean: I wouldn't say that you could blame Bechtel, but I think they overlooked a serious problem which could have been taken care of during the construction.

Lage: But it wasn't in their specifications, either?

McLean: No, it wasn't. And they didn't think it was serious. But we lost a whole reservoir of storage by having to drain, and we had to drain very rapidly. We opened up everything. Nobody knew about it except the district.

Lage: Somebody must have noticed all that water coming down the river.

McLean: Well, I don't know.

Lage: Nothing came up about it?

McLean: I don't know whether they did or not, but we were seriously concerned. I don't recall the exact dates that took place, but it was in the early sixties.

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McLean: Camanche was completed in '64, so this must have occurred in '65 or '66.

Lage: By the time it got filled up?

McLean: Along in there. I'm wondering if I got anything in my diaries about it. Let me see. [pause] [laughter]

Lage: August, 1966.

McLean: Yes. [reads from diary] "Met with Burns and Morrison Knudsen and Harnett in regard to the slurry trench and extra cost. Harnett told Burns that he could not justify any additional costs at this time but would do so if such costs were justified."

Lage: Who were Harnett and Burns?

McLean: Burns was the superintendent for Morrison Knudsen, and Harnett was the chief engineer of the district.

Well, here we are, right here: "Met with Burns and Wilson of M.& K. in regard to slurry trench."

Lage: Who are M. & K.?

McLean: Morrison Knudsen was a large contracting firm with headquarters in Boise, Idaho. They had the contract on the repairs. "In office until ten, went to Camanche and was there all day until 4:30. Went to Pardee and stayed overnight. At 7:00 A.M. went to Camanche. At Camanche all day with Bill Burns and Bob Woodruff. Back to Oakland at 5:00 P.M." So we were really concerned about Camanche.

Lage: How long a drive is it up to Camanche?

McLean: Oh, about an hour and a half, two hours, something like that. This all took place in 1966. I have some more notes here. "Met with Dave Dayton and Orin Harder in regard to going to Duncan Lake to see the slurry trench." Slurry trenches in those days were new. Duncan Lake, I believe, was in Canada. They had a large dam there that was founded on gravel. I sent these fellows there, the two of them, to learn how slurry trenches were constructed.

Lage: Because the slurry trench wasn't a common way of dealing with it?

McLean: That's right. This was something very new. I'm sure that if I looked through this diary enough I'd also find the date for the relief wells. I think this all took place about the same time. We were apparently working on the slurry trench in August. Let me see if I can go on here and see. We had a lot going on in those days.

Lage: Those were busy times, the fifties and sixties.

McLean: They were, yes. [looking at dairy] Apparently I had discussions on this as early as June of 1966: "Met with Dave Dayton, Jim Goodman, and Dick Hale to discuss Camanche slurry trench."

Wearing Two Hats: Special Projects and Field Engineering

Lage: During those years, the sixties, you were manager of the Field Engineering Division?

McLean: I guess so. I don't know when I changed from one to the other, you know. I was wearing a couple of hats. I was manager of the Special Projects Construction Division as well as running the Field Engineering Division.

Lage: You kind of went back and forth?

McLean: I kind of went back and forth. We had the Lafayette tunnel under construction. George Loorz and Ces Murphy were on the Lafayette tunnel.

Lage: What are Special Projects?

McLean: Well, the Special Projects was the unit that covered all of the construction of the facilities under the $252 million bond issue.

Lage: So that related to the bond issue, and then the Field Engineering Division took care of everything else?

McLean: The Field Engineering covered the contracts within the local section. In other words, while a lot of this was going on I also had contracts going for installation of pipes, like this pipeline out on Garrard Boulevard in Richmond. That was handled under the Field Engineering section. The local construction was handled out of the local budget.

But the Special Project Construction Division was formed as a separate unit to handle all of the construction under the bond issue. It was organized immediately after the approval of the bond issue in June of 1958. Mr. Macdonald at that time was appointed manager of Special Projects. In August of that year, although I still carried the title of head of the Field

Engineering Division--manager or whatever it was--I was also put in charge of the design of the Third Mokelumne Aqueduct. I put together a crew--I guess I was called "supervising engineer"--to design the Third Mokelumne Aqueduct.

I came, then, under the Special Projects Construction Division, and a fellow by the name of Bob Tillison, who had been my assistant, took over more or less the duties in the Field Engineering Division. Well, I continued in that capacity. As we got into the design of the line, then of course we got into the construction phase. Along with that, a lot of other operations came into being: Briones Dam, Camanche Dam, and all these other facilities--the Lafayette Aqueduct, the Lafayette Tunnel, the Walnut Creek Tunnel.

Lage: These were all Special Projects?

McLean: All these facilities came under Special Projects. Mr. Macdonald retired about 1960. No, not '60. Let's see.

Lage: You became manager of the Field Engineering in '59.

McLean: That's right.

Lage: You were assistant manager under him in '58. So maybe he retired in '59.

McLean: That is correct, yes. You've got it there. So that is correct. When he retired, I took over the Special Projects division, and I continued basically in that capacity until 1968, when I retired. In other words, during that time I was kind of wearing two hats, as supervising engineer of Field Engineering and, until we completed all the construction, as manager of the Special Projects Construction Division. I took that over and more or less continued for nine years until I retired in '68. All of these repairs--that is, the relief wells on the dam, the slurry trench, and all this other work--came during the period that I was manager of the Special Projects Construction Division.

Lage: So you were more or less in charge?

McLean: Of all that, yes.

Storm Damage at Briones Dam, 1962

Lage: Were there any problems on the other projects of a similar nature?

McLean: No, we had no problems. Well, let's see. I'll have to remember the year. It was in '62 that we had the tremendous rain in October. We had a tremendous storm. [looks through documents] This was while Briones Dam was under construction. It flooded Briones Dam and also went down through the Lafayette Aqueduct near Pleasant Hill Road. It flooded out several homes there. Here it is, right here: "October 13, 1962. Severe storm. Roads flooded. Briones Dam topped by storm water."

Lage: So the storm made the dam overflow?

McLean: Oh, yes. "Went to Briones to check on storm damage and at the Lafayette Aqueduct. At Briones with Phil Rutledge, consulting engineer and spent all day on problems from the storm. Met with Joe DeCosta at the office." It rained so hard. It was over the weekend: "Starting on Thursday, October 11. Overcast.. Showers in A.M. High winds during the day." And I went to Stockton on that day. "Discussed Bixler Pumping Plant and the use of natural gas for the Melones Pumping Plant. Went to Woodward Island to meet Jarvis Gates." And then on Friday we had a heavy storm. "Very heavy storm. Al talked to both Joe New and Hugo Hanson in A.M. in regard to conditions after the big storm." Then on Saturday, October 13, all the roads were flooded. I remember that very clearly. You couldn't get anyplace. "Briones topped by storm water. Called New, Hanson, and DeCosta"--this was on Sunday. I apparently got them together. Then I had a staff meeting. "Went to Briones to check on the storm damage at Lafayette Aqueduct," and again on Tuesday. Mr. Rutledge was our consulting engineer on the dam, and he was from New York. I had gotten in touch with him over the weekend and told him that he'd better come out. So I got him, and I spent the whole day with him out at Briones out on the problems.

Lage: Because it actually did damage to the dam?

McLean: The dam was only about half completed; we were still working on it. We didn't finish that until '64. When the storm occurred, it overflowed the top of the dam. It filled the reservoir and went over the top of the dam. So we were concerned about the erosion that occurred on the top of the dam. This is why I asked Mr. Rutledge to come.

So that was one of the problems we had on the Briones dam, but that wasn't too serious. The main problem that we had on

Camanche, as I mentioned, was the fact that we were very much concerned about the seepage under the dam. Seepage occurs. In other words, you have seepage in all dams--that is, drainage; let's not call it seepage. You get drainage out of every dam. All dams drain. You have drainage facilities, and the reason for that is to relieve the pressure under the dam.

This is what caused the failure of the St. Francis Dam in the Los Angeles area. This was a very famous failure. That was a concrete-arched dam. It was built by Bill Mulholland, who was responsible for the Los Angeles water system.

Lage: Was this on the Los Angeles River?

McLean: No, it wasn't on the Los Angeles River. It was on a small stream north of Los Angeles, in some drainage canyon. But it was a concrete-arched dam, and this is different. When you get a failure of a concrete dam, you get a complete collapse. That is, the whole structure just collapses. The wall of water that went down the canyon was 250 or 300 feet high, and it just washed the canyon clean. I forget how many people were killed, but there were homes along this canyon. There were forty or fifty people killed and homes destroyed.

After the investigations and conclusions, they determined that the failure had been uplift pressure because of an increase of seepage. They began to get seepage around the abutments. The seepage increased, and they became worried. They tried to drain the reservoir behind the dam, but they were unable to drain it fast enough. In the center of the dam on the upstream face there was a water level recorder. These are usually clock or electrically operated, and they record the water level for every minute or hour of the day. What they finally discerned was that one of the main blocks on the dam remained intact. That is, when the dam failed, it left this one section standing. I think I have a picture of it somewhere. They recovered the water level recorder and noticed that just prior to the failure of the dam there had been a sudden rise in the water level of the reservoir. Immediately, this told them that this center block had tipped upstream.

Lage: So it appeared like a sudden rise?

McLean: Yes. This appeared to be a sudden rise. The block had tipped upstream, and by tipping upstream, the water level recorded this as a rise in the lake level. Well, that was impossible. You couldn't get a sudden, instantaneous rise in the water level of a tremendous large lake like that. That's impossible, because it was in a comparably small drainage basin. So this is how they knew that the dam had tipped. This whole block had tipped upstream, and then the dam collapsed around it. The whole dam collapsed, and there were pieces scattered everywhere. There were big blocks of the dam all over the area. Some of them were even washed partially downstream.

This is what created the State Division of Dam Inspection. I believe it was 1929. Since then, every dam built within the state of California has to be reviewed; not only the plans, specifications, and design, but the construction of the dam itself comes under the inspection of a state dam inspector.

Working with the State Division of Dam Inspection

Lage: So that's an office that you've had to work with over the years.

McLean: That's right.

Lage: Is that difficult, to work with them?

McLean: No. We have found them to be very knowledgeable. But they want to know everything. When we had the overtopping of the Briones Dam, I immediately called them, and they came to the job site. I didn't notice their name in my diary, but you call them immediately anytime you have a problem or anytime you're doing something that may require them to look at it, as on Briones Dam, where we had quite a few problems in the south abutment. We ran into a lot of weak material in there in which we had to over-excavate and do a lot of extra work.

Immediately when this occurred, I got in touch with the man who was assigned to Briones. I would immediately call him, or my resident engineer out there would call him. I would meet him out on the job, and we would decide right there on the job what had to be done, how much had to be excavated, or what we had to do. We had some abutment problems out on Briones, particularly the south abutment, where we had to do a lot more excavating than we normally would have done. We also had some problems on the spillway that I had to get them to review. You have to be in touch with those people all the time. When you're building dams, not only do they come down regularly of their own accord, but if you have any problems, you call them.

That was the same thing that we had at Camanche Dam and also on dike one. When we had to put in those relief wells--well, both on the relief wells and on the slurry trench we had to submit plans, details, to the state as to what we were going to do in regard to these problems that we had on both the dike and the dam.

Lage: And do you find that the people in the state office are knowledgeable?

McLean: Oh, yes. Most everyone that I ever called on in the State Division of Dam Inspection was very capable. As long as you keep them informed, as long as you let them know what's going on and keep them up to date on all the work, they're very cooperative. They'll come down and spend the entire day with you on the project. I always had a very fine relationship with those people. I don't recall the names of those I worked with, but those who were assigned to both the Briones Dam and Camanche Dam I found extremely cooperative. We had a very fine relationship with them.

VIII CONSTRUCTION TECHNIQUES ON AQUEDUCTS AND TUNNELS, 1950s-1960s

Cost-Saving Innovations on the Third Mokelumne Aqueduct

Using the Single Fillet Weld

Lage: Is there anything special to tell about the building of the third aqueduct? You were in charge of that.

McLean: Yes.

Lage: Did it vary significantly from the first two?

McLean: No. We had Morrison and Knudsen on one portion of it. I forget the other contractors now.

Lage: Was the design much different?

McLean: Well, there were a couple of things that we developed in the design stage of the pipeline. Early on, the American Water Works Association [AWWA] specifications for large diameter steel pipelines normally required what we call a lap joint. And then they required a full fillet weld on the outside and a full fillet weld on the inside.

Well, just stop and think. When you have 82 miles of pipeline--let's multiply that times 5280 feet. So the actual length of that pipeline is 432,960 feet. Now, each section of pipe is 40 feet in length, so you divide that by 40. That means on that pipeline we had 20,000 single welds. The cost of those welds is probably within the neighborhood of--let's see: a welder in those days was getting about sixty dollars a day, and he would normally do about three joints a day. That means each joint that he would do would be $20 or $25 per joint; well, let's say $30 per joint, when you consider material. You've got to consider equipment, not only his wages. So it runs probably about $50 per joint. All right, let's multiply that by 50. That means you're talking about $541,000 to weld one joint on each section of that pipeline.

The standard from the American Water Works Association called for welding both the inside and the outside joint. So we decided to run some tests, because in a project as big as this, every time you can save anything it is good business.

Oh, and I forgot: in addition to this, when you weld on the outside, in your trench you have to have what is known as the bell hole.

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McLean: In order for a welder to get underneath the pipe to weld the outside joint, you've got to dig what we call a bell hole; you have to dig a trench deeper underneath the pipe, and you have to dig it wider on the sides.

Lage: So for each weld you have to dig a bell hole?

McLean: For each forty feet you have to go in and do this. It requires a special bucket, a special piece of equipment that you come along with after the trench has been dug, and you go in with this special bucket and dig a bell hole. Well, this adds more cost, probably another half a million dollars or more to an overall operation like that.

So Bill Trahern and myself--Bill was my supervisor--got our heads together and said, "Well, gee whiz. We ought to look into this," knowing that generally in welding a single fillet weld develops the full strength of your plate. If you have a half-inch plate, a half-inch fillet weld will develop the full strength of that. We began to think the old AWWA specifications were archaic, and we wanted to do something about this.

Furthermore, if you were able to weld a single fillet weld on the inside of the pipe, the welders could work in all kinds of weather. On the outside, if it were raining, your bell hole would be full of water and have to be pumped out. Inside the pipe, the welder could work continuously, winter and summer. So we carried out some experiments, and we found that a single inside weld was sufficient. We did not have to dig bell holes. The result of it is, I would guess, that we saved millions of dollars by being able to use a single inside weld.

Lage: Did you have to get that passed through various levels of inspectors, or was that an internal decision?

McLean: That was done entirely in-house. The decision was between Joe DeCosta, Bill Trahern, and myself. And believe it or not, the new AWWA standard is now a single fillet weld.

Reducing the Number of Pressure Relief Valves

McLean: The other thing that we did--and this is something very interesting, but I'm getting into technical stuff here which you can digest as best you can. Normally where a large aqueduct or pipeline goes up and down hills, you have to have air and pressure relief valves, not only to fill the line but also to drain the line. The purpose of these is to prevent your line from collapsing when you begin to drain it; the relief valve lets air into the pipeline. When you're filling, it lets the air out of the pipeline until the pipeline is completely filled with water. In other words, when you have a high place on a pipeline, like this, [begins to draw] we'll say that your pipeline comes up and goes down like this, which is quite common. Why, at this high point, you have a valve in here, and then you have an air relief valve.

Well, the old theory of collapsing was based upon a complete failure of a pipeline with a sudden rush of water out of it that required in some cases, like on the number one aqueduct, as many as five or more of these air valves in order to prevent the line from collapsing. Fact is, historically on the ten-foot diameter of the Los Angeles Aqueduct coming from the Owens Valley, and I don't remember the name of this big siphon, but it was a riveted steel pipeline, and I think they had a flood that came down this canyon and washed a portion of the aqueduct out. The result was that several hundred feet of the Los Angeles Aqueduct collapsed flat, because there was not enough air valve capacity to take care of it. From that was developed criteria for future pipelines as to the number of air valves you have to use to prevent a collapse. And, very interesting, on this pipeline that I'm talking about, the way they brought it back into shape again was to repair the place where it had washed out and put the water back in, and the pipeline came back into shape again.

Lage: And could be used.

McLean: This is historical and has been written up in a lot of textbooks--the failure of one of the big siphons on the Los Angeles Aqueduct.

And from that was developed this theory of the collapse of pipelines, large diameter aqueducts--of steel lines, particularly--and the number of air valves that you have to have. Well, on the number one and the number two aqueducts we had followed this theory. We had what we called big valve houses, and they were all along the pipeline. We have batteries of these air valves in there for filling the line and for draining the line. We decided to run some experiments on that. (I thought I had the article here by the mechanical staff on our district.) [looks through documents]

Lage: Was this again you and Bill Trahern who got the idea?

McLean: Yes. Here it is: "Crushing Strength of Steel Pipe Lined and Coated with Cement Mortar." This was done by Leslie Paul[1] in our mechanical division. See, it says right here, "The first experiments were performed on a 49-inch ID [inside diameter] steel pipe, wall thickness one-quarter inch..." Anyway, they went through the procedure on this, and we learned from this experiment by Leslie Paul. This paper was presented in October of '51. Then later we ran tests in '58 on the 87-inch pipe.

Anyway, here are the statements they made. This is the conclusion: [reads] "1. The experiments on the 49-inch-diameter pipe indicate the dependability of the von Mises formula as applied to collapse from external pressure of large-diameter bare steel pipe with closed ends. 2. Customary thicknesses of Portland cement mortar three-quarter inch for coatings and one-half inch for lining strengthen the 36-inch-diameter bare steel pipe against collapse from external pressure by at least 600 percent. 3. Vacuum valves can largely be omitted in the installation of large-diameter bare steel pipe if the pipe is lined and mortar-coated with good portland cement mortar."

Lage: You were able to eliminate the valves?

McLean: You can't eliminate them, no, but you can reduce the number of them. And by reducing the number of valves you reduce the time of filling, and if you had a failure and a sudden draining, your pipe would not collapse. Based upon that theory we were able to reduce by nearly three-quarters the number of air valves that were used on the pipeline, which was a tremendous saving. The innovations on the third aqueduct, not only on the design but also the construction, saved a tremendous amount of money.

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[1]. Leslie Paul and Owen Edie, "Crushing Strength of Steel Pipe Lined and Coated with Cement Mortar," from Journal of American Water Works Association, Vol. 44 #6, June 1952.

River and Freeway Crossings, Third Aqueduct

[Interview 6: May 21, 1991]##

Lage: Last time we were talking about the construction of a third aqueduct, and you told about three cost-saving innovations--reducing the number of pressure release valves, eliminating the second weld, and determining the proper thickness of the steel pipe. We hadn't talked about river and freeway crossings and if there were any particular problems associated with that.

McLean: In reference to the third aqueduct, the logistics of it required such an enormous quantity of steel that we had to divide it up into a number of contracts in order to permit the construction to go ahead within the time frame that we wanted it to be done. This would permit the fabrication at different locations and the steel supply to come from different places, and that's the reason we divided it up into five sections. There was section four, which extended from the east portal of the Walnut Creek Tunnel to Indian Slough. That was all buried pipe. Then there was unit three, which was about ten miles across the peat land. That was all the elevated section. Unit two, which was thirty-three miles in length, extended from Holt to the town of Wallis, with the exception of the elevated section in the river crossing. Unit one was five miles in length, from the east end of unit two to the west portal of the Pardee Tunnel. That was the most rugged section; that was a section they had to do a lot of blasting on because of the rock. That was really the toughest section.

The pipe for units one, three, and four, for about forty-eight miles was fabricated by Consolidated Western Steel Company in South San Francisco. C.K.F.M. Grover Company had a plant near Lockford, and they furnished the pipe for unit two--the thirty-three miles--and then the section for the river crossing. All of that latter part, which is about thirty-three miles, plus the river crossings were all fabricated at the plant in Lockford.

Lage: The river and freeway crossings--were they a special problem?

McLean: Well, yes. They presented a problem in that we had to go through the levees, and they required a coffer dam system where we could breach the levees; we had to breach these large levees on Woodward Island and the Orwood tract. There were two levees on Woodward Island, one on the east and one on the west. And then also the San Joaquin River crossing.

At the San Joaquin River crossing, when we constructed the third aqueduct, we also had to put in new crossings for the number one and the number two aqueducts. At that time the Corps of Engineers was planning on dredging the San Joaquin River deeper to provide for--I think it was a forty-foot depth or a forty-five-foot depth for the channel. So we had to lower both the number one and the number two at that crossing.

One of the things which was unique was the eight miles or more of the elevated section that crossed Orwood and across Woodward Island, and also the elevated section on the upper Jones tract. That pipe was fabricated by Consolidated Western Steel in San Francisco, and they fabricated in the plant in eighty-foot sections. They delivered it to the job in the eighty-foot sections and installed it on the steel bents. After it was installed and tested, they lined the inside by what was known as the centerline process. It's actually a mortar lining that is spun in place. The reason for it was that a forty-foot length of these mortar-lined sections weighed about forty tons--about a ton per lineal foot. Well, if they had lined all of the elevated sections the eighty-foot sections would have been too heavy to handle on a highway.

Lage: A ton a foot! That's very heavy.

McLean: Yes. Oh, that pipe was heavy. They had a special dolly made to haul an eighty-foot section on the highway, and the pipe was actually laid in eighty-foot sections. After it was in place and tested for hydrostatic pressure, they went in and lined the inside by the Cen-Vi-Ro method. I think I've got it described in here. [looks through documents] Then the outside was sandblasted and coated with a red lead and with one coat of aluminum.

Avoiding Lawsuits with Accurate Written and Photographic Records

Lage: You had written this paper?

McLean: Yes.

Lage: Is it common that the engineers write up the project for publication?

McLean: Yes, particularly on large projects. I don't know if it's standard, but I used to require a project report of all of my project engineers when they finished the job. We always had lots of photographs. I furnished every one of my project engineers with a camera, and we used to buy film by the gross. I told them over and over and over again, "Take pictures; take pictures of anything on the job. Every day, take pictures."

I don't mean to digress, but we've had a couple of lawsuits which were very interesting. I've always attributed the fact that the lawsuits were won to the photographs that were taken on the job. One of them was on the upper Jones tract. The Zuckerman warehouse was right near the Middle River crossing. Zuckerman had this warehouse where he used to prepare his asparagus for shipping to market, and it was adjacent to our right-of-way. It was during the asparagus season, and he claimed that during the period of time when we were building the number three aqueduct he could not get access to his warehouse and therefore claimed substantial damage by not being able to meet the first asparagus going to the market. Well, it happened that we had pictures of this particular time that he was talking about, where trucks were at the warehouse loading the asparagus. When we presented this to the attorneys, they dropped the lawsuit.

I had the same thing happen on the waste water project, along the south interceptor on Wood Street. One thing that I had done on all the buildings that were along this street, because we had a very large trench to put in the south interceptor, was to set what I call bench marks. Bench marks are reference points for elevation. Many, many times when you're building a large project, you get lawsuits claiming "settlement of building" because of the operations. So one of the first things I did was to have the survey crew put reference points on all the buildings so that we could check periodically. If there were cracks in the building, we photographed those cracks; so if a complaint came in and said, "Well, our building has been damaged because of these operations, and we can show you a crack," I can show you a picture of that crack that was taken on such and such a day, long before we ever started operations.

Anyway, we had set all these reference points, and in addition to that we went through and took photographs all the way along the interceptor location. We took photographs of buildings; we took photographs of cracks in the buildings. We had a substantial file of photographs. Then I had Ralph Aiken, an engineer, assigned to this work. He knew what to look for. He would go out periodically over the job and take photographs.

As the job began to near its end, the first thing we know we got a lawsuit from a market on Wood Street. I forget the cross street, but it was around Fourteenth or Sixteenth or maybe Twelfth. This fellow claimed that during the Christmas season, when he needed turkeys, chickens, and hams in his market, he couldn't get deliveries because his entrance was blocked by the contractor's operation, and therefore he lost his entire Christmas trade by not being able to get the turkeys into his market. So we went through our photographs, and here we find a photograph, taken a few days before Christmas, of a truck backed up to his market, unloading the turkeys and produce into his market.

Well, that fellow tried three times. He got different lawyers; he tried three times to get damages against the district. The attorneys refused to take it. They said, "Look, here are photographs of this place of yours, and here's the date and everything. How are going to refute that? You can't."

Lage: Who alerted you to document things in this way?

McLean: This was passed down to me from the good fellows I worked with, Bob Edmonston and John Longwell. They were my educators. I've always revered them, you might say, because I think they really were just fantastic engineers. That was passed on. After I was in charge of all this work, the things that I did--well, first of all, both Bob and John Longwell required that I write a report. The first job that I was on was with Bob Edmonston. Then when I went up to the Middle Fork of the Feather River on the investigations up there with Ben Painter, I had charge of all the field parties, and I had to write reports and send them to the head office of the Byllesby Company.

Lage: So this is before your work with East Bay MUD?

McLean: Yes. That's long before East Bay MUD. I had to send them monthly reports--what I was doing and what we were finding out. When I later became in charge of things, I insisted that my project engineers write reports. I found one thing that I blame on the colleges. I think the colleges had been very derelict in graduating engineers and not preparing them so that they could write good project reports--that is, articulate clearly so that other people can understand. This is one of the most difficult things, to my estimation. Now, I had some good engineers, and those fellows who wrote good reports have gone on to bigger jobs. Don Paff was one. He is now chief of operations for the Bureau [of Reclamation] on the Central Valley Project. Don was one of my proteges, you might say. Hugo Hanson was another one, and Charlie Spink was another one. Charlie Spink has had a terrific position with the Bechtel Company. And Joe Jenno. Those fellows have all gone on to top jobs. Not only were they good engineers, but they could write good reports.

Others I had, I would read their reports, and it was terrible. They didn't know how to really describe the project so that you could understand it. They knew what the project was, and they could write about it, but it didn't mean a thing.

Lage: Did you work with those people to improve their writing?

McLean: Yes. I would go through the report very carefully, edit it, and then I'd send it back to them. There were some times, I bet you, that I sent reports back three or four times. I know they used to think that I was an s.o.b.. But I said, "Look, if you're going to write a report that goes in the files, it's going to be there, and it has to be so that somebody can understand it twenty-five and thirty years from now."

Lage: Did Mr. Longwell put emphasis on good reports also?

McLean: Yes, very much so. Bob Edmonston was a terrific writer. He wrote most of the early reports for the California Water Project. I worked for him for a couple of years before I came to work for the district. I always admired Bob. He was extremely articulate. When it'd come to writing reports, he turned out volumes and volumes.

Lage: Did you model your reports on his? Is that how you learned to do it?

McLean: Yes, very much so. I learned a lot from Bob; I learned a tremendous amount from him. And I learned a lot from John Longwell. Bob used to tell me, "Mac, if you don't learn anything else, learn how to write a good report." You know, all the time that I was with the district, we never had one lawsuit. I attribute that to the fact that before we started a project we went through and documented it carefully with photographs, reference points, and everything else. The result was that we never had any problems.

Lage: So lawsuits were on your mind, even though society wasn't being as litigation-conscious as they are now?

McLean: That's right. We were not looking for litigation; we were trying to prevent anything. As I said, I had this Ralph Aiken, who went out and took photographs--weekly, daily. This saved us millions of dollars in lawsuits. Then when the project was finished, my project engineers wrote the reports. And they're in the file.

Lage: And are all the photographs preserved as well?

McLean: All the photographs, I'm sure. What they've done with them, I don't know. But we had all the photographs and reports in there, and the address of the buildings and so on. On one of the buildings, as I recall, they did file a claim, alleging that they had settlement of the building. It was on Wood Street, and it belonged to a trucking company. They had built the perimeter walls of the building that were well supported on a good foundation. Then they had filled inside the building with earth. There had been a slight settlement in the floor, but that was due to the fact that it was their own fill that they had put in, not settlement due to construction of the south interceptor.

Building the Second Lafayette Tunnel: Experimenting with New Technology##

Lage: You mentioned that you thought of a problem that came up.

McLean: When were building the second Lafayette Tunnel, the contract was held by a joint venture between Stolte Construction Company and Fred Early, Jr., Construction Company. They had decided that in order to construct the tunnel they wanted to use one of the new boring machines. This is quite a common practice now for large diameter tunnels. They use enormous boring machines. It must have cost between fifty to one hundred thousand dollars to put this machine together. It's a large rotary machine that actually bores the tunnel.

Lage: Like a giant drill?

McLean: It's like a giant drill, just like you were going to bore a hole in that wall. You have this machine with cutter heads. The muck that comes from this big rotating head is fed through a conveyor belt back into cars underneath this boring machine, and then those are hauled by an electric locomotive out to a dump.

They decided that they could save considerable money over the old method of tunneling. The old method of driving a tunnel is to install wooden sets and then use spiling that you drive in behind the sets to support the walls and crown. It requires a lot of timber and a lot of men to do it. With a boring machine, you have fewer miners and operators. On a normal tunnel operation, you probably have twelve to fifteen men at the heading, and they're the fellows drilling, shooting, and mucking. They go in and drill a round of holes. They load these holes with dynamite, and they use electric detonators to detonate the dynamite.

In a large tunnel where they shoot it with an electric battery, they shoot the center drill holes first, and then the outside holes are shot so that the material all comes in to the center of the tunnel. Then they go in with a mucking machine and load the cars, and they're hauled out to the dump. You have men called powder monkeys, you have others who handle the drills, and then you have the muckers, the men who go in with the mucking machine and pick up the muck. So it takes at least fifteen men at the tunnel heading.

When you use a boring machine that runs on the track, it only requires about half that number of men who work in the heading. With a boring machine you have an operator and an oiler. You don't do any shooting; you don't have to handle any powder, and you don't have electric detonators.

And there is a difference in the rate of pay also. When you're in a tunnel like that where you have to handle explosives, you've got to have a special place to store your explosives. You've got to have what we call a powder monkey who heads the crew loading the drill holes. The pay rates for those fellows are much higher, and also your insurance for the fellows working in the tunnel is much higher because you're using explosives. Where with a drilling machine you don't have any of those risks.

Lage: Was the drilling machine a new technology at the time?

McLean: That was a new technology at that time, and few had been used. Today most major tunnels except large vehicular tunnels use boring machines. On tunnels for penstocks, for power houses and water tunnels, it's become universal to use the boring machine.

Lage: But at that time it was something new?

McLean: This was something new. This was an experiment. The contractor built this machine at a substantial cost. My guess is that it went between fifty to one hundred thousand dollars to build the machine. The machine had to be built first and put together in prototype. Then it had to be dismantled and brought to the tunnel and reassembled. It was put together at the entrance of the tunnel. It had to be transported in pieces. I think it was fabricated in southern California and brought to the job by truck.

On all contracts you have a time schedule in which the work is supposed to be started and completed. Then you have liquidated damages. If the contractor doesn't complete the job within a reasonable length of time, they're assessed so much per day. This is based upon need. Technically, you cannot have penalties unless you have bonuses. There is a difference between liquidated damages and penalties. On a contract, you set a date for completion, and if you set a penalty it will be a thousand dollars a day if you don't complete the job within the time specified. That must be offset by a bonus. In other words, if the contractor completes it ahead of time, he turns a bonus.

But with liquidated damages, which are common on most contracts, you have to be able to prove that it has cost you because of the delay. If you don't have a tunnel to put the water through, it costs you so much per day due to the inspectors, the engineers you have on the job, and the loss of that facility. Those are liquidated damages.

The contractor decided to try the boring machine, and unfortunately the type of material they encountered in the tunnel did not permit the operation of this type of equipment. They were continuously getting cave-ins, and the machine would get stuck. To bore a hole, you've got to have a reasonably firm formation. The hole that you bore has to leave a neat hole that you can then shore behind the machine, with ribs to hold the ground until you can place your concrete lining. Well, it happened that the material was so soft that we were getting continual cave-ins. It jammed the machine, and the machine would be stuck. Then they'd have to back the machine out of the tunnel, go in and muck it out, and put the machine back in again.

They worked on this for several months. They finally pulled the machine out of the tunnel and went ahead with the usual method of regular tunnel work--that is, using sets, mucking, and blasting wherever it was necessary. This delayed the construction of the tunnel.

Assessing Liquidated Damages on the Lafayette Tunnel

Lage: It must have increased their costs.

McLean: It increased their costs considerably. Under the terms of the contract we had to assess the liquidated damages. The liquidated damages, as I recall, were two million dollars or more. We withheld this money from the payments to the contractor. This brought a protest from the contractors, George Loorz and Fred Early. They felt they were being unduly penalized. We had some long discussions over the damages. I can remember one meeting where we had the district attorney, Harold Raines, Joe DeCosta, John McFarland, myself, and the contractors' representatives. We had a long session on the subject. I was the one who really had to make the final decision.

Lage: Was the final say that you had to give an estimate of what the damages were? I mean, there was no question that they didn't complete the work in time.

McLean: They didn't complete the work within the scheduled time, but the real question was whether the district incurred any damages. The district was not ready to put water through the tunnel, so there was really no loss. We couldn't prove the liquidated damages.

Lage: Was that the point of view you took towards it?

McLean: Yes. I had to agree that there was no way that they should be assessed the liquidated damages. Of course, that was quite a shock to John McFarland, but I was the one who finally just said, "There's no way." In other words, the district is not ready to put water through the tunnel, so how can you assess liquidated damages when you can't prove that you have suffered a loss?

Lage: Did your attorney agree with you?

McLean: Yes. Harold Raines agreed.

Lage: But McFarland--?

McLean: McFarland was a little upset.

Lage: He was looking for a little windfall for the district.

McLean: Yes. If we had assessed the damages of two million dollars or more, we would have been in a lawsuit. In order to assess liquidated damages you have to prove that you have actually been damaged; they are actual damages. You have to prove that you've been damaged in that amount, and there was no way that we could prove it.

Neighbor Relations in Relocation of Lafayette Aqueductt

Lage: What was the project I read about that involved tunneling that created a lot of upset among the neighbors because of the noise? Was it this same tunnel? It was in the East Bay MUD book. It was out in the Lafayette area. The tunneling caused so much noise that the neighbors just had a fit.

McLean: That was on the relocation on the Number One and the Number Two Lafayette Aqueducts. We had to relocate them because of the state freeway location. I can tell you about that because I was in charge of the construction. In order to have a place where you can work, the contractor had to work at both the east and west portals. When you have tunneling operations, not only do you have to have trackage and a place to dump, but you also have to have large air compressors with sufficient capacity for your work. You also need a maintenance area for maintaining your equipment. When you're working on tunnels, you work twenty-four hours a day except Saturdays and Sundays. You work around the clock.

It was in this residential area, and these compressors go continuously, and they are noisy.

Lage: Twenty-four hours a day?

McLean: Twenty-four hours a day. The only time off is Saturdays and Sundays. There are three shifts. One shift goes on at eight o'clock in the morning and works until four o'clock in the afternoon; the swing shift comes on at four o'clock in the afternoon and works until twelve midnight; then you have the graveyard shift that comes at midnight and works until eight o'clock in the morning. You've got a continuous operation--compressors going, locomotives going in and out of the tunnel, and men working in and out of the tunnel. You also have men arriving and leaving each shift.

Lage: And this was very close to homes?

McLean: This was close to homes. I think there was one family right alongside the work area. We paid for them to live in an apartment while the tunnel was under construction. Also, there were a couple of other families we actually paid to take a two-week vacation. That was over at the east portal, near Pleasant Hill Road.

Lage: Would you have gotten in the midst of that?

McLean: Well, I got in the midst of the appeasement part, but I think it was Hart Eastman, who was the district secretary at that time, and the district's insurance carrier who appeased these people. I didn't get into all those details, but I knew that we'd had the complaints and that it was handled out of the secretary's department.

Lage: So there was a lot besides engineering. Public relations.

McLean: Yes. There are always problems, you know. Any construction job you get into, there's always appeasement of people, even when you're building pipelines. Tunnel operations--well, even Briones Dam was a twenty-four hour operation. Pardee was a twenty-four operation. Camanche Dam was twenty-four hours. You have to work. You see, the cost of those projects is so large that it's only on pipelines and similar projects you work an eight-hour shift.

Lage: You've got to keep your equipment going?

McLean: You've got to keep your equipment in operation. You have such an enormous cost of equipment, manpower, and overhead that you have to operate around the clock. You can't just work an eight-hour shift.

Lage: Unless you're using a boring machine.

McLean: Yes, unless you're using a boring machine.

Successful Use of Boring Machine and Laser Technology

McLean: The contractor used a boring machine on the Lafayette relocation tunnel. John Artukovitch was the contractor, from Los Angeles. He had a boring machine, and they did an outstanding job. They bored a ten-foot diameter hole.

That was very interesting, because we had two tunnels. One had to cross over the other. The state paid for that work, because the two Lafayette aqueducts had to be relocated to make room for the new freeway. That was near the Pleasant Hill Road intersection and Highway 24. The contractor used a boring machine, but here the foundation was much different. That machine bored an excellent tunnel. Then they put in the steel and placed the concrete. The 96-inch diameter pipe was laid on track and then concrete placed around the pipe.

The problem with the two tunnels was that west of Pleasant Hill Road, the number one aqueduct is on one side, and the number two aqueduct is on the other. When you come west from the Walnut Creek Tunnel, the two aqueducts are on different sides, and in order to keep them in line so that number one goes into number one and number two goes into number two, they had to cross over each other at Pleasant Hill Road.

John Artukovitch was awarded the contract. It was, as I recall, a three-and-one-half or four-million-dollar contract for the relocation. The state paid for that, because the freeway made it necessary. He elected to use a boring machine on that. That was in the mid-sixties--'66, '67. The boring machine was fabricated in Los Angeles, dismantled, and hauled up to the site. He bored both of those tunnels.

He used a laser beam to keep the boring machine on line. When we came to the middle of the tunnel from each end, they came within inches of each other, which is good. When you're drilling tunnels from both ends, when you come within inches you are doing very well. To get a control point down through the tunnel, we bored a hole from the surface down to the tunnels where we could hang a plum line in order to make sure we were on alignment and at the same check elevations, because they were both inaccessible. Both tunnels came within a matter of inches of true alignment, which really was good for tunnel work.

Lage: Are the terms Lafayette Tunnel and Lafayette Aqueduct interchangeable?

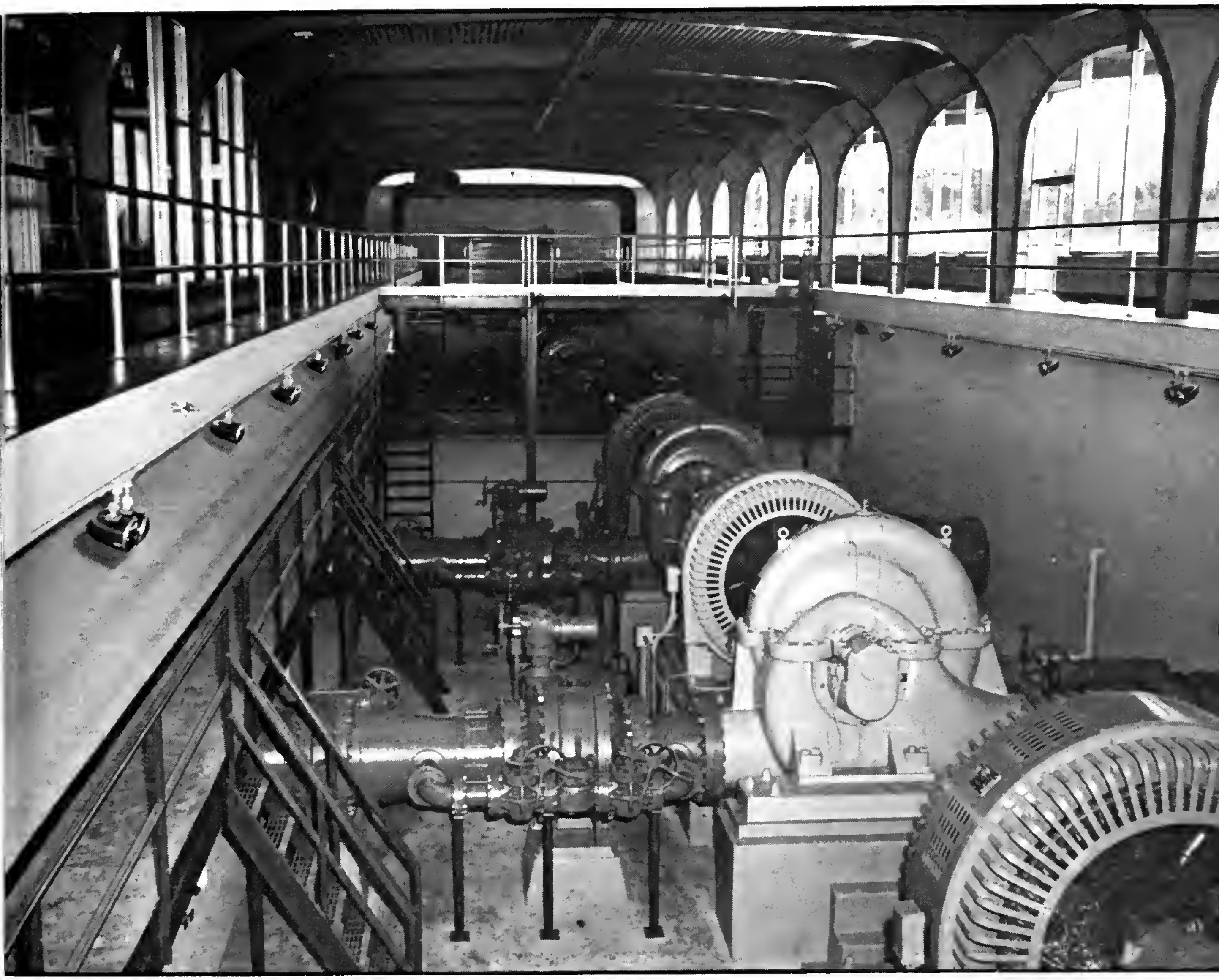
McLean: The number one Lafayette Aqueduct is a 96-inch ID [in diameter] monolithic concrete structure that extends from the west portal of the number one Walnut Creek Tunnel to the east portal of the number one Lafayette Tunnel constructed in 1927. Lafayette Aqueduct number two is a 96-inch ID reinforced concrete pipe that extends from the west portal of the number two Walnut Creek Tunnel to the east portal of the number two Lafayette Tunnel, constructed in 1962. The relocation tunnels were on both the number one and number two aqueducts near Pleasant Hill Road and were necessary to clear the right-of-way for Highway 24.

Construction at Pardee Dam, 1929

At the construction site of the San Francisco Bay outfall sewer, 1950. Left to right: Walter McLean, R.C. Kennedy, and Otto Bohls from EBMUD; Tom Veatch, consulting engineer; project manager and project superintendent from Healy Tibbets Company.

At the Orinda Filter Plant, 1967.

Orinda Filter Plant



Interior of Walnut Creek Pumping Plant

The three aqueducts for delivering water from the Mokelumne River, looking east from Indian Slough where they cross the marshy delta peat lands. The original aquaduct, center, has riveted joints and wooden supports. The second and third aqueducts have welded joints and steel supports.

The dining hall at Pardee, named in honor of Walter McLean in 1990.

IX POSTWAR CHANGES IN DISTRICT MANAGEMENT AND POLICIES

Recalling General Manager and Chief Engineer John Longwell, 1934-1949##

Lage: Earlier you mentioned Mr. Longwell as sort of a mentor. Could you tell in a little more detail what kinds of things he passed on? Were you working closely with him?

McLean: Yes, very much so, particularly during the early part in reference to the construction of the San Francisco pipeline, the Crockett line, the Orinda Filter Plant, and also the work on the waste water treatment plant. I was very close to John during all that time.

Lage: He wasn't manager yet at that time?

McLean: Yes. He became chief engineer and general manager after Mr. [Frank] Hanna left [April 1, 1934]. At the beginning he was the division engineer on the construction of the first Mokelumne Aqueduct.

Lage: What kind of general principles or working style did you absorb from him?

McLean: Well, he was an outstanding engineer. He had a very, very broad knowledge. He graduated from Cornell and went to work for the Bureau of Reclamation. He was on the Minnedota Project in Wyoming. At that time all of the top staff people--Arthur P. Davis, Frank Hanna, James Munn, John Longwell--left the Bureau of Reclamation to come with the East Bay MUD. Longwell came along, and he became the division engineer on the main section of the aqueduct between the Walnut Creek Tunnel and Pardee. That was his division. That was the entire aqueduct division. I became well acquainted with him. The headquarters office for that was in a building in Stockton.

When I went to work on October 4, 1927, John Longwell was the division engineer. When they closed that division office, it became the maintenance section. Then John Longwell moved down to Oakland, and Arthur P. Davis was our chief engineer and general manager. Arthur P. Davis left in the first part of the thirties when we had completed the aqueduct. I think it was about that time, 1929 or 1930, that Mr. Davis left and went to Russia. He took with him Lyman Wilbur from the design staff. He and Lyman went to Russia to build a big irrigation system in Turkistan in Russia. Mr. Hanna became chief engineer and general manager [1929], and Mr. Longwell was assistant chief engineer and assistant general manager. That was the time that I came in to work on the distribution system in 1931. Then when we started the waste water system project, Mr. Hanna had left, and Mr. Longwell became chief engineer and general manager. Robert Kennedy became assistant chief engineer and assistant general manager.

Lage: And that was the last time those two titles were combined?

Mclean: That's right. That is correct.

New Leadership under General Manager John McFarland, 1950-1968

McLean: During that time--and I don't recall the exact date, but it was about the time we had really gotten into the waste water investigation with Special District 1 about 1945 or '46, just about the end of the war--John McFarland came in [as head of the control division, 1947], and shortly after John Longwell resigned. When John Longwell left, John McFarland became general manager.

Lage: Let's talk a little bit about that, because you indicated last time that the new management brought a lot of changes.

McLean: That brought a number of changes. John McFarland came into the district. He was brought in by K. Leroy Hamman, who was chairman of the board at that time. His business was advertising. About that time, right after World War II, the district began to expand enormously. Lafayette, Pleasant Hill, Walnut Creek, Castro Valley, and all those areas were annexed to the district. There was a tremendous expansion going on. And at that time the district began to do a tremendous amount of contract work.

Lage: Was this the time of changeover from working with district forces to contract work?

McLean: That's right. There was a tremendous transition right after the war. There were numerous annexations and contract work, installation of pipes in many areas like Castro Valley and Pleasant Hill.

Lage: So you just couldn't handle it with district forces?

McLean: There was such a demand that it couldn't be handled with district forces, so a lot of work was contracted at that time. This is when the district went over to a tremendous amount of contracting, even for the installation of steel tanks. We began to get into pre-stressed concrete tanks about that time. This all came about during that period of time. Prior to the war we had done a lot of work with the WPA, the Work Progress Administration. There were some large pipelines installed with WPA help. We installed one here in San Leandro, and then we built Pleasant Hill Reservoir with WPA. There were a lot of jobs that we did with WPA. That ended right at the beginning of the war.

Then there was very little work except work for the war industries and such as the shipyards. Right after the war is when Special District 1 was formed, and we got into the investigations of that. Then there also came a tremendous amount of annexation, and we had to start installing a lot of pipes in those areas. I don't know the reason--of course, you never know the reasons--but K. Leroy Hamman decided to bring John McFarland aboard as an assistant to Mr. Longwell--that is, to help Mr. Longwell out.

Lage: And McFarland was a business manager, I understand.

McLean: He was a business administrator; he was not an engineer. He came in, theoretically, to help Mr. Longwell, who was chief engineer and general manager. But eventually Mr. Longwell resigned; this must have been 1949.

Lage: Its Name Was M.U.D. shows him resigning at the end of 1949.

McLean: Well, that's when it was.

Lage: McFarland came with the district in 1947. Do you remember the kinds of changes that occurred when McFarland--?

McLean: I was in Special District 1. We had a $23 million bond issue to construct the waste water project. That was after Longwell had left.

Lage: Did you ever talk to Longwell? Did he leave with some unhappiness? He must have been of retirement age.

McLean: He was with us during the construction of the interceptors and the outfall sewer. Mr. Longwell left in 1949, before the waste water project was completed, but I worked with him very closely during the time before he left the district. He was very interested in looking at the construction. I guess his main love was construction. He liked to come out and go over the projects.

I was not in close contact with current events, but I understand from what transpired at the main office that there was considerable turmoil during this transition period because a lot of new people came in with the district. Bill [William J.] Stephens was brought in to head Personnel, and then Tully Ferris came as an assistant to McFarland. There was a whole group of new people that John McFarland brought with him. Hart Eastman became secretary.

Lage: Were they well received? How did they look at you, in your position?

McLean: Well, actually it didn't affect me very much. I had a separate office for Special Project 1. They left us pretty well alone. Darrell Root and I worked close together, and we got along very well.

Lage: Out in left field?

McLean: Yes.

Lage: What happened in the central office?

McLean: I can't tell you too much, and this only came from Bill Trahern and Thaddeus Hague, the ones I had worked with there. There was considerable turmoil. First of all, when it came to signing drawings, you're supposed to have a chief engineer who is supposed to sign all the drawings. Well, nobody had been appointed chief engineer. When John Longwell left there was no chief engineer.

Lage: They didn't replace him right away?

McLean: No. They didn't designate anyone as chief engineer. The first thing we ran into when we started filing drawings with the state and others was who the chief engineer was. He was supposed to sign the drawings and put his stamp on them. All drawings and documents must be signed by a registered professional engineer. That's what I am; I'm a professional engineer. And you put your stamp on there. You also have a seal, and sometimes you use a seal. Then you sign your name. This is the requirement by the state and federal government, and this shows that these plans have been approved either by a chief engineer or by a licensed professional engineer. After several months they finally appointed Bob Kennedy as chief engineer [October 1950].

So that quieted that turmoil down. Of course, I was pretty much out of this, because Darrell Root and I were running the waste water project, and they left us alone. They didn't bother us, because I had an office separate from the group, and Darrell had an office that was also completely separate. In fact, his office was in the old Fox Theatre at Nineteenth and Telegraph. We had the ground floor of that building, and that's where Darrell was located. I had an office that I had fixed up on the top floor above the old meter shop. We improvised an office there, and I had about fifteen men or more there. George Marr was my office engineer.

Well, they didn't bother Darrell or me. All of the changes took place in the main office. They brought in Chick Adleman as head of all the maintenance operations.

Lage: So a lot more employees.

McLean: Well, they brought them at the top level, above everybody.

From an Engineering-Oriented to a Business-Oriented Management

Lage: Was it a loss of authority for the engineering side?

McLean: Well, it was a completely new regime that came in.

Lage: New people.

McLean: They were new people.

Lage: What were their new procedures?

McLean: They were not knowledgeable at that time about the operations of the district, and there was a lot of resentment among some of the older employees. It took a long time for things to really settle down. They did retain Mr. Longwell as a consultant. Mr. Longwell then opened up an office in the Financial Center Building in Oakland. He opened a consulting office there and was retained as a consultant to the district for quite a long period of time.

When I got into the investigation of the Middle Bar Project, Mr. Longwell worked with me and Orin Harder. That was after we had finished the waste water project.

Lage: The East Bay MUD book that you loaned me indicated that all this reorganization led to fewer management positions for engineers and more management positions for business personnel.

McLean: They did. That is correct.

Lage: Was that part of the hard feeling?

McLean: I think that was a lot of the hard feeling, yes. See, when Arthur P. Davis, Mr. Hanna, and John Longwell were there, they were all engineers. When John McFarland came in, this transition was completely over to business oriented rather than engineering oriented.

Lage: How did that affect the quality of the engineering that went on?

McLean: I can tell you that they were badly disturbed over a long period of time. It took a long time for that to straighten out. I would say that during that period of time there was a lot of efficiency loss. It didn't bother me, because I had the waste water project, and nobody bothered me.

Lage: When you came back from waste water did you notice some changes?

McLean: When I came back from the waste water project I got into a different setup all together, where again I was left alone. I was on the Middle Bar Project; I did that working with Francis Blanchard and Orin Harder. Then I had the Pardee Recreation Area; that was my daily work. And then when the $252 million bond issue was passed, I was immediately put in charge of design of the third aqueduct.

Lage: But did the kinds of changes that went on in the office affect the way you handled your budgets or the kind of people that were hired to work under you?

McLean: Well, at that time John McFarland brought to the district the budget process, and he brought forth also the management procedures that are in use today. Really, it was a time that the district had to go through, but it was a tough situation, because previously the district had never really had salary schedules, management procedures, and all of these different things that were brought when McFarland came to the district.

He brought to the district the business procedures, whereas the engineers previously had been completely engineering oriented. Although there was a budget, all of the procedures and the policies that we got into, job descriptions and all that, didn't exist before McFarland. We had had titles for various positions, but when Tully Ferris, John McFarland and the others came in, they developed all the procedures which the district has carried on today. The district had entered a new era.

Lage: Were you able to work under those new procedures when you came back from Special District 1?

McLean: Certainly. We finally were able to work under them. The animosities, you might say, that developed when this group came in melted off into the background and were forgotten.

Lage: Mr. McFarland was there until '68?

McLean: That's correct.

Lage: Was he well respected by that time, or was there still a kind of--?

McLean: I think by that time he'd been pretty well accepted. He actually went over with Great Western in 1968. He didn't retire from the district; he resigned to accept the job with them. And John Harnett came in, who was colonel of the Army Corps of Engineers. [Harnett was chief engineer May 1965-September 1968 and was appointed general manager in September 1968.]

Lage: And that was about the time you left also?

McLean: I left the first of August of '68, yes.

Rewards of Working for the District

Lage: Is there anything else you want to add about what it was like to work for East Bay MUD?

McLean: I was with the district during the greatest expansion period, from 1945-1968. Looking back on it, I think I was probably one of the most fortunate ones in the district, in that I had new challenges all the time. There was always something new that came up so that I had a new challenge to do this or to build that project, or to do something else. I look on my career with the district as probably one of the outstanding times in my professional career.

There were a couple times when I had the opportunity to consider a change of jobs. In fact, I was selected as one of two finalists for the job to head the construction of the State Water Project--that is, not the U.S. Bureau of Reclamation Project but the State Water Project. I went to the interviews, and I wasn't selected. I was one of two who were being considered for the top job with the state, under Harvey Banks.

Lage: So you would have taken that if you'd gotten it?

McLean: I think so. I think I would have taken that, because it was in a kind of slack period with the district. It was after we had finished the waste water project and before we had the $252 million bond issue. That was one time that I had thought of leaving the district, and I'm sure that had I been selected, why, I would have gone. That would have been a real challenge too, to be on the construction of the Oroville Dam, the canals, and the pumping plants. They finally selected someone who had been with the Bureau back in Washington. He had very little construction experience. Harvey Banks did his best to get me; Harvey wanted me because I had worked with him. Harvey was then head of the department, and he wanted me, but he was overruled, and I never did find out why.

Then I had another opportunity. Mr. Greeley of Greeley and Hanson in Chicago had a couple of projects. They had a large project in Brazil in which they were going to design and construct all the facilities for Sao Paulo; it was a big waste water project for the entire city of Sao Paulo. He wanted me to go to that, and they made me a very fine offer to go down there on that project. First of all, I was to go down and do all of the investigations for it, and then they were to set up a design office in Sao Paulo. I would have been in charge of all the work.

Lage: When was that?

McLean: That was right after we finished the waste water project. That was after '52.

Lage: That would have been a new turn for your career.

McLean: That would have been a challenge, yes. They made me a very fine offer to go down there, including all expenses. Just about that time we were looking at this $252 million issue for the district. With that in sight, I stayed with the district. And I've never regretted it, because I think I've left a very fine legacy with the district, and certainly my friendships with everyone in the district have been outstanding. I finished a forty-one-year career with the district when I retired in 1968.

Lage: That's something of a record, I would say.

McLean: I could have gone elsewhere, because I certainly had the opportunities. But when I look back, and then the period of time that I had on the board of the directors, they were all good. They were good years.

Relations with Board Members

Lage: In your employee years, was an employee at your level affected by changes on the board?

McLean: No.

Lage: Were your aware of, or did you get to know any of the people on the board?

McLean: I got to know all of them.

Lage: How would you get to know them? Did they come around?

McLean: Well, some of them used to come around, yes. And fact is, I had the opportunity in many cases of escorting them around the projects, you know. When we were building the aqueducts, there were times that we escorted them over the projects.

Lage: Did you ever escort Dr. Pardee around?

McLean: Very little. He usually came out with Herbie Nelson as his chauffeur. Dr. Pardee didn't come on the project very often.

Lage: But he was a very active person?

McLean: Yes, he was very active. Oh, yes, he was active for his age. My gosh, when he finally stepped down from the board, I think he was well along in his eighties. Then Bert Carrington, the director from Alameda, was a member of the board for thirty-two years. I got to know Bert very well. We used to have trips to Pardee when we were working on the aqueducts and Camanche Dam. Many times we'd take members of the board over the projects, and it was my pleasure to escort them on many of these trips and describe the projects to them. Particularly when we were building the aqueduct, I would take them through the steel plant and where they were installing the pipe. I got to know Bill McNevin very well and the others.

Lage: Anyone stand out as particularly--?

McLean: Yes. Louis Breuner always stood out as a real businessman. One thing I can say about the board in those days, and even up to the time I was on the board, the presidents of the board, excepting this present board, were all good businessmen. They had the district at heart; that is, the district was their prime interest. I would say that in most cases the projects that we put before them to build and to provide the money for, they were one hundred percent behind the staff. I don't know of any project other than the Middle Bar Project that was rejected.

Lage: That was an unusual case?

McLean: Yes, it was.

Board Decisions on the Middle Bar Project

Lage: It was the same time that you were having the reorganization in the district. Was there an interplay there between the new staff and the decision on Middle Bar?

McLean: I don't know. We worked on this very strenuously. I worked on it for over a year. Of course, we didn't get into the design of the project, but we looked at the feasibility of the project, and the feasibility of the project was good. Cost effective, it was good. We recognized that we were going to inundate the electropower plant. The electropower plant was old, and PG&E was not against the removal of the plant. There were ways to compensate them, and all they were interested in was due compensation, basically for the destruction of the power house and loss of power revenue. Louis Breuner, for some reason or other--and I am not sure of this--did not want to tangle with PG&E on this issue. He didn't want to either compensate PG&E or go through the process to build the project.

Lage: But he was the dominant figure?

McLean: He was president of the board at that time. John Longwell was our consultant on that project, and Longwell was very much in favor of the Middle Bar Project.

The Middle Bar came up again in the eighties, after I was on the board. The district was going to go ahead with it and had filed with the Federal Power Commission. Then we were threatened with a suit by Amador County, and finally it was up to Sandy

Skaggs, president of the board at that time, and Jerry Gilbert, the general manager. We decided not to fight it, and consequently nothing was ever done on it.

Need for More Water Projects in California##

McLean: But looking back, I think it was a big mistake that we never went ahead with the Middle Bar Project. We would have had to fight Amador County--that is, the litigation that they were threatening us with. But I think had we gone ahead with it and built the project, we wouldn't have faced the environmental situation that we face today.

In other words, if we are ever today to have enough water to take care of the people in the state of California, we are going to have to build more water storage projects. Otherwise the economy of California will be seriously affected. Agriculture uses around eighty percent of the water in the state, and the farmers are using it pretty efficiently. I don't know of any areas where they can reduce the amount they use without taking land out of production.

There are probably areas where they can conserve, but I don't believe that the conservation is going to solve our water problem. You see, the State Water Project is only delivering about one-third of the water that it should be delivering, and the Central Valley Project of the Bureau is delivering less than half of what it could be delivering.

Lage: If they had more dams, is that what you mean?

McLean: Yes. They have to complete the facilities that are supposed to be completed. The Auburn Dam should be completed and the Peripheral Canal built. I know that the Peripheral Canal is one of the biggest controversies in the state, but a lot of the problems that are in the Delta would be solved by building the Peripheral Canal. People don't understand that. The Peripheral Canal has become political, and this is going to prevent it. But if you're ever going to solve the problem in the Delta, the Peripheral Canal has got to be built.

What happens today is that when you turn the pumps on at Clifton Court Forebay, and you turn the pumps on at the federal project, what you're actually doing is pulling salt water upstream. This affects the striped bass and the salmon fishery.

If you build a Peripheral Canal, the water goes directly into the State Water Project in Clifton Forebay and also into the federal project. And then the outlets in the Peripheral Canal, into the channels of the Delta, keep the fresh water flowing into the Delta, and you don't get the backup of the salt water. The duck club of which I am one of the owners, the duck club on the Suisun Marsh, used to take water directly out of Suisun Bay and out of Grizzly Bay.

Lage: Your water for--?

McLean: The water for flooding our fields. We have twelve hundred acres, which is on the most westerly end of Grizzly Island. Up until about five or six years ago our water used to be so salty when we turned it in that it was killing all of our native plants. We were having a terrible time. Finally, through the Suisun Marsh Conservation Act, the State Division of Water Resources cut a channel into Roaring River which takes out up near Montezuma Slough. Now the water that we get to the marsh is much fresher. They spent several million dollars to get this water so that we can have fresh water for the many duck clubs there. Previously, over the years our water had increased in saltiness. That has been due entirely to the operation of the projects, and that would have been prevented by the Peripheral Canal.

The large water projects like the State Water Project and the Bureau's Central Valley Project have only developed about half of what was originally proposed. Of the $1.7 billion water project for the State Water Project, they've only spent a portion. They've got to complete some of the facilities that were in the original plan. The Casagrande Reservoir in Kern County and a number of others have not been completed, and they need to be completed in order to deliver the full amount of water for which they were designed.

Lage: So that seems to you to be the problem we have now, aside from our drought?

McLean: Yes. You know, the problems that we have today, which now are politically--. Don't misunderstand me; you and I are both environmentalists. We believe in taking care of our environment. You know, they talk about the wild river rafters. Those wild rivers did not exist until we built reservoirs that turned the water loose into the various streams. The American, the Stanislaus, the Mokelumne, the Tuolumne, and all of those--many of them never even had any water flowing in them during the dry seasons in the summer. Yuba River was virtually dry. Now they talk about the Sacramento Parkway, which follows the American River from Sacramento up to the Nimbus Dam. There is water flowing in that river today. Going back to my childhood, when I lived in Sacramento, that river was dry in the summertime.

Lage: So the dam regulates the flow?

McLean: The dam regulates the flow, releases the flow. There was never any water until Folsom Dam was built. There was never any water in many of the Central Valley streams during the summertime.

Lage: That's kind of ironic, isn't it?

McLean: And they have these white water rafters that raft down the streams. They do the same on the Stanislaus and all the other rivers. That condition didn't exist until the dams were built.

Lage: What response do you get when you point that out to people?

McLean: People marvel at the fact that these now exist, but they don't know historically the way I know that when we used to go swimming in the American River, you couldn't find a place to swim. The only place you could find to swim was where there was a big hole around one of the piers on the H Street Bridge. The rest of the time you could wade the river. If there was any water flowing, it was six to twelve inches deep, in one little stream along one edge of the river.

Lage: And those were normal rain years?

McLean: Those were normal years. In the summertime those streams were virtually dry.

X THE WORK OF A CONSULTING ENGINEER

Retirement from East Bay MUD, 1968

[Interview 7: June 5, 1991]##

Lage: How did you happen to retire in 1968?

McLean: Well, I had reached the mandatory age of sixty-five. I don't know whether they still do or not, but at that time they had the mandatory retirement age of sixty-five. My birthday was July 16. The subsequent month after that was August, so I was compelled to retire on August 1, 1968.

Lage: I think those laws have changed now. I think that's considered discriminatory.

McLean: That's right. I think it is.

Lage: Were you about ready to get out anyway, or would you have stayed on?

McLean: No, I could have stayed on. See, I had finished the major construction work on the $252 million bond issue. There was a tremendous amount of work that was done. I had charge of all that construction, and by the time I retired it had all been finished.

Lage: That was very good timing.

McLean: Yes. The aqueducts were finished, the tunnels were completed, the Sobrante and the Walnut Creek filter plants were completed. All those projects were completed, and I had completed all the reports. All the personnel who were temporary had left. Then I went back to my previous position as manager of field engineering, and that group was considerably smaller than all the personnel I had previously. The work then was mostly local, within the distribution system.

Lage: Not quite as exciting.

McLean: It wasn't as exciting as the work I had been on. So it was a good time for me to retire.

I was very much interested in going into consulting. This was a prime time for me to get into consulting work; with all the background and experience that I had had on all the major projects with the district, it was a prime time for me to get out and try my wings.

Expert Witness for Kaiser Steel in 1969 Lawsuit

Lage: Let's talk about your consulting jobs. You've mentioned several that sound interesting.

McLean: As I said before, I had hardly been retired and was just beginning to take a vacation, do a little traveling, when I got a call from John Feist, the head attorney for Kaiser Steel Corporation. They had a very large lawsuit that was going to be heard in the federal court in Denver, and John asked me to come talk to him at the Kaiser building. He wanted to know if I would go to work for him as an expert witness on the Homestake Project. That was the pipeline that went from Homestake Tunnel on the Continental Divide to supply water to Colorado Springs. It was a water supply line, a 48-inch welded steel pipeline. I said I'd be willing to go to work for him.

Lage: What was the lawsuit about?

McLean: The suit was brought by the contractor, the R. F. Fulton Company, against Kaiser Steel, the manufacturer of the pipe. The pipe was manufactured in their plant in southern California. Their contention was that the pipe didn't meet the specifications.

The pipeline was designed by Black and Vietch of Kansas City. It was what we call a bell and spigot welded steel pipe, and in specifying the tolerances on the pipe I believe they had a tolerance of plus or minus one-eighth on the spigot and plus or minus one-eighth on the bell. When they laid the pipe they used a tack weld at the top of the pipe and then put another tack weld at ninety degrees on the circumference, and then they lowered the pipe in place.

A Time to Remember

Splashes
August 1968

Late on Saturday, June 22, 1929, when workmen at Pardee dam knocked out bulkheads to release the first Mokelumne river water which would flow into San Pablo dam, Walter McLean, recently retired manager of the District's field engineering division, was watching. He is one of the few who was involved with almost every major construction project for the development of the District's Mokelumne river water supply during the last 40 years.

"As a young ambitious engineer just starting out," McLean said, "I wanted the experience of working on a really big project and I set my sights on Pardee. I'd worked for more than a year as a junior hydraulic engineer for the California State Division of Water Resources and I was just finishing up a two-year job as assistant engineer on a preliminary investigation of sites for the Feather River Power Development.

"I wanted to work on Pardee," McLean continued, "because at that time it was one of the largest concrete dams to be built in the world. In October 1927, I was hired as an assistant engineer in charge of concrete construction for the first Mokelumne aqueduct."

When the pipeline between the Lana Plancha gorge and Walnut Creek was finished, McLean was transferred to Pardee dam where he became assisitant to the resident engineer, E. L. MacDonald. "I got to Pardee just as the first foundations for the dam were being poured," McLean continued. "I stayed on until the powerhouse was finished and the machinery set. That was May 1930." From that year until 1945, he was senior engineer and supervising civil engineer in the District's distribution division. His work included construction of redwood tanks, steel tanks, prestressed concrete reservoirs, steel and cast iron pipelines, pumping plants, water treatment plants, dams, spillways, tunnels, roads, bridges and distribution reservoirs required for the steadily growing E.B.M.U.D. system.

A change of pace came in 1945 when McLean turned his attention from storing and distribution of water to the problem of disposing of it. His assignment was supervising civil engineer in charge of field engineering and construction for Special District No. 1, Water Pollution Control. In 1952 he had a chance to look to the future when he was assigned as supervising civil engineer, investigating the development of facilities for the District's future water supply from the Mokelumne river.

"A project which I really got a big bang out of came along in 1957," McLean recalls, "when I supervised the investigation and design of the Pardee Reservoir Recreation Area. We worked on designs for the buildings, layout of the water lines and sewers, boat docks, everything. Then we went to the State Wildlife Conservation Board to get the money." His final assignment as a supervising engineer came in 1958 when he worked on the design, plans and specifications for the $68 million Mokelumne aqueduct number three.

McLean was promoted to manager of the field engineering division on May 1, 1959. In December 1961 he was transferred to manager of special projects construction division, responsible for building Briones dam, the Lafayette tunnel and aqueduct and the third Mokelumne aqueduct. In October 1963, he returned to his former position as manager of the field engineering division and remained there until his retirement on July 31.

McLean was born in Sacramento at a time when regular ferries were the mode of transportation between the Capital and San Francisco and when water problems were of no legislative concern. He graduated from Sacramento High School and attended Sacramento Junior College, one of the oldest in the State, and the University of California at Berkeley. As a registered engineer, he belongs to numerous professional organizations and is a Fellow of the American Society of Civil Engineers.

McLean's wife, Margaret, was also born in California's gold country at Plymouth and was raised in Placerville. The McLean's have three children, all of whom are married. Their daughter, Phylis Click, is director of the College for Early Education in Los Angeles; one son, Robert James, is an engineer with Stolte Construction Company in Oakland and a second son, Edward Bruce, is employed by Pinkerton in Oakland.

Retirement plans for McLean include some consulting work after a long vacation. "I've been working all my life and I can't stop now," he said. But first he plans to do a little upland bird shooting and deer hunting this Fall.

Contractor Elmer Freethy, left, bids farewell to former manager of the field engineering division, Walter McLean. Over the years, they worked together frequently on many District construction projects.

Well, by laying the pipe by that method it accumulated a large gap at the bottom. If you happened to get two pieces of pipe that have a plus one-eighth on the bell and a minus one-eighth on the spigot, then you actually have a quarter of an inch gap. When the pipe is laid, you can have a gap as much as one-half inch. It was the contractor's fault in laying this pipe in this manner. As a result, they had to put a rod in the gap, what they call slugging, which is very poor practice.

In addition to that, when they shipped all this pipe, because of the very high head that was on the pipe, it had to be all in sequence. Every section of pipe had to be laid at a specific location. There was a section of about a quarter to a half mile in length, right within a couple miles of the Homestake tunnel, where the pipe was delivered out of sequence, and the contractor had to skip this section. He had to go ahead and lay the pipe and leave a gap in order to keep crews working. This was during the late fall. It was getting pretty cold high in the mountains; fact is, they had temperatures that were getting down to zero and even some minus temperatures.

When the pipe arrived that went into this section, he had to move all of his crew back to lay the portion where the gap in the pipeline was. As a result, he was claiming damages for the additional cost of the delay and moving the crew.

Lage: He was claiming damages for it from Kaiser Steel?

McLean: Yes, the contractor was claiming the damages for payment for the delay and move caused by the out-of-sequence pipe delivery, and he was also claiming damages for this problem with the gap in the pipe joints, alleging that the pipe did not meet the specifications. As I recall, the suit was for several million dollars, and it was in the U.S. federal court in Denver.

Lage: Did it actually go to court?

McLean: Oh, absolutely, you bet. I testified.

Lage: Was this your first time on the witness stand?

McLean: This was the first time I was on the witness stand, yes. I testified, and I was in court a week.

Lage: Did the lawyers work with you very much to prepare you?

McLean: Oh, yes. Absolutely. In order to be represented in the federal court in Denver they had to use a local firm. I was the adviser, basically, not only as the expert for Kaiser, but in addition to that I had to work with the attorneys in Denver.

Lage: Tell me what you learned about being an expert witness. What does it take?

McLean: One thing I learned on this in working with the attorneys was that very few of them were familiar with engineering or construction practices. I think most of my time as an expert witness has been to educate the attorneys to engineering terms and construction methods. The attorneys I worked with in Denver were Don Gentry and Charles Haines. They were a large firm of attorneys in Denver. John Feist, of course, was the chief attorney for Kaiser Steel Corporation.

That was '69. I started there late summer and worked just until Christmas.

Lage: Did you go on site?

McLean: Oh, yes. I would go back there when they were preparing the case and spend an average of a week. I stayed at the old Brown Hotel there in Denver. They had a suite of rooms reserved for Kaiser in the annex. I think the annex was about twelve stories high. I had a room with an adjoining room that had a desk, and I could work there. Kaiser had three or four rooms on the floor below me. It was about a two-block walk to the attorneys' office where I would go each day.

We flew first class on United Airlines both to and from Denver. I made several trips back there, beginning in September 1968. I would spend an average of a week there with all the attorneys, and during that time we went out to the site. Of course, the construction work had been finished, but we went out to the site and drove over it so that I could explain to the attorneys how the contractor would excavate the trench and lay the 48-inch pipe.

Most of my time was spent with them going over the contractor's claim. Then we went to court, and I believe we were in court for two weeks.

Lage: Were there any other engineers testifying?

McLean: No. I was the only one. Kaiser had their own engineers, but they did not testify.

Lage: But what about the contractor?

McLean: He was represented by his superintendent on the job and a couple of others who had been on the job. In the federal courts they would start at eight o'clock in the morning. The judge would start at eight o'clock in the morning, and we'd go until five o'clock at night. Sometimes it would even go beyond five o'clock. This was jury trial, and as I remember the most intelligent one on the jury was a schoolteacher.

Lage: So you had to make your testimony such that they could understand?

McLean: The testimony had to be made in such a way so that they could understand it, and this resulted in a lot of illustrations, just like I've done here. We had one of these great big pads on an easel.

Lage: Did you draw right there in the courtroom?

McLean: Yes. I had to get up and draw before the jury. I remember one day--and I always got a big kick out of this--the judge was questioning me. I had been on the stand all morning, and the judge was questioning me about the process of welding and how they laid the pipe. I was showing the way it should have been done; they should have used a hydraulic jack in the spigot end of the pipe to elongate it. And then it should have been tacked on the sides at the midpoint.

Lage: Tacked down the sides and not just the top?

McLean: Yes, so that you would equalize this space all around the circumference of the pipe so the space would be uniform all the way around. I was explaining this to the judge, and the attorney for the contractor tried to interrupt. The judge shut him up fast and said, "Mr. So and so, if you'll just sit down and listen to Mr. McLean you'll learn something." [laughter] It kind of took the wind out of his sails. I'll never forget that, because the judge went on questioning me.

I had analyzed very carefully the extra costs for the contractor caused by the out-of-sequence delivery of pipe. That was Kaiser's fault, but the contractor had grossly exaggerated the costs in his claim. First of all I eliminated his claim completely on the problem with the extra work he had to do because of the gap; that was his own fault. Then I reduced his claim on the sequence of delivering the pipe.

It was getting very close to Christmas, and finally the case was given to the jury.

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McLean: What got to the jury was a claim for somewhere around $160,000 for one item in addition to the original claim. When the jury brought the verdict, they had included this $160,000 in the total claim. The judge said, "I'm not going to allow that! I'm not going to allow that. That's completely wrong. I'll cut that in half." The final award was less than $100,000.

Lage: And the original suit had been for--?

McLean: The original suit was over $5 million.

Lage: So you earned your consulting fee on that money.

McLean: Yes, I earned it, absolutely. I sure earned it.

Testifying for the Bureau of Reclamation, 1969-1970

McLean: I hadn't any more than finished with the Kaiser suit when, while I was staying at the Brown Hotel in Denver, I got a call from Barney Belport of the Bureau of Reclamation. This was in '69. Barney said, "I want you on a lawsuit that we have down in Texas." I said, "Barney, you don't need me. You've got all kinds of good men in your organization." He said, "I want somebody who is unbiased and who can look at this objectively as my expert." And he said, "I want you to come to work for me on this case." Well, I had hardly finished the Kaiser litigation when I went to work for the bureau. I spent pretty nearly a year again commuting to Denver for the bureau, into 1970.

Lage: Were they being sued?

McLean: Yes. They were being sued by another contractor. It was a 350-mile aqueduct through the Panhandle of Texas. This was all concrete pressure pipe, and it went from Amarillo, Texas, to Lubbock, Texas, and served all the communities and irrigation for farms from the Canadian River. It commenced at the Canadian River and went through the Texas Panhandle.

Lage: And the Canadian River is--?

McLean: It's in Texas, and there was a reservoir on the Canadian River just north of Amarillo. I spent a year on that project with the bureau. That was in the U.S. Court of Appeals.

Lage: Do you have to be specially certified to be an expert witness in these cases?

McLean: Yes. I had to be certified by the federal court in Denver, and I had to be certified by the court of appeals that I could serve as an expert witness. Fact is, I have a list of where I have been certified. I've been certified by the federal court in San Francisco and there are several, I guess, in northern California. I think there's a half a dozen or more courts that I've been certified by.

Lage: Is that just a rubber stamp process, or do they really examine your qualifications?

McLean: They review all your qualifications and your background experience for you to be permitted to serve as an expert witness.

Well, that went to trial in August or September 1970. That was just heard before the judge; that was not a jury.

Lage: Does that affect the way you present your case?

McLean: Oh, absolutely. These federal judges are pretty keen. They've been in there for a long time on the appeal judge circuit, and they are good, no question. Henry Strand was the chief attorney for the bureau. When I got his Christmas card this year, he told me he was retiring. I had a very fine relationship with him. There again, I commuted back and forth to Denver about twice a month. I would go back and spend whatever time he wanted with me, reviewing all the claims, reviewing the pictures. We went over the project. There were two or three times that we went to the project. We flew from Denver to Amarillo, and a government chauffeur would pick us up there. We'd spend the whole day going over the project. There were miles and miles and miles of reject pipe.

Lage: The bureau rejected the pipe, and the contractor sued?

McLean: The bureau rejected the pipe. Normally this pipe is made in about a ten-foot length. The pipe is made in molds, and it's centrifically spun by what they call a Cen-Vi-Ro process. When they spin the pipe, it's in a mold. They use a very dry mix. When they put this in the mold and spin it, they have a roller in the pipe that compacts the concrete. Normally the pipe is made in ten-foot lengths, and they put just enough concrete in the mold to give a proper thickness.

Well, they got the idea that they could extend the length of this pipe to twenty feet. They didn't want so many sections of pipe, so they made the mold longer. The trouble with that was that by making it longer, they couldn't make the roller stiff enough to compact the concrete, the roller would bow, and the pipe would be eight to ten inches narrower in diameter in the middle of the pipe than it was at the ends. If you had a forty-eight inch pipe in the center it might be as little as forty inches.

Lage: Now, I don't see how the contractor thought he had much of a claim against the Bureau of Reclamation.

McLean: In addition, many the bells were full of uncompacted concrete. There were miles of rejected pipe.

Lage: So the bureau rejected the pipe?

McLean: The bureau rejected the pipe as not meeting the specifications.

The judge didn't come out with his report for about a year. He mentioned all of the different things that I had testified about the project. He gave quote after quote of what I had said about the contractor's pipe fabrication methods. Finally he awarded the contractor $223,000 which I had testified they were entitled to. The suit, again, was around $10 million or so. I told the judge that in my opinion--and I gave him all the figures--they were entitled to a judgement of about $223,000 and that was all, period.

Well, the Cen-Vi-Ro Corporation then appealed this judgement. Finally, believe it or not, after going through the appeal process, which took four or five years before finally coming up with an award, they didn't get any more out of it. They finally accepted the $223,000. I wrote back to Hank Strand, the attorney for the bureau, and I said, "How lucky can you be!" They got the judgement on inflated dollars. If they had accepted the $233,000 five years ago, the money would have been worth a lot more. But getting it today, why, it's worth a lot less." He wrote back and said, "Leave it up to you to figure something out like that."

Thoughts on Being an Expert Witness

Lage: Were you ever offered a case where you thought you couldn't accept it because you didn't agree with what you'd been asked to do?

McLean: Yes. I don't recall which one, but I have had one or two like that, where I told them I didn't think they had a case, and I wouldn't work with them on it.

Lage: Do you enjoy it?

McLean: I do. I really do. I receive a good fee. It takes a lot of research, and I receive $90 per hour for the research work. On the witness stand I get $250 an hour, with a minimum of $1,000 per day.

Lage: You're surely worth it, when you consider what's at stake.

McLean: You know, I've always said that they're paying for my background and my experience. On all the cases I've been on, there's never been a complaint about my fee. Every case I have been on, I don't remember one that we ever lost.

Lage: There must be something else, though--the ability to communicate to the jury and the judge. Do you have any thoughts about that?

McLean: That's right. Very rarely do you ever get a jury in any of these cases, even in federal or superior court, where I would say they have more than average high school intelligence. The thing you have to do is to get the jury or judge to understand what the case is about. You have to be able to draw pictures and explain to them things that they can understand clearly.

Also the judge--generally this sort of thing is not common knowledge to the judges. Unless the judge does a lot of research work, you have to explain these things to him. You have to get the judge so that he knows what you're talking about. If it's laying pipe, or whatever it happens to be, he has to know what you're talking about. This is why I've always been very careful to draw pictures and spell everything out, even put down formulas related to the problem. Whether they understand the formulas or not doesn't make any difference. They see that you know what you're talking about. I think this is a big help.

I think every case that I have worked on, I've always felt that the judgement was fair and equitable and reasonable. I don't think I have ever had one where I felt the judge or the jury awarded any exorbitant amount. In most all cases the judgement has been virtually zero; they haven't gotten anything.

Lage: Are you usually on for the defendant or the plaintiff? Or does that make a difference to you?

McLean: I have been on both, but I prefer the defendant part. I have been on several for the plaintiff.

Lage: Why do you prefer being for the defendant?

McLean: As a general rule I've felt that I'm more interested in defending someone against a claim than I am in trying to help the plaintiff make a claim. Generally when you analyze many claims, the plaintiff has grossly exaggerated the claim. The first thing you have to do is review the claim and tell them what is fair.

Lage: So if you were on the plaintiff's side, you'd have to go along with his grossly exaggerated claims?

McLean: You have to go along with what he wants. Sometimes, in one or two cases, I said, "Look, I can't take this because you don't have a case. Look for somebody else."

Lage: Is the cross-examination process a painful one?

McLean: No, it doesn't bother me. I know engineering and construction, and the attorney who's cross examining me doesn't. When I'm answering questions on engineering, he doesn't understand.

Lage: It gives you the advantage.

McLean: I have the advantage. Any time they start to question me on construction or engineering, I know that I've got the better of them. I like to match wits. I enjoy matching wits with an attorney when it comes to cross examinations, because even on depositions they are playing my game. I don't mind it at all.

<u>The Case of the Leaky Sewer Line, Bethel Island</u>

Lage: Is it any problem for you keeping up with new technology?

McLean: No.

Lage: Or have there been that many changes?

McLean: Well there've been a few, but generally most of them are straightforward. The last lawsuit I worked on was at Bethel Island in the delta. I worked on for it for a couple years.

Lage: And who was that with?

McLean: It was the installation of the sewer system for all of the homes on Bethel Island. This was a case where it was all originally septic tanks, but because of the high groundwater tables--this island is in the Sacramento-San Joaquin Delta, one of the islands where there was a marina and a lot of homes--it got to the point where the pollution was terrible.

Lage: It's right there in the middle of the delta, isn't it?

McLean: Yes, it's right in the middle of the delta. The result was that finally they were compelled to build a sewage collection system and take the waste water into the treatment plant at Oakley. They were having a very high infiltration into the system. Infiltration may be due either to roof downspouts and poor joints in the laterals or main line system. In the old days, when they used to make cement joints, the cement joints were made very poorly, and you get infiltration into your system from ground water. Now we use plastic and rubber joints, which are very tight.

In some of the old sewers in Oakland and Alameda it used to blow the manhole covers off because of excess water when it rained. All the water poured into the sewer system through the old cement joints. Many homes had their downspouts connected into the sewer. All this extra water overloads the collection system.

This also creates a problem for your waste water treatment plant. The waste water treatment plant is designed for waste water flow only, and when you get double that during a rainstorm, this puts a big load on your waste water treatment plant. This is what was happening at Bethel Island. They let a contract for fourteen miles of sixteen-inch collecting pipe throughout Bethel Island to sewer this entire area, plus a long line that went to the treatment plant. After it was in operation, as I recall, the flow was somewhere around over a million gallons per day into the treatment plant, whereas the flow from homes and commercial establishments was less than a half a million. Immediately, because of the poor soil conditions, they blamed the contractor for the joints in the line leaking. The contractor called me in as the expert.

Lage: And who was suing the contractor?

McLean: Contra Costa County and the homeowners on Bethel Island were suing the contractor. I don't remember the contractor's name. The attorney for the contractor was the firm of Catalano and Associates in San Francisco. I was called in as the expert. The lawsuit was for was over five million dollars. After looking at the plaintiffs' claims, I said, "The first thing we must do is make a TV survey of it, to find out where the leakage is coming from. Then we can determine the merits of this claim." Their claim was against the contractor who had built the system, saying that he hadn't installed it properly, and that it was leaking to the extent of over half a million gallons per day. We retained a TV firm from Fresno, and we made a complete videotape of the entire system with a color TV camera.

Lage: I think of the system as being underground.

McLean: Yes. The system is all installed ten or twelve feet below ground.

Lage: How do you do make a videotape in those conditions?

McLean: They had a television camera that was about five or six inches in diameter and about two feet long, and they had a cable. Manholes are normally located four or five hundred feet apart, depending on the terrain. They passed a cable down through one manhole and up another manhole. Let's say we'll take a five hundred foot reach. Then they put the camera down the manhole, and attached to this cable is the electric transmitter that comes from the camera. It actually measures the number of feet it travels between manholes, and as they electrically reel this camera along it takes a complete picture of the inside of the sewer. You can sit there in the van alongside and watch in color--they have a large TV screen--and watch every joint in the pipe and the water that is in the pipe. You can also see any leaks in the joints.

First they have to flush the pipe. There is always some sewage flowing in this pipe. The pipe is flushed from a fire hydrant before they put the TV camera in the pipe.

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McLean: If there's any obstruction of any joint or a leak, it's all recorded on the TV tape. The camera shows the amount of water flowing, and it records a dip in the pipe. If there happens to be a sag, it will show on the camera. Sometimes the camera will be underwater. If there is standing water in the line, the camera will show that. The TV gives you a complete picture of this sewer line.

We did find some sags. By judging the depth of the water, why, we could tell where there was a three-inch sag or a four-inch sag in a pipe. But that doesn't hurt anything; it means water stands in there. But we found the leakage was coming from the laterals where the people themselves had connected into the sewer line.

Lage: Oh, so the people had come in, or hired contractors to come in--?

McLean: After this sewer line was built, the people were compelled to disconnect the septic tanks and bring their house sewer into the main sewer. At the sewer line they leave a lateral connection. The lateral is fabricated right in the pipe, and it has a bell on it. The people are supposed to bring their line and connect into the lateral in the main sewer line.

In most cases the water table was above the pipe. When the homeowners made their connections to the main line, they just put a piece of pipe in the joint, and then they put a little plaster around it. Well, the leakage was coming in from the pipe that connected to the main.

Lage: So the connection between the main sewer pipe and the household pipes was where the water was coming in?

McLean: That's where the leakage was all coming from. The county was supposed to have inspected this to make sure that it was absolutely bottle tight. We saw some where there was so much water flowing, it was actually shooting out of this pipe into the main sewer. This all showed on the TV.

Lage: It's amazing that there are companies that provide this kind of TV service.

McLean: Yes. I've used it in cases, and in cases just like this, where you have to take a look at a pipeline or sewer line. The nice part about color is that it shows everything clearly.

Lage: When you showed this, I'm surprised that the county would even go ahead with suing you, once you've shown the problem.

McLean: The plaintiffs wanted to go ahead with it, yes. I have forgotten the judge's name. We went to court four times, and the judge told the plaintiffs, "You don't have a case!" He saw these pictures, and he said, "You don't have a case!" And they kept insisting, "Well, we want to go to court; we want to have it tried before a jury." So he said, "Okay, I'll set a date for you." And it would come just about the date, and then it would be postponed, and we would have another hearing. This took two years. It was absolutely ridiculous. They didn't have a shred of evidence, because we had found the contractor's work to be without fault. I sat there in the court room, and there were experts for the county, experts for the people, and the attorneys for the plaintiffs.

Lage: Did it ever go to trial?

McLean: It didn't go to trial. We spent one day there from eight or eight-thirty in the morning until nearly eight-thirty at night, and the judge tried to convince these people that they didn't have a case. He said, "How can you go against this evidence that you have of where the water is coming from?" And they still insisted that they wanted to go to trial. Four times we did that. Four times.

Finally the last time--I wasn't present that time--they settled. The plaintiffs who made the claim got zero, the county came out with nothing, but the contractors and engineers, of course, had a lot of money coming. They got all their fees and costs. I never did get all the full details of the settlement, but the plaintiffs lost everything; they didn't get anything out of it. I was on that case for pretty nearly two years.

Designing a Honduran Shrimp Farm

Lage: Let's talk about some of your consulting jobs that were not court cases. You've mentioned the Honduras experience, and that sounded very interesting. Tell me about that.

McLean: That was for a shrimp farm (aquaculture) in Honduras. I was working with McCreary-Koretsky, a consulting firm in San Francisco. They had a contract with Armour and Company. Armour and Company had been experimenting with the propagation and rearing of shrimp, or prawns, as we call them. They had had a facility in Florida in which they had carried out a long series of experiments for three or more years, rearing these large prawns artificially on an experimental basis for market. McCreary-Koretsky was doing some other work, and they had an office in Tegucigalpa, the capital of Honduras.

My particular role was not only to oversee the hydraulics of it, but also the proposed construction. Our assignment was to go to the Caribbean coast in Honduras, near the port town of La Ceiba. They proposed to construct a series of shallow ponds that would cover approximately two thousand acres. That would be around three square miles. These ponds were to be constructed of a size that would range from two acres to four or five acres per pond. They were to have a water depth of not more than four feet. It meant that you had to build levees around each pond to get a water depth of about four feet in the ponds. These shrimp grow to marketable size in about ninety days. In other words, all the criteria that was given us was that you would have shrimp in the ponds for about ninety days. They were really small, minute, when they were put in the ponds, and you fed them fish meal. The reason for going to Honduras was that there is a tremendous abundance of fish meal down there, and there was plenty of land available. The total amount of feed that you would give them was about a pound and a half of fish meal for every pound of shrimp. As the shrimp grew, you increased the amount.

We had a number of problems. First of all, we had to find an area where the soil was mostly clay, because that had to retain the water in the ponds. Then the next thing was the levees. The other was the system of pipes that we had to have that would not only permit us to fill the ponds with water but also to drain the ponds. We had to be able to drain the ponds rapidly; you harvest the shrimp when you drain the ponds. We had to provide an eight-foot security fence, and this was very interesting to me. Around the perimeter of the 2,000 acres we had to install an eight-foot security fence, and we had to install electric flood lights along the fence to keep the natives from trespassing and stealing the shrimp.

Then we had to construct a town, a small town for the workmen. I think there were somewhere in the neighborhood of about one hundred workmen. Some of those were bachelors, some had families. They employed both women and men, and we had to provide separate quarters for them. And then we had to have family quarters for superintendents, chemists, and all the other personnel who worked on the farm.

We had to provide a water supply and a waste water system. We had to have a laboratory and a refrigerated warehouse. We had to have the processing plant where you process the shrimp and where they were packaged and frozen. And then we had to have a freezer warehouse. We also had to have a vermin-proof warehouse in which to store the fish meal. These were all the criteria that were given to us by Armour Company.

The laboratory was very interesting, because the way they obtained the eggs from the shrimp was from the boats out in the Caribbean that harvest the shrimp by nets. When they brought in the shrimp, they would pick out the females, which apparently are very easily identified because they are all covered with eggs. They would collect all those together on the boats, and then helicopters would go out to these boats and get the pregnant females, if you want to call them that, and bring them to the laboratory. There they milked them of the eggs, and the eggs and larvae went through about five or six different processes. The eggs were first put in agar agar to grow as a culture.

Lage: Agar agar?

McLean: Yes. Agar agar, just like you do for bacteria; you put them in that. Then they went through various stages as they were growing. I don't recall the length of time, but it was two or three months that they went through this process before you could put them out in the pond.

We had several criteria to meet in constructing the ponds. The water in the ponds had to be of uniform salinity--that is, as close to a uniform salinity as you could get. We couldn't permit predatory fish or the eggs or the fry of predatory fish to get into the ponds, because if they did they would feed on the fish meal and eat the baby shrimp, see. We had to provide facilities so that in drawing the water out of the Caribbean we didn't get these predatory fish. We had to locate a site where there was good clay bottom, with soil that was mostly clay, where we could use it not only to build the levees but also to make the ponds.

They had several methods by which they wanted to harvest the fish. You would harvest the shrimp every ninety days. We looked into one method that used a vacuum process. As you draw the water from the pond, the shrimp follow the water. If we had a large vacuum suction pipe in there where they were following this water as we were draining the pond, we could suck them out of a sump and take them into an area where we could remove them in baskets near the processing plant. That was one idea that we investigated. The other was to have large baskets when the water was being drawn out of the pond, and when one of these baskets got full, to hoist that up on a carrier and take the shrimp into the refrigeration warehouse.

There had to be a big refrigeration storage area because you have to hold the shrimp for forty-eight hours before you can de-head them. That has to be done by hand. In order to keep from damaging the meat when the head is removed, experiments have shown that they have to stand for about forty-eight hours in--not a cold temperature, but about forty degrees. As I recall, it was around forty to forty-eight degrees, and then the heads would come off easily. And this is done by hand.

The other problem was to obtain a uniform source of salt water. We ran tests for about a year. Along the coast of Honduras there are a lot of large fresh water rivers that come into the Caribbean. The currents flow out from these rivers and follow the coastline. You have to go quite a distance into the Caribbean in order to get away from the influence of the fresh water. You cannot have fresh water in the ponds. If you get fresh water in the ponds, that kills the shrimp; the shrimp wouldn't survive. So we had to go far enough out into the Caribbean to where we would find water of a salinity that was reasonably constant year in and year out and of the correct uniform temperature. We found that the intake for the pumping plant which would deliver the water into the ponds had to extend four thousand linear feet into the Caribbean. We found this by carrying out a series of tests throughout the year, so it took us about a year to determine how far the intake would go out into the sea.

Lage: Were you down there for the whole time?

McLean: No. I went down there several times when all the work was going on. We had an office in Tegucigalpa and also a field office at the site where these tests were carried out.

One of the things that I noticed down there was that there are two levels of wealth, the very poor and the very wealthy.

Lage: Do you have some observations from your exposure to living conditions there?

McLean: You'll see that many of the people living there are very poor, although one of the things that I noticed was that all the youngsters, the schoolchildren, though many of them were barefooted and didn't have sandals, why, they were always clean. They had their clothes cleaned, washed, starched, and ironed. Even the poor were neat and clean.

To get to the coast we had to fly from Tegucigalpa to La Ceiba. The landing field there was just gravel, and of course only small planes could land there. We had to take a DC 3 flight from Tegucigalpa. The airport was just an open shed. They had one locked area where I guess they kept baggage and things that had to be stored. The airport itself had just a corrugated tin roof--an open shed. Every time you'd get off a plane there was a group of beggars. Wherever you'd go you'd find people begging. There was one woman you never failed to see down there. She had two blind children, I don't know whether they were hers. As soon as the plane would land, why, these people would come out, asking for money, and she always had these two blind youngsters with her.

Lage: It was quite a cultural shock to fly back and forth to Honduras, it seems.

McLean: Yes. I think I told you that we went one night to a birthday party for the president of the Bank of America. It was very interesting to find that the men were all in one area, and the women were in another area--no mixing of the sexes.

Lage: Were these Americans or Hondurans?

McLean: They were mostly local natives. There were a few Americans. This was in Tegucigalpa. Usually the Americans are there on business; you meet a lot of Americans on business. To my knowledge we were the only firm working down there as consulting engineers. The man who was the president of the Bank of America was American, and he could speak Spanish fluently. The engineer who was head of our office there, Leon Delhey, had worked in Peru, and although he was American, his wife was from Peru. He could speak Spanish very fluently, and he was our interpreter wherever we went.

After we had worked on this project for over a year, we finally put together our report. At that time Greyhound had taken over Armour Company. We went back to Chicago and spent a couple days there in which we presented the project to the Armour and Greyhound people.

One of the things that I forgot to mention, though I talked abut the harvesting, was the process we had to go through after the harvest. The shrimp are in large baskets, and the baskets are put in the refrigeration room. After forty-eight hours of being under refrigeration the shrimp go to the processing plant. At the processing plant they go to the women who take each shrimp and pull the head off. Then they go on a conveyor belt, and from there they're sorted according to the number of prawns per pound. They go into this sorting mechanism over conveyors, where they are graded. As they are graded, they go into five-pound boxes and through a quick freeze unit where they are frozen solid in five-pound boxes. From there they go into a large freezer warehouse. They are stacked in there until they get enough to provide a shipload. Then refrigeration trucks take the large boxes of shrimp out of the freezer warehouse, down to the docks, and into the freezers on the ship. From there they go to New Orleans or other gulf states.

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McLean: When we priced out the total cost of the project, the cost of producing the shrimp was about two dollars per pound.

Lage: Two dollars a pound loaded aboard the ship, and from then on in, the price of transportation and the middlemen--.

McLean: Yes. It was an interesting project.

Lage: It sounds as if you got involved in every step of it.

McLean: Yes, I did.

Lage: Was that your job, or you were just interested?

McLean: Yes. I was involved in the salinity test, temperatures, ocean intake pipelines, hydraulic engineering, ponds, piping, etc.

Lage: Were you working as a team with people who weren't engineers?

McLean: Yes. See, we had these people in the office at Tegucigalpa, and my job was to go down there and consult with them and go through the tests they were doing.

Lage: Kind of review the whole process?

McLean: Review the whole project.

Lage: They must have had biologists there.

McLean: Oh, yes. We also had a fellow working with us from Armour and Company. He was the biologist and the one who had been through all the previous experiments. He worked with us the full time.

We went to Chicago and appeared before the board of directors of both Armour and Greyhound. They accepted our report, which went through all of the cost data on all of the work and the various ways we had planned everything, and we submitted drawings. They took a long time to review our work, and finally, because of the political situation down there, decided not to build the project.

Lage: After all that planning?

McLean: Yes. They never went through with it.

Lage: So all of this that you are telling me is just in abstract. It wasn't really in operation?

McLean: It was never built.

Lage: Oh, I had visions of the ship coming right up to New Orleans.

McLean: We were disappointed that they didn't build it. I was really disappointed that they didn't build it, because I had put in a tremendous amount of work in it. We worked for nearly two years on it. It was pretty costly.

Lage: I would think so. And it seems to have given you some insight on cultural differences.

McLean: Yes. Oh, we had a lot of fun on that. It was very interesting. The few trips that I made down there were worthwhile. On one of the trips, flying back, we had a layover in Mexico City for nearly a full day. While we were there we went up to that beautiful museum, the Aztec museum. That was a real experience.

I can tell you the big contrast between the very wealthy and the very poor there. They use a lot of charcoal. You see it coming in large bags from the mountains on muleback. A lot of the cooking the natives do is with charcoal. The houses where they live, those that I saw, don't have glass in the windows--the windows are open--and there are no chimneys, so the smoke from cooking fires comes out the windows, and you'll see the smoke stains above the windows. All the washing, or at least a big portion of it, is done in the river. You see the women taking their big baskets of clothes to the river, where they wash them, and they carry them back and hang them up on long lines near their homes. At the airports, you go into the men's room, and all the toilet paper has been stolen; there's no toilet paper. If you have to use the toilet, you'd better have your own toilet paper. There's no soap; it's also been stolen.

We were there once during a time when they were holding the general election. The way they get people to vote, at least how it was in Honduras, is that they go out with these large army trucks. The people stand alongside the road, and they load them in these trucks and bring them into town where they can vote. Then they take them back and let them off where they were picked up. That was one of the last times that I was down there.

The airport was closed the day of the election, and we were told it would be closed. It was a Sunday, and everything in town was closed. We'd been to La Ceiba, and then we'd flown to San Pedro del Sol and stayed there overnight. We were to meet our plane at San Pedro del Sol, but the airport was closed. I called up whoever was in charge and asked if we would be able to get the flight to Mexico City, and they said, "You'll get the flight out all right. But you'll have to go through the airport; there will be a way for you to get through the airport, and then you go directly out to the plane. Don't stop in the airport."

We got down to the airport, and there were armed guards patrolling. Finally the plane came. I told them we had a flight out to Tegucigalpa, and they let us through. There were three of us on that flight. There were all these armed soldiers guarding the airport building. When the plane arrived, it just came up the runway, we ran out and got in the plane, and they closed the door. All the window shades were drawn. We went to Tegucigalpa for a stop and then to Mexico City.

Troubleshooting on a Pipeline in Ghana

Lage: Did I notice that you also had some jobs in Africa?

McLean: No, I didn't go to Africa, but I worked with Kaiser Steel on a project in Ghana. It was one of the largest reservoirs in the world, on the west coast of Ghana. Kaiser had built a large aluminum plant. A pipeline runs from the dam to the towns of Tima and Accra on the west coast. It supplies water to the aluminum plant. I was called in on that because the concrete lining had failed in the line, which was about thirty miles in length. It was a mortar-lined steel pipe. The lining was only about three-sixteenths of an inch, which is a very thin lining. It was designed by an engineering company in Tel Aviv, a Jewish company. It was well designed; there was nothing wrong with it.

The water in the reservoir has a ph of about seven, so of course it's very corrosive. It was a well designed plant, and the pipeline was well designed. They had a hydrated lime plant in order to treat the water and to raise the ph to 8.0-8.5 so that the water would be alkaline and not so corrosive. The natives didn't know how to operate this lime plant, and consequently they had just shut it down. Something had gone wrong, and they hadn't done anything to repair it. Adding lime solution to the water was necessary to prevent the corrosion in the pipeline.

Lage: And you looked at that problem from here? You didn't have to go over to Ghana?

McLean: I looked at it from here, from the plans and all the data. I did do some long distance telephoning, talking back and forth. What happened was that they started to get corrosion in this pipeline. When they started to get the corrosion in the pipeline, it started to loosen the cement mortar lining. Once the water got behind the lining it started to remove the lining. The broken lining started to plug the pipe, and it decreased the flow in the pipeline. To counteract that, they put more pressure on the pumps, and this tore out more lining. One section of pipe was practically filled with this broken lining. At the end of the line there was a reservoir that served the towns of Tima and Accra. A large amount of this lining was carried into reservoir. There were tons of it in the reservoir.

Kaiser wanted to know what could be done about it. You couldn't get in to re-line it; they needed the water. First I wanted to know what had happened to their lime plant. Was it in operation? By long distance calls back and forth to the treatment plant I found that the motors on the lime slakers had burned out, and they hadn't done anything about getting new motors. The lime machines had been idle. Then they brought in the firm from Tel Aviv that had designed the plant to look at the problem, and I gave them a copy of my report. I told them they better get the lime plant functioning; otherwise the pipeline will be leaking like a sieve, and they won't have a pipeline. They'd better get the lime plant operating and get the ph to 8.0 or 8.5 ao that they can protect the bare pipe.

One of the first things they had to do was take out the section of pipe that was filled with the concrete lining material. They had to get in the pipe with wheelbarrows and shovel the debris out. That was my recommendation. They had to shut down the pipeline for a period, as they should first fill the reservoir full and cut down on their water use. The pipeline not only supplied Kaiser's aluminum plant with water but also the adjacent cities. My recommendation was to fill the reservoirs, get the pipe opened up, clean it out, and then get the lime plant functioning so they would protect the pipe.

Lage: And just forget about the lining?

McLean: Forget the lining. There was no way they could line it, because it would take too long. I suggested that if they wanted to line the pipe sometime in the future, they would have to shut the line down for a period of time; then they could line a short section, but they would have to have a bypass. They would have to move this bypass along so that they could shut down a section, bypass it, and then re-line. Whether they ever did that I don't know, because my job ended when I made the report and the recommendation to get their lime plant going and clean the muck not only out of the reservoir but also out of the pipeline. I don't what happened after that.

Consulting on BART's Market Street Tunnel

Lage: I wanted you to talk a little bit about your consulting work on BART [Bay Area Rapid Transit]. You worked on the Market Street station and the transbay crossing.

McLean: The work I did on BART was with Ed Peterson, who was head of construction for the Three Companies. He had come from Bechtel. Ed called me in to consult with them on the Market Street tunnels. The problem there was that until they got nearly to the Civic Center on Market Street, the soil was all sand fill. In drilling the tunnel through the sand, they were getting settlement on the street. This is probably due to a number of things, not only to de-watering--that is, to removing the water--but also, when drilling tunnels like this one, they use a breast board in the heading to prevent sand from running into the tunnel. There's always a certain amount of sloughing; you cannot always prevent it. The result was that the street was settling. In some reaches this amounted about two feet.

There were two factors that came in here. San Francisco has a high pressure salt water fire line. Probably very few people know that, but they have a twenty-four-inch pipeline that goes up Market Street and parallels the BART tunnel. That's a cast-iron line, bell and spigot joints, with a special lead joint. Accordingly, as the ground settled, the pipeline settled.

Lage: So that puts a lot of stress on the pipeline?

McLean: This is what the city thought. The city was concerned that with this amount of settlement the pipe joints were going to leak. I plotted the pipeline, showing the settlement at the joints, and I didn't agree with the city. The city wanted the contractor to dig up every one of these joints and recaulk the lead joint. The 24-inch line was five feet or more below the surface. Each pipe section was twelve foot in length, and you'd have to uncover every joint and caulk it. I said I didn't agree with them. I felt that the line was perfectly all right and that it would take that settlement without any deformation or any leakage.

Lage: What did you base that on?

McLean: Because many years ago, when I had been with the district, we had a 12-inch cast-iron line that went over what was known as Standard Oil Hill in Richmond. That was when the highway went through there. We had to lower that line, and of course everybody thought we'd have to go out there, take the line apart, and lower it. Instead of that, we just dug underneath it and let the pipe come on down, which it did. I think we lowered the pipe a foot and a half or more. It never caused a bit of leakage, and that was a pipe with lead joints, the same as the San Francisco line. So the experience that I had had proved to me that there was enough flexibility in the lead joint that it could take this amount of settlement.

To satisfy the city we did dig up some joints where they indicated and proved to them that it wasn't necessary to do any caulking. That settled the problem.

Cathodic Protection, Under-Bay Cables, and Ships' Anchors##

McLean: The other problem I got involved in with the Corps of Engineers was on the anodes they had for the BART bay crossing tube. In the Oakland inner harbor, which is alongside the San Francisco-Oakland Bay Bridge, there is the Port of Oakland inner harbor. The BART train tube is just south of the harbor. At that point you have anode cables, a cluster of piles, and a cathodic station to the north of the harbor entrance. Cathodic protection is to prevent corrosion in and on the tube. Where there are stray electrical currents they are conveyed through the cables to anodes, and the bay tube is protected. Stray currents may come from street railway rails or the train operations.

Lage: From the BART train itself?

McLean: Yes, the BART trains. There are stray currents, and the tube may become an ideal transmission line for those stray currents. If you don't drain those off, they will drain off the tube. Wherever they drain they will remove metal. This is how you get what we call electrolysis of pipelines. To take care of that, like we have on the aqueducts, you must bond the joints. Then you install drainage stations. The drainage station is just as if you were draining the water off, but instead of that you're draining off the electrical currents. You drain the current off into magnesium anodes so that rather than corroding the metal on the pipe or the tube, the current goes off to these magnesium anodes.

Well, to take it from the tube to the anode beds you have a cable from the BART tube to the anode station. This was across the channel, north of the tube, where they put in a battery of piles. They had a cable that extended across the harbor entrance to the drainage station.

Lage: Did that drain the whole tunnel?

McLean: They have these at frequent intervals. The main one was in the inner harbor where the cable crossed the channel. They laid the cable right on the surface of the Bay floor.

In order to reduce the speed of ships entering the harbor, when they come into the dock they drag an anchor. Sometimes the anchor would drag the cable and break it.

The contractor was under a guarantee, so he had to replace the cable. Every time he'd replace it, the ships would come in and pull it out. They'd lost half a dozen cables by that time, and the contractor was screaming.

Lage: They didn't think that one through too well.

McLean: No. So he asked, "What are we going to do?" I recommended to Ed Peterson that they go in and dig a deep trench five feet or more in depth and put the cable in the bottom. Then cover the cable with gravel to a depth of two feet and fill the trench to the surface with large rip rap boulders--all the large rocks they can put in the trench. After that they never had any further trouble losing the cables.

Lage: I suggest that when the Port of Oakland gets its permit to dredge the channel, you'd better remind them that that's there. [laughter]

McLean: Yes. Oh, they will watch it, because it's got a sign up there.

Lage: It sounds to me as if you're a good idea man, a problem-solver. Is that something you're known for?

McLean: I think so, yes. You run into this in engineering all the time. This isn't anything unusual, you know.

Lage: But they didn't think of it.

McLean: Well, no. Believe it or not, there are lots of cables laid across the bay like that. Normally all these power cables that go across the bay are laid right on the surface. Nobody ever thinks about it. But here you had a case where they overlooked the fact that ships coming in have to slow their speed down, and they drop their anchor.

Lage: I wonder how long it took them to figure out what the problem was after they kept breaking?

McLean: Nobody stopped to think, "Dig a deep trench, install the cable, and fill the trench with rip-rap." When they did that, they didn't have any further trouble. I run into lots of things like that. That's just part of the game.

Lage: I know we haven't covered all of your consulting work, but we really should move on to your time on the district board of directors. But I think we've gotten a good picture of the kinds of things you ran up against as a consulting engineer.

XI EBMUD BOARD OF DIRECTORS, 1979-1990

Running for the Board

[Interview 8: August 5, 1991]##

Lage: This time we want to talk about the board of directors of East Bay MUD. Tell me how you ran for the board.

McLean: Well, let's go back a few years. After I had retired from the district [August 1, 1968], I had done a little consulting work for the district. They called me in on a couple of occasions on problems they had, and I worked with them on those. At that time Charles J. Wright, who was an attorney and who lived in Richmond, was appointed to the board. He had been an engineer who had worked for me on the waste water project. I knew the family quite well. He had been an officer in the Seabees in World War II, and he came to the district right after he was discharged from the U.S. Navy, when we were building the waste water project.

His wife was a legal secretary, and she had worked for the city attorney [Tom Carlson] for the city of Richmond. They encouraged Chuck to take up law, and even while he was working for the district he was studying law at night. He eventually passed the bar examination and then took up practice as an attorney after he had left the district's employ. Because he was well known in the Richmond area, he was appointed to the board of directors to fill out the term of William McNevin. When he came up for reelection, I had known him so well that I helped out on his election.

Lage: Had you done this kind of work before?

McLean: No, I had never done this before. But being very interested in the board of directors and who was perpetuated on the board, I was very much interested in having him continue, because he was a good member. He was on the board with Louis Breuner, and he ultimately did become president of the board.

I had known most of the members on the board--Louis Breuner, Howard Robinson, Bert Carrington, and also Ted Hitchcock in San Leandro.

Lage: Did you know them as an employee? Did you have occasion to know them through your job?

McLean: Yes. When we had the large projects under construction, the board members many times would come out and visit the projects. It was my duty to take them around, and I became well acquainted with all of them. K. Leroy Hamman was president of the board. He was also president of the Boy Scouts, and I was on the executive board of the Boy Scouts. I knew him personally, and I knew Ted Hitchcock very well.

Well, Ted was up for reelection in November of 1978, and I was interested in helping him out on his campaign. Lila, my wife, and I had been on vacation. I think we'd been to Montana on a fishing trip for a couple of weeks, and when I came back I contacted Ted Hitchcock and was going to help out on his campaign. It wasn't known publicly, but he had developed cancer, and after I had met with him and talked with him about the forthcoming campaign with the district, he said, "I'm not going to run for reelection because of health." He said, "Why don't you run?"

Well, that kind of shook me off my feet, because I'd never been interested in running for any political office. But he said, "You go ahead and run, and I'll endorse you." So I went to the district office, and I'll never forget this. John Plumb was the secretary of the district at that time, and you'd get your nomination papers from the district. I went down, and I said, "John, I want nomination papers to run for Ted Hitchcock's seat." He said, "You!? You want papers?" And I said, "Yes. Is there anything wrong with that?" He said, "No, I guess not."

[the following section was revised during the editing process by Mr. McLean, with the assistance of his campaign manager, Jim Zeno]

McLean: My previous campaign experience was limited. I did some campaigning in 1974 for Charles J. Wright. In 1976 I served as finance chairman for Bert Carrington and Bill Moses to the water board. Art Ames, like myself another retired EBMUD employee, was chairman.

My first of four elections for the water board was on the November 1978 ballot. Ted Hitchcock was chairman, and Bill Groeniger was finance chairman. I engaged James V. Zeno, Sr., a San Leandro public relations and media consultant, as my campaign manager. Zeno brought a strong, winning track record from previous EBMUD campaigns. He had managed the $252 million water development bond campaign in 1958, plus winning campaigns for Charles Wright, Bert Carrington, Ted Hitchcock, and other EBMUD directors during elections spread over two decades, from 1958 to 1978.

In my second, third, and fourth campaigns, Zeno continued as campaign manager; and Jack Maltester, former mayor of San Leandro, and James Dieterich, past president of the Alameda County Taxpayers Association, served as chairman and finance chairman respectively. The steering committee also included co-chairmen Bob Tucknott and Ted Kuntz of Castro Valley, and Dick Karn of Hayward; co-chairwomen Cecile Johnson and Violet Zeno of San Leandro; and publicity director Jim Zeno, Jr., of San Francisco.

Lage: What media did you utilize to get the "Elect McLean" message across?

McLean: We used direct mail, including brochures and postals targeted to the five cities in Ward 7, with its more than 100,000 residents; publicity stories; newspaper ads in the <u>Hayward Review</u>, <u>Oakland Tribune</u>, <u>San Leandro Gazette</u>, <u>San Francisco Chronicle</u>, and <u>San Francisco Examiner</u>; more than 2,500 outdoor signs; pencils with McLean punch-lines; business-size election cards; pamphlets; handbills; and other materials. [See following pages for sample campaign materials, 1978-1990]

Lage: Did you have any campaign slogans?

McLean: Yes, I had several: "Elect Walter 'Mac' McLean, East Bay MUD Water Director--Best qualified by on-the-job experience." "Elect Walter McLean--Keep high quality water at reasonable rates."

Lage: How did you personally campaign?

McLean: The best way to get elected is getting yourself known and implanting your name and office sought in the minds of the voters, trusting they'll remember to vote for you on election day. I attended an average of a hundred meetings and public gatherings before each election. I was given a courtesy introduction at many of these meetings. With my on-the-job campaign manager and volunteers, we passed out hundreds of small "Elect McLean" cards. We pursued this route for more than a year and a half before each election day. Many candidates punch doorbells; I never did, because I was also busy with my consulting engineering practice in

San Francisco. I took time off to attend public luncheons and dinners, after which I returned to work in my San Francisco office. Between my professional assignments and running for office, I was putting in a seventy-five-hour week.

During my first campaign in 1978, I was extremely busy. I had several legal cases and was working on litigations. Also, I had a large pipe job in Virginia. I had to go there once a month, flying to that project. Obviously, I didn't have time to walk precincts in five cities in Ward 7. Therefore my presence at public gatherings, with one hundred to five hundred in attendance, was the best opportunity to shake hands with potential voters.

Lage: Were there issues that had to be discussed?

McLean: Many issues, primarily the American River water rights and the proposed Buckhorn Dam, both relative to water supply and storage. Future water supply was a key theme of all four of my election campaigns.

Lage: Was there any relations to party politics?

McLean: Not in behalf of my three winning campaigns, which were conducted on an independent, nonpartisan basis. However, in each of these successful races the opponents linked their campaigns to political parties. These were fundamental errors on their part, because consumers disdain partisan ploys in the administration of water development. In contrast, we distributed literature documented by background qualifications, with emphasis on my credentials synonymous with my water development training and experience. Zeno, Sr., and Jim Zeno, Jr., did most of the campaign writing. In all of the material and copy they prepared, you will not find one reference to a political party.

Lage: What was the basic structure and format of the EBMUD campaigns? Were the individual members of the water board elected by all the voters in the district?

McLean: Before my tenure on the water board, five members were elected at large by voters in Alameda County and Contra Costa County. When I ran in 1978 to succeed Ted Hitchcock, the utility district boundaries had been revamped, and the board had been expanded from five to seven members, each representing one of the seven areas. I ran in Ward 7, representing San Leandro, Castro Valley, San Lorenzo, and portions of East Oakland and Hayward. Helen Burke of Berkeley, who was elected in November 1974, promoted the seven-ward system, which went into effect January 1, 1974, and facilitated her election the following November.

ELECT Mc LEAN FOR LOWER WATER RATES. . .NO TAX INCREASE

Campaign Brochure
1978

VOTE
WALT Mc LEAN
FOR LOWER WATER RATES

ELECT WATER RESOURCES LEADER

WALTER R.

Mc LEAN

EBMUD DIRECTOR, WARD 7

Please vote Tuesday, November 7, 1978

WALT Mc LEAN is supported by civic, fraternal, professional, labor, industrial and numerous other community leaders

Citizens for the Election of Walter R. Mc Lean

Clifford Asbill
Bettie Agliano
Joseph Agliano
Gus Beckert
William J Bettencourt
Joseph M Bettencourt
Helen A. Bettencourt
Jill Brenneman
Dudley H Beeson
Elizabeth S. Berg
Douglas Berg
Georgia A Coppa
Lucial P. Colby
Elizabeth Cordoza
Violet S Cobb
Wilma Castillo
Bob Coney
Richard B Cowell
Jerry Connitt
Anne Howell Dean
John A Deadrich
Paul Davis
Marcia Davis
Aldo Davalle
Carolyne Fahrbach
Charles E. Foster
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Jesus Gill
Valance P Gill
Val Gill, Jr
Charles Gebbardt
Robert Goddrich
Anthony Gomes
Virginia Gebhardt
Wilma Gebhardt
Mark Gebhardt
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Paul Hertzog
Gertrude Hertzog
Dave Houser
Richard Houser
Nancy Lynn Holm
Charles R. Hitchcock
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Sadie Jackson
Edna Mae Johnson
H B Johnson
Robert G A. Jones
Guy T Kuntz
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Layton Landis
Virginia Leger
Evelyn Lowman
Jeffry J Lewis
Jack D Maltester
Ruth Maltester
Richard Mills
Anne Milhiser
Edward B McLean
Lila R McLean
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Theo Maillet
Charles Matzen
Frank Middleton
Donna Nicholas
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Helen Olsen
Peter Paletta
Lillian Paletta
Bill Quarry
Allan Ramos
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Belinda Rapold
Joe Smith
Joe T I. Smith
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Richard Soares
William Soulis
Don Spruance
Everett Tasto
Jane Tasto
Robert Turknott
Victor Viviani
C. E Wilson
Mary Wilson
Richard Wilson
James V Zeno
Violet M Zeno

BEST QUALIFIED BY ON-THE-JOB EXPERIENCE

ELECT

WALTER R. Mc LEAN

A Proven Water Resources Leader

- Mc LEAN is former manager of both the Field Engineering and Special Construction Divisions of the East B Municipal Utility District.
- Mc LEAN was associated with or responsible for studies, design, construction and development of all water fa ities at EBMUD for more than 30 years.
- Mc LEAN left EBMUD in 1968 to form his own firm as a Consulting Civil Engineer specializing in Water Resourc
- FOR THE LAST 10 YEARS, Mc LEAN has been a consultant on Water Development Projects and U.S. Envir mental Protection Agency Grant Projects throughout the United States.
- MC LEAN was chairman of the Citizens' Shoreline Commission, whose feasibility studies led to the developm of the San Leandro Marina and adjoining golf course.
- Mc LEAN'S water administrative affiliations include:

  Past President, American Public Works Association
  California Water Resources Association
  American Water Works Association
  Society of American Military Engineers
- McLEAN is the only candidate in the field of seven, with **water development experience — that's what this elect is all about! Mc LEAN knows the job!**
- Mc LEAN, with his educational background, training and knowledge of EBMUD, plus his broad experience a consulting Civil Engineer, is the **best qualified** candidate for Water Director of Ward 7, representing San Leanc Castro Valley and East Oakland. That's why C. R. (Ted) Hitchcock, retiring water director, and the overwhelm majority of the city officials responsible for the needs of those communities, have endorsed Mc LEAN for the wa Board of Directors.
- Mc LEAN pledges to fight for lower water rates (such as eliminating the extra charge for drought conditions t were controlled as of last February 1).
- Mc LEAN pledges to fight for the full value of every tax dollar in the true Jarvis—Gann spirit expressed by people at the June election.
- Mc LEAN is Vice-chairman of the San Leandro-Castro Valley-East Oakland Committee for Lower Taxes. In dition to his water service, Mc LEAN has established a record of professional and civic leadership:

  Current Chairman, San Leandro Board of Appeals. . .prominent member of California Alumni Associat (majored in civil engineering and business administration). . .Society of California Pioneers. . .Ameri Society of Civil Engineers (Fellow and Life Member). . .Consulting Engineers Association. . .Engineers C of San Francisco. . .Board of Directors, Bay Area Council Boy Scouts of America. (Presently, Chairma Physical Properties Committee). . .Silver Beaver Award, Boy Scouts of America. . .Arthur Greulich Awa Camp Fire Girls of America. . .United Crusade. . .Red Cross. . .Many other Community, Fraternal and Yo activities.

Notice To All Citizens

Don't Be Fooled! By Law, the EBMUD Water Board is a Non-Partisan Independent Office; Whatever Your Party Affiliation, You May Vote For Walt McLean on Tuesday, November 7. His Name is on Your Ballot.

McLean Campaign Committee: 655 Montague Avenue, San Leandro - William Groeniger, Finance Chairman
C. R. (Ted) Hitchcock, Honorary Chairman

opeiu-3

ELECT Mc LEAN FOR LOWER WATER RATES. . .NO TAX INCREAS

EBMUD Campaign Committee
To Re-Elect
Walter R. McLean, Water Director, Nov. 4, 1986

Election Results
1986

655 Montague Avenue • San Leandro, California 94577 • Telephone 357-4330

Jack Maltester, Chairman

Jim Dieterich, Jr., Finance Chairman

December 3, 1986

Memo to: Walter R. McLean, Incumbent EBMUD Director, Ward 7
From: James V. Zeno, Political Consultant and Campaign Manager
Subject: RESULTS - Area breakdown, November 4, 1986 Election

	McLean	Hindshaw	Cryer	Kinder	McLean margin over Hindshaw
San Leandro	8,705	6,049	805	1,201	2,656
Un-Incorporated (Castro Valley, San Lorenzo, Hayward area)	10,496	7,756	2,447	970	2,740
Hayward (City)	306	228	36	28	78
E. Oakland	1,601	1,563	138	167	38
TOTALS	21,108	15,596	3,426	2,366	5,512
	(50%)**	(36%)	(9%)	(5%)	

Absentee Vote (Included in above results):

McLean	1,485
Hindshaw	703
Cryer	236
Kinder	148

Precincts won by: McLean, 116; Hindshaw, 21.

**McLean's total with <u>four contestants in one race</u>, was the highest victory percentage in EBMUD election history. With the third and fourth candidates garnering a combined 14% of the total in this (11-4-86) plurality race, 44% was needed to win first place.

McLean	21,108
Hindshaw	15,596
Cryer	3,426
Kinder	2,366
TOTAL VOTE	42,496

cc: Maltester, Tucknott, Dieterich
Kuntz, Johnson, Jim Zeno, Jr.

Campaign Materials
1990

RE-ELECT

WALTER R. McLEAN

A Proven Water Resources Leader

EBMUD Water Director
Ward 7

(Covering San Leandro, Castro Valley, Hayward, East Oakland)

VOTE TUES., NOV. 6, 1990

Jack Maltester, Chair., Jim Dieterich, Fin Chairman

EBMUD Campaign Committee I.D. 761261
655 Montague Ave., San Leandro

BEST QUALIFIED BY ON-THE-JOB EXPERIENCE

Re-Elect McLean • Best Qualified By On-The-Job Experienc

KEEP OUR WATER RATES LOW

KEEP OUR WATER CLEAN AND PURE

KEEP OUR WATER SYSTEM SAFE AND SECURE

KEEP TOUGH ON TOXICS

PROTECT OUR WATER SUPPLY

PROVIDE WATER STORAGE FACILITIES

CONTINUE EBMUD'S WATER CONSERVATION PROGRAM

KEEP McLEAN

EBMUD

Lage: Did you hook in with any other candidates running for other offices?

McLean: No, in my winning campaigns that would have been antithetical to my policy of separating our election race from partisan persuasion.

Lage: Wasn't that the time when a group called PACE started endorsing water board candidates?

McLean: Yes, Helen Burke emerged as the storm symbol of their anti-development philosophy. In fact, several groups dubbed as "no-growthers" opposed my candidacy during all four of my election campaigns. They were unsuccessful in my first three winning four-year campaigns. They scored in my quest for re-election as an incumbent to a fourth term in November 1990. Unfortunately, this happened on the same ballot when voters passed a two-term-only limitation for state officeholders. This voter revolt carried over to district and local elections and helped defeat many incumbents who were overcome by the "too long in office" syndrome that is peaking out in the 1990 decade.

Lage: What groups endorsed you?

McLean: Union entities: the Operating Engineers, headed by vice president Bob Skidgel; the Building Trades Council; the Carpenters Union; and the Associated General Contractors.

Lage: Where did you encounter your strongest opposition?

McLean: It came from the Alameda County Central Labor Council, two EBMUD employees union affiliates, and the Sierra Club.

Lage: What was the composition of your grassroots support?

McLean: A citizens committee labeled "1,000 Citizens for McLean." These volunteers were recruited by Zeno Associates through signature petition solicitation and "people to people" polls and interviews. This committee passed out McLean literature door to door in the neighborhoods. They also furnished women and manpower for the "McLean telephone callers."

Lage: What was the motive of the three labor organizations that endorsed you?

McLean: They were strongly interested in the water district contracting out work to the private sector and creating more jobs. I'm referring to the Operating Engineers, Building Trades Council, and the Carpenters Union. Paradoxically, the Central Labor Council supported the "no-growth" candidates at the financial behest of their EBMUD employee union affiliate, two large groups of dues-paying members. And therein lies the sad water election tale: three incumbents--McLean, Mary Warren, and Sandy Skaggs--who decided to quit the political wars are out! Today candidates sponsored by the "no-growth" elements have seized control of the East Bay Municipal Utility District board of directors, and are in!

[end of revised section]

The Contracting-Out Issue

Lage: You believe in contracting out?

McLean: Yes, I've always believed in contracting out, because I think that is the most efficient way for work to be done by the district. It is true that there is a lot of work done by district forces that cannot be done by outside contractors. But installation of new pipelines, the construction of reservoirs, and even consulting work can be done by outside firms. I have always believed that that is the most economical way for public organizations to operate.

Lage: Did you observe something as an employee that developed that belief?

McLean: It's from my own observations.

Lage: But why?

McLean: Well, I'll tell you why. To begin with, when you take an organization within a public entity, you have a force of people to take care of X amount of work. Sometimes to keep that force busy you generate work that is not necessary. Furthermore, you have to look at inclement weather--rainy weather and such as that--in which your forces can't work, and there again you make work which sometimes is not necessary to keep the personnel occupied. With contractors, first of all they go out to bid; you get the lowest, most responsible bidder. Those people come on the job and do the job; and when they are finished, they are finished and are off. You don't have anybody that is on civil service, on a payroll that you have to carry because he is a permanent employee.

I have always believed that all of the work that is possible to contract out should be contracted out. I've always believed in private contractors. That is through my years of working, you might say--to begin with, in the private sector, and then being in charge of millions of dollars' worth of work with the district on big contract work. You know, a public organization cannot gear up to do big work, like building the Mokelumne Aqueduct or something like that. It could be done, yes. But the big contracting firms have the equipment, and they have the skilled personnel carry out big projects, whereas the district does not have qualified people.

Now, when it comes to installing services, replacing small mains, or things like that, the district maintenance and operation personnel are highly qualified to do that, and you can't compete with them. But when it comes to installing big pipelines and building dams or things like that, there are not the personnel to do that.

Lage: Is there a difference of opinion on that?

McLean: Oh, you bet there's a big difference of opinion. The district personnel would like to do everything.

Lage: And hire more--?

McLean: Yes, hire more people. But I disagree with them. The whole time I was on the board I was very much against expanding the district forces to do more work. My philosophy has always been that the district should have a force of people, engineers and maintenance people, who can handle basically all the routine work that comes to the district. When it comes to replacing small lengths of pipeline, installing services, and doing all those jobs, this is what the district is highly qualified to do, and this what they should be doing. But when it comes to larger work, not only in the engineering department but larger projects, then those projects should go out to the private sector.

There are a number of reasons. Let's look at the engineering part of it. The district's engineers are highly qualified, they are very fine people, a good organization. But unfortunately they don't get into enough of a variety of work so that they know what is going on on the outside. The private consulting engineer does a large variety of work to survive; he does everything, all types of work. Those people are far more experienced in some jobs, like the design of a dam or many things like that, where the district does have qualified people. Consequently, that type of work should be contracted out. And on big construction projects, building reservoirs and other projects like that, this is the place to contract out.

Lage: Has that been the policy overall? Has your view prevailed?

McLean: Originally it was the policy of the district. Way back in the early days, this was the policy of the district. And it was the policy of the district because the people who had come over from the Bureau of Reclamation were great believers in that. They believed in a small organization and then contracting out everything beyond that. That carried for a long, long time, but later on the district forces began to build up more and more. The Municipal Utility District Act, as it's known, says that the district shall contract out any and all work that cannot reasonably be done by district forces.

Well, that leaves a little loophole there, and that's unfortunate. There has always been quite an argument--or disagreement, I should say--between the unions at the district and staff and board. While I was on the board, when it would come to cases like pipeline installation or other work, we said that anything over four thousand feet of pipeline had to be contracted out. The unions always wanted to do more; of course they want to do more all the time and build up more and more personnel. We always had a restraint on that, and that's why we've always tried to keep the forces in the district at a fixed number of people.

Lage: Is there a trend towards more work done by district forces, do you think?

McLean: Well, I don't think there's been any change. The fact is, I'm not so sure what they're doing now. With this new board that was virtually elected by the unions, I'm afraid there's going to be some slippage on this. I know that myself, Sandy Skaggs, and Mary Warren were always in favor of holding the line on increasing personnel.

My philosophy has been this: If you take the average amount of work that the district does, this should be done by district forces, and you can draw that line at a certain point. Any peaks above this, any time that you have a lot of work that comes in, it should be contracted out. And I mean this both from an engineering standpoint and a construction standpoint. I think this is good business, and this has been my philosophy. This is why private industry has backed me for the board.

Lage: The unions as well as the contractors?

McLean: That's right. Not only the contractors, but the labor unions and everybody else, because they have believed in my philosophy on this. I think this is the most economical way for any public entity to work. This is the way that they should work. You should have enough people for emergency and to carry on the general operations of the district. Those people are skilled; they're qualified to do the work. But anytime that you have anything above that--that is, peak work where you have to build a reservoir, a dam, a big pipeline, a big pumping plant, or anything like that--then that should be contracted out, both from the engineering standpoint and the construction standpoint.

Lage: Okay, I'm glad we got into this.

McLean: This is the way public entities should work.

Lage: Let's get to something I wanted to discuss about your board membership. Were environmental issues raised during that first election?

McLean: I don't think any environmental issues ever came up in the early elections at all. It wasn't until this last election that the environmental issues began to rear their ugly head, you might say. I think this occurred when Nancy Nadel came on the board. She worked for the Environmental Protection Agency in San Francisco.

Lage: And she came on just at the last election?

McLean: Yes. She came in on the last election, three years ago in 1988.

Lage: Is it every four years that they run?

McLean: Yes, four years. She's up for election in '92, and she came on in '88. She defeated Ken Kofman. Helen Burke also has always been a very strong environmentalist.

Representing Ward Constituency on the Board##

Back-Flow Devices for Wells

Lage: Did you see your role on the board as representing the views of the people of this ward or more making use of your expertise?

McLean: I do feel that I represented this area, my ward, that I represented those people on the board. We met with groups on three or four occasions, but as a general rule, if I received a request or a complaint from someone, from a constituent in my ward here, I immediately followed it up and pursued it as to what the request was and what I could do about it.

A good example was in reference to the back-flow devices for wells. In my ward I guess I had most of the private wells. There were a couple thousand of them in this area. You see, when this area was developed, particularly in San Leandro and Castro Valley, they were all little farms. Even in this area they originally were little farms, maybe one acre. In fact, this prcperty of mine was a part of an acre farm. I guess if you look at it, Castro Valley used to be a group of little chicken farms. Most of them were five-acre plots, and there was no water supply out there; it was all private wells. When you bought a piece of property, you drilled a well for your water supply.

Lage: So there's an aquifer underneath this area?

McLean: Yes, there is an aquifer. Fact is, there's a well next door, and there's a well across the street that they use for irrigating their gardens. And I think the house in back here that I bought my property from had a well on it. I would judge that within my ward, and this includes Castro Valley and around the Marina and that area out there, I forget what the count was, but there were a couple thousand wells.

The Clean Water Act of several years ago said that all private wells within an area where there was a domestic or public water supply had to have a back-flow device on it. The purpose of that was so that if you were connected to the utility district supply, you could not get the water from the well into the public water supply. They have to have back-flow devices. You'll see these in many, many, places around here; well, up here at the San Leandro high school they have a well for irrigating their lawns and all their shrubbery, and they have back-flow devices. A back-flow device is a unit that has check valves on it and two little pet cocks, as we call them, or gate valves, for checking whether there is any pressure on the one side that could permit water to flow into the utility district system.

Well, the district notified all those that we knew had private wells. Now, a lot of them we didn't know; a lot of the wells were not revealed. Of course we notified the people that they would have to do something about these private wells.

Lage: Was it an expensive procedure?

McLean: The average cost was around a thousand dollars or more, and in some cases up to a couple thousand dollars. What happened was that the district sent notices to those who had wells, that this had to be taken care of within a period of time. Of course, my phone got to ringing with calls from these people: "What are we going to do about it?" It required them to install this back-flow unit, and then it had to be checked and inspected. Well, some of them went ahead with the installation. After hearing from many of the people with wells who could not afford the cost, I discussed it with the general manager and asked why we couldn't do it free of charge or at a very small charge. In many, many cases these people were only using the well for irrigation; it was not connected to the house supply.

Lage: How did it get into the system if it was separate, if they just used it for irrigating?

McLean: Well, it did not. But you see, the act does not define it. It says that whenever there is a private well on the property you must install this back-flow device. Now, some people did have it connected to their house supply. Others, like those who live over near me, only use the well for irrigation; but they still had to put in a back-flow device. The one across the street is the same way. You still have to have it on the utility district supply. And this is in case--let's say that something happens to the water supply, if we got into an earthquake situation where there was no water or something like that. All they'd have to do is make a little connection from their well to their house supply, and they would have water for their toilets and other uses. So it was because of the chance that they could connect to the house supply that they had to install the back-flow unit. Most all of these are installed right outside the house or very close outside.

Anyway, because there were so many of them and because of the cost--to have a plumber come and do the work, the cost was anywhere from one thousand to two thousand dollars. To put out that large amount of money was difficult for many of the homeowners, particularly in my ward.

Lage: So you suggested the district do it?

McLean: Jerry Gilbert and I talked quite a little bit about doing something about it, and finally the district came up with the idea that we could make up our own units, and we would install them free of charge. I was one of the ones who pushed to do this. The result was, as far as I know, that many of them have been changed to date. They're still working on it; they haven't changed all of them, but they are working on all the ones that are known. The district is doing it as part of the work. But that was one of the issues that came up four or more years ago. Most of them were in my area.

Lage: Did other board members object to this kind of--?

McLean: They went right along with it, and everything was okay. But it did save the people a lot of money on the installation of the back-flow device. Of course, industries like Gerber Foods that used to be here had their own wells. Granny Goose had their own well, and Fleischmann's also had wells. But those back-flow devices, which are large, were installed at the time they received service. Many of the small wells out in my area were virtually unknown, and people were using them for irrigating lawns and gardens as a matter of course. Fact is, some of them even occurred after the drought. When the drought of '76-'77 first started, some people even drilled wells.

Lage: I heard they had water witches coming and locating water.

McLean: Oh, yes, you bet. They went in and put in wells so that they could irrigate their shrubbery and gardens. That was probably one of the biggest issues that I had during my time on the board.

Lage: Of a local--.

McLean: Yes, of a local nature. And I took care of most of them.

Stand on Buckhorn Dam and Elevation Charges

Lage: What about on the broader issues that the district faced, say on how rates should be set? Did you feel you were representing your people or some larger--?

McLean: Yes. Yes I did. On the rates and even on Buckhorn Reservoir. I had several occasions where I addressed people not only on Buckhorn Reservoir but also on the need for the American River supply, in which I pointed out to them that Buckhorn Reservoir was needed for many reasons, particularly after the first reports came out.

Lage: I don't want to get into a whole discussion of Buckhorn yet but more on how you operated on the board. Did you try to find out how your district felt, or did you try to shape your district's opinion?

McLean: I don't know whether you remember Measure Z.

Lage: Yes.

McLean: Why, all of my area voted for Measure Z, for Buckhorn Reservoir. I have the records here, which I saved. I always believed that

that was influenced by my talks that I gave before people as to why we needed more storage. That was not true of Oakland--of course I had nothing to do with Oakland--and Berkeley voted overwhelmingly against Buckhorn, as you know. But my ward carried fully on that. I don't know whether I was influential on it or not, but I think that in talks I gave before the Sirs, the Rotary Club, and various other organizations, it had something to do with the vote.

Lage: Before the "Sirs," did you say?

McLean: Sirs. That's an older men's organization. "Sons in Retirement" is a national organization. I gave a talk before them in Castro Valley, at the Willow Park Golf Course, and on two or three other occasions, at the Blue Dolphin and several other places. On general overall water issues, but particularly related to storage. I'm sure that had some effect upon the vote in my ward.

In regard to the water rates, I received many questions on water rates. I always explained very carefully to them so that they would understand why the rates were necessary. I had very little of it in my ward, but one issue was the so-called elevation charge. I think there is a little of it in the Fairview district and some in Castro Valley. There are some people out there who have the elevation charge, and I really never heard any complaints in reference to it. However, I was never in favor of it. I felt that there was a little discrimination with it, and all the time I was on the board I tried to get it changed, but I was not successful.

Lage: That seemed to be part of a larger trend toward rates reflecting the actual cost.

McLean: That's right.

Lage: That's something that you don't agree with?

McLean: No, I don't agree with it. The purpose of it--and this was fostered by Jack Hill and Jerry Gilbert, all due respect to them. They felt that people who lived in the higher elevations, because the water had to be lifted up to reservoirs for the higher elevations, should pay that additional cost, the so-called energy charge. I always felt it was more equitable to have the same rates for everybody, and I'll tell you why. Number one, a good portion of the elevation charge is related to areas like Orinda, Lafayette, and maybe a little of Moraga, but the bulk of it is out in the San Ramon Valley. Now, the district every year has a replacement cost. Part of the annual budget is the cost for replacing old mains. Everybody pays for that, whether you live in the elevation charge area or in a low area. It's part of the budget--replacement of more or less ten miles of pipe every year. Practically all of the replacement work is in the area west of the hills.

Lage: The older-?

McLean: The older areas. In Alameda there are pipes that are over one hundred years old. Alameda had what we called old sand-cast, cast iron pipes. Many of those have corroded so badly that you can only get about half the flow through them of what the normal capacity would be. All of this replacement program has been going on since the district took over the East Bay Water Company. Well, you have to take a look at the areas, particularly Orinda, Moraga, Lafayette, Walnut Creek (well, Walnut Creek may not be so much), Danville, and San Ramon; they're all in elevation areas, but they're also paying for replacement of mains over on this side. Whereas all of those installations over there are practically new; Pleasant Hill was started in the late forties, early fifties, and the piping in Castro Valley was put in somewhere in the late thirties, I believe, just before the war. Most of those are new pipes.

Lage: So you think it kind of balances out, the elevation and the replacement fee?

McLean: What I'm saying is that you are charging people because they live in the higher elevation areas; you charge them an energy charge. But they're also paying for the replacement of these pipes over here. I've always said that if you're going to require them to pay an elevation charge, then you should charge the people west of the hills for pipe replacement and not the people east of the hills.

Lage: How did your fellow board members react to that?

McLean: Well, I could never get it through; that is, I couldn't get it through the general manager.

Lage: Oh, even the general manager?

McLean: I couldn't get it through him; he didn't see the logic of it. That's why I said everybody should pay the same rate. In other words, those people who had the energy charge--forget about that. And forget about the fact that the people west of the hills have the costs of all the replacements. But we never did get very far. I fought that down to the bitter end. Even up to the time I left the district I was still talking about it.

The Proper Role of the Board vis a vis Staff

Lage: I'm trying to get a sense of how the staff, and Jerry Gilbert in particular, related with the board. You mentioned that you could never get your plan through Jerry Gilbert.

McLean: The board is a policy-making board. I know that I and none of the other directors ever got into the day-by-day work of the district. This was out--verboten, you might say. I have always believed that. Of course, I had lots of personal discussions with Jerry, but Jerry ran the staff. He was the general manager of the district, and we let him manage all the affairs of the district. The board established the policies, and if there was anything of a policy nature that would come up, why, it always came to the board for approval or disapproval, discussion, and everything else. I headed the planning group for pretty nearly the whole time that I was on the board.

Lage: Now, what was the planning group?

McLean: Any of the projects to go in the budget or any of those things that came from the staff went through the planning committee. I was also on liaison board between the district and the East Bay Regional Park District.

Most all of the planning that the staff was working on came before the planning committee--the new projects and everything else.

Lage: Did it also involve rates and things like that?

McLean: No, rates came under finance. But the planning committee, which I chaired, mostly was the new building and the various other projects that were either in the mill or were under construction.

Lage: How closely did you look at that as a board member, but also as somebody with expertise?

McLean: Well, we looked at it very carefully, not only from a feasibility standpoint but also the cost standpoint.

Lage: Did you look at it as an engineer?

McLean: Absolutely; you bet I did. I took a very careful look at it. We always had discussions on it. Then they were approved, and our recommendation went to the board for voting. When it came before the board, it was up to the board whether to vote yes or no on the committee recommendation.

Lage: Was there any difficulty in working with staff?

McLean: Oh, no. If it was an engineering project, as most of them were, we had Dennis Diemer. If it was waste water, we had Wally Bishop. We'd go through all the charts and the costs and listen to their recommendations. We also had Ted Way, the chief engineer. They always came before the committee with the costs and the charts.

Lage: Do you remember any instances where you helped modify plans?

McLean: I don't recall any, but I'm sure there were. I'm sure there were suggestions made by the committee. Then they went back to do changes and came back again for a review and recommendation. We covered a lot of projects and a lot of work on the committee. That was one of the main committees. Of course, there were also the finance committee and the human relations committee.

Lage: But you didn't sit on those?

McLean: No. I didn't sit on those. I did sit on the retirement board. I was on the retirement board I think for the full time that I was on the board of directors. There were a lot of things that came up while I was on retirement board which we went over very carefully. One thing I can say is that there was a very definite separation between board and staff. We left staff alone, which I understand is not true with the present board. They want to get involved in everything.

Lage: Was that the consensus on the board as you served on it all those twelve years?

McLean: Oh, absolutely.

Lage: Was there a change in balance of power between board and staff during those twelve years, or do you think it remained about the same?

McLean: It is my suspicion that the relations between the board of directors remained about the same. The board of directors stayed away from the day-to-day staff operations.

Lage: You had [A. C.] Carrington, yourself, [Sanford] Skaggs, [William P.] Moses, [Kenneth] Simmons, and [Helen] Burke; and [Jon Q.] Reynolds was president when you came on.

McLean: That's right. Yes. Skaggs and I were new.

Lage: And you had John S. Harnett as general manager until April '81.

McLean: Yes.

Lage: How did that board function with staff?

McLean: There was a good relation between the staff and the board. Burt Carrington had been on for a long time, Bill Moses I think was either in his second or third term, Jon Reynolds was in his second or third term, and Helen Burke had been elected to the board in 1974. When the ward concept was enacted by the legislature and the board enlarged from five to seven directors, C. R. "Ted" Hitchcock was the other director to fill one of the two new seats in Ward 7.

Hiring Jerry Gilbert as General Manager, 1981

Lage: And Mr. Harnett was general manager. How did that board work with Mr. Harnett?

McLean: All right. What happened was that John S. Harnett had come to the district as an assistant to John McFarland. He was a colonel from the Corps of Engineers. I forget how long his term there was, but he came in somewhere in the mid-sixties as an assistant to John McFarland. When Joe DeCosta retired as chief engineer in 1965, McFarland appointed Harnett as chief engineer. There was quite a change at that time. Harnett remained as chief engineer until McFarland left [in September 1968], Harnett became general manager, Walt Anton was promoted to director of engineering, and Don Larkin became chief engineer.

They were not the best qualified, you might say, to carry out the policies of the district.

Lage: The team that was in place?

McLean: The team that came into place.

Lage: So when you came on the board--?

McLean: When I came on the board, there was considerable discussion about the attitude of the staff. We were not moving ahead with things like the American River and projects to carry the water supply into the next century and a lot of those things. The American River litigation was being handled by the legal department. Walt Anton was director of engineering, Don Larkin was chief engineer, and Gordon Laverty was in charge of distribution. They were not qualified for the job.

Lage: Did you know that from your previous work with them?

McLean: From working with them. I worked with all of them. Don Larkin was a sanitary engineer. It was just one of things where no progress was being made.

Lage: And Mr. Harnett was not the greatest leader either?

McLean: That's right. He was not the best leader in the world.

Lage: Did other board members agree, or did you know this from the insider's view?

McLean: They agreed. Finally we asked Jack Harnett to resign, and that's when we brought Jerry Gilbert aboard.

Lage: It seems to me that you told me there was some story behind either the resignation or bringing on of Gilbert.

McLean: Yes. The story behind Jerry Gilbert was this: We had one of these head-hunters, as you call them, out to find a replacement for the general manager. It finally was down to two persons. One was an Afro-American, and I think he was in the waste water department or a similar position in Washington, D.C.; and Don Paff, who was the manager of the Las Vegas Valley Water District. Don had previously worked for me in the district. He was my project manager at Briones Dam, and he had been with the district previously. A very good man.

We had interviewed both of those men, and we had had them bring their wives to dinner. We had a room at the Holiday Inn near the Oakland airport where we carried out all of our interviews. When we got down to the final interview we also had them bring their wives so that we could meet with them in a social atmosphere. When we finally got down to voting, it got down to a deadlock of Simmons favoring the fellow from Washington, D.C., and he had with him Jack Hill and Helen Burke.

Lage: In '81 [Jackson] Hill and [Kenneth] Kofman came on, replacing Moses and Carrington.

McLean: It was myself, Kofman, and Skaggs who were for Don Paff. Then there was Hill, Burke, and Simmons for the other person from Washington, D.C.

Lage: And you had one more person. Who was that other person?

McLean: Jon Reynolds.

Lage: He was the president.

McLean: Jon Reynolds was president. And Jon wouldn't vote to break the tie.

Lage: Why not?

McLean: I don't know. He wouldn't vote.

Lage: Is it usual for the president not to vote on these things?

McLean: Well, yes, it's possible. He wouldn't vote, and we were deadlocked for two or three sessions. Every time we went through this situation we were deadlocked. On Sunday evening I received a phone call at my home. It was Jerry Gilbert. Jerry said, "I understand that the board is deadlocked on the general manager issue." I said, "That's correct." He said, "Do you think there's any chance for me?" I said, "I think there's a terrific chance for you, Jerry."

Lage: Where did Jerry come from?

McLean: Well, Jerry had been with the North Marin Water District, and he had also been on the State Water Resources Board. He'd been the executive director of that at one time. Then he left and went into the consulting business. How I happened to know him so well was that I had been called in by his firm and another consulting firm in Sacramento because they had a problem on what they called the I-5 interceptor, which was the large sewer pipeline from the waste water treatment plant on the Sacramento River to a big holding basin near the I-5 interchange structure in Sacramento.

What had happened there was that they had a budget of about twelve million, and when they had finished the final design of the interceptor the cost was up to about sixteen million. They didn't know what to do. They called me and asked me to take a look at this and see what I would suggest. I spent several days walking the project and looking at the aerials, and I finally came to them and said, "Here is my suggestion." Number one, they had this routed all the way around through city streets and under the I-5 interchange structure. They had a ceiling there, which was going to be hard to get equipment under, and they also had to drive some long sheet piles.

I said, "I'm going to recommend that you do this. Number one, you'll follow the freeway through the city housing area and school property alongside the freeway, through the housing area of the Sacramento Housing Authority, and cut the end of an apartment building off so that you can get through." They said, "Oh, my gosh! We can't cut the apartment building off." And I said, "Well, why don't you go to the city and ask them?" They said, "What do you estimate that this will save?" And I said, "My total estimate is less than ten million dollars."

They went to the city housing authority, and the city housing said, "Yes, we'll let you cut the apartment building off." So they followed the route I suggested and tunneled under the I-5 freeway. Due to the shorter length and less problems in city streets, the final cost was $9,600,000.

I had worked with Jerry on that project, and I'd known Jerry when he worked at North Marin and also when he was with the state. I guess it was about seven o'clock at night that he called me and wanted to know if he had a chance to apply for the general manager's job. I said, "I think you've got an excellent chance. Your background and experience is what the district needs. I'll give you Jon Reynolds' telephone number, and you call him at home tonight." So he called Jon, and Jon told him to come down immediately. Jerry came down and met with the board, and he agreed to accept the position if he was chosen; and we voted for Jerry.

Lage: Just like that?

McLean: That's how he got the job.

Lage: Did you get support from all the factions?

McLean: Yes. We finally got a majority vote. After Jerry came down and talked before the board, we got the majority. And that's how Jerry got the job. But Jerry always said I was the one responsible for getting him the job.

General Managers from Davis to Gilbert: A Firsthand Assessment

McLean: Well, I knew Jerry. I have worked under all the general managers in the district, every one of them. Every general manager.

Lage: That's quite a record.

McLean: Yes. I've worked for every one of them, both on the board and also as an employee. Remember, there have not been that many. Arthur P. Davis and Frank Hanna, John Longwell, John McFarland, Jack Harnett, and Jerry Gilbert; and I've worked for every one of them and have known them very well. And I would say this: Of the outstanding ones that have been with the district, there have been John Longwell; Arthur P. Davis didn't stay very long. Well, you have to look at him; he was the organizer of the district. He put the district together and oversaw the projects: the first aqueduct, the acquisition of the East Bay Water Company, the construction of Pardee Dam, the construction of Lafayette Dam, and tunnels. That was his real job. Then he left for Russia and took with him one of the fellows from the district; Lyman Wilbur went with him to Russia on a big irrigation project in Turkistan.

The next one who became general manager was Frank Hanna. Mr. Hanna was the chief design engineer for Pardee Dam and the Mokelumne Project, and Frank was general manager for about two years. Then he left and retired. The next phase was John Longwell, from 1934-1949. This was when we got into the annexations of a number of areas: Pleasant Hill, Castro Valley--those areas were annexed during his particular regime. Orinda, Moraga, Lafayette, and Walnut Creek were all annexed to the district. Then came the war, and we had the period in which there was more or less coasting. But during that period of time we also have to look at some of the things that were done. Number one was the connection to give San Francisco water. That was a 24-inch pipeline that commenced at Lake Chabot and went to San Lorenzo, where San Francisco installed a pumping plant and pipeline to connect to the peninsula. That was the story of San Francisco--water.

The next was the 24-inch W.S. Crockett pipeline, which was put in in 1935. That was under John Longwell, and it supplied the sugar company at Crockett. Then there was the supply to Mare Island during the war and the emergency there. There was the supply to Treasure Island from the district for the water supply. That covered the war period, and right after the war we had all of this tremendous amount of expansion and the various annexations.

Lage: And we still have Longwell in charge here?

McLean: Still Longwell. He served up until--oh, I forget when he left [December 31, 1949]. He was general manager until most of the waste water project was under construction. This is the time when John McFarland became general manager. John McFarland did not have any experience in the water field; he was a businessman. Leroy Hamman, who was on the board of directors at that time and was president of the board, was later succeeded by Louis Breuner. I knew Roy very well, because he was president of the Boy Scouts when I was on the Boy Scout executive board. He was instrumental, I believe, in bringing John McFarland aboard.

Lage: Now you're rating your general managers here.

McLean: Yes, okay. I'm going to tell you the ones I think have been the outstanding general managers. Number one, John Longwell. Well, first I think you have to consider Arthur P. Davis, who laid the foundations for the district and who really established all of the early policies of the district. From an engineering standpoint, he was the one decided on the Mokelumne River supply.

John Longwell was the next engineering general manager. He was the one who really built a lot of the facilities: the first aqueduct, the waste water facilities, the large filter plants, and the large expansion that occurred during this time. Those two I would rate quite high because they were the ones who laid the foundation for the district as it is today--the distribution systems and all of that.

Then we got into a phase about that time where McFarland became general manager. He was a business administrator, and he established the salary rates and a lot of the policies that now exist today--personnel policies and everything else. You have to look at him from the business side. He was the one who really put the district on a business basis more than had previously been done. John McFarland was a good administrator who relied upon the engineering staff to carry out the policies of the board of directors.

Under McFarland, Bob Kennedy became chief engineer for a short period of time [January 1, 1950 to July 31, 1958]. He and McFarland didn't get along, Mr. Kennedy resigned, and Joe DeCosta became chief engineer. It was during Joe DeCosta's time [August 1, 1958 to April 30, 1965] that we moved forward again with the big construction program, the $252-million bond issue which was voted in in June of 1958. That ten-year program went through until I retired on August 1, 1968. Joe DeCosta was chief engineer until '65, when he retired.

Then John Harnett took over the last period, and this is when we finished up all the major construction. John McFarland resigned on September 3, 1968, and John Harnett became general manager.

Jack Harnett came when all the construction work was complete. During this period we experienced the first severe drought [1976-77], when the district had to pump water out of the Middle River. Then Jack Harnett resigned, and Jerry Gilbert was appointed.

In rating the general managers, I would rate Arthur P. Davis and John Longwell as outstanding engineers and nationally known. You have to look at John McFarland from a little different standpoint. As far as engineering was concerned, he had no knowledge of it. However, he did establish the business policies of the district which have carried over to today. I think that was necessary. Prior to that time the district had been engineering oriented: Lay the foundation and do the building to maintain service. Then John McFarland came in, and there was a tremendous upset in the district staff. He came at a time during the annexation and expansion of the district's boundaries. New policies and procedures were needed, and John met the challenge. During this time several key staff personnel left the district.

Lage: You mean he fired a lot of people?

McLean: Well, there was disagreement, and people left. Bob Kennedy left. Bob was a good engineer. There were several other people who left. Why, I can't say. Then, because of the studies that we had made previously--this is when we carried on the $252-million bond issue. We had finished the waste water project in 1952; John Longwell was there during part of that period. Then we had the tremendous expansion period, 1958-1968: the third aqueduct, the second Lafayette Aqueduct, the second Lafayette Tunnel, the Walnut Creek Tunnel, the Briones Reservoir, the Camanche Reservoir, the Sobrante Filter Plant, the Lafayette Filter Plant, and the Walnut Creek Filter Plant. That was the $252-million bond issue, and that was a tremendous expansion period.

In rating the general managers you cannot leave out John McFarland. John did establish the business policies and procedures of the district.

Lage: What would you describe as Jerry Gilbert's contributions?

McLean: Jerry Gilbert's contributions, to my estimation, were moving the district out of a period of lethargy into the period of doing something about the American River supply and doing something about additional storage, such as Buckhorn. I think his contribution was pushing that through, particularly during a very difficult time of environmental situations. This has been a tough battle, the water supply management program which he really inaugurated. Plus we had a lot of expansion out in the San Ramon Valley and then the controversies we've been through on this--the lawsuits by the Environmental Defense Fund in regard to the size of the pipe to serve the San Ramon Valley, the American River supply, and Buckhorn Reservoir.

Regrets about Abandonment of High Middle Bar Dam

McLean: The one thing that I regret very much is that the construction of the High Middle Bar Dam was not pushed. The High Middle Bar Dam was a project upstream from Pardee that I worked on in the fifties. After I had finished the waste water project, there was a period of four or five years, and Orin Harder and I put together the Middle Bar Project. This was a project that had been looked at back in the twenties. We were to the point of filing to the Federal Energy Commission to build the project. We had all the analyses and the feasibility studies, and we were ready to proceed. This was right after I came on the board, about 1980, 1981. Because Amador County threatened us with a lawsuit, we dropped it. I think one of the biggest mistakes we ever made was dropping the High Middle Bar Project. If we had gone to the courts and fought Amador County on that, we would have had that project, which would have been of tremendous benefit to the district today.

Lage: Would you have needed that and the American River both?

McLean: Yes. We still need the American River.

Lage: So this wouldn't have solved the problem of the American River?

McLean: No, this would not have. The true safe yield of the Mokelumne is only in the neighborhood of 215 million gallons per day, in spite of the fact that we have water rights to 325 million.

Lage: What would have the High Middle Bar Dam have done?

McLean: I'll tell you what the High Middle Bar Dam would have done. Number one, it would have controlled the full flow of the Mokelumne River. The full flow. It would also have generated the maximum amount of hydroelectric energy from the stream flow.

Lage: And then that gets sold to PG&E, is that right?

McLean: That's sold to PG&E. It would also have given you a maximum pool in Pardee Reservoir, which would give you a gravity flow in the aqueduct at all times, winter and summer. It would also have controlled the flow over what we call the south spillway at Pardee Dam, which has always been a very dangerous situation, because any time we get a flood flow over the south spillway we get a blockage of the stream below the Pardee powerhouse. This creates some real problems of removal of debris. The last time we had that it cost us somewhere in the neighborhood of $300,000 to clear the river, plus the loss of the powerhouse during all that period of time.

By building the High Middle Bar Dam you would have added all these particular benefits, and you would have been able to control the full flow of the Mokelumne River.

San Joaquin County is now looking at the project. The district has turned over all of our reports to them--I guess a lot of my reports and everything--that we wrote during the time when we made the study. San Joaquin County wants to build it because they say they need more water supply.

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McLean: San Joaquin County needs more water. One of the problems there is that the groundwater table in the Stockton and Lodi areas has been badly depleted, and because of the present drought they need additional water both for agricultural and urban use.

Lage: What role did Jerry Gilbert have in this Middle Bar decision, and what role did the board have? How was it decided?

McLean: I don't know whether Jerry recommended it or whether Skaggs recommended it, but it came before the board. The fact is, we didn't want to get into a legal battle with Amador County. I forget who the district attorney was up there. But you see, with all the legal battles that we had with Amador County in the early days--we had pretty well got those behind us. Since then our relations with Amador and Calaveras Counties had improved, particularly after we paid them generously for additional water rights--$2.5 million each for the 125 mgd.

You see, our first rights on the Mokelumne were 200 million gallons a day. We fought both Amador and Calaveras counties for seven or eight years after Pardee was built to make sure that we had the rights to the 200 million. That was a bitter battle, and it left some very, very bad blood in those mountain counties. The fact is, the district was hated for many years afterward. If you said you were with the district, they might take a shot at you.

Lage: You experienced some of this yourself, I would think.

McLean: Yes, you bet. I'll tell you, the hatred of the mountain counties against the district in those times was pretty volatile because of the lawsuits, not only with Lodi and those people but also Amador and Calaveras counties. Well, when we acquired the additional 125 million, which brings us up to 325, we paid each of the counties $2.5 million. That was back in the fifties, and it kind of changed our relations a little, that we were the guys with the big sack, you might say, and we gave them this in order to acquire the rights for the other 125 million.

Among the old-timers there's still been the resentment against the district, and the particular one who had lost the battle of all the lawsuits was the district attorney of Amador County. As soon as we started having public hearings on the Middle Bar Project in order to get the public's opinion--this was before we had to file an environmental impact report--to determine if we should go ahead with it, there were many protests against it.

Lage: This had been in the works a long time.

McLean: Yes, you bet. We started the studies back in '52.

Lage: And then it was in the eighties when they decided not to go ahead with it?

McLean: That's right. It's been nearly thirty years ago since we started on it. Then we revised it again after Jerry Gilbert came aboard, to go ahead with the construction of the Middle Bar Project, and the district was all set to do it. And then this district attorney of Amador County threatened a lawsuit and to get out an injunction. Apparently Jerry felt that couldn't be resolved, and Skaggs recommended to the board that we drop it. So we dropped it.

Looking back, of course, your hindsight is always better than your foresight. But looking back today, had this been Arthur P. Davis, John Longwell, or Ted Wittschen, the attorney, I think we'd have said, "To hell with them; we're going go ahead and build it, and we'll fight them in court."

Lage: So the general manager could have had a deciding role, do you think?

McLean: That's right, yes.

Lage: If the general manager comes down strong on an issue, does the board tend to follow along?

McLean: Yes. Also, I think Skaggs himself, being an attorney, didn't want to put the district in a long legal fight. He's not the type of attorney like Harold Raines [EBMUD attorney, 1947-1966] and the other one, the first attorney we had [Theodore Wittschen, 1925-1947]. Harold was ready to do battle at the drop of a hat. If anybody opposed the district, he was ready to battle with them. I don't know whether that's good or bad as far as a public agency is concerned, because you do create a lot animosity, but also we won a lot of cases. If it hadn't been for Ted Wittschen, the first attorney--I want to tell you, he was an aggressive attorney. He had come from Miller and Lux [owners of vast California land holdings who were engaged in protracted legal battles over water rights], and had been in all their water rights battles, and he was a tough opponent. When he took on a lawsuit, it didn't make any difference how big it was; he battled it through to win. And he did; he won all his cases. If he hadn't won the cases that we had against those people and come to an agreement, then the district would not be where it is today.

Lage: You would like to see a more aggressive policy?

McLean: Yes. He was a very aggressive attorney, and so was Harold Raines. Harold Raines was very much so.

Gilbert's Role in Tightening a Lax Administration

Lage: Shall we finish off with Jerry Gilbert's contribution? I want to be sure that you complete what you have in mind now.

McLean: Yes, okay. Jerry Gilbert, to my estimation, has brought the district forward to where it is today. I think he did an outstanding job; he's a tough administrator. He had a lot of demands, and he made his staff toe the line. This is what the district needed.

Lage: Needed a tough guy in charge?

McLean: Yes. John McFarland and Jack Harnett were sort of--I wouldn't say patronizing, but more or less easy-going with staff. As I say, I have to compliment McFarland on his policies of administration. I think that's what put the district where it is today on the business policies. But there was a lot of patronizing going on within the ranks of the district during the time that they were with the district.

Lage: Now, what do you mean by that?

McLean: Well, I'm not going to go into all the details on that.

Lage: "Patronizing" is such an intriguing word.

McLean: I don't want that to be on the record.

Lage: You know we can remove something that you think is indiscreet when you look at the transcript.

McLean: You know, we've had the dining hall at Pardee and other facilities at Pardee. Both John McFarland and Jack Harnett used to take their families and friends up there on weekends and use the district facilities. This was never permitted under John Longwell or Arthur P. Davis. The only ones who went to Pardee and used the lodge and the dining facilities were those on business. Or, when we had the $252-million bond issue, when we took groups of people there, particularly the press, city managers, and local business executives, where we wanted to show them the facilities. McFarland and Harnett were taking their friends and their wives and using the facilities, and the district paying for the meals, housekeeping, and all the rest of the stuff, see. When Jerry Gilbert became general manager, that was stopped.

Lage: Did you talk to him about it? Or did he just pick it up right away?

McLean: He picked it up, because it was obvious. It was a matter of having known. Jerry Gilbert then stopped all of it.

Lage: So he sort of tightened up the ship?

McLean: He tightened up the ship. And of course that created a lot of resentment, not only within the two unions but also with other personnel. As I say, I don't want go into detail, but--.

Lage: No, but it helps to understand.

McLean: There had been a lot of favoritism going on within the district. Consequently, when Jerry learned of it, he stopped it immediately.

Jerry Gilbert was a tough administrator. This was completely opposite from Jack Harnett. Joe DeCosta was easygoing; he had a good, responsible staff, and he let them do their jobs without any interference. Joe was a good engineer, and he expected his staff to keep him informed; otherwise he never became closely involved. Joe was easygoing, and he got along well with everyone.

Lage: So Jerry Gilbert was more of a return to the previous standards?

McLean: Jerry Gilbert was a good administrator, and he was a good engineer. His management style was more of the Arthur P. Davis and John S. Longwell type.

Urgent Need for Understanding of California's Unique Water Problems and Needs

Lage: Do you think it helps to have an engineer as general manager?

McLean: Absolutely. I think, to be very truthful with you, that the ones they are looking at for general manager now are administrators in public works, not water. The fellow they're looking at is from Arizona [Jorge Carrasco hired as general manager in 1991], a former city manager of Scottsdale.

Lage: So it's public administration?

McLean: Yes. I think they're going to have a difficult time. My personal opinion is that California's water situation is one of the most difficult and complex in the United States. This coming decade in California is going to decide what is going to happen to our water in California. Unfortunately we have a chief engineer who is from Texas, a head of planning who is from Seattle, a fellow from Personnel who is from Seattle, and now the district is going to have a public administrator from Scottsdale, Arizona. Just totally out of the California water picture. I think this is going to just create havoc for the district; I really do.

Lage: You don't think they can learn about the situation?

McLean: Well, the water picture in California goes back to the Gold Rush. We have water in California, but the problem is that you have everybody taking a shot at it. These are all environmental issues: you've got the Save the Bay Organization; you've got the bay delta situation; you've got fish and wildlife, the endangered smelt, and the chinook salmon; you've got the commercial fishermen, wetlands people, the State Division of Fish and Game, white water rafters, save-the-river people, and others--all demanding that the water in California be managed to their demands, with urban and agriculture at the end.

Lage: So it might take a public administrator to deal with all of this?

McLean: It is going to take a long time for the new people to become familiar with the problems. That's my personal opinion. Now, he may be all right as far as administration is concerned, but here's a chief engineer who's only been with the district six or seven months, and here's the fellow who's head of Planning who has been with the district six or seven months--.

Lage: So it's a real change-over time.

McLean: Wally Bishop will probably leave within a short time. Wally Bishop should have been the general manager. He's leaving; he's going back to waste water for a while, and then apparently he is going into the consulting business. Keith Carns, another outstanding engineer, has left. And then you've got a board that is completely environmentally oriented, and they don't know the picture. They don't know what the water problem of California really is.

Nancy Nadel makes a statement in the newspaper that we already have rights to 325 million gallons a day, so why do we need the American River water, when the true annual flow of the Mokelumne River is only 215 million gallons a day. And by the year 2000, the consumption, regardless of conservation or anything else, is going to be up to 246 [mgd]. And you tell me why the district needs storage or the American River supply.

If we have a failure on the Hayward fault that severs every one of our supply tunnels, you have less than a six-month supply of water here to serve the Bay Area if the aqueducts are also out of service.

What I'm saying is that we have people who are completely unfamiliar with the water situation in California, and it is serious. We have enough water, but we've got to conserve and recycle all of the water that we can. That's number one; we've got to recycle all the water we can, and we've got to practice as much conservation as we can--low-flow toilets and showerheads and all of those things.

And we've got to build more storage. We've got to control and conserve all the surplus water that occurs on the Mokelumne and American Rivers. Water only occurs in California between roughly between October 1 until about April 1. That's our maximum source of water. Historically this is when we have had our large floods in California. But you've got all these other agencies that are pecking at that water. The economy of California is agriculture. Very few people know that, but the economy of California is agriculture. They keep screaming about agriculture using eighty percent of the water in California. This is true; they do. But look at what they produce. They produce $19 billion in business for the state of California.

Lage: Do you think agriculture could do with more water conservation?

McLean: They are doing conservation. I was consultant for the Tecopa Irrigation District near Bakersfield for a couple years on some problems they had with their distribution system. All of their vineyards and orchards are on drip irrigation. It's true that you do use a lot of water for rice, but the type of rice that is grown in California is not grown anywhere else. They also use a lot of water on cotton, but the type of cotton that is grown in California cannot be grown anyplace else. It's what they call the long fiber cotton, and it's the only place in the United States that I know today where they can grow the long-fiber cotton. I don't know whether it's the soil or what it is. But people say, "Oh, cotton uses too much water. Rice uses too much water." Maybe they do. But you have to understand; that's a part of the economy of California.

Now, there are a few orchards in northern California that to my knowledge still use the old flooding process that they used years ago. The new orchards and the new vineyards that are going in, every one of them is irrigated by drip irrigation. I was up through the Sonoma Valley a couple of weeks ago. I had to go up to the Boy Scout camp; they had some problems up there. I noticed all the new vineyards going in, and every one of them is using drip irrigation. There is a pipe running along the trellis and then a pipe going down to each vine.

So farmers are conserving. You still have cotton and rice that they point their finger at and say, "Look at all the water that they're using." And they do use it. But you have to remember that with rice the only water that is used is evaporation and transpiration. With rice, the water flows in the field at the highest elevation, and then it flows down through the rice field and returns to the river. Water comes into what we call the high check, and then it gradually flows all throughout the various checks. It comes into the top check, goes in the next one lower down, and finally, from the last one, it goes into a drainage ditch and back into the river. The only water that's used is evaporation, and up in those rice fields you probably get about thirty-six inches of evaporation a year. Then you have transpiration, which is used by the plant growing. The annual use to grow a crop of rice is about 4.5 acre feet per year. One acre foot of water is 325,800 gallons. Water is required during the entire growing period, because rice grows in water. Rice is planted in the spring and usually harvested in September. So you can blame rice and cotton for excess use of water, but where can you grow the type of rice that we grow in California, and where are you going to grow our type of long-fiber cotton? In the Central Valley of California you cannot grow any other kind of crop on the land where the rice is grown. The soil type is adobe, and the land is suitable only for rice.

Lage: Those are all good points.

McLean: Where new orchards and new vineyards are being planted, those farmers, every one of them, are developing new methods to irrigate the trees and vines.

Lage: Changes are being made.

McLean: Yes, they are conserving. There are lots of things that they can do. For instance, the city of Los Angeles, in the Coachella and Imperial Irrigation Districts, and a lot of those districts are being served by open canals. They're large canals, and they're not lined; they're earthen canals. Los Angeles is paying for the lining for some of those canals to gain the water that is lost. Even in the Central Valley and in northern California there are lots of the irrigation districts where the canals are unlined, and you do get losses from transpiration and evaporation; where there are earthen canals, you do get losses. The economics of lining those canals has got to be weighed against the crops, the cost of lining, and cost of water.

Lage: I would think they'd be replenishing the water table, too, in the unlined canals.

McLean: They do. They do replenish the water table, and when you get the losses through the sides of the canals you do get some losses that go into the groundwater table. But the point I'm trying to convey here is that I think the next decade in California, whether the drought continues or not, is going to be the most critical period that we've ever had because of the water situation. People are beginning to wake up to the fact that we've got to do something about all of these situations. What are we going to do about the salmon? What are we going to do about the smelt? What are we going to do about San Francisco Bay? What are we going to do about the delta--the saltwater intrusion in the delta?

Lage: How do you place these issues? Are they important in your mind?

McLean: I think they're all equally important. You cannot consider one without the other.

Lage: Can they be solved along with the water situation?

McLean: They've got to be solved. If California is going to continue to grow--and it's going to grow; you can't stop it--we've got to solve the water problem. This means a lot of development work. It means building the Auburn Dam. It means building Buckhorn Reservoir. It means building the High Middle Bar. And it means building the peripheral canal, the large state reservoir in the San Joaquin Valley, which is a part of the water project.

It means building all of these facilities. Also, we may have to go to recycling water, like the district is now doing. It's going to mean that a lot of these industrial facilities that we have today will have to recycle the water rather than putting it in the sewers. This is what we're doing now at the Chevron refinery in Richmond. The district has a $20-million-dollar project to build the facilities there for the Chevron refining plant, to take the waste water from the West Contra Costa treatment plant and treat the water down to the point where Chevron can use it in their cooling process. We've got to do more of that. That saves about four or five million gallons of water a day. That's a large amount. You can do the same thing with the Union Oil Company. You can do the same thing with Exxon, and you can do it with the Shell Oil Company in Martinez.

Lage: Are these things that the district helps fund?

McLean: No. Exxon and Shell are not within the district. Only Union Oil is within the district. Shell is in Contra Costa County.

Lage: Is Union willing to go along with something like this?

McLean: Well, they're going to have to. If we're going to conserve water, all of these facilities have to be utilized. But you have to recognize that in spite of all this conservation you're still not going to meet the needs of this area unless you develop more resources. Desalinization is not practical.

Lage: Is that for financial reasons?

McLean: Financial reasons--it costs about four times as much. Recycling costs about twice as much, but you can afford it providing you can save X number of gallons of water. These things, Ann, are going to have to be done. We're going to have to do the ultimate in every bit that we can. But what I'm trying to say is that in spite of all the conservation and everything else, you still have to develop facilities to conserve water, storage.

And another thing I'll tell you, and whether it can ever be realized--. There's still a lot of water in the north coastal basin that is virtually untouched. The Mad, the Klamath, the Eel, the van Dusen rivers--every one of those have large quantities of water. When I was working with the state Division of Water Resources we looked at those many years ago as a source of water that could be conveyed into the Central Valley. It still can be done. But environmentalists put the Eel River into the Wild [and Scenic] River Act, and it takes an act of Congress to get that out. You could take water out of the Klamath, the van Dusen, and the Mad. Every one of those has very large flows, and there is somewhere in the neighborhood of 2.5 to 3 million acre feet of water available in the north coastal basin. Someday that's going to have to be utilized. We're going to have to develop it and bring it over into the Central Valley. But we've got to do more than that. We've got to raise Shasta Dam; Shasta Dam can be raised. We've got to build the Auburn Dam.

Lage: This is a big agenda.

McLean: If we're going to sustain the population growth that we have and continue our style of living--. Look at the number of industries that because of the water situation are leaving and moving to Oregon, Washington, and Idaho. I don't know whether you've read about the situation in Oakland--the number of industries, the number of people, and the number of stores that have left.

Lage: Because of water, though?

McLean: Well, I don't think it's entirely because of water. I think there have been a number of factors. But the big industries that are talking about future expansion are going to Washington, Colorado, and other states where there is an ample supply of water. What's going to happen to the economy of California if we don't take care of the local water problem and solve our statewide water problems? Industries needed to employ people here are going to leave.

Why are developers going to these outlying areas? Because of the water situation and taxes. Look at the developments taking place in Tracy, Manteca, Modesto, and also towards Sacramento. Look at the developments in the Benicia, Fairfield, and Vacaville areas. Why? Because of water and the cost of connections becoming prohibitive.

Lage: Because they can't afford homes here. And there's not much land.

McLean: That's right. Land is cheaper, water is abundant. But they're going to run into problems here, too, because they're now taking water out of the groundwater table. The first thing you know, within a few years the groundwater table is going to be depleted. This is what I say, Ann--that in the next ten years, we've got to do something about the water in California. Some way or other the governor has to come up with a coalition to solve California's water problems.

XII BOARD POLICY ISSUES: WATER SUPPLY AND DEMAND, AND OTHERS

Water Conservation and the Rate Structure

[Interview 9: August 12, 1991]##

Lage: Today we're going to go on with the board period, and I thought we'd start talking about water conservation. I know there were some differences of opinion about when water conservation should be turned to and what its role was. It seems you were one of the members of the board who was most reluctant to impose conservation.

McLean: That's right. I thought that, looking at the water we had in storage and also in regard to particularly stringent conservation measures, particularly proposed by Helen Burke, and also wanting to go to a much higher rate structure that would create a situation where people would have to pay more. I never felt that a rate structure was conservation-oriented. I didn't feel--particularly for the people east of the hills, who perhaps might have a higher income than the others in the hill area here--that a rate structure was going to have much effect as far conservation was concerned.

Lage: Oh, I see. Because they have more ability to pay?

McLean: Well, they are more able to pay. They have much larger pieces of property plus extensive landscaping, and they were going to retain their landscaping as far as possible. With conservation, I'm sure that to get 15 percent, which we did and were very successful, I don't think the rate structure has had anything to do with it. Historically, rate structures have never had an effect on conservation.

Lage: So you don't think people are that concerned about what their bill is?

McLean: There might be some low income groups where that might have some effect, but most people in low income groups don't have large land areas, and therefore it really doesn't affect them. It only affects those people who have--like my place here, where I have about a quarter of an acre, and many of the places out in the area east of the hills. It's not at all uncommon for them to have half an acre or even an acre with large lawn areas and lots of trees and shrubbery. An inclining rate is not going to affect them, because they're going to pay it. They'll complain, but they'll go ahead and pay it. There's always been a real question as to whether a rate structure has any affect upon conservation.

Limitations and Successes of Water Conservation

Lage: What do you think is the answer, then, to promote conservation? Or why was the district successful?

McLean: Well, the conservation, of course, has been successful, there's no question about it. Conservation has been successful with the result that for the past three or four years the rate of consumption has remained about level. Previously, consumption had been increasing over the years at 5 or 6 per cent annually. I think a lot of things have taken effect, particularly like the people who installed low-flow showerheads, and they have cut down on the yard watering. I know I have; you can see my lawn. There has been voluntary cooperation. How long this can be effective is questionable.

Lage: You think it's more a response to a crisis?

McLean: Yes. People have responded to this, but when it rains again and we get back to a normal snowpack and a normal year's water supply, I don't think people are going to be so free about wanting to conserve. Because they have seen their lawns go dry, they have seen their shrubbery distressed. They're going to say, "Why do we have to continue this water rationing?" I hope this year, after Governor Wilson gets through with all the budget problems, he gets in and does something about the overall water problem in California. We have got to do something about it. Conservation is not going to be the entire answer. We must stop the loss of surplus water into the ocean during flood flows by building more storage to conserve the water for future use.

Lage: You think that we have to increase supply?

McLean: We have got to increase our supply. I was just reading an article in the paper this morning in regard to the tremendous loss there has been in agriculture this year. People forget that California is agriculturally oriented. Our economy is agriculture. Even in the delta, a lot of the farmers are not going to plant beets, they're not going to plant tomatoes, they're not going to plant asparagus, they're not going to plant corn; they're not going to plant a lot of crops. The water which they are normally entitled to for riparian use they have turned over to the state for the state water bank, which could in turn be given to an urban area that needs the water.

Just stop and think of the jobs that this affects. It affects not only the processing plants but the trucking industry and many, many, other labor-oriented industries. It's a domino effect. Industries also are beginning to feel this. Those that are water-oriented are moving out of California. Many have gone to Portland, Seattle, Colorado, Denver, Boise, and Nevada. They're leaving California. Think what that's doing to the economy of California.

Lage: Now, on this very issue that you just talked about, did board policy change over time? It seems like conservation is an answer that came to be more accepted. Is that your view of it?

McLean: We didn't enter into the drought era until five years ago, and I wasn't on the board when we had the '76-'77 drought. The board never anticipated that we would ever get into a five-year drought. Historically, we've never had a four-year drought. Well, it happened, and we've had the fifth year now. People begin to wonder, "Are we going to have a sixth year? What is the situation?" There's always an effort on the part of Helen Burke. Helen Burke has always been on this conservation orientation. Nancy Nadel was the same when she came on the board, and we also had Jack Hill. They wanted to go to extremes--strict rationing and higher rates.

Lage: Did this include changing the rate structure?

McLean: The rate structure and everything else. The inclining block rate structure was Helen Burke's idea.

Lage: What about the gutter flooder law that was passed [August, 1987]? Do you remember that?

McLean: Yes, as I remember the board proposed the use of shut-off nozzles when using a hose for washing cars. Also no washing sidewalks and no flooding of the gutters when sprinkling lawns, etc.

It didn't have much effect. I think the greatest effect was the advertising we had in the papers, the billboards, and the signs on buses and BART trains and stations. I think this had really the greatest effect to get people to conserve. It was effective, no question about it.

Lage: Did Jerry Gilbert sign onto that enthusiastically?

McLean: Yes.

Lage: Do you think he did a good job of directing the public relations effort?

McLean: Yes. I think Jerry did a very good job. The board was in favor of the effort toward voluntary conservation. But Helen Burke was constantly wanting to make everything compulsory, either to fine people or something like that. Sandy and I and Mary Warren never did go along with that theory. We felt that voluntary conservation was far better to get people to cooperate. And it has proven out. This year, as you've seen, they asked for 25 percent reduction; last year I think it was a 15 percent reduction. I think this year they asked for 25 percent, and they're even going as high as 30 percent. So I think rather than force people and try to fine people and those sort of things, it is far better on a voluntary basis--that is, to try to get people to understand why it is necessary. And I think this has been very effective.

Lage: People seem to have signed onto it, during the drought at least.

McLean: Yes. And the district has been very successful. I'm going to be very much interested in seeing how the people are going to react when we get into some of this information that they will have on the water supply management program regarding additional storage. I have felt that conservation is not the entire answer. You have to have conservation; there is no question about that. And then it may be necessary for new construction, which of course comes under the line of conservation--for new homes and new buildings to use low-flow toilets and to have everything in the building that will induce low flows. Rather than have high pressure in toilets, washbasins, and showers, maybe reduction of pressure as well as low-flow units are part of the answer.

Lage: Is that required now?

McLean: No, it is not required. There are some cities that require them.

Lage: It's a city ordinance, then?

McLean: Yes, it's a city ordinance. If I'm not mistaken, I think Monterey has an ordinance on new construction. I don't know about Santa Barbara. Santa Barbara may have, or San Luis Obispo.

Lage: Any cities within the East Bay MUD district?

McLean: No.

Lage: Is that something the district works with the cities about?

McLean: Yes. We have a landscape ordinance now, as you know, and fact is, we've been trying to get all the cities to adopt a uniform landscape ordinance, using drought-tolerant shrubs, trees, etc. The district has worked with the nurseries and the nursery people who do that work to use drought-tolerant shrubs and to reduce the area of lawns and those sort of things. There are a number of those ordinances, but it has not really been adopted every place.

I think the water industry itself is doing this. There is a Water Coalition now that is attempting to have a universal practice throughout the state--that is, to get the various water agencies to adopt something like low-flow toilets and low-flow showerheads, and then to even limit lawn areas based upon the size of the property. I think this has got to come. I think it's one of the things that will have to come, because I think conservation is in the cards, there's no question about that. But conservation is still not going to solve the problem of our water supply. We have still got to build storage, and we've still got to utilize every drop of water that we can.

District Water Recycling Projects

McLean: This means recycling. We're going to have to recycle water--.

Lage: From the sewage treatment?

McLean: From sewage treatment plants, because there's a tremendous amount of waste water. A great deal of that, of course, is from various automatic facilities--dishwashers, laundry, and all of those--which all go into the waste water system. And we've got to utilize it. Of course, you have to recognize that there is a limitation to using that water. The district was one of the pioneers in this; it started out with the Richmond golf course. Recently we added the Galbraith golf course in San Leandro, and we've gone to the Alameda golf courses. The real big one has been the Chevron plant out in Richmond. That site will be under construction this year. Two of them that will be on line this year will be the Willow Park Golf Club and the Chabot municipal golf course, which will be using water from Lake Chabot.

Lage: Does this require a special pipeline?

McLean: Yes, they require pipelines and pumping plants. The cost of the recycled water is about twice of what the regular water is. In other words, all of this requires facilities, and this costs money. But we are saving water. Most of these golf courses use upwards of a million and a half or two million gallons of water annually, or even more. The Chevron plant out there will save upwards of five million gallons per day. However, that's only a small percentage of the water they use. Chevron has been one of the largest consumers of water from the district for years, using upwards of ten or fifteen million gallons of water per day. They're one of the district's large industrial consumers.

Lage: But they can't use the recycled water for all of their needs?

McLean: No, they can't use it for everything. They are using it apparently in their cracking facilities and in their cooling towers. I think they use the water over and over; that's my understanding. I'm not sure of all the mechanics. But those are areas where you can use recycled water. The cost of that plant will take a long time to pay off.

Lage: Who pays for that? The district?

McLean: The district is paying for it.

Lage: So the district doesn't charge them twice as much for the water?

McLean: No. The price of the water to Chevron will be just about the same as the regular supply.

Lage: It costs the district more.

McLean: Yes. However, you are limited as to where you can use recycled water. For instance, take the sprinkling that goes on along our freeways on the median strips. All of those are supplied by pipes that are connected to the regular distribution system. To use recycled water in those areas you have to go from a treatment plant that is located several miles away and build an independent pipeline to supply a few gallons of water along a freeway. The answer there is not to use shrubbery or plants that require water--to use something that can carry over from your winter rains. Use some other type of landscaping. I think in the future you probably will see some other method along our freeways that will get away from landscaping.

Now, in reference to the Chabot golf course and the Willow Park golf course, those require pumping plants, and they require very extensive pipelines. If you know where the Chabot golf course is, way up on the top of the hill--they have to put in a pumping plant at Lake Chabot. This was one of my ideas, to use the water from Lake Chabot, which is not used in the system. It's rain water or water that is released from Upper San Leandro Reservoir. Rene Viviani, the owner of the Willow Park golf course, is a very close friend of mine; I've known him for many years. He uses district water for irrigating the golf course. He said to me one day, "Here's all that water down there at Lake Chabot. Why can't we take the water out of there to use for irrigating our golf course rather than buying regular water?" I said, "Well, maybe you've got a good idea." Rene said, "Why don't you look into it?" So I talked to Jerry Gilbert about it, and Jerry said, "Yes, why don't we?"

Lage: Is Lake Chabot considered an emergency storage?

McLean: Lake Chabot could only be used in case of an emergency. There is no connection to the system as it is now because there is no water treatment plant there. There was a small plant, but it was limited in capacity. The only time Lake Chabot would ever be used would be in case we had a failure of our three tunnels and we had to release water from upper San Leandro into Chabot, and then we could take water from Chabot into the system. One of the problems is that it is very low in elevation. The elevation of Chabot is 215 feet, and our aqueduct zone is around 300 feet. So the only part that you would serve would be from elevation 200 down. You could get water into the areas that are below that elevation, such as Alameda and Oakland, but to get it into the aqueduct zone you'd have to pump. That is, you'd have to boost the water into the aqueduct zone; the aqueduct zone is elevation 300.

Lage: So by using it for the golf course, how does it get replaced?

McLean: Water flowing into Lake Chabot is either from rainfall or by release from Upper San Leandro Reservoir. They're installing a pumping plant and putting in a pipeline from Chabot to a small lake near the clubhouse. All of the water for their irrigation system comes from the lake on the golf course, and there they have a pressure pump that serves their entire golf course. So the district will pump the water over into this small lake, then they will pump it out of the lake to irrigate the entire golf course, and they'll have all the water they need. The cost of the water is slightly less than using the water out of the system. The important part is that we're saving about half a million gallons of water per day from the distribution system.

Lage: But doesn't that water have to be replaced in Lake Chabot?

McLean: It's replaced by rain water. Chabot has a small drainage area. During times of peak flow, Upper San Leandro overflows and goes into Lake Chabot. Lake Chabot overflows sometimes, and then the water goes into San Leandro Creek to the bay. But normally the water level remains uniform throughout the year except for evaporation. Chabot is operated by the Regional Park District for boating and fishing.

The district is also looking at Union Oil Company in Rodeo to see what can be done about installing a plant similar to the one at Chevron in Richmond. The cost of using recycled water is about twice the cost of regular water, and there are not many places where there is a nearby source of water that can be readily obtained for recycling.

In the San Ramon Valley they have been looking at the golf courses for a long time in conjunction with the Tri-Valley Authority wastewater treatment plant and also the Contra Costa sanitary district, thinking about using recycled water from those plants for park areas. At Danville, San Ramon, and Walnut Creek there are schools and other public places with large playgrounds and park areas where they could use recycled water, as well as at the many golf courses. Those projects, unless they are located close to a wastewater treatment plant, are not economically feasible. It means separate pipelines, pumping plants, and storage reservoirs. You must have a system which is independent completely from the domestic water system. You can't use the same pipes; it has to be completely independent.

Lage: So there are limitations to that recycling?

McLean: That's right. There are limitations. Eventually you're going to reach a point where you're using basically all the recycled water that you can, and your increase then is going to have to be from the regular distribution system--the regular water supply.

<u>**The Charged Issue of Supplying New Development outside District Service Areas**</u>

Lage: Well, that seems to lead into a discussion about annexing--the annexations and supplying areas outside the boundaries. That was a hot issue, it seems.

McLean: Yes. Annexations were always a problem with the board. When Nancy Nadel came to the board, you had her and Helen Burke who were very much opposed to annexations. Prior to Nancy Nadel it was Jack Hill.

Lage: Were these annexations within the district boundaries?

McLean: Let me define the boundaries. Originally, when the district was organized, we acquired the first 200 million gallon Mokelumne supply, and that was only to take in the area west of the hills. It took in only the cities of Oakland, Richmond, El Cerrito, Albany, Berkeley, Piedmont, and San Leandro--the seven cities west of the East Bay hills [a 93-square-mile area].

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McLean: Castro Valley was annexed in 1931. Then, recognizing that the 200 mgd was not going to be sufficient to meet the growth, we started negotiations with the mountain counties, Amador and Calaveras Counties, for another 125 mgd.

Lage: Is that million gallons per day, mgd?

McLean: Yes. Our original rights were 200 million gallons per day. That's what we had when we built Pardee Dam. As time went on there were annexations in Lafayette [1931], Orinda [1934], Pleasant Hill [1941], Moraga [1948], Walnut Creek [1952], and finally into the San Ramon Valley [1958, 1964]. But prior to the time the San Ramon Valley really came in, we recognized the fact that we would not have enough water from the 200 million gallons a day to meet the district's growth. So we started negotiations with the two mountain counties in which we agreed to pay them \$2.5 million each for another 125 million gallons out of the Mokelumne River. At that time we established basically what we call the ultimate boundaries. Those boundaries were drawn somewhat irregularly, following along the line of the hills, out in the San Ramon Valley, and took in partially down to about the county line.

Lage: When were lines drawn?

McLean: We would have to go into the records, but I think it was right after the war. At that time--and we'll have to look at the dates on that--all of these annexations started coming in.

Lage: I'm surprised they even thought of development in the San Ramon Valley. It was so remote at that time.

McLean: Well, you see, what precipitated that was Walnut Creek. First we had Pleasant Hill, which came in just before the beginning of the war; we built the Pleasant Hill Reservoir by WPA labor. I don't recall when Walnut Creek came in. You see, Walnut Creek was served by California Water Service, which was located in San Jose. They still are a water company that serves a lot of little communities throughout the state. But the people in the Walnut Creek area at that time were unhappy with the water because it came out of Mallard Slough, near Pittsburgh. It was river water, and it had a very high saline content.

So Walnut Creek wanted to join the district. The only way they could join the district was to form an entity within themselves, have a bond issue, buy out the water company, and then annex to the district. This took place, I believe, right after the war. I think it was during that time that the district was negotiating with the mountain counties for the additional 125 million gallons per day. This is when we drew the so-called ultimate boundaries.

Well, during this period of time LAFCO, the Local Agency Formation Commission, came into being. They are the agency that, when an annexation occurs, designates who the water supplier may be. Take the San Ramon Valley; there is no other agency out there that can supply the water. The problem that you run into is that there is no other source of water for these people unless they drill a well.

Lage: So either you're annexed or you don't build there?

McLean: That's right. Of course, most of these areas originally had wells, but the wells have gone dry.

Lage: These are all out in the Danville-Alamo area?

McLean: They're in the Danville and the Alamo area. See, this [refers to map] denotes an area not served by the district. I think that may have been one that came in recently that had their own wells. We had two or three of them while I was still on the board. Here were small areas that consisted of five-acre parcels. When they went in there originally, they drilled their own wells. Now that we've had five years of drought, the wells are not sufficient.

EAST BAY MUNICIPAL UTILITY DISTRICT
P. O. BOX 24055 · OAKLAND, CA 94623 · (415) 835-3000

Fact Sheet
April 1985

OVERVIEW

EBMUD is a publicly owned water district formed in 1923 under the Municipal Utility District (MUD) Act of 1921. Today, it serves water to 1.1 million customers and provides wastewater treatment for 600,000 customers residing in portions of Alameda and Contra Costa Counties.

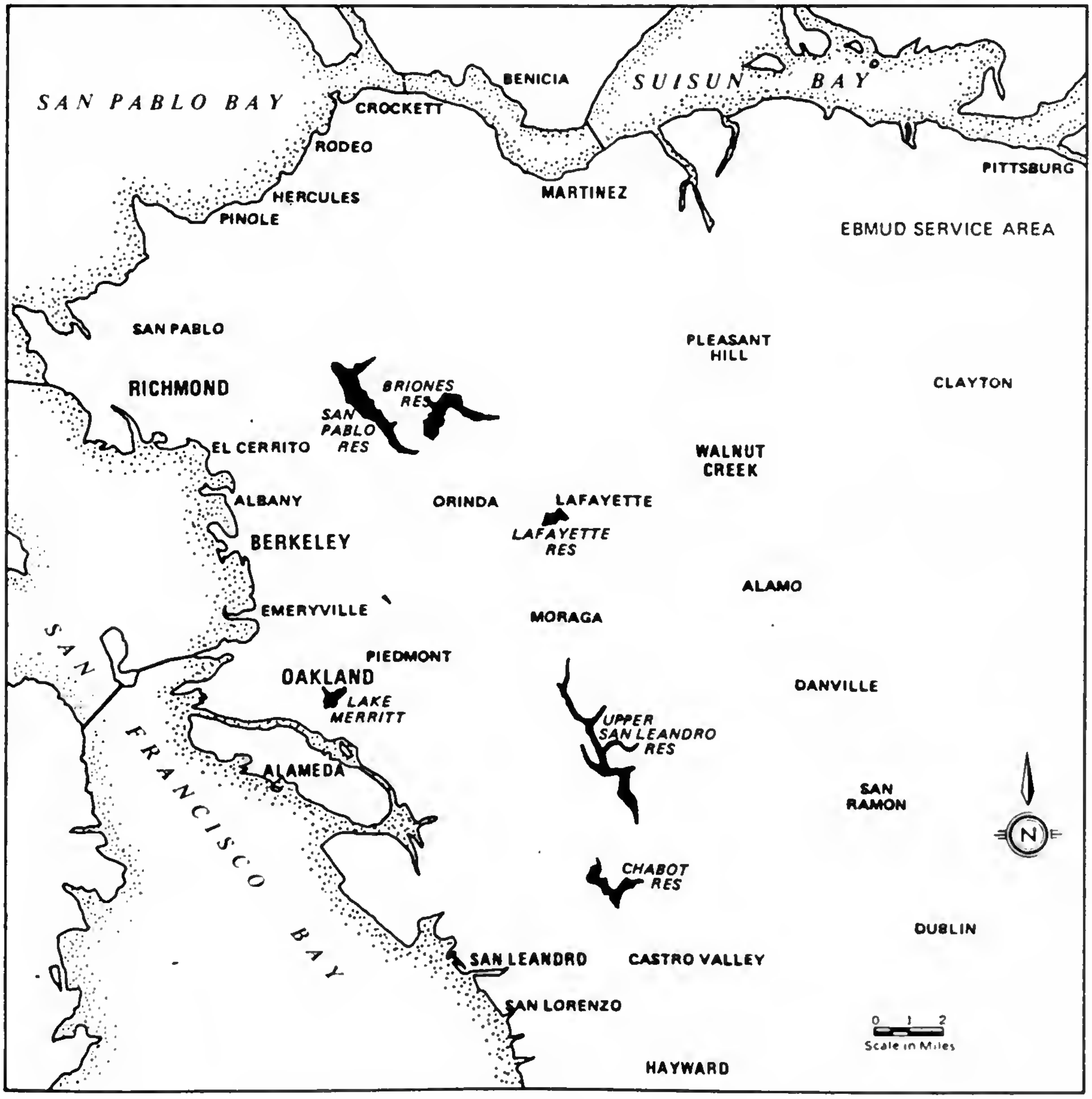
The Water System includes a network of reservoirs, aqueducts, treatment plants, and other distribution facilities stretching from the Sierra foothills to the Bay Area. The service area of ~~240~~ square miles includes 20 incorporated cities and 16 unincorporated communities in Alameda and Contra Costa Counties. 317

The Wastewater System treats the domestic, commercial and industrial wastewater collected by six cities and a local sanitary district in an 83-square-mile area in Alameda and Contra Costa Counties. This system is described briefly on page 7 and in a separate fact sheet available from EBMUD's Public Information Office (891-0615) or the Wastewater Department (465-3700).

WATER SYSTEM

The 20 cities served by EBMUD's Water System include Alameda, Albany, Berkeley, Danville, El Cerrito, Emeryville, a portion of Hayward, Hercules, Lafayette, Moraga, Oakland, Orinda, Piedmont, Pinole, a portion of Pleasant Hill, Richmond, San Leandro, San Pablo, San Ramon, and a portion of Walnut Creek. Brentwood is served water by contract.

Unincorporated communities served include Alamo, Ashland, Blackhawk, Castro Valley, Cherryland, Crockett, Diablo, El Sobrante, Fairview, Kensington, North Richmond, Oleum, Port Costa, Rodeo, San Lorenzo and Selby.



WATER SYSTEM SERVICE AREA

The wells are going dry, and there's no water. At some of the homes, people are hauling water by truck. They didn't have enough water. Well, we had many arguments about this on the board.

Lage: It sounds like one of the hottest issues on the board.

McLean: It was one of the hottest issues on the board.

Lage: Over whether you would take in these areas that were not part of the service area?

McLean: That's right. People have the option of one or two things. Number one, LAFCO designates that there is no other water company to serve them; there's no other source of water except the district water. Basically, what they can do if we refuse is go back to LAFCO, LAFCO can go to the board of supervisors, and the board of supervisors can order us to serve them. We've never gone that far. The other action is that they can annex to one of the cities which now is served by the district, and then by law the district is obligated to serve them.

Lage: So these areas were outside city boundaries?

McLean: Yes, that's right. We've had many, many arguments on that. Basically, we had Helen Burke and Jack Hill, and then Nancy Nadel. Particularly after Jack had left the board, Nancy Nadel was absolutely against serving these people.

Using Water District Policy to Control Growth

Lage: What was their reasoning as you saw it? What did you see as their motivation?

McLean: They didn't want any more development. Their policy is no more growth. They didn't want any more people within the district. Bruce Smith, a developer in Contra Costa County, built five beautiful homes that were adjacent to but right outside the district boundary. This happened about three years ago. Originally these homes had wells, but the wells went dry. They applied to the district to give them a service connection. Well, we had a long battle on the board because of that. Helen Burke and Nancy Nadel were opposed to giving them water. I've always looked at it from a humanitarian standpoint: give them the water.

In other words, the amount of water that we were selling to these people was so small in quantity that it didn't amount to a drop in the bucket. I think one of the last was somewhere around four or five million gallons per year. This was a group of small ranchettes that had their own private wells, and the wells had gone dry. They applied to the district for water, and of course we had another long argument about not wanting to give them water. I would have given it to them right in the beginning, because when you talk in terms of the amount of water, it's minimal.

Lage: It seems like one issue when people are already established there and have been using wells, and the wells go dry. The other issue is new development.

McLean: Let's take a look from the standpoint of new development. Most of these developments are within the ultimate boundaries, and we are compelled to serve them unless we declare an emergency. We never did declare one. There was a big argument about declaring an emergency during the drought, but we never did declare an emergency. It was up to the board as to whether we would serve or not.

Lage: What position did the staff take on it?

McLean: The staff always was in favor of serving.

Lage: So it was mainly a few people on the board in opposition?

McLean: It was the people on the board, and we had many arguments regarding serving water. I always took the attitude, and Sandy Skaggs and I think Mary Warren did, that these people were entitled to the water. They were within the boundaries, they had paid taxes on their property to the district for many years, and they were entitled to the water service.

There was a time that the district had a very high tax rate. The people who were within the district boundaries paid a district tax, basically for the water supply. They were entitled to the water service. As long as they are within the boundaries, the district must provide service.

Lage: Were these arguments brought up--that the district could be compelled to serve?

McLean: Oh, absolutely, every member of the board knew it. Helen Burke knew it. They knew that we had to serve them.

Lage: What were the dynamics on the board? It sounds as if it was a charged atmosphere.

McLean: Well, it was. Every time one of these requests to serve came up, it really became a knock-down-drag-out battle, you might say. The attitude from Helen Burke and Nancy Nadel was: "We don't have enough water." But the amount of water that those people would use was so minimal it was a drop in the bucket in comparison to the overall consumption.

We had the same argument over the city of Brentwood. Brentwood had a serious problem, because the water from their wells had a high concentration of nitrates. It was really ground water pollution. Brentwood was different, because they were completely outside the district's boundary. They were asking for surplus water. Well, of course, the last two years we declared that we did not have surplus water, and finally we didn't give them any. There was a period of time when it was a health problem. Their wells were very high in nitrates. The water was just not safe to drink because of the health effects on babies and elderly people. Finally we gave them a million and a half gallons per day. Again, we had another fight in the board about giving them water.

When we built the first aqueduct, the founding fathers envisioned that many of the cities along the pipeline would be served from the aqueduct. This, of course, was right in the beginning, and I do not know the reason for their thinking. On the first aqueduct we left taps where a connection could be made for a water supply. At Stockton I believe we left a twelve-inch tap, and I think at Antioch and Pittsburgh we also left taps. I don't know whether we did that for Walnut Creek, but we left taps where those cities could connect into the aqueduct. During World War II, Camp Stoneman at Pittsburg was supplied by water from the Number One aqueduct.

Lage: So that was the vision?

McLean: That was the vision of the founding fathers. Coming along to the issues today, where we have now a board of directors that are anti-development, what they're really trying to do is stop development in this area by curtailing water development.

Lage: I don't think they would argue with you on that. I mean, don't they come straight out and say it?

McLean: This is a fact.

Lage: They agree that that's their purpose?

McLean: Yes, that's their goal: no more water, no more people. I don't know how you're going to stop growth. Financially, it is going to hurt the entire Bay Area. It is going to affect the consumers of the district, because industries and developers that require a dependable water supply are locating elsewhere.

Lage: I noticed in the minutes of board meetings that during debates over the San Ramon Valley annexations a lot of conflicts-of-interest charges were made.

McLean: Well, Helen Burke and the Sierra Club sued the district. When we put in the last pipeline to serve that area, we already had one (48") pipeline and this was the second line (66"). The Sierra Club and the Environmental Defense Fund brought suit against the district to prevent the district from putting in a pipeline that would take care of the ultimate growth of the San Ramon Valley. The people in San Ramon, Alamo, and those areas said, "Look, when you put in a pipeline this time, make it large enough to take care of the ultimate growth of the entire area." This is what we did after protests by certain members of the board.

Lage: And I remember seeing in the minutes arguments between board members about the size of the pipeline.

The Tri-Valley Sewer Connection

McLean: I want to tell you there were some big fights, and there was a lawsuit. We won the suit. This is what happened in the Tri-Valley situation. The Tri-Valley area is that area of Livermore, Pleasanton, Dublin, and adjacent unincorporated areas. When they planned to put in the so-called "super sewer" from the Tri-Valley area that discharges into San Leandro Bay, the engineers at that time planned to make the sewer pipe large enough for the ultimate development of the valley--that is, put it in now to provide for all future development.

Lage: How would you decide what the ultimate growth would be?

McLean: You take in to account the kind of development that will occur in the area, whether multiple or single family or industrial. To give you an example, when we were making the studies for the original East Bay wastewater treatment plant, we used models of drainage areas. Every sewer line that you have is built in a drainage area. Normally you have these ridges and high areas, and in between you have a low drainage area. Then a sewer line is installed in the drainage area, and all houses that are built up to the crest of that ridge will drain into this sewer line. The models we used for sizing the north interceptor and the south interceptor, the ones that follow along the San Francisco Bay shore--the models that we used at that time for ultimate development of the drainage area--were models of Philadelphia, Chicago, New York, St. Louis, and other large eastern cities where they had similar population density. Then you use the projected ultimate density, the present density, and what you estimate the density will be in fifty years, and you size the interceptor accordingly.

We used a high density model for both the north and the south interceptors. These were to be sized for fifty years. This was starting back in the fifties, and they were to be sized to the year 2000. The result is that the south interceptor has not developed the flow as we had estimated. We are now twenty-five years into our model, and we still have additional capacity in the south interceptor. This is why Tri-Valley wanted to come in and connect into the south interceptor, and there was enough capacity to handle the estimated Tri-Valley flows.

Lage: Did Tri-Valley want to send untreated wastewater into the EBMUD system?

McLean: The Tri-Valley Authority wanted to convey the untreated wastewater into the district's south interceptor, thence to the treatment plant where it would be processed, and into the San Francisco Bay outfall. They wanted to size that pipeline for the ultimate development of the Tri-Valley area. They were prevented from doing that by the Sierra Club and lawsuits. By the end of the next couple of years they will have reached the capacity of the present pipeline and outfall. This is why they are searching for another facility to discharge the additional flow from the area. They're nearing the capacity of the present outfall, and they have no means to handle the excess. This is why they wanted to come across the hills into the district's interceptor to the treatment plant.

Lage: Could the treatment plant handle it?

McLean: We could handle it very nicely. There is sufficient capacity in the district's facilities to handle the additional flow. The growth model we used for the year 2000 has not occurred; as a result, we have excess capacity to handle the flow from Tri-Valley.

Lage: So who won the argument about whether to take on the Tri-Valley?

McLean: We could have taken the Tri-Valley flows, but both Oakland and San Leandro were opposed to the project. San Leandro said, "We don't want raw sewage under pressure going through our city." Both San

Leandro and Oakland threatened to sue Tri-Valley if they went ahead with the project. They didn't want this sewer in either city.

Lage: Do you think it presented engineering problems?

McLean: No. It was all political. They didn't want Tri-Valley discharging their wastewater into the district's system.

Lage: Where did the original sewer line come from?

McLean: The original sewer comes from the Tri-Valley wastewater treatment plant to a pumping plant through a pipeline across the hills and into the San Leandro Bay outfall discharge.

Lage: All treated?

McLean: Yes. It is treated effluence. Because of the lawsuits that were brought against them, it prevented the Tri-Valley Authority from building the pipeline and outfall to the ultimate size for the entire Livermore Valley. They should have built the sewer line and the outfall large enough to take care of the ultimate development of the Livermore Valley. If they had been able to do that, it probably would have cost them only a very small amount of money to add five or six inches to the inside diameter of the sewer.

In order to take care of the development which is occurring there--they have reached the capacity of the present facility--they have to go through the San Ramon Valley to the north into Suisun Bay. The present plan is to connect the Contra Costa Sanitary District's sewer line in the San Ramon Valley to the district's wastewater treatment plant and the outfall into Suisun Bay. The Contra Costa treatment plant will have to be enlarged to handle the additional flow from the Tri-Valley district. To take the flow from Tri-Valley through Contra Costa Sanitary District will cost many millions of dollars more than their original plan of going to San Leandro Bay. Just think how much this has cost the people in Livermore Valley who were prevented by the Sierra Club and the EDF lawsuits from adding a few inches to the original sewer.

Lage: Perhaps what you're saying is that making it difficult for them doesn't stop growth.

McLean: It didn't stop growth. That's what they tried to do; they tried to stop growth by limiting size of the sewer line. They tried to do the same thing on the 580 highway by limiting the amount of traffic with a diamond lane. The same thing has happened with the sewer line. This is the same thing that happened in the San Ramon Valley when they tried to stop us from putting a large pipeline to Alamo and San Ramon, so that it would only take care of the present growth rather than the expanded growth.

Limits to Controlling Growth in the Bay Area

Lage: As someone who has lived here for so long, what do you think about all this growth?

McLean: I don't know how you can control the growth in this area. We're trying to control growth, the Sierra Club and the environmentalists are trying. What is this doing? It is forcing people into automobiles to live in Fairfield, Tracy, Manteca, Modesto, Stockton, and Lodi, where they can find affordable housing. My grandson was compelled to go to Tracy for a home for him and his family. Finally, he's gone to Portland; he's gotten out of here completely. He was head meat cutter for Safeway, and in order to have affordable housing they had to go to Tracy and then to Portland, Oregon.

What this has done is force people into automobiles, driving miles away, where we have to increase the size of our highways. In West Oakland and a lot of other areas we could demolish a lot of the single family homes that are virtually worthless, put in multiple family dwellings where people can afford to live, and keep the people living within the core cities.

Think of the cost of developments that are taking place in areas such as Tracy. First they're going to be faced with water and wastewater problems, whereas within your core cities you have all the necessary facilities. When I was in England and other European cities, I saw them demolishing five- and six-story apartment buildings to be replaced by fifteen- to twenty-story apartment buildings.

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McLean: Affordable housing, that's what's needed within the core cities. You're creating more air pollution; you have more automobiles for people to get to the workplace. Get on any one of our highways on a workday. Go to Walnut Creek. I had to go to Walnut Creek on a consulting job that I had a month ago, and I had to be at the office in Walnut Creek at eight o'clock in the morning. Every day I would get tied up fifteen minutes or more trying to get through the Caldecott Tunnel. This happens both going east in the morning and coming west at night.

Proposed Merger with Contra Costa Water District

Lage: I was confused about the issue of either coordinating or merging with Contra Costa's water district. That seemed to be under discussion throughout your whole period on the board.

McLean: We had meetings on that subject for a long time. I was a member of the liaison committee. Craig Randall was the president of the board of Contra Costa Water District. Sandy Skaggs was our president. When I came on the board we had many meetings. We had them for three or four years. There was discussion of a merger of the two agencies. I think it would have been good for both districts; that's my personal opinion. I was in favor of it, and I think Sandy was also in favor of it.

Lage: Now, their water quality was not the equal of EBMUD's?

McLean: Their water comes out of Rock Slough, which is delta water from Lake Shasta, U.S. Bureau of Reclamation water. They were very anxious to get district water. Of course there would have been some problems, but I think it would have been good for both districts.

Lage: In what way?

McLean: For the district from the standpoint of development and income. The district has lost industries here within our original boundaries. All of the canneries that used to be here have left. Heinz has left, General Foods, Gerber, and all of those have moved to Tracy and elsewhere. They were large consumers. Contra Costa County Water District is basically domestic consumers; they don't have many industries. They have a few along the waterfront, but they're not large consumers, with the exception of Shell Oil company. I guess they serve Shell Oil, but I don't think there are many other large consumers that are served by the Contra Costa Water District.

This would have been a good base of revenue for the district. In addition to that, it would have extended the district boundaries out to take in the eastern areas of Walnut Creek. These areas should have been within the district's boundaries to begin with.

Lage: So just part of Walnut Creek is within district boundaries?

McLean: Yes, that's right. There's a line through Walnut Creek--I don't know just how it came to be, but it was probably the area originally served by the California Water Service Company--where one side is Contra Costa County Water District, and the other side is the East Bay Municipal Utility District.

Lage: So in a sense you're saying that having more consumers can be good for the district financially?

McLean: Yes.

Lage: Does it keep rates down?

McLean: Keep rates down. And we had plenty of water.

Lage: But not when the drought started.

McLean: Well, of course if you look at it from a drought condition, you still could have used the Rock Slough supply. This probably would have precipitated the requirement for additional storage. Probably we would have built the Middle Bar Project, and we might even have built Buckhorn and Pinole Reservoir.

Lage: It would have forced--?

McLean: Yes.

Lage: What about the Los Vaqueros Reservoir?

McLean: I have always been in favor of the district participating in that.

Lage: That was the Contra Costa Water District reservoir?

McLean: Yes. They are going ahead with that.

Lage: And do they want the district to help build that?

McLean: Yes.

Lage: And then share it?

McLean: We gave them some money. I seem to have the figure of around $100,000 that we gave them to participate in the studies. I've always been in favor of the district participating. It's just another source of supply in an emergency, if EBMUD ever got into a situation where we had some problems of supply. I've always felt that a large agency such as the district ought to have alternate sources of supply. Things can happen. Normally nothing is going to happen; the aqueduct has held up for fifty years or more. But it's always good to have another source of supply. Los Vaqueros would have been that. I've always felt that the district should have participated in it to the extent of 150,000 or 200,000 acre feet. It does pose problems for the district to use that water. But in an emergency you use whatever is available.

Lage: It's not of good quality?

McLean: It is not as good a quality as the Mokelumne or American River supplies. However, the operation of Los Vaqueros Reservoir is to obtain the water from Rock Slough when there are peak flows--during the wintertime when the water has much less salinity, when you have less sodium in it--and then store it, which is good. It's a good deal. The problem the district [EBMUD] would have using this supply is that if they wanted to supply the aqueduct system, you have to recognize that the Walnut Creek, Lafayette, and Orinda filter plants do not have sedimentation basins.

Any use of the delta water, taking water out of the delta or out of Rock Slough, you have sedimentation problems. So to use water from Los Vaqueros Reservoir, you'd have to build a pretreatment plant to reduce the turbidity of the water. Contra Costa may have to do that. You'd have to build a pretreatment plant large enough to take care of the capacity of Walnut Creek, Lafayette, and Orinda filter plants. Those plants now take the water directly off of the aqueducts. The turbidity in Pardee Reservoir is practically zero--less than ten--whereas the delta water is very high.

Lage: So there are a lot of problems?

McLean: There are problems with the use of a supply from Los Vaqueros, but our district serves 1,250,000 people. Accordingly, you've got to have means to obtain an additional supply. I've always said we need the American River supply. We need the American River supply for emergencies and also for our future water supply.

Lage: Is the quality of the American River water better?

McLean: The reason we chose the American River water is that it has the same high quality as the Mokelumne River. That can be taken directly into the aqueduct system and the three filter plants east of the hills.

Anyway, I have always been in favor of Los Vaqueros, and I hope the new board will participate in Los Vaqueros Reservoir with Contra Costa Water District.

Lage: It's not a decided issue yet, then? Is it still ongoing?

McLean: As far as I know. I don't think there's any definite agreement.

The Wet Weather Project

Lage: I also wanted to get your comments on the wet weather project.

McLean: The wet weather project now is pretty well underway and nearing completion.

Lage: Did that have conflicts or problems associated with it?

McLean: No.

Lage: It's designed to end the frequent overflows of raw sewage into San Francisco Bay during storms, is that right?

McLean: The north and the south interceptors were built for just the regular wastewater flow to the year 2000. That's the way they were sized, based on our studies. Because of old city sewers and many, many cases of building roof downspouts and drains being connected to existing sewers, we had a tremendous infiltration problem. That infiltration problem, which occurs in many of the older sewers, exceeds in many cases several times the capacity of the interceptor sewers.

Lage: So the rain flows directly into the sewers, is that the idea?

McLean: Yes, that's right. The excess water goes into the interceptors. Consequently we had to provide for the excess flow, because the treatment plant couldn't handle the excess. You reach the capacity of the sewer and the treatment plant. We had to construct overflow structures where we intercepted many of the large city outfall sewers; Fruitvale Avenue was one, there was one at the Embarcadero, and there were another two or three sewers from Berkeley.

When you had a severe rainstorm, a heavy storm, you would get all of the water from the city sewer lines, and the interceptor would overflow into the bay. We would have discharges into the bay of raw sewage several times a year. It was untreated sewage with all the rainwater flowing into the bay from these overflow structures.

Because of the Clean Water Act, EBMUD was issued cease and desist orders to stop the overflows. There is a fund, called Super Sewer Fund, to permit the district to go ahead with what is known as the Wet Weather Program.

Lage: Is that federally funded, then?

McLean: That's federally funded, and the state of California also participates. I think 75 percent is federal, 12.5 percent is state, and then a similar amount is from the local entity. The district has then gone ahead with the Wet Weather Program, which is now nearing completion. In addition, the cities have also had to repair many of their large collecting sewers. There's the Foothill Sewer and also the Grand Avenue sewer, where they had to replace the old sewers because of the poor condition and infiltration. Previously these sewers (twenty-seven of them) all discharged into the bay, and the infiltration was not a problem.

Lage: Why does the city pay for those rather than the district?

McLean: Well, because these are city sewers. The ones contributing to this infiltration were some of the very large sewers in the city, where ground water seepage and rainwater entered where joints were poor.

Lage: So those are owned by the city and not by the district?

McLean: That's right. They were built by the various cities, and each city was responsible for them. The cities are responsible for the water entering the interceptors. This is why we had to build the Fruitvale retention basin near the coliseum. Storm water is retained in the basin until the main treatment plant can handle the flow from the retention basin. The excess flow goes into the retention basin, is released into the sewer after the storm has passed, and flows in the interceptor get back to normal. Then you can treat the water and discharge it out through the regular outfall. All of this work is under construction. They have a contract that was just awarded recently for the Point Isabel plant. The Point Isabel plant is going to handle all the flow from the north. The retention basin being built at the wastewater treatment plant is the one that was supposed to be constructed in the Emeryville area.

Lage: There seemed to be a controversy about where that should go. Tell me about that.

McLean: Well, it was originally designed to be put in the area near the Judson Steel Company in Emeryville, right near the Bay Bridge interchange structure.

Lage: Where 880, 80, and 580 all come together?

McLean: Yes, where 580 and all of them come together. To the right hand side of that there's a piece of vacant property that I think used to belong to the Key System or Santa Fe railroad. It was an excellent site for the storage basin, because the north interceptor goes by the west side of the property. The advantage of this location was that when the north interceptor was full, with the surplus wet weather flow coming in, it would flow into the basin. Then after the storm had passed, it could be released into the interceptor to enter the treatment plant.

Mary Warren was against the location because she said that the city of Emeryville expected to develop that area as a bio plant. Nancy Nadel stirred up the neighbors to the south of the area, so they protested to the district.

Lage: Did it have some odors associated with it?

McLean: No, these wet-weather basins are covered; there's no odor. This particular one would have been covered and landscaped. In fact, at one time they considered using the roof of it for a parking area. Because of the opposition from Emeryville and the neighborhood to the south, they forced the district to construct it at the treatment plant. The basin has been built in an area at the treatment plant that was needed in the future to expand the plant.

This change of location cost an additional $12 million or more to move it over to the treatment plant site. And the real problem is that it has taken up space that ultimately will be needed for the plant itself.

Lage: So that was another issue that you lost?

McLean: That was another issue that I lost. I fought for putting it over in Emeryville, and so did Skaggs; but Mary Warren and Nancy Nadel were against it. I don't remember who else was against it. Anyway, the board voted to go to the treatment plant. I was very much disappointed, because I think it was a mistake to occupy the limited space at the treatment plant. That space will be needed in the future for additional facilities of the wastewater treatment plant.

Lage: Is there anything to say about the composting project? Finding a market for that sludge?

McLean: They only compost a small portion of the sludge, but it has been very successful. They have always found a very ready market for it.

Lage: Why do they only compost a small part of it?

McLean: Because there is no demand. In other words, we're about meeting the supply and demand. In the Central Valley we'd have a larger market, but our market here is limited basically to local landscape organizations. I use the compost; I can show it to you in all my flower beds. Through one of the local nurseries here, I think I have bought twelve to sixteen yards of it. But it's a supply and demand situation, and so far I don't think the market has expanded much beyond the district's boundaries. It's an excellent material for mulch. It keeps the weeds down and saves on water. I think if the district was located in an area where you had a larger market, it would be all right. They've expanded some, but they are limited also in space when it comes to handling it at the site. But with the amount of tonnage that comes from the plant daily, it's difficult to process all of the sludge.

More on the Need for Middle Bar Dam and Buckhorn Reservoir

Lage: The next topic I've written down here was hydroelectric plants. We talked about Middle Bar.

McLean: Yes. We were looking forward to proceeding with the construction of Middle Bar project. At that time the district was threatened with a lawsuit from Amador County. We also had protests from the white water rafters, and there were local protests against the project.

Lage: What about Railroad Flat? Was that a similar problem?

McLean: Railroad Flat, that's a small project, and it wasn't the most viable project. Had we built Middle Bar--there were many benefits.

Lage: Middle Bar was a big project.

McLean: Middle Bar was a big project. It was a high dam located at the headwaters of Pardee Reservoir, at the upper end of Pardee Reservoir. It would have provided many benefits which I felt were essential in addition to the water supply. It would have given us a high pool in Pardee where we could obtain maximum gravity flow in the aqueducts at all times.

Lage: So it was for water supply as well as for hydroelectric power?

McLean: Yes. The Middle Bar project would have controlled the full flow of the Mokelumne River. The reservoirs that we have on the Mokelumne do not provide the full control of the maximum yearly peak flows. As far as the average flow is concerned, the present reservoirs are sufficient. But we have had some very tremendous floods. In '86 we had a peak year. We had over a million acre feet or about twice the mean annual flow in the Mokelumne River.

The mean annual flow is about 750,000 acre feet, whereas the peak flow that we had during those floods was 1,200,000 acre feet.

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McLean: The PG&E reservoirs at Salt Springs and Lower Bear reservoirs hold about 150,000 acre feet. Camanche holds 420,000 acre feet, and Pardee will hold 210,000. So there was a surplus of several hundred thousand acre feet of water that went to waste. If you had Middle Bar reservoir, which would contain about 400,000 acre feet, you would be able to store that water to carry over into drought periods.

Lage: If you had that, would you not need Buckhorn?

McLean: You need Buckhorn. Don't confuse Buckhorn Reservoir with the Mokelumne River storage. You need Buckhorn for local storage.

Lage: But I thought that was to get wet weather water.

McLean: That is intended for the American River water supply. The reason you need Buckhorn Reservoir is because you have to have some storage for the American River water because of Judge Hodge's decree regarding the time that the district can take that water. You can take American River water for use here within the district only for a short period of time, from about April 1 to July 1, when there is surplus flow in the American River. In order to store 150,000 acre feet of water, you've got to have storage for that water, because all of the other district reservoirs would be full or filling.

Lage: But if you have the Middle Bar, would you need the American River water?

McLean: Oh, absolutely.

Lage: It's not enough even if you control the full flow of the Mokelumne River?

McLean: You need Buckhorn for local storage. In the event of a failure of the aqueducts across the delta or a failure of the tunnels. Additional storage is needed for the distribution system, both east and west of the East Bay hills. Pardee or Middle Bar reservoirs don't serve the distribution system. If you have a failure on the aqueducts, you've got to have local storage to carry over until the aqueducts can be repaired.

Problems with the South Spillway of Pardee Dam

McLean: The benefits from Middle Bar--there would be a high pool at Pardee. Maximum hydrogeneration. It alleviates the problems that we have with the south spillway. The south spillway at Pardee Dam has always been a problem. Every time you have an overflow at the Pardee spillway, debris that is washed from the hillside at the base of the spillway blocks the main channel below the dam. It stops the hydrogeneration. The last time we had an overflow was way back in the sixties. That time it completely blocked the river below the dam and flooded the powerhouse. It took us four or five months to remove all the debris from the river at the base of the dam and open the river channel.

Lage: Was that a problem with the original engineering concept?

McLean: It is a problem, yes. Many studies have been made to correct the condition, and all are very costly. But we have taken the risk instead of actually correcting it. Every time there is an overflow, even a small flow, it washes the hillside and keeps sliding the debris into the river. We should have built a different type of a spillway, but we've lived with it. Fortunately, we've been able to control the river over many years. Since Pardee Dam and spillway were built we've had about three spills in which the river was blocked below the dam. If we ever get the maximum storm flow that the spillway was designed for--120,000 cubic feet per second--you'd have a real problem on your hands, and you could have a problem with the safety of the dam.

Pardee is a concrete arch gravity dam. Every dam, whether it is an earth-filled dam, a concrete dam, or a gravity dam, has to have a means to relieve hydrostatic pressure under the base of the dam. To prevent that pressure, we have a drainage system within the dam itself. Earth-filled dams and concrete dams have drainage systems. In the base of Pardee Dam there is a series of pipes to intercept all of the seepage from the reservoir and convey the water to the stream channel below the dam. This drainage system is located near the upstream base of the dam and extends across the base and the abutments. The amount of water flowing from the system is measured daily.

Lage: Does it flow into the spillway?

McLean: It flows out into the river. If you get a high tail water on the base of a dam where that pressure is not relieved, you get an uplift pressure on the base of the dam. And from that can come a dam failure.

Lage: So if the spillway is blocked, that would occur?

McLean: If the river is blocked and the drainage system cannot function, then you get uplift pressure on the base of the dam, and you have a failure. The famous dam that failed, the St. Francis Dam near Los Angeles that was designed by the Department of Water and Power, had this same problem. In this case the center of the concrete dam actually tipped upstream, and the entire dam collapsed, sending a wall of water down the canyon. There were nearly three hundred people killed.

Lage: I think you told me about that.

McLean: The failure of the St. Francis dam in 1929 was due to uplift pressure under the base of the dam.

Lage: So is that something you suggested be corrected at Pardee?

McLean: Oh, yes, absolutely. This is one of the problems that I have mentioned to the engineers, because they're planning to raise Pardee Dam forty feet or more. If they raise the dam as planned, they will have to provide for a new spillway and abandon the present spillway. That will prevent further erosion of the hill at the end of the present spillway and any further blockage of the river.

Lage: Do they agree with this? Are they listening?

McLean: They listened to me; I don't know whether they've agreed with me. The location of a new spillway will be a problem if they proceed with raising Pardee Dam. The south abutment is another problem. Originally Pardee was designated as an arched dam. After the contract was awarded for the construction, exploration of the south abutment showed serious faulting of the rock. As a result, the design was changed to an arched gravity dam. During construction, the south abutment was grouted very extensively with cement grout to fill the seams in the rock. A new spillway and the foundation for the south abutment will be real problems if Pardee Dam is raised.

Other Issues: Fluoridation, Watershed Rangers, Watershed Protection

Lage: Shall we turn to some side issues that seem to occupy the board? One would be fluoridation. Did you get in on that?

McLean: Yes. I was on the board when the fluoridation issue came before us.

Lage: Did the board take a stance on that?

McLean: Yes, the board agreed to go ahead with the fluoridation. I think that was the one of the few issues where the district actually agreed with the public.

Lage: Was there public pressure?

McLean: There was considerable public input on fluoridation

Lage: Was it on both sides of the issue?

McLean: On both sides, yes. We had both the pros and cons, and I think from all the testimony and letters that we had, the board decided to put the fluoridation issue on the ballot for the consumers of the district to vote on it.

Lage: Did it go to a vote?

McLean: Yes. It went to a vote of the people, and they voted for the fluoridation [November 5, 1974].

Lage: That really is public input.

McLean: Yes. I think it was unanimous on the board that we would put it up to a vote of the people, and the people voted for it.

Lage: Did you have a personal opinion about it?

McLean: I've always been kind of neutral. I've always felt that there are other means to accomplish fluoridation. Actually, it's the younger generations who benefit most from it--that is, the youngsters up to the age of fifteen. I have never believed that you should subject an entire population to benefit a few. You have fluoridated toothpaste and other means that are just as beneficial, rather than going through not only the cost of fluoridating the water supply but subjecting the entire population to it when it doesn't do the older generation any good. Although fluoridation doesn't cost very much, it is a cost additive. Why subject a public water supply to an additional cost when the benefits are only for a small portion of the population?

Lage: But you did feel that going along with the public vote was a good way to resolve it?

McLean: Oh, yes. Sure. I think that was one of the logical ways to do it.

Lage: You mentioned you were on the liaison committee with the East Bay Regional Parks.

McLean: Yes.

Lage: And I saw reference in the minutes to a lot of controversial things about watershed rangers. I didn't quite understand what all that was about.

McLean: One of the first issues we had was the arming of EBMUD rangers. The district has always patrolled the watershed lands. We still do; we still patrol them. But the district rangers not only did maintenance, they devoted a lot of time to patrolling and looking for trespassers and unauthorized persons in district lands.

Lage: Were they unarmed originally?

McLean: They were unarmed originally.

Lage: When did they decide it was necessary to arm?

McLean: I forget the exact date, but the rangers felt they had to be armed for their own protection.

Lage: I saw it mentioned first in the minutes in 1982. Does that sound about right?

McLean: Yes, I think that's when it was, about '82. The board began to take a pretty hard look at their request to carry firearms, because then they really became peace officers. In discussing the issue, we found that the board of directors would be personally responsible for the action of the district's rangers. If one of the rangers got into an argument and shot somebody, the board of directors would have been personally responsible. There was some lengthy discussion on this subject between the rangers, staff, and the board of directors.

Lage: It sounded like there was a lot of public input on that issue.

McLean: Yes, there was.

Lage: Were people for or against it?

McLean: Most of the people were against the rangers having firearms. They were against arming any of those people. There was a lot of controversy in regard to the need for firearms.

Lage: Was it the staff that felt they should be armed?

McLean: No, the staff took a neutral position on it, but the rangers themselves wanted to carry the firearms for their own protection.

Lage: I see. They felt the need.

McLean: They felt that they needed the additional protection. In case of a confrontation with a hunter who was carrying a gun, they would be unarmed. Every once in a while you have people poaching and hunting deer and other game on the district's properties. The rangers tried to give us this story about confronting a hunter with a gun, they would have no way of protecting ourselves, and they would be killed. That, of course, was a good argument.

Lage: How was it resolved?

McLean: Actually, there is a duplication of services between ourselves and the regional park district. All of the district lands really are contiguous to or more or less integrated with the regional park district. The regional park district has a regular police force; their people are regular policemen. They have a helicopter and a short-wave radio for instant communication, and they are on duty full time. Finally it was resolved by having an agreement with the park district that they would do all of our patrolling and emergency response where they could dispatch the helicopter for emergencies. That's the way we finally resolved it, by turning over all of police patrol duties to the regional park district.

Lage: Did they then take on your watershed rangers?

McLean: Well, some of the rangers went to the park district. They took those who wanted to do only the armed patrolling. We gave them the opportunity to transfer. I do not remember how many of them transferred; perhaps there were a half dozen of them who elected to go to work for the regional park district. The remainder of the rangers stayed, and they still patrol the district's watershed lands, but they are unarmed.

Lage: And then they call in for help if they need it?

McLean: Yes. Well, they're at the San Pablo and Lafayette recreation areas, and they do maintenance work as necessary. They are not permitted to carry any firearms. They no longer have the policing duties; that has all been taken over by the park district.

Lage: Was that satisfactory to the populace?

McLean: It's worked out very well. Of course, the district people can call in the regional park district for a police officer or the helicopter if needed. Mary Warren and I were on the liaison committee with the park board, and we met about every couple of months to review the costs. It worked out very well; I think it's a good arrangement.

Lage: Any other areas that you had to work on in that committee?

McLean: No, that was basically it. We did have some discussions in reference to particularly the properties along Redwood Road that drain into the Upper San Leandro Reservoir. Some of them are contiguous to the park district, and some of them are contiguous to the EBMUD district. There's always been a problem of contamination from the dwellings. Both districts have an agreement that whenever the opportunity would occur, either the regional park district or the water district would buy the land and get rid of the residence. There's a good-sized population living in there, and all of the residences have septic tanks. Any effluent from the drainage fields flows into San Leandro reservoir.

Lage: Are we talking about the little community of Canyon?

McLean: It's the Canyon community. That has always been a problem. The district always had a policy that whenever any of those properties were available, the district would buy them. I don't know how successful we've been through the years, but some have been acquired. That community has been a nuisance not only to the regional park district but also to the EBMUD district. There were horse stables also, but the horse stables are all gone now. Recently the park board bought an old stable area there.

Over the years both districts have had the policy of eliminating or getting rid of any property within the drainage basin of the district's reservoirs.

Fishing and Boating on District Reservoirs

Lage: You've mentioned fishing at the reservoirs. When did the policy to allow fishing on the reservoirs come about?

McLean: The East Bay Water Company and the district [EBMUD] had a policy of no fishing in any of the reservoirs. There was a bill that went through the legislature to open the district's reservoirs for fishing in the fifties, before I came on the board. Staff and management discusaed this for a long time, and finally we recognized that we would have to agree to it and provide access. After I finished the wastewater project, one of the first reservoir recreation projects I worked on was Pardee. There we received money from the state fish and wildlife fund. That was to provide a boat launching ramp and the means of access, sanitary facilities, water supply, and facilities for opening Pardee Reservoir for fishing [opened to the public in 1958]. Then we opened up San Pablo [1973]. We did very few improvements at San Pablo. There weren't many improvements required, because that was leased to a concessionaire, and the concessionaire provided most of the facilities. The district did some of the work--built the access road and picnic areas and a few other facilities. At Lafayette Reservoir we constructed all the facilities, including a beautiful building. District personnel operate the Lafayette Reservoir recreation area, and it is used largely by people from the local communities [opened 1966].

Lage: Without a concessionaire?

McLean: Without a concessionaire.

Lage: How does that compare with San Pablo?

McLean: Well, of course, it's a much smaller reservoir. It does get a tremendous amount of usage, particularly from Lafayette, Orinda, and Walnut Creek.

Lage: And the district manages it all right?

McLean: Yes, the district has done all right in the management. However, you have to understand that none of these recreation areas have ever been money makers. I don't know how much is in the budget this year, but the district normally contributes about $5 million or more annually to these recreation areas.

Lage: So they don't even break even?

McLean: They don't even break even.

Lage: So you consider it a public relations asset?

McLean: That's basically what it is, public relations. San Pablo and Lafayette are used extensively. A lot of the people come from different areas. Lafayette is used mostly by local people; Pardee is used considerably by people from Stockton, Sacramento, Lodi, and those areas. It gets heavy use during the summertime.

Problems with Recreation at Camanche Reservoir

McLean: Camanche Reservoir [opened 1966] has been a kind of a problem because of the drought years and the low water. Originally it was leased out to two concessionaires--one for the north and another for the south. They built all the improvements. Because of the lack of attendance, they finally reached the point where they were nearly bankrupt a couple of years ago. The district finally had to take them over. Now we lease all the facilities to concessionaires.

Originally there was a tri-county board composed of Amador, Calaveras, and San Joaquin counties to oversee the Camanche recreation area.

Lage: I see. So you had the other counties involved?

McLean: We had the three counties in it originally. They wanted to participate, and we turned that over to the tri-county board. The facilities were all leased out to concessionaires, and they built most of the improvements. Because of several years of drought that we've experienced and the low water, attendance has declined. The other thing is that the summers are so hot at Camanche that a lot of the people from the valley go to the mountains; they go up to Strawberry, Lake Tahoe, and Silver Lake.

Lage: To get away from the heat.

McLean: To get away from the heat. Consequently, Camanche Reservoir is more or less left out during the heavy usage. Also, the water's been so low recently that there is no way to launch boats. Use at Camanche Reservoir recreation area has been rather limited. When the reservoir was full, there was a lot of use. But it never was enough to repay the original costs for constructing the facilities. Finally it got to the point where the concessionaires could not continue, so the district had to take it out of their hands.

The district has had to put quite a bit of money back into the various facilities. The restrooms were all going to pieces; they hadn't maintained them. Some of the toilets were not functioning, windows were broken--.

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McLean: The district has had to take care of the maintenance which the concessionaires had neglected to do. Consequently there has been a considerable additional expense the last couple of years on Camanche. Whether it will ever be a tremendous success is hard to say, particularly if the drought continues.

Boaters used to do a lot of water skiing on Camanche, which is not permitted on Pardee Reservoir or any of the local reservoirs. Camanche Reservoir was ideal for water skiing when it was full; it has a large surface area that is excellent for skiing.

Lage: You don't worry about the affect of boating on the water quality?

McLean: Camanche is not used for a public water supply. Camanche was built to store water for the Woodbridge Irrigation District, the riparian owners along the river, and the Woodbridge Water Users Association, which had prior water rights on the Mokelumne River. The district does not take any water from Camanche. All of EBMUD water comes from Pardee. This is why we prohibit water skiing and swimming at Pardee.

Lage: Is Pardee big enough for speed boating?

McLean: Yes, Pardee would be large enough. But it's prohibited there because of the potential risk of polluting the water. Camanche was for irrigation only. Prior to constructing Camanche Reservoir we had to store enough water in Pardee to take care of the riparian owners, the fishery downstream, the Woodbridge Irrigation District, and all others who have rights to water from the river. Today the river losses are such that in order to get the full entitlement to the people downstream, we have to nearly double the flow that is released from Camanche to the Mokelumne River. If we had to store this water in Pardee, there would be very little water left for the district's water supply. That's why we built Camanche Reservoir. When Camanche Reservoir is full, it holds water enough for nearly two years of supply for the irrigation districts and riparian owners. Camanche holds twice as much water as Pardee. Camanche holds 420,000 acre feet, where Pardee only holds 210,000.

XIII BOARD ISSUES: PERSONNEL AND OTHER INTERNAL POLICIES

Instituting Affirmative Action Policies

McLean: Let's talk just briefly about affirmative action.

Lage: Yes.

McLean: The board has always had a policy of affirmative action, and I believe that the district's affirmative action record was good. I resented very much--one of the problems we had on this board was Helen Burke, Jack Hill, and Ken Simmons constantly advocating more minority participation in the district's contracts and work.

Lage: Ken Simmons was a strong proponent of affirmative action.

McLean: Ken Simmons was a strong advocate for the use of more minorities, particularly Afro-Americans. He always felt there should be a higher priority for minorities. Simmons always emphasized the use of more African-Americans, to the extent that he wanted to reject contracts if the contractor did not have the specified minority participation.

Lage: He was concerned about the policies of your contractors as well as the district.

McLean: That's right. I have never felt that we should ever have a quota system. Everybody should be on an equal basis; in other words, qualifications should be the criteria, rather than saying you've got to hire a certain percentage of Asian Americans or other nationality.

Lage: What viewpoint actually prevailed? Did you turn down contracts because of contractors' minority hiring records?

McLean: I don't think there was ever a time when we rejected a bid or proposal because of affirmative action. Staff usually screened all bids and proposals and came in with a recommendation to the board. You see, the problems you have with contractors are different than hiring personnel. With the district you can establish a policy where you can employ people to conform to the affirmative action program. But with contractors you have to recognize that they do not have control over the people they hire. Most contracting organizations have a permanent staff of a fixed number of estimators, foremen, truck drivers, and office personnel. This is only a small portion of what they need when they go on a job. If they get a job from the district, whether it's an office building pipeline or whatever it happens to be, they go to the union hiring hall for the remainder of the personnel they need.

Lage: And they take what is given them?

McLean: They take whoever is sent to them from a list. They really don't have any choice. Whatever is sent out to them they have to take, if they are a union contractor. Trying to control the contractors' affirmative action virtually becomes an impossible task. When a contractor bids on a job, he will list minority firms as subcontractors. Every contractor today has a list of minority firms that they use. They can be Hispanic, women-run firms, Asian, Afro-American, or a combination. When the minority firms need electricians, plasterers, painters, roofers, pipe workers, welders or any other classification, they obtain them out of the union hall. They take whatever the union hall sends them, regardless of nationality.

What Ken Simmons wanted was a quota system. The entire time I was on the board, Ken was always insistent about the role of the black community. He wanted to go to a system based on the population of the different races within the district. Because there was a high percentage of blacks, in the affirmative action program you would have X number of blacks, Hispanics, Asians, and native Americans. The board overruled Ken Simmons' proposal, but generally it was on a four-to-three vote, because Sandy Skaggs, Mary Warren, and I saw that we would have some real problems with the contractors' associations.

Lage: Who on the board would have been your fourth vote?

McLean: Ken Kofman and later John Gioia. But Ken Simmons, you couldn't make him understand. He, Helen Burke, Jack Hill, and Nancy, when she came on, were all oriented to hiring more Afro-Americans.

Lage: Were they more concerned about blacks than about women, Hispanics, and Asians?

McLean: Yes. Ken Simmons particularly was mostly for blacks. His idea was that you should have more blacks even with the district.

District Employment of Minorities

Lage: What about minority employment of district personnel?

McLean: The district has done very well. I forget what the percentage of minorities is now. We received regular reports from Jerry Gilbert. We've never been up to what Ken Simmons thought we ought to be, but the district has a fairly good cross section of all minorities. Don Jackson, who is head of maintenance and operations, is outstanding. I believe he came from BART. Ruth Foster, who was secretary to the general manager, and Artis Dawson are both exceptionally fine people. They're all black and really highly qualified, which I think is excellent. My personal feeling is that anyone coming into the district should be on an equal basis and should be qualified. If they are qualified, I don't care whether they are black, Asian, Hispanic, or white. I think they've all got to meet the same qualifications. I have never been able to feel that because the district is a public organization there should be a difference between them and any outside organization.

Lage: Do you think the district should make an effort to find the minority workers who are qualified?

McLean: Absolutely. Well, the district has always had a recruiting program to find them, and I know there's been a terrible lack of Afro-American engineers. They are just not available. The greatest number of minority engineers come from Hispanics, Asians, Chinese, and Japanese.

Lage: I didn't know so many Hispanics--.

McLean: Oh, yes. We've had Hispanics; there are Hispanic engineers. I've worked with Hispanics in the private sector in the consulting business, and they're good. I think the Asians are tops, particularly the Japanese and the Chinese. Even in the private sector you'll find a lot of Asians. There are more Asians--Japanese and Chinese--and even East Indians. But few blacks. I only know of one black engineer, Jeff Hilliard, who is now employed by the district.

Lage: That makes problems recruiting, doesn't it?

McLean: Yes. Well, I don't know the reason, but they apparently don't have the technical background; there are very few in engineering. You'll find them in the business sector, but they're not in the technical field.

Lage: Well, maybe it has to start down in the school level.

McLean: Yes, that's where it starts. I think it starts right in the elementary schools and in the high schools. The district has even tried going to high schools to encourage them to take the engineering and mathematical subjects. They just don't seem to have the interest for the technical subjects.

Difficulties of Bonding Minority Contractors

McLean: I think the district has had a good recruiting program, particularly with minority contractors. They have tried very hard to get minority contractors to submit proposals on district work. The big problem that many of the minority contractors have is that they do not have the bonding capability. They haven't established a good bonding experience, and they cannot get a faithful performance bond or other types required by the district contracts.

Lage: Is this like an insurance policy for them?

McLean: You see, on any public works contract you have to put up what they call a faithful performance bond. It's a bond that says you are going to complete that contract. If you don't complete that contract, the bonding agencies have to complete the contract. Not so much Hispanics, but when it comes to blacks, very few are able to get bonding.

Lage: Did Ken Simmons deal with this kind of problem? Did he have ideas on how to deal with it?

McLean: He's never dealt with it, no, because I don't think Ken, to begin with, realizes what the problem is. In the private sector, in my consulting work, we did a job for the Oakland schools at one time. There were two or three minority (black) subcontractors who wanted to bid on the job. They went so far as to ask the Oakland school department if they wouldn't bond them. You really defeat the purpose of bonding if the agency does the bonding.

Lage: Is it a state law? Is the bonding required?

McLean: It's a state law that on any public work of this type you have to have a faithful performance bond.

Lage: It must be hard to get started--to start up a contracting firm.

McLean: That's right; you have to have gained a reputation and be well financed.

Lage: But how do you get a reputation when you are a new firm?

McLean: That's always the big question. I guess the thing is to work long enough as a subcontractor under a contractor. The general contractor has to have the faithful performance bond. A subcontractor can work for another contractor unless the general contractor requires a bond of him. On many large jobs, if a subcontractor has a contract for one million dollars or higher, the general contractor may require a bond from him or some type of signed agreement that he will finish the work. If he doesn't finish the work, he has a bond that's responsible for completing the work.

There have been a few large contracts, and one of them was the Caldecott Tunnel--the first Caldecott Tunnel. I believe it was Kaiser Construction Company that had the contract, and they had some real problems in that tunnel. They walked off the job, and the bondsmen had to finish the tunnel.

Lage: That's not good for the reputation.

McLean: True. But this minority situation--I read that the district, on some of these contracts, is encouraging minority contractors, women-owned organizations and particularly the Afro-American minorities, to bid on district work. This is the new board. The new board is very much oriented toward minority contracting.

Lage: But it seemed that your board did a lot for minorities.

McLean: True, we did a lot of work with them. We did everything we could to encourage them to bid on district work, but many minority contractors bidding on district work are unable to obtain a faithful performance bond.

Comparable Worth

Lage: What about the issue of comparable worth? That's related to wages for women's jobs within the district.

McLean: The district certainly looked at that problem. I have always believed in comparable worth. I've always believed that women should be paid for whatever type of work they do. If they work alongside a man, and they're both painters, they should be paid the same wage. However, you get into some gray areas when you start to compare, we'll say, an executive secretary with some other type of position.

Lage: With a more laborer-type position?

McLean: Yes, something like that. It's a little difficult to say, "The secretary should be paid as much as this person out in the field because they're both performing a skilled function." One is doing one type of work, and the other is doing another. That confuses me a little bit; I haven't been able to reconcile that. But I can say that where two people are doing similar types of work they certainly should be paid comparably. And I think the district has attempted to do that as much as possible. It is a little difficult to say that a secretary ought to be paid as much as a skilled automobile mechanic or similar situations. I have a little difficulty relating that theory of comparable worth. And I think the board also had that same problem.

Lage: It presents more problems.

McLean: Yes.

Lage: I think we'll stop here, because we'll have to come back, and we might as well be fresh.

A Controversial Contract Award Decision##

[Interview 10, August 20, 1991]

McLean: In all of the years that I was on the board, most of our meetings finished by four-thirty or five o'clock. During the process of the award for the furniture and the partitions in the new building, there was a bid submitted by a black firm from Oakland. The bid they had submitted for the partitions and the furniture was about $600,000 lower than the next bidder. The reason for that was that they had not submitted their bid in accordance to the plans and specifications but on an entirely different type of furniture and partition.

The result of it was that there was a large delegation from the community, comprised mostly of blacks, who were protesting the award to anyone other than the firm that had submitted this bid. It was a long session, with speakers from the Oakland community. Among them were Paul Cobb and a number of other prominent persons. The meeting went on for several hours. There were twenty-five or thirty speakers who got up and spoke before the board, and as a result it was getting into the evening hours.

Finally the attorney, Bob Madow, asked for a recess and a closed session to consider the bids. Mr. Madow told the board that they had only two alternatives: either award the contract to the next responsible bidder whose bid was based on the plans and specifications or reject all bids. Those were the only alternatives. We could not award the contract to this black firm that had submitted this lower bid, because the bid did not comply with the plans and specifications.

Lage: Was it drastically different?

McLean: Yes. It was an entirely different material and everything else. The board deliberated on the alternatives and then went back into regular public meeting. The board rejected all bids. I think it was close to nine o'clock that night before we got out of the board room. That is the latest board meeting ever during my tenure on the board.

Lage: Why did the board decide to reject all bids instead of deciding to award it to the low bidder who was in conformity with the specifications?

McLean: Well, the next bid was about $600,000 higher than the one that had been submitted by this other firm. I never liked to re-bid work, because it's just like playing poker. You've already revealed your hand, and you've told everybody about what the price is. However, we did reject all the bids. About three months later we received bids again on the same plans and specifications, and a Hispanic firm from Sacramento bid the job and was awarded the contract. I don't recall what their bid was in comparison to the previous bids, but as I recall it was more favorable than the original bid.

That was one of the longest meetings we ever had. Sometimes the board meetings might go to six o'clock, but that was very rare.

Lage: What time did they begin?

McLean: Always at 1:15. We'd atart at 1:15, and then we'd go until we finished the agenda. Most of the time the meetings went rapidly. There were many times when we were finished by two or three o'clock in the afternoon.

Value and Problems of Public Involvement in Board Policy

Neighborhood Objections to Building Buckhorn Dam

Lage: You had a lot of meetings, I noticed in the minutes, that were public hearings and seemed to be pretty fiery.

McLean: Yes, some of them, particularly when we were on the water management program. Most of those meetings were scheduled at night. We had one at the Oakland Center, another at the Kaiser building, and one in Walnut Creek. However, those were scheduled for seven or seven-thirty at night. The one we had in the Kaiser auditorium was a long session. The house was full, standing room only.

Lage: Now, what was the issue there?

McLean: That was in reference to the EIR [environmental impact report]--that is, the water management plans.

Lage: On the Buckhorn Dam?

McLean: On Buckhorn Dam and Reservoir, yes. We really had a fiery session on that.

Lage: Were both sides represented?

McLean: Both pro and con sides were represented. There was a lot of opposition to Buckhorn Dam, particularly from the people in Castro Valley. Their protests were in regard to the traffic on Redwood Road. The study of traffic conditions is required by the EIR. On earth-filled dams you have a lot of imported material, what is known as drainage material. On the back of the dam there's a gravel drainage blanket for relieving the pressure on the dam. On the upstream face of the dam you have rip rap rock for slope protection. All that material had to be imported for Buckhorn Dam. Altogether it required a million tons or more of that material, and that has to be hauled in over roads during the construction period. Because of the Redwood School on Redwood Road, there was a tremendous amount of protest about the truck traffic.

One of the things that was very interesting to me was that back in the late seventies we built the new Upper San Leandro Dam. The original San Leandro Dam [1926] was a hydraulic fill. The clay core of the hydraulic fill had never completely dried. Tests were made at the University of California when we studied the dam for seismic forces, and the tests showed that in case of an earthquake we could have had liquefaction in the core, and the dam might have failed. We had lived with this for many years.

With San Pablo Dam, also one of the early hydraulic-fill dams (1919), because there was ample room on the abutments we were able to reinforce the dam both on the upstream face and the downstream face. With Upper San Leandro Dam, because of the very narrow area where abutments for the dam were located, it was impossible to strengthen the upstream and the downstream face as we were able to do at San Pablo. Consequently, in order to provide the storage for the Upper San Leandro Reservoir, we had to go downstream between a quarter and one-half mile to a new site and build a new dam.

The interesting part about it is that this new dam had about the same quantities as the proposed Buckhorn Dam. At several meetings we had in reference to Buckhorn Dam, I questioned a lot of the people, particularly the principal of the Redwood School. First I asked him how long he'd been at that school, and I think he'd been there twenty years or something like that. I said, "Do you remember when we built Upper San Leandro Dam about seven or eight years ago? Do you remember all the hauling that occurred on Redwood Road at that time?" He said, "No. I don't remember it." This was very interesting, because I questioned several people about this, and none of them remembered the trucking on Redwood Road during the period the dam was under construction.

Lage: It was the same road?

McLean: Yes. And all the quantities were virtually the same. We hauled continuously--concrete, rock, and gravel--and none of those people remembered. It proved to me that today, because we have these EIRs and public meetings, people imagine the negative things. Suddenly we have these waves of protest, many times brought about by a small group. When the new San Leandro Dam was built we didn't have to have the impact report and public hearings.

Consequently, we went ahead and built the dam, and nobody paid any attention to the project. The environmental impact report process costs the taxpayers millions of dollars annually in preparation of the reports, public hearings, and delays to the work. Personally, I have felt it is a waste of time and money.

Lage: As a board member, do you see the public hearing as a way to try to convince the public or a way to hear what the public is thinking?

McLean: I've always believed that public meetings are good, but I think what actually is happening today is that people get all disturbed over something that really, if they didn't know about it, wouldn't even bother them. I don't know how you can overcome it, because our present EIR process requires public meetings and hearings. As soon as you get the public involved, then you have all this reaction. I certainly believe that public meetings are good to inform people of the project and to listen to their problems. After all, they are really shareholders, and they should know what the district is doing. However, it only takes half a dozen or less individuals among a group to arouse the people, and then you've got a whole wave of reaction against the project. This was proven to me very definitely on the Buckhorn-Castro Valley situation along Redwood Road.

Lage: Were you able to make an impact by that kind of comparison that you put forth? Did people listen?

McLean: No. Here was a dam that people didn't even know had been built. It was under construction for over two years, and we were hauling concrete, drain rock, and all kinds of material. There were trucks going up and down Redwood Road, and people paid no attention to them. But here you have a report that says there's going to be a truck every so many minutes, and right away they conjure up a large truck full of rock that will be traveling past their school and making noise. The traffic that goes past there day after day, you know, they don't pay attention to it. And they never paid any attention to it when we built the original dam in 1979. I don't know the answer. I think public meetings are good, but sometimes they stir up a lot of problems that people really, if they didn't know about it, wouldn't pay attention to.

Lage: It did seem, over your period on the board, that the level of public involvement increased.

McLean: Absolutely. Helen Burke and particularly Nancy Nadel have always been great ones for public meetings. I certainly agree; I think a public meeting is good, but I believe that many times the final result is just the reverse to what we hope it would be.

Lage: What is the hope?

McLean: Many of the big projects that we've built--Briones Dam was one, and many of the other large projects that we have built--for Briones we had to haul large quantities of imported material, with trucks going back on forth on the San Pablo Dam Road. We never held public meetings on those. It was our job to build the dams, tunnels, and pipelines for the public water supply, and we never held a public meeting.

Objections to Adeline Yard and Lafayette Maintenance Center

McLean: Once you get into public meetings, like cases like the Adeline office and maintenance yard, the north intercepter wet weather basin, and also the proposed East Area Center at Lafayette--for all of those we held many public meetings, and the animosity, the resentment against these projects was stirred up by one or two individuals. In the Adeline situation we could have got by very well with only a negative declaration.

Lage: What is the situation at Adeline Street [former site of EBMUD headquarters]?

McLean: We could have got by with a negative declaration, which would have cost very little or nothing. An EIR was required because of the local protests, and as a result it has taken over a year to complete the report. The EIR has just been completed.

Here is a situation where there has been a maintenance yard in this location since 1913. This was the maintenance headquarters for the former East Bay Water Company. These people are protesting about it because they don't want a maintenance center located there, even though all of that area is zoned industrial. There are a few houses around there, but they really don't belong there. These houses are remnants from a community that has become an industrial area. There's the Pacific Pipe Company and many other industries in the area. Breuners used to have a warehouse right across the street from the district office.

The city of Oakland wants to purchase the district's Oakport property. That is land that the district owns, a part of which is used for pipe storage west of Highway 880, across from the Oakland Coliseum. The Coliseum wants to buy that for parking and other uses. It is too valuable for warehousing and pipe storage. I forget what the value of the property is, but I believe it is somewhere around five or six million dollars.

The district has leased one piece to a large trucking company (Comozzi). Then we have a storage yard for pipe, hydrants, and other material. But the property is too valuable for pipe storage. They can realize a substantial sum of money from the sale. In addition, it is a poor location for storage facilities.

At Adeline, with the maintenance people being able to move into what was formerly the headquarters office, a lot of the adjoining property can be vacated of the trailers and parking, and the area can be used for pipe, hydrants, and many other materials that we normally store at Oakport. Furthermore, the advantage of having the storage and all of the other facilities in one area is that it is the most accessible to the freeways. Also, you have all personnel in one location. Materials stored at Adeline are needed everywhere in the distribution system. Trucks can come in there for material, travel to Richmond, to the South Area Center, or east to Lafayette and Walnut Creek; it's a good central location. Whereas Oakport is accessible to only one freeway, which is very heavily traveled at all times.

Lage: But, again, we're talking about public input.

McLean: That's right.

Lage: Is the public in the neighborhood of Adeline a problem?

McLean: Yes. The people in the Adeline area are opposed to a maintenance yard. I believe Nancy Nadel generated this, because she lives in West Oakland, and the people there have protested having a maintenance yard at this location. This has been a maintenance area for seventy-odd years; this was the maintenance headquarters of the former East Bay Water Company, and it hasn't changed. All we did was buy the property across the street and build an office building. The maintenance yard, which takes in that entire block between Adeline and Magnolia, has always been used for that purpose. We could have got by very cheaply with a negative declaration. Instead, we have to go through an EIR with the public hearings, which has cost the district more than the negative declaration.

Lage: But you don't think the EIR was required by law?

McLean: We could have gotten by with a negative declaration. It was not required by law because there already was a maintenance center. That's the same as with Lafayette.

Lage: Yes, what happened at Lafayette?

McLean: We had a maintenance center at Lafayette as early as 1929.

Lage: Was it near the reservoir?

McLean: At the time the Lafayette Reservoir was built, we had a maintenance center north, across the street from the reservoir. That was the headquarters for the division that handled the maintenance of the aqueducts from Lafayette to Indian Slough in Contra Costa County. We had both a maintenance building and a storage building. The headquarters office was near the base of the dam. Now the people in the Lafayette area don't want it at this location. There is a costly lawsuit against the district to determine whether the district, under the Utilities District Act, has to obtain permission from a city in order to build a maintenance facility.

Lage: So you wanted to build a new facility on the same ground?

McLean: We wanted to build a new facility in the Lafayette water treatment plant area. We have a large available area, and we want to build the maintenance facilities there. That is the most economical location, according to the district's studies, as far as ingress and egress to the service area. The district conducted a series of studies to determine the most feasible location. We studied sites in Danville and Walnut Creek. At present the district has a very small area in the center of Walnut Creek, but that is not large enough for present and future needs.

Lage: How did the board line up on that? It is a very different community from the Adeline community.

McLean: The board as a whole voted to go ahead with the Lafayette Center, after all the studies and the EIR showed it was the best location. The result was that the city filed a lawsuit against the district to prevent the district from building the maintenance facility. The suit was settled in favor of the city of Lafayette, pending an appeal by the district.

The district has been courteous by going to the city, having a public hearing, and meeting with the planning committee. Then we get all these protests from the people. It is costing the district millions of dollars annually just because of these situations. Many years ago, when I first came to the district, we went ahead and built the project. We got the necessary building permit and proceeded with the work without all the cost of EIRs, public hearings, etc.

Now, you can say this is good, or it's progress. I sometimes question whether it's really necessary, because the cost of all of this is coming out of the taxpayers' pockets. The EIRs on any one of these projects is costing the district millions of dollars.

Lage: Before the EIR requirements, when you were designing and building new facilities, did you take into account the feelings of the neighborhood where you were working?

McLean: We always notified the city and the residents in the immediate area. I'll give you a good example. When we built the north and the south interceptors on the wastewater project, we went down Wood Street. We had a wide, deep trench in. The first thing I did, when we had the drawings and specifications complete and ready to go to out to bid, was to sit down with the Oakland city engineer, the fire department, and the police department. Those people were concerned about traffic, fire access, and police protection. We held many meetings about their concerns. We learned what they wanted us to provide for crossings, etc, and we provided those facilities. We also notified the people living along Wood Street by sending letters to everyone as to when construction was going to be in progress. We never received any protests.

Lage: Did you make an effort to accommodate--?

McLean: Absolutely. If someone needed a driveway access, we made provisions for them. Or we told them, if the street was going to be closed on such and such a date, that they should take account of this. We also sent notices to people of street closings and also had people contacting the residents daily if there was anything unusual going on.

Costs of the EIR Process

Lage: So you think you don't need the EIR process in order to be sensitive?

McLean: Well, it seems to me, having seen both conditions, that the environmental impact process has had the result of bringing people into a situation about which they know very little and having them become adversaries. It takes only one or two people to stir up the rest of the people on the situation, and the result is that we have an adversarial situation that creates a lot of problems. We built many large projects where we never had to prepare EIRs or hold public hearings.

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McLean: We never had a lawsuit on any one of the large projects, and some of those streets were really torn up. There was no access at all, because we were right in the middle of the street. Having worked in both eras--the non EIR and with the EIR--maybe the EIR, the public meetings, and the public hearings and all are good. But I seriously question if we haven't gone to the other extreme. It is costing people millions and millions and delaying or stopping many projects that are urgently needed.

Lage: It is costing a lot of money.

McLean: Yes.

The Long Overdue Administration Building in Oakland's Chinatown

Lage: Okay, let's talk a little bit about the new administration building, which seems also to have been a bit of a controversy--the location of the building, and now I understand there's some concern about the costs.

McLean: I have always believed that the district needed a building where everybody could be together. This building is long overdue. First, the building at West Grand and Adeline, which was built in 1952, should have been built large enough for future growth or provisions made to enlarge it in the future. When it was built, it was not large enough to contain the full staff at that time. Also, it was in the wrong location. That area is an industrial area. I don't know why they chose that location. Louis Breuner was president of the board at that time, and the Breuner warehouse was right across the street. Whether this was an influence or not, I don't know.

Furthermore, the building is on a concrete pile foundation. That location was an old arm of the San Francisco Bay. The pile foundation is not strong enough to sustain another addition. There is no elevator. It was a very frugal design. All of the furniture and equipment in that building had to be carried up and down flights of stairs, which to my estimation was stupid. There was not enough space to contain the entire staff. There was no thought of future needs of the district. The minute they moved into that building, it was too small.

I was always a strong advocate during my tenure on the board, of having a building located in the center of a transportation network where it was accessible not only by automobile but by mass transit. And the building should be large enough to take care of future expansion. Consequently, I was always a strong advocate for the new building. I was not entirely enthusiastic about the location that was chosen for this new building; I thought we should have gone further uptown, near the Kaiser Center. There was vacant property there, or we could have acquired suitable property. I felt that further uptown was an ideal location, but the board finally settled on the location in Chinatown as a result of the insistence, I think, of Mary Warren and Ken Simmons. They were strong advocates to get in the Chinatown area.

Lage: In the redevelopment area?

McLean: In the redevelopment area. Also the city of Oakland wanted us down in the redevelopment area, and we got the property from the city of Oakland. That was part of the idea of locating there.

Lage: Was that choice itself a controversial one?

McLean: Well, not too much. I don't think there was much discussion on it. I had my opinion on it; I don't know how Sandy Skaggs stood on it. My opinion was that we should have been uptown. I think it was a better location, although the transportation situation wasn't as good as it is in the redevelopment area.

The redevelopment area is a good area for transportation. Of course, they didn't provide parking space for all the employees' cars. The unfortunate part of it is that there's been a very strong reluctance among a lot of the employees to use public transportation. Whether this transition will take place is hard to say. Personally, if I were working as a staff member there, I think I would ride BART or other public transportation.

Lage: Is it close to a BART station?

McLean: Oh, it's right across the street from a BART station; it's about a block and a half from the Fourteenth Street BART station.

Lage: It's just getting people accustomed to taking it. They weren't really accustomed to taking public transportation at the Adeline site.

McLean: I have my office in San Francisco at 580 Market Street, and I'm right near the Montgomery Street BART station. You think I would drive over to San Francisco? I can go to the San Leandro BART station and catch the train, and I'm in my office in San Francisco in thirty minutes.

But the trouble is, the people working for the district have become so accustomed to driving their cars and parking in that open area near the Adeline offices that's it's going to take a long period of time to change the habit. The result is that the district has contracted for a shuttle bus at a cost of $140,000 per year to provide transportation for employees from 22nd and Adeline up to the new building.

Lage: You mean they're going to park at Adeline and take--?

McLean: They're going to park at Adeline and take a shuttle bus up there, and the district is paying for the shuttle bus.

Lage: That does seem ludicrous.

McLean: It's ludicrous in my estimation. There are key personnel who have district cars, and space has been provided for them. They also provide visitor space, but because of the cost of providing parking space in a building like this, it becomes prohibitive to provide for everybody who works for the district. The result is that a large percentage of the people have to park at 22nd and Adeline and take a shuttle bus to the main office. That will cost the district a substantial sum of money annually, and this is going to continue until they get the people divorced from their automobiles and taking public transportation.

Lage: Were there other problems with the new building besides the parking? I think I heard about cost overruns.

McLean: Well, there has been a large cost overrun, and I can't tell you why. There were delays, that's one thing. They got into a lot of hazardous material, but I think the city of Oakland is supposed to pay for the removal of the hazardous material under the building. But that delayed the project a lot. Then they had some damage due to the Loma Prieta earthquake. That dislodged some of the panels on the outside of the building and also some windows. They had to do some additional work on those items. The cost overrun I think has been ten or twelve million dollars. What the details on all of them are, I don't know.

Regardless of the cost, I think the important issue finally, after sixty-nine years, is that the district has a building which is large enough for all of the staff and all of the people who are connected with the headquarters group. In addition to that, they at least have the communications systems and everything else all together in one place rather than having them scattered all over the country, you might say. In addition to that, there is ample space for expansion in the future--in other words, when the time comes.

This building has only nine stories. It was supposed to have twelve stories, and they were going to lease out any vacant areas for office space. I am not sure of the reason, but they finally cut off the three top stories. Whether this was good or not, I would question. I don't think we can predict what the future holds and what might happen in the long run. As you know, there was talk for a long, long time of merging with the Contra Costa County Water District. I sat on that committee for a long time, and we used to have regular meetings and talks about consolidating with Contra Costa. Whether that would be a good move, we don't know, but it might have been to the advantage of both agencies, because the areas are so contiguous. There might have been a real advantage to consolidate with Contra Costa. Also, at one time there were discussions of Hayward joining the district.

Lage: And all this would require even a bigger building.

McLean: The day may come when the additional space would be needed. At present, San Francisco now supplies Hayward. Hayward uses about 25 to 40 million gallons a day. Hayward originally was going to come into the district, and then they decided to connect to San Francisco. The day may come when San Francisco is going to reach the limit on their water supply. If that time comes, I doubt they will continue to serve Hayward. At that time there's going to be a real demand for the district to serve them.

Lage: It seemed from the minutes that there were people on the board who were opposed to the idea of a new building altogether. Is that right?

McLean: Absolutely. Helen Burke, Nancy Nadel, and Jack Hill.

Lage: Did they want to stay on Adeline?

McLean: Jack Hill and Helen Burke were strongly opposed to a new building. They were very much opposed to it.

Lage: What was their thinking?

McLean: Well, I don't know. They said we should add to the building at the Adeline site, either build upwards or go outward. When you analyze that building, it was unsuitable to try to expand. Number one, there was no elevator. To get additional area, you would have to triple the capacity of the existing building. And how would you do it? You would have to enlarge horizontally, go out into the lot and build just two stories all the way through. You couldn't increase the height of the present building, because the foundation is not adequate for any additional stories.

Furthermore, it's in a very poor location. It's isolated. The transportation is poor; you have no basic transportation to the area except buses. If you expanded horizontally, you would use up parking space, and therefore you isolate employees who drive to work. There might have been a few of them who would take the bus, but there are only one or two buses that serve that area. It was impractical to try to add to the present building and to take care of all the personnel that are needed. The new building consolidates the Oakland business office, the construction group, and those people who were scattered around in buildings in the area.

People have never taken into consideration the lost time when they have to travel back and forth to the cafeteria or to a trailer or other building. We have never counted the lost time for people going from one area to another to meet with their supervisor or go to the cafeteria. This has cost the district millions of dollars over the years.

Well, it was impossible to expand at the old site, and still there was strong opposition to the new building. Helen Burke never voted for a new building; she was opposed to it, and also Jack Hill. Nancy Nadel was also opposed to it.

And as far as criticism about the overruns, I don't know too much about what they were, but we had a competent engineer on the project, and I'm sure all of the overruns have been carefully documented and can be justified, because if they couldn't be justified, why, they wouldn't be paid. This is not at all uncommon in projects, because many times you run into unforeseen difficulties. Foundation conditions are one of the most prevalent problems when it comes to construction work. You can never predict what your foundation conditions are going to be.

Lage: So then if the contractor runs into foundation trouble, he's justified in adding on--?

McLean: Oh, absolutely. Justified in what we call a change order. These are very common. Also, who knew that we were going to run into a lot of hazardous material at this office building? As I understand it, there had been a cleaning works and perhaps a gasoline station there, and when they commenced excavation for the parking areas, they found hazardous material. All that material had to be cleaned up and removed, and that delayed the general contractor. When a contractor is delayed, particularly if he is held up from proceeding with his work, he has a staff on the job, his office, trailer expense, telephone, overhead, and all of those items that he has to be compensated for. This is beyond his control. The sooner you get it cleaned up, then he can proceed with his work. All of those items create extra costs.

Sandy Skaggs as EBMUD Board President

Lage: Let me just change gears here for a minute. Give me some idea how you assess the role of Sandy Skaggs and his position as president for so long.

McLean: Sandy, to my estimation, was one of the outstanding board presidents that the district ever had. I've always had a great deal of admiration for Sandy. I didn't always agree with him; I think there were many times when we could have gone ahead with something, and he felt that, to get a majority of the board, we had to shelve it. But I don't recall many such cases. Sandy did an outstanding job; he carried out his board position as president very well, and we needed him.

Lage: How did he handle what seems like a bit of animosity and certainly conflict on the board?

McLean: Well, there were some clashes. Helen Burke and Sandy clashed many times. That was quite common, and I think Sandy handled it very well. He didn't clash with any of the other members. I think he clashed with Jack Hill on some occasions where there was disagreement, but most of the disagreement was between Helen and Sandy, and a lot of this was over public meetings, night meetings, and similar issues for which she was a great advocate.

Helen was great for bringing in the public. I don't know what her background was or the reason for it, but she wanted the public involved in practically everything. Sandy and I disagreed. I've always felt that the more you get the public involved, the more problems you have.

Lage: How did Sandy handle moving the meetings along when they got cantankerous?

McLean: He would go right ahead with them. As I said earlier, most of our meetings were through by four or five o'clock at the very latest. We'd start promptly at 1:15, and we'd move right through the items very quickly. Usually there wasn't too much debate on the items, and they would go through.

Lage: Was there an effort made to get a consensus position, or was the minority--?

McLean: As a general rule, we had pretty good consensus. Although there were controversial issues and, as I say, a lot of the controversy we had was between Helen Burke and Sandy.

Lage: I noticed there were a lot of charges back and forth of conflict of interest.

McLean: Yes. Helen alwaya charged Sandy of conflict of interest because of his relation to the Blackhawk development.

Lage: What was his relation?

McLean: He had been an attorney for some of those subdivisions in the San Ramon Valley. Helen always used to challenge him on conflict of interest, and he used to challenge Helen with conflict of interest because she worked for EPA [Environmental Protection Agency]; so there was a little controversy between the two of them.

I have a great admiration for Sandy. He did an outstanding job. He took us through a period in which the district came out very well, and I don't think there were any issues that weren't solved properly. We accomplished a lot during the twelve years that I was on the board.

Lage: How well or how closely did he work with Jerry Gilbert?

McLean: He worked very close with Jerry. When I was vice president, we always had a breakfast meeting prior to the regular board meeting, usually at a small restaurant in Lafayette. We would go over all of the items, either the same day or the day before the meeting.

Lage: Just you and Sandy?

McLean: Sandy, Jerry Gilbert, and I. We'd go over the entire agenda for the meeting. I thought these meetings were good. I know that when Mary was vice president, she also attended the meetings. Ken Simmons was vice president, but I don't think he ever attended any of those meetings with Sandy. I attended every one while I was vice president; I was vice president three times while I was on the board. We went over what the issues were, whether there would be any controversy, and how we would handle it. I think this was very helpful, to go over the meetings agenda. In general, we had very little public input.

Lage: Little public input on most issues?

McLean: That's right. We had very little input on most issues. Oh, once in a while you would have someone appear before the board, but it was generally very short. Very rarely would we have any major controversy.

Lage: So we remember the controversial things, but there was a lot that wasn't?

McLean: Yes, that's right. I thought Sandy handled meetings very well. I don't think we ever had any real problems as far as the meetings were concerned.

The Board's Role in Labor Negotiations##

McLean: Each time that labor contract negotiations were going on we met with the staff. We met with Jerry Gilbert and with the professional labor negotiators. It is my opinion that it is absolutely wrong for the board to become involved in labor negotiations.

Lage: You mean actually the hands-on type of involvement?

McLean: The hands-on type, which the present board did.

Lage: They met with the--?

McLean: Oh, absolutely. They met with the labor union, and I think that is absolutely wrong and should be avoided under all conditions. First, these negotiators are professionals; that is, the people representing the union, particularly the top people with the union who go into these negotiations, are professional people. These things are not new to them, where the board of directors are neophytes when it comes to negotiating with the professionals. The result was that the unions got practically everything they wanted. They got their 3 percent increases for the next three years and also benefits equal to 1.1 percent for the same period.

Lage: I wonder why the board got involved this time?

McLean: Because the labor unions elected these new people.

Lage: Oh, they went out and--?

McLean: I understand that the labor people went out and walked the precincts for them and contributed financially to their campaign.

Lage: Which members were supported by labor?

McLean: Nancy Nadel was supported by the union. Cohen, Flashman, and McKenney were all supported by the unions. That's absolutely wrong. The board is a policy-making board and should not become involved with union personnel; that is a staff job. We had a hands-off policy. I think the board president should be censured for that. They should not have anything to do with the unions; that is not policy, that is getting down into the operations.

Lage: In the minutes, the previous board seemed concerned with trying to improve relationships with employees.

McLean: We were always concerned about improving relationships. I was very much in favor of that, and I think all the other board members felt the same.

Lage: Was there a lot of animosity between management and labor?

McLean: I think there was. There was some animosity between the top-level management and the unions. The unions made many demands. We had several issues that took place. One was in reference to a supervisor for the laboratory at the wastewater plant. They have three sections down there, as I recall, in the biology section of the lab. And no supervisor. Well, there was a fellow there who was one of the top biologists or chemists, and Wally Bishop wanted to make him the supervisor over the other three units.

The union very much opposed that arrangement, because every time you take a person out of the union ranks and make him a supervisor, then he's no longer under union control; he becomes the supervisor. Anytime there was any change to a supervisorial position, the union loses a dues-paying member. We had a lot of controversy in reference to this change. The union protested these promotions every time; there were lengthy discussions on it. However, the board went ahead with the staff recommendation, regardless of all the protests by the personnel of both unions. There was animosity between the board and the unions because of that.

During the strike [May 1985], whenever we had a closed session on union relations it was only between the professional negotiator, staff, and ourselves; the board never met with the union negotiators, which this present board has done. I think it's absolutely wrong. Also, I see that the BART board is meeting with the unions. This is wrong.

Lage: Now, what was Jack Hill's role? You were going to say something about Jack Hill.

McLean: Jack Hill and Helen Burke were in sympathy with the union cause. Whenever we had one of these closed sessions in regard to the progress of contract negotiations, Jack Hill would meet with the presidents of the two unions and tell them everything that went on in the closed sessions. That violated his role as a board member. That was absolutely wrong. As a member of the board, I know the unions never approved my reelection. I appeared before them at each election and spoke to them, but they turned me down every time.

Lage: So this was sort of routine, to go to them for an endorsement?

McLean: Every time I was up for reelection, they requested that I appear before them for their endorsement. I answered their questions, but they never endorsed me. They endorsed my opponent every time, and they lost every time except this last one.

The Board's Responsibility to the Public

McLean: I have always felt that the board should never be beholden to the unions. A board member is there to serve the people and not the unions. That is the role of the board. I was elected by the people. Every one of the board members has been elected by the people. My duty is to the constituents of Ward 7 who elected me. I'm sure all of the board members felt that way. I can't answer for them all; I know Sandy and Mary Warren felt the same responsibility. I always believed that. I would not want to be beholden to the unions.

I felt that my role as a member of the board of directors was to see that the district carried out its function as a public agency--public water agency, public utility--for the benefit of all the people within the district, to watch over the finances and see that rates were kept reasonable. Any money that was spent was well accounted for. I never at any time ever violated any travel regulations. I know that every one of the board members watched the expenses very carefully whenever we went to a meeting. I went back to Washington, D.C., once on business for the district with Sandy Skaggs and Mary Warren. I have gone to some of the waterworks meetings, but every time I went to one of these I was conscious of being a public servant. As such I watched my expenditures, my travel expenses. I can truthfully say that there wasn't at any time one nickel that wasn't spent on business. I went very few times while I was on the board. You can look at my expense accounts over the years, and they were the lowest of all the board members.

I read in the newspaper the other day about some of the AC Transit board members who spent $32,000 on travel during the year. I just can't believe board members spending public money like that. I believe that a member who is elected by the people--Sandy Skaggs, myself, and every other one of the board members--

has a duty is to the people who elected him. I hold myself accountable for the expenditures of the district, and my job as a board member was to see that the district was run properly and not extravagantly and that everything was carried out in the most business-like manner possible.

Lage: And you felt the board as a whole met that standard?

McLean: Yes. I felt that Sandy Skaggs and Mary Warren and all of us were very conscious of that. What concerns me very much, though, is that this new board is oriented to the district's unions. I read in the board minutes where John Rohan, who's president of the local union, appears before the board and requests various concessions. This is wrong, to my estimation; these requests should come to the staff and not to the board.

Lage: Well, you had union representatives appearing before the board, too.

McLean: Well, yes, but if there was a controversy with the union, that was immediately turned over to the staff for a report. The board itself never got into this. We kept our hands completely clean of the union, and this is the way it should be. In other words, these are staff problems. If it were a controversy between staff and the union, let them work it out. It should be worked out by them. The board has nothing to do with that. I see this new board getting into these situations, which they have no business doing.

lage: Running the day-to day--.

McLean: Absolutely. And this bothers me. I have been reading the minutes of these meetings, and it alarms me, the issues that they're getting into that are staff-related. Boards are policy-making bodies. You have a staff to run the day-by-day operations, and that is their job, not the board's job.

Lage: Now, did Sandy Skaggs as president have to point that out?

McLean: Absolutely. Yes, many times. He always had any issue with the union referred to the staff.

Lage: It was something that the board had to be reminded of?

McLean: Well, I don't think Sandy ever reminded us of it; I think Mary Warren, John Gioia, and I recognized that, and we kept a hands-off policy. I can't say that this was true of Helen Burke and Jack Hill, because they were sympathetic to the unions.

The unions were always trying to get the board to listen to their problems and controversies among themselves, staff, and Jerry Gilbert or themselves and Wally Bishop. The union wanted to get the board involved, but Sandy Skaggs would not tolerate it. We'd listen to them, yes, and Sandy would say, "Refer it to Jerry Gilbert for a report." Or to Wally Bishop for a report.

And that's the way it should be. The board should not get involved in those things; because the minute you get into these issues, they bypass the staff, and they come to the board every time. The minute the board begins to take over the problems of the union, you're putting yourself into a staff position and not a board position. The board is a policy-making body, and it should be hands-off on any of these other issues.

Lage: That's a good thought to end our discussion of your service on the board of directors. [See following pages for materials relating to Mr. McLean's retirement from the EBMUD Board of Directors.]

Transcriber: Rita Bashaw
Final Typist: Judy Smith

Final Statement of the EBMUD Board of Directors

Last Board Meeting Tuesday Nov 27, 1990

On January 8, 1991 when the new Board of Directors takes office, a new era will begin.

67 years ago, in 1923, the first Board of Directors of this District went to the Mokelumne River to obtain an adequate supply of high quality water that would serve the East Bay communities through this century.

They fought hard in the Courts to obtain the water rights. In 1924 the people voted the bonds to construct Pardee Dam, and the aqueduct to deliver this water to the East Bay. On June 23, 1929 the first Mokelumne water was turned into San Pablo Reservoir. At that time there was less than a 30-day supply remaining in the company's reservoirs.

All of the subsequent Boards have carried out the policy of the "Founding Fathers", which was to provide a high quality, low cost water to the District consumers.

I am happy and proud to have been both a member of the Engineering Management Staff for 41 years and a member of the Board of Directors for 12 years. My 53 year association with the District will leave a legacy of aqueducts, dams, filter plants, reservoirs, the waste water treatment plant, the interceptors and outfill sewer. All of these facilities will carry the District into the next century and I am proud to have participated in these accomplishments.

During the 1960's it became apparent that the water supply from the Mokelumne River would not be sufficient to supply the District's needs beyond the year 2000; a search began for a supplemental supply of water to serve the District well into the 21st century. As a result of this investigation, the American River source was selected as meeting the criteria of the Mokelumne. During this period the Bureau of Reclamation was searching for contractors to purchase the water that would be impounded by the Auburn Dam to be constructed on the north fork of the American River. Accordingly, a contract with the Bureau was signed in 1972 to take this water from the Folsom south canal.

After 18 years of litigation, in April of this year 1990 the District was finally granted the right to take 150,000 Ac ft, 134 MGD from the American River. I believe it is essential that the necessary facilities be provided to make this supply available to the consumers during this decade, otherwise severe water shortages will occur.

The District has been the leader in California in promoting the use of reclaimed water, private wells for landscape irrigation, drought tolerant plants and other innovative ideas to reduce consumption. However, regardless of the District's conservation efforts, the growth within the District boundaries will soon exceed the historical safe yield of the Mokelumne water rights. (215,000) M.G.D

This is my last meeting as a Board Member and I am proud to say I have never missed a meeting during the 12 years I have held office. To the best of my ability I have carried out the Board's policy at all times to provide and maintain a secure, high quality water for the lowest possible cost to the ratepayers of this District.

In closing I want to thank the District for a rewarding and satisfying lifetime career, it has been my pleasure to serve with some of the finest men and women in public service --- the employees --- past and present --- of the District. Thank you.

Walter R. McLean

Approved as to
Form & Legality

General Counsel

RESOLUTION NO. 32419

COMMENDING WALTER R. McLEAN HONORING HIM FOR HIS MANY YEARS OF SERVICE TO THE EAST BAY MUNICIPAL UTILITY DISTRICT

Introduced by Director Skaggs; Seconded by Director Simmons

WHEREAS Walter R. McLean has reached a unique milestone as the person with the longest cumulative service to EBMUD -- 53 years; and

WHEREAS during more than 40 years as an EBMUD civil engineer, Mr. McLean served this District with dedication in a career spanning the period in which most of the foundation facilities of the District were created. He returned to serve another 12 years as a member of the Board of Directors in times when remarkable innovations were achieved in both water and wastewater; and

WHEREAS among the cornerstone facilities bearing his personal engineering contribution are Pardee Dam; the first and third Mokelumne Aqueducts; Upper San Leandro Dam, Reservoir and Filter Plant; Briones Dam, and the Lafayette Tunnel and Lafayette Aqueduct; and

WHEREAS during his Board service, Camanche Power Plant and Pardee Power Plant #3 were designed and completed; many improvements in storage, pumping and distribution capacity were carried out to enhance water pressure and firefighting reserves district-wide; ozonation and other technological improvements to water treatment were implemented to reduce the amount and cost of chemicals needed and improve the quality of water served; the OP/NET (Operations Network) system was implemented; and

WHEREAS the Water Supply Management Program was adopted by the Board, leading to the on-going Water Supply Improvement Projects, helping to assure a healthful and reliable water supply for the future; the American River supply lawsuit was at last resolved in EBMUD's favor; a Computer-Aided Mapping program was put into operation; and a New Administration Building was planned, constructed and soon will be occupied; and

WHEREAS at Wastewater, commercial success continues with the CompGro soil amendment produced from recycled sludge; a cogeneration facility supplies half the energy needs of the Wastewater Treatment Plant; an Infiltration/Inflow program is eliminating stormwater overflows through renovation of storm and sanitary sewers in seven communities; the new Oakport Wet Weather Treatment Plant is in operation, new stormwater storage facilities are under construction at the main treatment plant, and recycled wastewater is in use at Galbraith Golf Course in Oakland and at Richmond Golf and Country Club, reflecting the support and continued interest of Mr. McLean in technical innovation; and

WHEREAS Mr. McLean, in his professional career at EBMUD, as an engineering consultant, and with his Board leadership, including three terms as Vice President, has earned the esteem of his peers in the American Society of Civil Engineers, American Public Works Association, East Bay Engineers Club, and his associates and fellow board members, and was awarded lifetime membership in the American Water Works Association;

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of the EAST BAY MUNICIPAL UTILITY DISTRICT hereby expresses its deep gratitude to Mr. McLean for his unprecedented years of outstanding service to the District, and wishes him well.

Unanimously ADOPTED this 11th day of December, 1990.

AYES: Directors Burke, Gioia, McLean, Nadel, Simmons, Warren and President Skaggs.

NOES: None.

ABSENT: None.

ABSTAIN: None.

Sanford M. Skaggs
President

ATTEST:

Paula E. Malcom
Secretary

THE DISTRICT LOG
EBMUD

Volume 20, Number 25 | Public Information Office | December 14, 1990

This LOG honors the contributions and aspirations of our four departing directors, in thanks for their guidance and dedication to EBMUD.

Walter R. McLean

Walt McLean has reached a milestone that perhaps no one will achieve ever again--53 years of service to EBMUD and its customers--first for more than 40 years as a civil engineer, then for an additional 12 years on the Board of Directors. His goal, as an employee and later as a board member, was "to assure a high-quality water supply into the next century. That's why we went to the Sierra for the Mokelumne River water, why we went to the American River." One of the greatest District accomplishments, he feels, was "the conclusion of the American River lawsuit (the decision) that the contract with the Bureau of Reclamation is valid. We're going to need that water before the end of this decade."

He has great affection for EBMUD. "I don't know of any place...with such a fine group of people." His satisfaction with his professional life shows as he lists projects he helped to build. "My name is on nearly everything, starting with the first aqueduct, Orinda Filter Plant, the third aqueduct and the wastewater plant. I worked on Pardee Dam. I am very proud that I was able to play such a role."

There were disappointments, of course. "We had studied a new dam at Middle Bar (on the Mokelumne River a few miles above Pardee Dam). The Board turned that down because of pending lawsuits from Amador County. That was one of the biggest disappointments I ever had." Nevertheless, "relations with the mountain counties are better now. One thing that improved relations was the recreation area at Pardee. Now, they're willing to join (with EBMUD) on groundwater studies."

Some projects give special satisfaction. One is the new centralized administration building. "I wish I could say how much it has cost over the years for our offices to be scattered about," he muses. "When I worked on SD-1 the man in charge was on 16th street (the original downtown offices), the design office was near the Paramount Theatre, and I was above the old meter shop where the cafeteria is now! You can imagine the hours...wasted." Describing the more recent scattering from the Adeline Street offices, he says "It's been enormously inefficient. We should have had (the new building) 15 years ago!"

McLean, who at 87 is still active as an engineering consultant, has earned the esteem of his peers in the American Society of Civil Engineers, American Public Works Association, East Bay Engineers Club, and his associates and fellow board members at EBMUD, and was awarded lifetime membership in the American Water Works Association.

Like the projects that remain as his true monument, Walt McLean is long-lasting, and one of a kind.

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