WATER FOR LOS ANGELES

Gerard A. Wyss

Interviewed by Andrew D. Basiago

Completed under the auspices
of the
Oral History Program
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Los Angeles

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CONTENTS

Biographical Summary.....vi

Interview History.....viii

TAPE NUMBER: I, Side One (December 2, 1985).....1

Childhood and early work experience--Works for the Metropolitan Water District of Southern California (MWD)--Employed by the Los Angeles City Department of Water and Power (DWP) on the Mono Basin Project--Experiences during construction of the Mono Craters Tunnel--Environmental impact of the Mono Basin Project--Collapse of the Mono Craters Tunnel.

TAPE NUMBER: I, Side Two (December 2, 1985).....27

Geological surveys preceding the Mono Craters Tunnel--Quicksand hazard in the tunnel--Inducted into the army, 1943--Assigned to the University of Tennessee for advanced engineering training--Transferred to the 106th Division and sent to England--Experiences during the Battle of the Ardennes--Captured by the Germans--Prisoner of war camp.

TAPE NUMBER: II, Side One (December 2, 1985).....55

Prisoner of war camp taken over by the Russians--Escape to American Lines--Thoughts on World War II--Postwar work for the DWP--Struck by lightning during a fishing trip in the High Sierras--Recovery--Promoted to senior waterworks engineer--Helps develop safety standards for work areas on public streets.

TAPE NUMBER: II, Side Two (December 2, 1985).....81

Japanese trade missions to the DWP--Differences between the Japanese and American labor force--Failure of the Baldwin Hills Dam--Sequence of events during the crisis--Aftermath of the dam break--Role of oil company drilling practices in the failure of the dam--Effectiveness of DWP organization in meeting the crisis.

TAPE NUMBER: III, Side One (December 2, 1985).....107

Attempt to drain the Baldwin Hills Reservoir--Legal activities following the Baldwin Hills Dam break--Leadership in the DWP--Changes in the training of new engineers within the DWP--Perspectives on potential water shortages in Southern California--Role of the news media in issues that concern the DWP--Rate blocks for water used by industry.

TAPE NUMBER: III, Side Two (December 2, 1985).....132

Water quality in other parts of the United States--Impracticality of separating water for potable and nonpotable uses--Possibility of sabotage of the water system or poisoning of water supplies--Work on fire-hydrant efficiency--Gradual replacement of water mains in Los Angeles--Water for industry--Water from the Coachella Valley--Operation of the DWP trouble board--1971 Sylmar earthquake.

Index.....159

BIOGRAPHICAL SUMMARY

PERSONAL HISTORY:

Born: March 26, 1913, Los Angeles, California.

Education: Public schools in Los Angeles; Los Angeles Polytechnic High School; studied geology, mining engineering, and civil engineering at the University of California, Los Angeles, the University of Southern California, and the University of Tennessee; B.S., Civil Engineering, University of Southern California; M.S., Public Administration, University of Southern California.

CAREER HISTORY WITH LOS ANGELES CITY DEPARTMENT OF WATER AND POWER:

Surveyor's aide, Mono Basin Project, 1936-37.

Civil engineering associate, water engineering design division, 1939-49.

Waterworks engineer, water engineering design division, 1949-55.

Senior waterworks engineer, water engineering design division, 1955-60.

Principal waterworks engineer and assistant division head, water operating division, 1960-65.

Principal waterworks engineer and division head, water operating division, 1965-67.

Assistant chief engineer of waterworks, 1967-73.

OTHER PROFESSIONAL EXPERIENCE:

Chairman, Metropolitan Water District of Southern California, 1935-36.

Engineer, International Geophysics, Texas, 1937.

Office engineer for private engineering firm, Los Angeles, 1938.

MEMBERSHIPS AND AFFILIATIONS:

American Society of Civil Engineers.

American Water Works Association.

Optimists International.

Rifle and Revolver Club.

Rod and Reel Club.

Water and Power Speakers Club.

STUDIES AND ARTICLES:

"Fire Hydrant Efficiency Standards," **American Water Works Association Journal**, July, 1958. With Walter J. Burns.

Master's thesis, "Fire Underwriters' Rating of Water Supply Systems," University of Southern California, 1960.

"Work Area Safety on Streets and Highways," **American Water Works Association Journal**, August, 1965.

"Meter Setups for Industry," **American Water Works Association Journal**, July, 1971.

"Rights of Water Utilities in Streets," **American Water Works Association Journal**, December, 1973. With Roy E. Dodson.

INTERVIEW HISTORY

INTERVIEWER:

Andrew D. Basiago, Interviewer, UCLA Oral History Program. B.A., History, UCLA.

TIME AND SETTING OF INTERVIEW:

Place: Wyss's home in Laguna Hills, California.

Date: December 2, 1985.

Time of day, length of sessions, and total number of hours recorded: The interview began in the morning and continued in the afternoon following a break for lunch. A total of four and one half hours of conversation was recorded.

Persons present during interview: Wyss and Basiago.

CONDUCT OF INTERVIEW:

This oral history is one in a series with retired long-time employees of the Department of Water and Power, City of Los Angeles, and individuals in the office of the City Attorney for Water and Power. Duane L. Georgeson, Assistant General Manager-Water, Department of Water and Power, selected individuals to be interviewed after consulting with key members of his staff.

In preparing for the interview, Basiago consulted sources in the DWP's municipal reference department and in the Water Resources Center Archives at UCLA. He looked at inhouse material, including DWP memoranda and the employee magazine **Intake**. In addition, he also read several academic histories and reviewed **Los Angeles Times** articles dating from 1913 to the present.

Beginning with Wyss's childhood and education, the interview covers his experience of events and operating procedures in the early years of the DWP. Particular attention was given to Wyss's work on the Mono Basin Project; his experience as a near victim of the Mono Craters Tunnel cave-in in January 1937; his time as a soldier and capture by the Germans during World War II; work as a crisis manager who led emergency water division and evacuation protocol during the 1963 Baldwin

Hills Reservoir Dam break; his participation in the DWP response to the 1971 Sylmar earthquake; and work as an engineer studying work-area safety and fire-hydrant efficiency.

EDITING:

George Hodak, editorial assistant, edited the interview. He checked the verbatim transcript of the interview against the original tape recordings, edited for punctuation, paragraphing, and spelling, and verified proper names. Words and phrases inserted by the editor have been bracketed.

Wyss reviewed and approved the edited transcript, and made minor corrections and additions.

Gary White, editor, prepared the table of contents and biographical summary. Bryce Little III, editor, prepared the index.

SUPPORTING DOCUMENTS:

The original tape recordings of the interview are in the university archives and are available under the regulations governing the use of permanent noncurrent records of the university. Records relating to the interview are located in the office of the UCLA Oral History Program.

TAPE NUMBER: I, SIDE ONE

DECEMBER 2, 1985

BASIAGO: Why don't we start off by discussing where you were born and your early experiences.

WYSS: Okay. Well, I was born in Los Angeles and educated in Los Angeles public schools. I was always interested in outdoor activity, so I decided that as a life work I would pick some profession that would be tending towards outdoor activity. So I decided to take up mining engineering. I studied mining engineering in school and I had to leave school--that is the university--before I graduated. I found that just at the time I left school there was quite a shortage of jobs in the mining engineering field. This was in the Depression in 1935. So in looking for work I found that the Metropolitan Water District [of Southern California (MWD)] was hiring engineers and surveyors for desert engineering work. I signed in with them, and found the work so interesting that I decided I would make civil engineering my profession, rather than mining engineering. I proceeded from one civil engineering job to another until I wound up with a career in waterworks engineering (a branch of civil engineering) in the [Los Angeles City] Department of Water and Power.

BASIAGO: Tell me a little bit more about your growing up. Was there anything you did that later led into this career?

WYSS: No, I don't think so. I had more or less of a normal childhood. We didn't have much money and were raised in the Depression, and we had some illness on the part of my parents that made it imperative to work hard. So I guess you could say that my childhood was a rather severe one, as far as the normal fun that kids have. I've had to work ever since I could remember, and it made for a kind of sober childhood.

BASIAGO: How young were you when you had your first job?

WYSS: Oh, I think I must have been-- Well, I started out delivering papers when I was just able to run around on a bicycle. I worked on any kind of a job I could get, including working for a shoemaker and delivering shoes and things like that. I even worked for a cement contractor when I was very young, and did heavy work, regular pick and shovel type of contract work. So I got involved in construction at a very early age, probably much earlier than they would even allow kids to work nowadays.

BASIAGO: Fourteen or fifteen?

WYSS: Yes.

BASIAGO: Where were you going to school when you launched into this career in engineering?

WYSS: I was rather fortunate in schooling. When I graduated from grammar school, instead of going to a local school--which I believe was probably Manual Arts [High

School] at that time--I was able to get special permission to attend Los Angeles Polytechnic High School, which was probably one of the finest technical high schools in the country. I took up electrical engineering there, and they had a lot of high school courses that were equivalent to college courses in some other jurisdictions. I even took up calculus in high school, so I got involved in the various branches of engineering even in high school. I think that had something to do with selecting engineering as a profession in the future.

BASIAGO: So you started your job with MWD very early; you were what, about twenty-two?

WYSS: Yes. And I started out in what they called Division 6, and moved over to Division 5, which went from the Perris area near San Jacinto, clear out to the Whitewater area in the desert. The job consisted of every kind of survey work and inspection on a major pipeline construction. I was fortunate in having a party chief who wanted me to check every calculation. So I got involved in a lot of pretty technical computations right from the beginning, much more than the usual rear chainman would get.

Then I left the Metropolitan Water District to go work for the Department of Water and Power in the Mono Basin. That was in May, 1936. And to me that was just like going into heaven, because the Mono Basin Project was in a rather

high altitude in the eastern High Sierras, and there was a considerable amount of hunting and fishing available at all times whenever you had any spare time. We lived right in the construction camp, so that the minute we were through with our day's work we were right in the middle of a recreation area. And that was wonderful. I found out every hole in all the creeks around there where the trout were congregating, and I got a considerable amount of hunting in too, which made it sort of a wonderful time for a city boy. And compared to the desert the High Sierras is really wonderful country.

BASIAGO: Was there any individual who was your mentor at this phase? A few people have mentioned Burton [S.] Grant. Did you work under him at all?

WYSS: No, I was hired by Burton Grant, and this was in the old Water and Power Building at Second and Hill Street. When I went up to the Mono Basin, I went to work for Norman Imbertson, who was a fine field engineer. The thing that impressed me most about him was that there was a camaraderie involved in working with him, and the attitude he had towards all of the people who worked for him. He wasn't the slightest type of a stuffed shirt. He was just an average fellow, and yet he ran the project. I was tremendously impressed with his leadership ability that way. He made everybody feel like they were a member of the

organization. And on the first or second day I was there, why, I went fishing with him. And I felt that was just the most wonderful exhibit of democracy on the part of supervision I ever ran across. He inspired his men to produce to the utmost of their capacity, and he did it in such a quiet way that it was hardly noticeable. He was a fine engineer, and he certainly got the work out.

BASIAGO: You mentioned that when you were working on the Mono connection you were inspecting tunnels--

WYSS: Yeah, this was a real interesting part of the job. We had a lot of surface surveying to do, and we were building earth-filled dams. Probably the most fascinating part of the job was the tunnel construction. The thing that made the tunnel construction so interesting was the fact that the Mono Craters Tunnel was probably one of the most difficult tunnels ever constructed. It had every conceivable hazard to tunnel work that you could imagine. It had large quantities of water; some was very high temperature and some was freezing cold. And it contained a lot of carbon dioxide gas that bubbled out, and that created difficult working conditions. Carbon dioxide gas is not poisonous, but it displaces oxygen and it will smother you after a certain length of time, particularly if you are working hard and breathing deeply. So we had to monitor the concentration of carbon dioxide gas regularly,

and one of my jobs was gas inspector. We would carry a container of sample bottles and we would--at certain stations in the tunnel--gather specimens of gas and then take it out, and through a titration process in the laboratory determine the concentration of carbon dioxide. When the carbon dioxide got up to a certain point we would either have to bring more air into the tunnel, or shut the tunnel work down. So it was important to have people who could work vigorously to get these samples. Getting the samples involved going right up into the heading where a lot of fresh gas supplies could be injected into the tunnel proceedings. We had to go in every part of the tunnel too, so there was hardly any part of the tunnel--no matter how dangerous it was--that wasn't an area that had to be covered thoroughly.

BASIAGO: So did you have a field laboratory for that?

WYSS: Yeah, we had a field engineering laboratory where we were able to run all kinds of tests on cement and gravel, and even gas analysis. Part of our job was to get the samples in the tunnel and then bring them out and analyze them, then turn in a report.

BASIAGO: How did you avoid possibly perishing in taking the samples?

WYSS: Well, that part wasn't particularly dangerous. We weren't in any more of a dangerous position than the actual

hard-rock miners themselves. But this tunnel had a lot of loose rock in it, and it had some areas where they had gone through a clay lakebed. When the clay was exposed to air it started swelling--what we call swelling ground. And the forces of this swelling clay were so tremendous that they would just crush the big steel sets that were used to line the tunnel. In order to accommodate this pressure they would build cribs of heavy timber in behind the steel sets, and the timbers would crush. After they had crushed to a certain extent, then they would start pushing the steel sets in. And when the steel sets compressed to the point where the trains couldn't go through any more, then the hard-rock miners would have to go in there and dig out the clay, pull out all of the crushed timbers, and put new steel sets in that weren't deformed; then the process would start all over again. But it was a real weird feeling to get in the face of a tunnel where the men were working, and know that behind you the entire tunnel was closing up--just relentlessly; it never ended. It was a continuous thought in the back of your mind that it would be kind of nice if the tunnel would be stable, but you knew all the time that it was closing in on you.

One of the real hazardous, certainly thought-provoking, jobs that we had as inspectors was steel inspection. Our job as a steel inspector was to determine

at about what point the steel sets would fail, so there would be plenty of warning for the hard-rock miners to pull out the timbering and relieve the pressure. In order to measure the compression of these steel sets, we would set two stainless-steel grommets exactly ten inches apart. We would have to drill a hole in the steel sets, and then put these steel grommets in there. Then every day we would measure with an Ames strain gauge the exact distance between these two points. As it would compress, the strain gauge, which would register up to a thousandth of an inch, would give you an idea of just how the steel was actually compressing under these relentless forces. Our job was to crawl in behind these steel sets and get the Ames strain gauge reading. And continuously around you there would be a sort of crunching noise as these timbers would crush. And every once in a while these timbers would crush. Every once in a while a big timber would let go with a big loud bang, and when you were in behind these sets in among the timbers it was a little frightening sometimes to hear a timber let go just a couple of feet away from you, knowing that the whole thing was closing in on you all the time.

BASIAGO: What was doing the crushing, what were the forces behind that?

WYSS: Well, it was the exposure of these claybeds to air. When you drive a tunnel through these claybeds it

exposes the claybeds to air, and this particular clay was some kind of a residue of volcanic action. It had such a quality that when it was exposed to air, the clay would expand. The clay would be stable until you drove a tunnel through it, and when you drove the tunnel through it, then it was exposed to air and it would start crushing in. It was a very weird phenomenon, but this was just one of many things that made that tunnel so dangerous.

BASIAGO: Did you ever get any extra pay for this kind of work?

WYSS: No. No, that was in the Depression, and everybody got $135 a month, I think, from a party chief right down to a rear chainman. Nobody complained much, because the alternative was to go back in line waiting for a job somewhere.

BASIAGO: Did that kind of manual experience earn you brownie points later, in terms of rising in the department?

WYSS: Oh, I'm sure it did, because the people that I worked with, like Norm Imbertson, Loring Tabor, and others like that, had a good chance to analyze what your capabilities were under stress. We were under plenty of stress almost all the time. Even surveying in the tunnel you had to dodge trains running in and out, things like that. You were working pretty much on your own, so whether or not you produced what was expected became apparent

pretty readily. There was no way of goofing off on a job like that without it being pretty clear. And it was pretty clear too, whether or not you suffered from claustrophobia or some other hang-up like that in going underground. Some people simply couldn't stand it underground; it would just throw them off their rocker. It took a special type of mentality to be able to accept the hazards of underground work and still not let it affect your work.

And it bothered you to a certain extent, no matter how much you could adapt to it, because you knew all the time that all of these forces were working to destroy the tunnel. Your job was to stay ahead of them. Like I say, when you work by yourself there you have very little support.

We had an example one time that really made me feel good: I was the lone inspector on Shaft I construction, and this shaft was going down through quicksand. That was another hazard in the tunnel that I haven't mentioned. But if you weren't careful, if something wasn't done right, this quicksand would be under pressure and it could come right up in the shaft and get everybody that was working there right in the bottom of the shaft. So we had to excavate down in the tunnel--or in the shaft--and then put forms in, then reinforcing steel in the forms, and then pour concrete. We had to use an accelerator on the

concrete to make it set up fast before the pressure from this quicksand would break up the concrete. In order to make sure that you didn't lose too many men, we had diaphragms in the shaft. You had to go down through these diaphragms, and if the sides of the shaft caved in you would only trap the men down under the diaphragm, but the men above that diaphragm then would have a chance to get out. I was working clear down in the bottom of the shaft inspecting some forms, and I heard a shuffling noise. Each one of these diaphragms had a little trapdoor to come down through. I looked up and H. [Harvey] A. Van Norman, our chief engineer at the time, was coming down through this trapdoor. Now, he had no need to go down to the bottom of one of the most dangerous shafts we had up there, but he was the type of a man who didn't worry about hazards. Here he was down in the bottom of the most dangerous shaft on the job, and needless to say it was a tremendous morale booster to see this chief engineer down in the bottom of a hole where the lowest-paid engineer was working--and without any obligation on his part to ever come down there. It was a very positive influence on me to see the chief engineer of the whole organization coming down there, in an area that was hazardous to the people that were working in there, and without any real concern for his own safety. I found that pretty inspirational leadership on

the part of management. It made a very lasting impression on me.

BASIAGO: These men were almost military-style leaders in a sense. They were generals almost.

WYSS: Yes, that's right, they were. And it was a very direct type of leadership, too. It was an almost man-to-man type of leadership. They didn't just pass edicts down the line of command, and that sort of thing. Everybody in a management position was directly involved with everything that happened.

BASIAGO: Has that changed, and if so, when did it begin to change? And why?

WYSS: I'm not sure. I get the feeling that it has changed somewhat now, but it is hard to define any potential changes because the conditions are so different. Nowadays most of all the heavy construction work is finished, and probably would never be permitted again the way the Mono Basin Project and the second barrel of the Los Angeles Aqueduct were constructed. There are so many forces. With the environmentalists and obstructionists nowadays, the chances of having any of this heavy and dangerous field construction to the same extent that we had in those days is pretty slim. I get the feeling that the department is involved a whole lot more in protecting and maintaining its facilities and resources now than in developing new ones.

BASIAGO: What kind of environmental impacts did your work have then that environmentalists might find fault in now?
WYSS: Well, everything that we did they would object to now. We built the Grant Lake Dam on Rush Creek, and trapped all the water in Rush Creek to divert it into the Mono Basin Project. I am sure the environmentalists would have fought us tooth and nail to keep us from ever building that dam in the first place and cutting off the creek. Then we picked up the flow of two or three streams in Mono Basin that just ran down into Mono Lake, a desert lake, and were completely wasted. I'm quite sure that they would object to every one of them being diverted. And then the Mono Craters Project itself: Why, when we drove the tunnel through we tapped a lot of different aquifers that were present in the craters--in the Mono Crater chain--and nobody, of course, knew where the water went. But in a case like that nowadays, they try to prevent the tunnel from being constructed--just on the chance that it might adversely affect springs or underground water supply elsewhere. The whole project involved things, in those days, that would be very difficult to get approval on nowadays. As a matter of fact, we're even having a fight now on the Rush Creek fishery. They had heavy runoff in the Mono Basin area a few years back, so they discharged water over the spillway of Grant Lake Dam down through the

Rush Creek area, and some of the trout in Grant Lake washed down into the creek and formed a new fishery. And now the fishermen--I'm critical of them in spite of the fact that I'm a devout fisherman myself--but they have taken the position that once the fishery is established it should never be allowed to disappear again. So they're fighting the department to keep them from ever cutting off the water supply that was dumped, simply because of a surplus water supply at the time. This is the sort of thing that is happening all the time now. It seems like you're just fighting a continuous battle now to hang on to what you have in the line of utilities. Strangely enough, the fact that you have a couple of million people depending on the water supply seems to be secondary to the question of whether or not lizards can reproduce, or whether you interfere with a seagull nesting area. Things that from a practical point of view are completely inconsequential.

BASIAGO: Men like [William] Mulholland and J. B. [Joseph Barlow] Lippincott, who essentially founded the department, were outdoorsmen and had traveled extensively in the West when it was still very rugged. Lippincott was almost a naturalist, he was so well rounded. Was there any level at which they did exercise some kind of environmental tolerance? I mean, short of worrying about every little species, was there a certain ethos or code that they maintained?

WYSS: Well, I don't think that they were concerned with the environment as such. I'm sure that they gave it consideration in everything they did, but in those days there wasn't an environmental movement. It was far more important to provide water for a city like Los Angeles than it was to worry about whether or not the water would run out into Mono Lake or Owens Lake and have any influence on the fluctuation of the water in these basins.

BASIAGO: Did they give you any orders about things like littering around the camps, or worrying about erosion from digging?

WYSS: Yes, we always considered erosion and litter and that sort of thing. We tried to be pretty strict on protecting the environment as we worked, and I thought we did a good job myself. All of us were hunters and fishermen and outdoorsmen, and we were as much concerned with having a good future environment around our construction area as any outsider--far more so, because we were directly concerned with the environment ourselves. It was pretty precious to us, but we didn't make a big issue out of it. We just presumed that it was our responsibility to provide reasonable environmental protection, and it seemed strange to us that anybody would make a special problem out of it. The thing that irked us most was that a lot of people that had nothing to do with the construction

work just presumed that we were out to destroy the environment. It never seemed to occur to them that we were concerned with it too.

BASIAGO: What were some of the things that the department, let's say at the time of the Mono construction-- We're talking about the late 1930s at this point?

WYSS: Yes.

BASIAGO: What were some of the things, besides litter and erosion from the digging, that you were under orders to be concerned about? I'm trying to define the limits of the environmental considerations that--

WYSS: Well, we were concerned with sewage handling and things of that sort. We tried to put all of the sewage facilities in a dry area where they would never get into the water supply. Actually, our own construction camps drew their water from the local creeks and underground facilities, so it was important to us to maintain the purity of all of these supplies; if not for environmental protection, for our own security and sanitary protection.

BASIAGO: It sounds like the few things that we've talked about are environmental considerations that affect humans: the water they're drinking--

WYSS: Oh, yeah.

BASIAGO: --the degree of litter that would be around, and naturally, erosion from flooding. Was there any deference

shown to wildlife at all, any incidents that occurred in which these hunters and fishermen--?

WYSS: We never had any problem with the wildlife, as far as we could see. If we were doing anything for them, we were probably enhancing it. For instance, when we built Grant Lake Dam and the Crowley Reservoir we provided far better flight facilities for these migratory waterfowl than were ever there before. They had nothing but a few swamps there before, and we provided large areas for them. When we put in the power project below Crowley Dam we worked with the [California Department of] Fish and Game to provide a nesting area for the brown trout. We put in gravel beds and things like that to facilitate the spawning of the trout. Actually, we worked pretty close with the fish and game people in Mono Basin and Owens Valley, and I thought that we had a very good working relationship with them.

BASIAGO: Were many managers in the department outdoorsmen?

WYSS: Oh, yes.

BASIAGO: Fishermen?

WYSS: Everybody was. I don't think any of them up there were not fishermen to some extent. Some of them were pretty avid fishermen. I know that I used to go fishing almost every day if the weather was permissible. And most of us were also duck hunters. And I remember one of the

more pleasant experiences I had with Norm Imbertson was when I went duck hunting with him. I was a beginning engineer and he was a seasoned veteran, and yet we went hunting on a personal basis; it wasn't a question of rank or anything in the organization. I shot more ducks than he did on the opening day, and we were still friends--that proves how strong our friendly relationship was. [laughter]

BASIAGO: What were some of the other things that the people who tended to work for the department had in common?

WYSS: Well, I think just plain surviving was an important thing then.

BASIAGO: There were a lot of survivors, a lot of--

WYSS: Well, this was a question of economic survival. We weren't paid very much, and we had a lot of young families that started up there. The people built their own little cabins to live in, and everybody helped everybody else to get through. It was a question of everybody working together to try to squeak out a living, with the Depression being a pretty hard taskmaster.

BASIAGO: So you were on site up there, around Mono Lake.

WYSS: Yes. I was not married at the time; so I bached with a couple of other engineers. We had a little house trailer parked alongside the field engineering laboratory, and we lived in the house trailer.

BASIAGO: Who were they, do you recall?

WYSS: Yes, Doyle [F.] Boen, and Doc-- No, I don't remember the other fellow's name. He was a fine engineer, but he left the department shortly afterward. We had some awfully interesting discussions when the weather was inclement and we were cabinbound. Our little house trailer didn't allow for much moving around. So it was a very cozy arrangement, and a good test of compatibility among engineers.

BASIAGO: It seems like you were dealing with a lot of loose soil often, and a lot of water. Were there any incidents of flooding, where you were as much at risk as when you were digging the tunnels?

WYSS: Well, yes, that was a continuous problem. We had an awful lot of water coming into the tunnel, and whenever the water got too large in volume we would have to increase the size of the pumps. And as we went farther into the craters it became more of a problem, because we had to have more booster pumps. So we would develop a big pumping station and have electric sump pumps (440-volt motors), and then farther up towards the heading we would use air pumps to pump the water back to the big sump. Of course, we had ditches on both sides of the track in the tunnel to carry the water too. It was a continuous battle against the water coming in. And the swelling ground that I mentioned was another problem. When we lost the heading on the west portal section of the tunnel--that was as good an example

that you could find of some of the hazards of driving a tunnel through an extinct crater.

One of the evidences of dying volcanism is the generation of carbon dioxide gas. I explained that problem, but the problem of swelling ground and moving rock-- We had a lot of disintegrated rock, and that all had to be shored up when we went through it. And then we'd hit some solid rock and had pretty good going, and then we'd get an awful lot of water. Then next thing we knew, we'd hit a seam that had an awful lot of real hot water, and we'd have to put a metal shield over the tunnel to divert the water so it wouldn't fall on the workers.

BASIAGO: How hot was it? Was it scalding?

WYSS: Yeah, almost scalding hot. Hot enough to burn. Of course, that would raise the humidity in the tunnel too, which meant that between the cold air, the hot water, and all the vapor in the air, it was almost 100 percent saturated. So you would actually be working in a fog all the time. Water would deposit on almost everything.

Then they lost the heading and entire west section of the tunnel. We would load up the heading, and then they would back everybody off and explode the charges in the heading. Then the mucking machine would move forward into the heading. The mucking machine operator would be on the front of the machine and this would scoop up the material

and dump it onto a conveyor belt that would drop it into a whole set of dump cars behind the mucking machine. One car would be fastened right on the mucking machine, and he'd dip up there and jump the car back. And then they had what they called a chuck-tender on the back end of the mucking machine, and he would transfer these cars around so they'd keep moving, having a fresh car to fill in. So the mucking machine operator had to keep a sharp eye out for anything that looked real dangerous to him when he started working on the pile of rubble. I think we were about three miles into the tunnel and going downhill as we went towards the south and the east. They set up a bunch of charges in the heading, and then they blasted, and the mucking machine operator started his machine back into this pile of rubble. What they didn't know is that they had just shot into a volcanic chimney. (A chimney is a natural volcanic shaft or blowhole.) The Mono Craters Tunnel is full of chimneys that were apparently open at one time but gradually filled with volcanic ash, and then they were all saturated with water too. This one particular chimney was three thousand feet high, which meant that the water pressure in there was about 1,300 pounds per square inch. I was working on gas inspection at the time. The mucking machine operator was on the front of his machine working this loose material, and the chuck-tender was just behind

him. I was right alongside the chuck-tender at the heading, and the chuck-tender yelled, "Look out, a blowout!" Just then the whole heading blew in and it inundated the mucking machine operator and killed him, but the chuck-tender and I were just far enough back so we could start running.

BASIAGO: This was running down the tunnel, out toward the head of the tunnel?

WYSS: Yeah, we were three miles in from the portal.

BASIAGO: You were three miles in from the face of the tunnel?

WYSS: Yeah, and uphill. Of course, we were wearing heavy rubber tunnel gear, hip boots, and hard hats; so we were hardly in a position to move fast. We started running for the portal, and warning everybody as they went to clear the tunnel out, that the water was coming in fast. And the water would keep rising up on our hip boots as we went. Then we got back to the first big booster station where the 440-volt lines were, and the water got up high enough then to short out all of the lights. From then on out we must have run at least two miles. It was in total darkness, and, of course, there were holes in the bottom of the tunnel. We would run down the track until we came to a train that was stalled, and then we would have to go around the train--all feeling around in jet blackness. We had

flashlights, but we could only use them sparingly because they got dim pretty fast.

BASIAGO: Did you say a train?

WYSS: Oh, yes. They had some of these trains, a couple of them at least, that were stalled in the track. I guess the operator just took off and left the train there.

BASIAGO: Because he knew the flood was coming?

WYSS: Yes, well, they yelled ahead. The chuck-tender and I were the last ones to get out, and when we got out we were really exhausted because the water was up about to our waist at that time. When I got out I found to my surprise that I was still carrying my heavy steel box of gas samples. I don't know what goes through a man's mind in an emergency like that, but I didn't even think of throwing away the box. Of course, they were worthless at the time. The water had come into the tunnel so fast that once the electric sump pumps were shorted out the air pumps couldn't even begin to handle the problem. So the tunnel was lost, and it took about a year-and-a-half, and, I think, three million dollars, to de-water the tunnel and get back into the heading and start working again. But anyway, this gives you an idea of some of the hazards of working underground. I mean, I came awfully close to terminating my career right at the beginning.

BASIAGO: What year was this?

WYSS: That was, I think, around January of 1937.

BASIAGO: What caused the blowout?

WYSS: Well, this volcanic chimney was all full of ash and water. Apparently, when they shot the heading they broke all that loose, and apparently it was locked in place until the mucking machine started cleaning it out. The mucking machine just pulled a key rock out loose, and then the whole thing caved in.

BASIAGO: So, it was like a volcanic cone that had become an aquifer?

WYSS: Yeah.

BASIAGO: Just cut right into the center of it.

WYSS: Yeah, they just cut right into it, without knowing it.

BASIAGO: Was that bad geology?

WYSS: No, it wasn't. The geology was pretty thoroughly checked out on the line. They drilled a lot of diamond holes and had core samples taken every so often. But what they didn't realize: The geology was so complex in the Mono Craters that the sample holes that they drilled were simply too far apart to analyze completely. And of course, engineering is like that; you can only do what is reasonable. Our problem was to determine what the potential cost for the Mono Craters Tunnel would be, and compare that to an open ditch construction that went way

around the Mono Craters Tunnel, and would have cost quite a bit. So they analyzed the cost of going through the tunnels based on all the geological surveys that they had made. And given the cost of going around it, it was economically feasible to do the tunnel work.

If they had known that they were going to lose the west portal tunnel, they would probably have never opted to go through the craters. And considering the volcanic activity that's taking place up there now, they might have opted for an open ditch even if it cost more, because it's a lot easier to maintain an open ditch. A tunnel like that is a sort of questionable facility, because you never know what kind of rockfalls take place inside. We had a particularly interesting problem in concrete lining: We lined the tunnel as we went with concrete, but the thing that nobody was sure about was just what kind of concrete would develop when it was setting up in an environment that was saturated with carbon dioxide gas. Ordinarily concrete sets up in an oxygen and nitrogen environment, but here we had a carbon dioxide environment. For all we knew, it might have left the concrete spongy. It turned out that the concrete did hold up very well, but we did get rockfalls periodically in the tunnel. And anybody that went through the tunnel had quite an experience, because they had to figure that if they went in one end they had to

come out the other. They went through with rubber boats and things like that in tunnel inspection, and it turned out that they had to go over rockfalls and things like that in the tunnel itself. Now, I think one of the problems that concerns the department is the reliability of the Mono Craters Tunnel. It's the sort of thing with so many variables that there simply is no reliable answer.

TAPE NUMBER: I, SIDE TWO

DECEMBER 2, 1985

BASIAGO: Let's focus for a moment on what you might call research and development. It seems that in this case with the western portal there, the department suffered a three million dollar loss following an incident that, let's say, it couldn't predict. You just also mentioned that it wasn't known whether the concrete would set up in a carbon dioxide environment. What kind of research and development was conducted before this? Were there any experiments?

WYSS: We never knew, I don't believe, before we started the tunnel that we would have this gas problem. There was no evidence of that from the outside, at least not in the concentrations of gas that occurred in there. From the test holes that were drilled we had no idea how high the temperature of some of the water would be until we got down into the tunnel itself. And the tunnel would change rapidly in just ten feet. A lot of the test holes were fifty or one hundred feet apart, and a lot of the volcanic materials would change radically in nature in just one short stretch.

BASIAGO: From what minerals to what, geologically?

WYSS: Well, it's almost all lava and basalt from volcanic activities. We had very few unusual minerals because that type of formation, geologically speaking, is a very new

development. It's one of the youngest of all of the geologic periods, and consequently there was very little chance for any minerals to develop in there, other than just the normal lava and basalt minerals, and pumice, sand, and gravel associated with volcanic activity.

BASIAGO: And you were using diamond bits to do the test?

WYSS: They did on the original test core. They took cores to study, and most of the cores seemed to be pretty solid crystalline rock.

BASIAGO: Were those done sequentially as you were going, or was that all done beforehand?

WYSS: It was all done beforehand--

BASIAGO: It was all mapped out, the whole--

WYSS: Yeah, to analyze the cost of tunnel work, versus putting an open channel in clear around the Mono Craters Tunnel.

BASIAGO: Let's talk some more about the dangers of tunnels. You mentioned these diaphragms, which were kind of emergency locks. How did you decide who would go down to the most dangerous levels, past the most dangerous diaphragms?

WYSS: Well, it was simply part of the job. Everybody knew that when they went down through the last diaphragm that they better be particularly alert, so they watched for any kind of evidence of undue pressure. They would excavate face up to it

the material out and then put the forms in, and caulk the forms to keep the pressure out, then pour concrete out and use an accelerator to get the concrete to set up fast. Once the concrete was set up it would be relatively safe, but there was always that hazardous area when you were working in the bottom of a shaft, or in the heading of a tunnel, where you simply had to face up to the hazards. That's the thing that makes tunneling such a dangerous thing. If it's crystalline rock, you have no problems to speak of because the walls support themselves; but when you have shifting rock, loose material, and swelling soil, you just simply have hazards that will have to be overcome somehow or another.

BASIAGO: It wasn't decided on the toss of the coin, who would--?

WYSS: No, no. Anybody that worked there took these chances with anybody else. As a matter of fact, if you couldn't work underground, you found out pretty well, and you either had a surface job or you looked for work elsewhere. But the hard-rock miners are a very happy-go-lucky group. They just simply take the hazards that come along, and they do it all the time. They just live from one day to the next. The engineers are a different breed of people, though, because this is only a temporary occupation for them, whereas the hard-rock miners have to face up to it year after year.

BASIAGO: Do you remember any incidents where you were trying to pull somebody out of the quicksand?

WYSS: No, I didn't have any problems like that myself, but there were plenty of incidents like that in there. Every man depended on his coworkers in there to help them.

BASIAGO: How did you test for quicksand? There have always been varying--

WYSS: Well, you didn't have to test for it, it just comes oozing in like water.

BASIAGO: Oh, it was--

WYSS: Quicksand is simply water suspending sand of some kind, almost in solution, to the point where it has no stability. It won't take any load because anything goes right down through it and all the particles that are partially suspended in water simply move out of the way, and anything will sink right down into it. There's nothing mysterious about it. It's simply a formation where the water has a tendency to move up and keep anything from solidifying. Ordinarily, water drains out of a soil formation, and as it drains out the soil becomes solid. Sand is particularly good that way, because if sand can be compressed it's a tremendously good foundation material. The bad part about sand is that it erodes very rapidly, and if you ever get water underneath it, why, it won't support anything. We had a similar problem on the dams, and we had

to watch for clay pockets in the dam. Clay is a little bit related to quicksand in that the fine particles of clay have little particles of water in between them, and you can only compress it so much because the water gets locked in there and it just acts like a sponge. If we didn't distribute the clay that we use for a binder in the earth-filled dam far enough, we'd find out that one area just acted like a sponge, and that had to be dug out and reworked and filled in with a more compressible material.

BASIAGO: If you're traveling along here digging a tunnel, how do you get around the problem of quicksand? Do you--

WYSS: Well you--

BASIAGO: --just dredge it out?

WYSS: --just simply have to fight it out and find some way of taking care of it. There are ways it can be done. A lot of times when the water is particularly bad, they can drill holes and inject some kind of a sealing compound ahead of the tunnel, and then blast into that. Quite often they will inject cement in a slurry form under high pressure and inject it out, and hopefully it will seal up these fissures. That's one way they quite often sealed off a lot of the water. They drill out of the tunnel on either side and inject a cement slurry in there with an accelerator that would make it set up real fast; then, hopefully, wait for it to seal up and block off the

water. If the water is moving in too large a volume it carries the cement out before it can set up. You have an entirely different problem then. They have tried injecting sawdust and things like that to seal up these different fissures to control the water.

BASIAGO: So what experiences with the department did these lead to? You were up there for about two years in Mono?

WYSS: No, I was only up there about a year.

BASIAGO: About a year. Then what did you do in 1938-39?

WYSS: Well, when I left the department, I went to work for an electrical-geophysical outfit in Texas called International Geophysics. We did a lot of resistivity, geophysical work for the oil companies. I spent about a year on that. Then I went to work for a private engineer as an office engineer in Los Angeles. He wanted me to take over the business when he retired, but I didn't have my engineering license at the time, and as a matter of fact, I didn't have my degree in engineering yet. The work in a private engineering office is so demanding that you don't have time to do any advanced college work to work towards a degree, or to prepare you for the state license. So I went back to the department when there was an opening, so that I would have a predictable schedule in order to take night classes in engineering and to prepare for civil service exams, as well as the state license exams. In California

you can't practice civil engineering unless you have a professional engineers license. It was relatively interesting, when I--

BASIAGO: Why don't you tell me about your war experiences.

WYSS: Okay. When I first went into the army, I went through the-- What do they call it now? Well, it was down at Camp Hahn; it was the induction center. They had a demand for soldiers in some fields. I went to Fort Belvoir, Virginia, and went through combat engineer training. After that, I was assigned to an engineering forestry battalion, and that was very interesting, but not exactly along the line of engineering. Then after we'd been in the forestry battallion for some time, an opportunity came up to get into a program called the ASTP, the Army Specialized Training Program. We didn't know just exactly what the objective was, but it was an awfully good opportunity to go back to college and get specialized training. It turned out that what the army was doing was selecting people on the basis of IQ and mechanical aptitude to train them for potential warfare involving nuclear war. So I--

BASIAGO: What year was this?

WYSS: This was in 1943 and '44. So I was assigned to the University of Tennessee to take advanced engineering training. It was a very happy circumstance that the same

material that we took there could be applied towards an engineering degree. They had--

BASIAGO: Excuse me, let's go back to the army's motivations again. You were to be trained as soldiers in nuclear war, or as engineers?

WYSS: Well, as engineers I believe, but I'm not quite sure yet just what the entire program anticipated.

BASIAGO: In what capacity? Did they need people to administer the weapons in the field? What did they have in mind? Do you know?

WYSS: They never told us that.

BASIAGO: Obviously, you weren't on the Manhattan Project?

WYSS: No, no, this was a general fundamental engineering training.

BASIAGO: Perhaps they were thinking of smaller bombs?

WYSS: I think they were, and atomic demolition projects and things like that. It was never explained to us what the basic idea was, but they were training a core of people with engineering background for highly specialized work.

BASIAGO: Let's talk about your education. What did you study there in Tennessee?

WYSS: A lot of general engineering subjects, like hydraulics and mechanics of materials and that sort of thing. It was a regular engineering curriculum, and the University of Tennessee had an extremely good engineering

school. We spent quite a bit of time on engineering fundamentals, and a certain amount on military training too.

BASIAGO: So, it was almost as if they were trying to think of all the tactical uses of A-bombs and--

WYSS: I think they were. I think that was the basic idea behind it. It wasn't an officer training school; it was a highly specialized engineering school. I have an idea that if it had gone to its limits, it probably would have involved being made into engineering officers for specialized purposes. They had one facility that I thought was unusually clever for the army. In order to motivate the married people, they had a regulation that you could live off the campus on weekends if you got straight A's and B's. The campus was surrounded by a chain-link fence and we were confined to the campus all during the week. No leaves at all. It was a real strict engineering training program. But you could spend the weekend off if you got straight A's and B's. Needless to say, all the married men whose wives were living in the area, and who could only look at their wives through the chain-link fence, got straight A's and B's. It was the most effective program that I've ever seen for inspiring people to work hard.

BASIAGO: Were you married at that time?

WYSS: Oh, yes. We had an awfully interesting experience there: My wife had decided to come down with me to the University of Tennessee. We almost lost each other on the Southern Railway. There was an awful lot of confusion in the station during wartime. But we finally got down to Knoxville, Tennessee, where the University of Tennessee is. We got our luggage and got off the train, and we didn't have any idea where to start looking for lodging. We didn't know at the time, but the Manhattan Project was in full swing there, and there wasn't a rental spot in the entire region in Tennessee around Knoxville. We didn't know that, because it was such a hush-hush project that we never heard of it. We didn't know what else to do, so we went to the local Catholic church--and there aren't very many of them down South because it's a pretty strong Baptist area. So we went to the priest's house and he says, "Well, they're awful hard to find here, but I understand that Widow Brown has a roomer who is moving and she may have a place." So we went down to Widow Brown's place and brought our luggage up on the front porch. And Widow Brown turned out to be a real fine person. She asked, "When will you want the room?" We said, "Right now." It turned out that we were very fortunate in finding one of the very few rooms available down there. So we had a very interesting stay down in Knoxville. My wife went to

work for the Tennessee Valley Authority while we were down there, and also for the draft board. Privates were getting fifty dollars a month. That didn't go very far for a married couple; so it was a struggle, but a very interesting one. Tennessee is a fine state, and the University of Tennessee is just an excellent educational institution. We felt that our stay down there was very pleasant. Unfortunately, the army high command had mistaken the capability of the German army. They thought the war was practically over, and then all of a sudden they found out that they had lost a lot of men in Europe. They needed a lot of replacements so they shut down the whole ASTP program, and put all of the people in the ASTP program in the group to fill in combat divisions. So I was transferred to the 106th Division, a brand-new combat division that was just being formed at Camp Atterbury, Indiana.

BASIAGO: Let's back up a little bit. I don't know if we got this, but what did ASTP stand for?

WYSS: Army Specialized Training Program.

BASIAGO: So what you're saying is that they took some of these brainier guys that they had put into this special training, and then turned them into combat soldiers?

WYSS: They took them and dumped them right into the combat regiments. They had selected all the brains in the army

who might have been qualified mentally, but they were certainly not qualified physically. They also shut down the aviation training program, so a lot of potential pilots were also bracketed into this replacement program.

BASIAGO: After what battle did it become necessary to transfer these guys?

WYSS: Well, this was just before the Battle of the Ardennes, and they had anticipated, I think, a whole lot fewer losses than they had. So they formed this 106th Division, and when we arrived in Camp Atterbury, why, it turned out that the army had a program typical of the military. And the officer in charge of communications had first crack at all of the new candidates. So he went right down the line on the IQ measurement, rather than any other qualifications the men had for communications. So the first thing I knew I was in the communications company repairing telephones. I protested to the commanding officer, because I told him that my entire background is in engineering--I can earn my keep in engineering here, but I don't know anything about telephones. But they were completely unsympathetic, and I finally went to the chaplain and he interceded for me and I got transferred into the combat engineers. I got sent into the headquarters company of the combat engineers, and trained in a water purification unit. This division was sent

overseas on awfully short notice with very little training. When we got over to England, why, we only were there a couple of weeks before they sent us over to the Ardennes area to take the place of other divisions that had been moved in there for rest and recuperation. It was considered a quiet area and so they just moved this almost completely untrained division in. It was the most ill-equipped division, I think, the army ever--

BASIAGO: Fielded?

WYSS: --developed for combat. They might have had an awful lot of potential in other areas but not in combat.

BASIAGO: So the whole 106th was the--

WYSS: Well it was--

BASIAGO: --intelligentsia.

WYSS: --it was largely ASTP trainees and air corps trainees; neither of whom had been trained particularly for ground combat work.

BASIAGO: It didn't sound like you had any boot camp in--

WYSS: Very little. We had enough work on the rifle range to sight in our rifles. The M1 is a very tricky rifle to sight in, and once you get one sighted in, then it turned into a pretty good combat weapon. But they took all of our combat-ready rifles away from us and issued new rifles when we got over in England. The new rifles were not sighted in at all, and we had no way of sighting them; we didn't even

have time. So when we got over into Germany--we were in the Ardennes area near Luxembourg--a lot of us took our rifles out and sighted them in on wild rabbits and things like that, because it was the only way we had a chance to get them sighted in. When the Ardennes battle broke loose, the 106th was almost totally unprepared for it. We moved into the area that was vacated by another division, and we just--they had left their carriages for their artillery pieces in place--we just traded the barrels. Unknown to us, the Germans had scouted out every position in there. We were in their territory and they knew the country. We didn't realize it, but the water point that another fellow and I were assigned to was under enemy observation, and every gun emplacement that we had there the Germans knew all about. We were a pretty naive bunch to be put in there. But the army had decided that this was a quiet area, and the Ardennes was too difficult for armored units to penetrate. They were a hundred percent wrong because the Germans did a tremendous job of moving all of their heavy armor and everything right through it. When the Battle of Ardennes began they threw five or six thoroughly trained combat divisions on two or three American divisions that were either badly decimated in combat, or were, like our 106th Division, composed of people with virtually no combat training. It was really a butchering job. The

Germans had no trouble at all annihilating the 106th Division. A lot of the engineers, unknown to them at the time, did a pretty good job of holding back the German advance by isolated combat action where they would hold a bridge or something until the Germans were just ready to overwhelm them. Then they would blow the bridge up and the Germans would have to go around and look for another bridge to cross the river. It was a case where it was almost every man for himself, because even the officers had no training. The general in charge of the 106th Division lost his mind and had to be taken off to a psychiatric unit.

BASIAGO: After the war, did you ever get any explanation of who had goofed up in high command?

WYSS: No, they never-- That was the best cover-up job I think they have ever done. They did issue some statements to the effect that, sure, they knew the Germans were going to come through there, and they knew they could suck them in, and then when their supply lines were extended then they could overwhelm them and end the war. Well, that was just sheer nonsense because our people were told that there was nothing to worry about in there, because you're going to go into this quiet area, and you're going to get a little training, and then we'll send you off to the active areas. As far as we could find out, there wasn't anybody in any level of command that had anticipated the Germans'

advance through the Ardennes, in spite of the fact that there was quite a bit of warning. This was something like Pearl Harbor, where the evidence that was developed was ignored because it was so illogical. They thought the Germans were finished, and they thought the war would be over with by Christmas.

BASIAGO: Christmas of '44 now?

WYSS: Yes. Nothing could be further from the truth. We had a sort of a crazy thing happen at our water point that could only happen in the American army. We found out that there were quite a few elk in the area, so we decided we would hold an elk hunt. This, of course, was entirely on our own, and none of the officers in command had the slightest idea what we were doing. We were operating this water point right in the front lines. We were surrounded by rather dense forests, and the people from the combat regiments would come to our water point to pick up water. We found a bunch of fellows who were interested in a good elk hunt, so they found some reason for staying overnight with us at our water point. Well, this threw the Germans a real curve. The Germans knew that there were just two of us at this water point, so they figured they would just walk through there and mop that up and continue when they advanced--an advance that we knew nothing about.

So we drew straws and I drew the short straw, so I had to stay and operate the water point. There were only two of us at the water point, and there were seven fellows from the combat regiment that came and joined with us to have a good old-fashioned elk hunt. Of course, the Germans not only knew nothing about that, but it was inconceivable to them that any army would ever do anything like that. In the German army, I think that would call for a firing squad if they decided to have an elk hunt in the middle of the war.

BASIAGO: Did you get your elk?

WYSS: Yeah, they did. They got one elk and they brought it in, just the day before the Ardennes battle started. We got ahold of a local butcher, and we told him that if he cut this elk up for us we would split the meat with him and he could have the hide. We had it all opened up and hung out on a door leaning up against the back of this mill, where we had our water point established on a little stream. They decided to let it air overnight, and then the next morning he would butcher it up. That night, the miller, who owned the mill that we had confiscated for our water point, came in and said that the next day the Germans were going to advance, and that if we were smart we would get out of there quick before the Germans overwhelmed us. Of course, we figured all he was doing was manufacturing

this so he could get us out of his mill, so we told him to get lost. About daylight the next day--I think this was December 14--the Battle of the Ardennes started, and we were as surprised as anybody. The first thing we knew, there were artillery shells blowing up all around us, and fortunately for us we were in a little swale. The Germans were shooting with their 88-millimeter artillery at us, and they couldn't arch the shells to drop down into our area, so they would explode overhead. We just moved down a couple of floors in the mill and we fortified the mill and got ready for the war, because at that time we were ready to take on the whole German army. There were nine of us here at this mill, and the Germans, with their intelligence pretty thoroughly developed, knew there were only two of us there. Well, the first thing we knew after a couple of hours of shelling, we saw a German patrol coming down the far side of the valley. We couldn't quite understand exactly what it was, because the Germans were all in white outfits. We never had any white outfits, or anything like that for snow fighting. Nothing had ever caught up with us in the Ardennes. We didn't even--our engineering outfit didn't even have half of their engineering equipment. It was lost somewhere back in England, or in transit.

BASIAGO: So you had, what, just regular army green or camouflage?

WYSS: That's right. That's all we had. When we saw this German squad--it was a reinforced squad of about twenty or twenty-five men coming down the far side of the valley--we couldn't hardly believe our eyes. It didn't take us very long to realize that the fun was over and the war had begun. This German squad stretched out along the far side of the valley, and they set up a machine gun in a little gap in the hedgerow. And then three of the German squad scouts came right in on our courtyard. We waited until the scouts had gotten right in the courtyard, and then we started shooting at them. I think it just simply flabbergasted the Germans because they only expected two people here, and the nine of us all had semiautomatic weapons and we put out quite a bit of firepower. The Germans had made one mistake: They were in white outfits and there was snow all over the ground. But where they came down the far side of the valley the snow had melted on the hillside, and it was brown-colored earth and their white outfits just silhouetted them against the slopes. So my water point partner and I both have M1's, and all the rest of them just had carbines, so we just started picking off the Germans on the far side of the valley. It was just like a shooting range. These Germans were silhouetted in white against the brown bank. It didn't take them very long to realize what they had gotten into. We had them

pinned down behind this hedgerow, and they got one burst off with the machine gun before I picked off the machine gunner, and they pulled him to one side and another guy grabbed it, and I picked him off. One by one, for about six hours, we just picked off the Germans on the far side of the valley. Towards the evening when it started getting dark, we saw three Germans heading back up the valley and there were two fellows carrying a wounded man, and the rest of them, I think, were all dead. But we wiped out this German patrol, and I think they reported back that this whole road intersection was heavily fortified. [laughter]

All we had was a bunch of scared elk hunters in there, and we were all out of ammunition by the end of the day anyway. We had about a half a dozen hand grenades and just a few rounds of ammunition left, and we decided then-- Well, just after dark the miller rapped on the door again and he says they're coming through here now, so you better get out while you can. Well, we figured it was too late then anyway, at any rate we ignored him, and a short while later there was a big clanking noise and the doggonest conglomeration of German armor came through that you ever saw. We were right on the edge of a little street and these big German tiger tanks came through so close that we could reach out and touch their antennas.

BASIAGO: You were in trenches on the side of the street?

WYSS: Oh, no. We were in the mill building, and the German armor came through for about four or five hours. Then we watched as they set up machine guns down at the road intersection, and it wasn't very long before they had the entire valley saturated with German troops. Every once in a while somebody would pound on the front door of the mill and yell, "Is anybody in there?" in German. We had all of the doors barricaded with big piles of grain and we just kept quiet. They apparently presumed we had gone, but anyway they left us. So about two o'clock in the morning all nine of us dropped out the back window of the mill and headed back up towards Germany, so we could circle around all these areas where they had set up all the machine gun nests. Then one by one we separated--that's a wild story there, but it's not pertinent to this particularly. But three days later I was captured by the Germans trying to get back to the American lines. It turned out that the Germans were advancing faster than we could on foot, and we could hear firing ahead of us. We could tell the difference in sound between the German machine guns and the American .50-caliber guns. We could hear the .50-calibers going off, and then little by little they would quiet down. There was nothing left but the sound of German machine guns, so we knew the Germans had taken another town ahead of us. So we would keep on walking, and at the end

of the third day, why, we had been without food and any shelter for three days, sleeping out in the snow. Our feet were badly frozen and I walked right into a German command post and I gave up to a sentry, who was just as surprised as I was. By that time I was hallucinating. I didn't realize it, but I had all the symptoms of-- What's this phobia that--?

BASIAGO: Fear of what?

WYSS: Fear of, a phobia having to do with cold.

BASIAGO: I don't-- Hypothermia?

WYSS: Hypothermia.

BASIAGO: That's not a phobia. That's where you're frozen.

WYSS: I had hypothermia. I didn't realize it, but I was in sort of an advanced stage of that. It's fortunate that I did get under shelter then, or I wouldn't have lasted.

BASIAGO: That's where your body temperature is falling.

WYSS: Right, your body temperature has been dropping off to the point where you didn't have command of all of your mental facilities.

BASIAGO: Let's go back a little bit to the mill. You guys were an advance party?

WYSS: We were operating a water point right up in the front lines.

BASIAGO: I see.

WYSS: Our job was to purify water for the combat regiments.

BASIAGO: So you were at the mill there at the water point, and your buddies got pushed back a few towns. They marched past you. Wasn't there a battle there in front of the mill?

WYSS: Oh, yes.

BASIAGO: Why did you hold your position? Were you under command to do so?

WYSS: Our job was to simply fight, so we fought. We would have been far better off if we would have listened to the miller and taken off for the rear. As it was, when we did finally get into prison camp at the end of the fighting we found out there were very few survivors.

BASIAGO: What about the nine guys that you were with?

WYSS: Never saw them. When I was taken into this command post, I met my partner on the water point, Beckmeyer, and we never met any of the other fellows. We got a lot of inquiries from their wives after the war trying to find out if we had any idea what happened to them--they just disappeared. An awful lot of people did that in the Ardennes. Some of them were shot by the Germans, some of them simply died out in the snow--

BASIAGO: Of exposure.

WYSS: --and were never found again. It turned out that in our headquarters company, my water point partner and I are about the only ones that survived from the whole company. The rest of them were dead.

BASIAGO: So the ones who you were supplying water for--a lot of those guys died?

WYSS: Oh yes, an awful lot of them died, but we didn't know them very well. We just met them on a day-to-day basis when we supplied them with water.

BASIAGO: So you went up to the German soldier and surrendered. What happened after that? At that point you were hallucinating from hypothermia.

WYSS: He took me in and took me down into a basement. There were a few scraps of soup left in the bottom of a container they had down there, a stew pot. I was able to have a little bit of that, and then I met my former partner at the water point there.

BASIAGO: Was that Beckmeyer?

WYSS: Beckmeyer. His feet were pretty badly frozen too.

BASIAGO: What's his first name? Do you remember?

WYSS: Bill.

BASIAGO: Bill Beckmeyer.

WYSS: His feet were frozen too, and we massaged each others feet to keep the circulation going. I think we saved them from having to be amputated. Of course, in

prison camp if you had to have any amputation it was almost like a death sentence because we didn't have any anesthetics or antiseptics.

BASIAGO: Oh, my.

WYSS: It was a pretty grim possibility, but we were able to save our feet by massaging them more or less continuously. Anytime we had any chance we worked each other's feet over.

BASIAGO: Do you have any recollections of the soldiers who you surrendered to? Were they mean or just--

WYSS: No, that's very dim. Like I said, I think I was hallucinating at the time. It was a very odd experience. There was a heavy fog hanging over the Ardennes all this time and you couldn't see very far ahead. We were heading towards Antwerp when we were on our own, to try to get through the American lines. The Germans were firing buzz bombs and their V1 rockets at Antwerp. We knew that, so every time we would see one of the buzz bombs going over we would pick out some trees and follow that until the next buzz bomb came over, so we knew we were heading in the right direction. In order to go in a straight line you would line up a couple of trees, and you would go to the first tree and then you would pick up another one in the same direction. It got to a point where I would look up ahead and I wouldn't see a tree, I would see a German

soldier holding a Mauser rifle in his hand, and I could see every detail in the rifle; then I'd get a little bit closer and found out it was just a tree. That's the time when this hypothermia had taken effect. It was very fortunate that I did actually stumble into the German sentry, or I wouldn't have made it. But any rate, I was reunited with my water point partner, and we were together a couple of months in prison camp before we finally got separated. It was fortunate for both of us, because we were able to help each other survive.

BASIAGO: How long were you in prison there with a--

WYSS: I was there until May of 1945. We were about six months in prison camp.

BASIAGO: Where was the camp located?

WYSS: Well, the first camp that we were sent to was near Limburg in the Sudeten area in west Germany, but then that camp was so heavily crowded that they marched us way into central Germany. That was Camp Stalag 4B. Then they marched us into central Germany to camp Stalag 8A, and I'm not quite sure where that was. We never did find out. It was a kind of temporary camp, so I think they closed it down after the war. I was assigned to 8A for a while, and then they evacuated the people from 8A and marched them farther into Germany. I had a pretty bad attack of yellow jaundice at the time, so I was sent into what they call a

lazaret in Czechoslovakia. So I wound up, in the last month or so of the war, in Czechoslovakia at this little prison hospital. Finally, the Russians moved in from the east and took over Czechoslovakia; and the next thing we knew we were the prisoners of the Russians. That turned out to be more hazardous than being prisoners of the Germans, because apparently none of the Russians had been told that they had any allies; so everybody was their enemy. We were dressed in all kinds of mixed up uniforms. I had a partly American uniform and partly English, and I think I had a German overcoat. Every time we turned around some Russian was pointing a submachine gun at us. So we came, and we couldn't communicate with them. Most of them didn't know who Americans were. They were told that the Studebaker trucks that they were riding around in were made in Russia, and that they had no allies. So it was obvious to us that we were in more danger there than anywhere else. We were a mixture of English and Americans and Australians--one Australian.

BASIAGO: I'm wondering, do you think-- Are you saying that the Russian soldiers were misinformed by their leaders?

WYSS: They certainly were.

BASIAGO: For what reason do you think?

WYSS: Just a typical Russian attitude that they had no allies, they only had enemies. Their soldiers were completely brainwashed.

BASIAGO: So this was even before the end of the war that soldiers were being made to think they had no friends.

WYSS: It was before the end of the war. We decided we better get away from them. We had a pretty good idea that the American lines were only forty or fifty miles away. But at that time somebody, on a political decision, decided that the Americans would go only so far and let the Russians fill in the gap, which was a horrible mistake because it led to the Russian occupation of Berlin which was a--

TAPE NUMBER: II, SIDE ONE

DECEMBER 2, 1985

BASIAGO: Let's go back to the point when you were captured. What was happening? You were, the prisoners, were following the Germans as they advanced many miles. What was the situation then?

WYSS: Well, I think as the Allies advanced from the west the Germans had moved the prisoners of war farther inland. I think their idea was that they wanted to hang on to the prisoners of war rather than lose them, so as to keep them as bargaining chips towards the end of the war. I think they knew at that time the war was going very unfavorably towards them.

BASIAGO: What do you recall about how life was like under German encampment before you were captured by the Russians?

WYSS: Well, there was a very large discrepancy in the way that we were treated in the different camps. If a camp was run by the old German army regulars, everything was done strictly in accordance with the Geneva Convention; but if it was run by the Blackshirts, anything went. They didn't recognize any regulations covered by the Geneva Convention. As an example, in one camp there was a pile of potatoes out in the middle of an open area and these potatoes were used to feed-- We were in the strafe column in a big sort of community farm, and these potatoes were

piled out in the middle of an open area and they were used to feed the pigs. They actually fed the prisoners of war potatoes that were lower in quality than those they fed the pigs. One Russian from the Russian group working in this farm walked over towards the pile of potatoes and the German guard just simply shot him. They dug a hole in the courtyard and buried him.

BASIAGO: These were the SS?

WYSS: Yeah. No record, no nothing. They just simply exterminated him. That was the sort of thing that happened when the fascists would use the prison column. They would march their soldiers into a German area, and if somebody fell down, they would just simply shoot him. It was a tremendous contrast between the way the regular German army operated and the Nazis. There's no comparison. So you never knew, until you found out what kind of organization was in charge of you, just what your hazards were.

BASIAGO: So you were a prisoner of the SS, and at other times just the general country boy field soldiers?

WYSS: Yeah, that's right. It was rather confusing, because there never seemed to be any set pattern on who was in command of what area. Consequently, you just simply had to be awfully careful that you didn't transgress on any of the orders, because the Nazis were simply unpredictable. But the regular German army, we were pretty well impressed

with them. We thought they did a reasonable job, considering the difficulties they were under. They had very little food for themselves, and when they had it they split it up with the prisoners of war. So we felt we were treated fairly well by the regular German army, whereas the Nazi storm troopers were vicious and unpredictable.

BASIAGO: Do you look back at that distinction now when people try to say that the whole German people weren't responsible for the war, that in fact, it was just this element--

WYSS: It's hard--

BASIAGO: --these Blackshirts.

WYSS: --it's hard to assess that, when an awful lot of the Germans were not in favor of the war, and a lot of them were in favor of stopping the war at an early date. I think that the administration in Germany was so ruthless that they didn't dare speak out. When we were marching through one town in a prison column and a lot of our-- We were in pretty bad shape because we were pretty thoroughly starved and barely able to walk, and a lot of the fellows were wounded and their wounds were bleeding and their bandages were just makeshift. As we walked through the town, some of the German housewives would come out and offer us water and pieces of bread and stuff like that. The guards would just simply take their rifles and drive

them off, so it took a lot of nerve for a German woman to try to help the prisoners. This was in spite of the fact that our air force had been wiping out their villages. So I thought that a great deal of consideration for the prisoners was shown by a lot of the civilians. I feel that an awful lot of them were victimized by the party in power, and I think that the Nazis represented a relatively small percentage of the German people. They simply controlled all the rest of them pretty ruthlessly.

BASIAGO: Did you ever have any incidents when the Blackshirts pushed the other German soldiers around that you remember?

WYSS: No, we never had, never ran across that. It seemed like we were either under one jurisdiction or another. I'm not quite sure when the jurisdictions shifted. One thing they never did was take us into their confidence.

BASIAGO: So do you think you've forgiven the German people, as a nation, as a--

WYSS: Well, I think I would forgive the German people, but not the leaders.

BASIAGO: Oh, yeah.

WYSS: We're having problems with the communists now, and the communist regime represents something like 13 or 15 percent of the Russian population. The Russian population never gets told the truth and they never have any say in

their future, so how can you blame the Russian people for what's happening? It isn't a question of any nation making its own decisions. It's the leaders that do it, and in this country it's almost inconceivable how 13 percent of the population could ruthlessly control all the rest of the country.

BASIAGO: What do you recall about being captured by the Russians? What do you recall from being a prisoner under the Russians?

WYSS: Well, one of the things that impressed me was the surprise that the Russians showed on the standards of living of everybody in Czechoslovakia. I think their standard of living was so much higher than the Russians that the Russians couldn't hardly believe what they were seeing. They confiscated everything they could get their hands on. The Russian trucks were loaded down with brassieres, women's silk stockings, guitars, and all kinds of things like that. They just simply confiscated everywhere they went. They were just like a bunch of locusts. They just simply cleaned up everything that was moveable. It was our understanding that before those trucks ever got anywhere near Russia all of that stuff was confiscated, so that they wouldn't be able to take them home and find out how the rest of the world lived.

When I was in this camp, about the time the Germans decided the war was over, the Russians began to start advancing again. The Russians had stopped on the Elbe River. They stopped there waiting for the Americans to bleed themselves to death. It was a pretty cold-blooded proposal on their part. We could tell what was happening because we could hear the guns quite a ways to the east of us, all stationary. They never moved. The Russians just stayed there waiting for the Americans to do all the fighting, and then they would move in for the kill. And that's exactly the way it happened. We decided that with all the dangers inherent in being a Russian prisoner, we better get out of there. So we made a deal with an Australian who was an ambulance driver. He drove a real weird contraption. It was an old vehicle with a big wood burner on the side that generated gas, and the gas was piped into the carburetor. So before he went on any distant trip he would load it up with wood and water to generate this gas. We decided that when the Russians let their guard down, why, twelve of us would jump on this ambulance all of a sudden and take off for the American lines. It worked out pretty well. We had a crazy trip in this wood-burning ambulance to get through the American lines. When we did get away from the Russian jurisdiction and saw our first American GI, we were a pretty happy

bunch. But it was one of those cases where you just simply had no idea what was going to happen next. We never felt at ease until we saw that first American.

It turned out that our diet had been so sparse that we had no idea what condition we were in. One of the first things that happened when we got into the American lines, they gave us C-rations. We thought that was simply wonderful because C-rations are just like a seven-course meal. I got a can of spaghetti and meatballs--I couldn't wait to open it up--and then gobbled it down. It didn't stay down for more than five minutes. My stomach simply wasn't used to anything as rich as spaghetti and meatballs, and I just upchucked the whole works. We found out that our stomachs had shrunk to the point that we had to be very careful what we ate. Everything had to be pretty bland. We couldn't eat anything that was rich or greasy; our stomachs simply couldn't tolerate it. At any rate, it was awfully good to get back into the American lines.

BASIAGO: I'm kind of at a loss in understanding how you you went from German to Russian captivity. How did that happen?

WYSS: Well, the Germans had pretty strict control of Czechoslovakia, and then towards the end of the war apparently the word was passed around among the Germans that the war was over and they had better shift for

themselves. So they just drifted away and the Russians drifted in. There wasn't any combat involved at all. The Germans just evacuated the area and the Russians just moved in. To give you an idea how the Russians behaved: After the Germans left, there was about a day or two in there before the Russians moved in, and I found a real good German Mauser rifle. So I figured, good, this is going to be a souvenir for me if I ever get out of this place. I confiscated this German rifle and hid it under a bush. When the Russians came through they apparently searched under every bush in the place, because the next time I looked it was gone. There were even little .22-caliber cartridge cases laying around from the German occupation, and the Russians picked up every little piece of copper cartridge case they could find. They left a scorched earth behind them. They apparently were interested in acquiring **anything** that they had never owned before. A lot of them seemed to have an Asiatic appearance, and I think a lot of them had come from the Asiatic section of Russia. As far as we could find they were just completely uneducated and couldn't even read or write.

BASIAGO: A lot of the soldiers in Afghanistan now are from the Mongolian states.

WYSS: I wouldn't be surprised.

BASIAGO: So, I guess you were shipped to various places in Europe.

WYSS: They flew us over to the channel and we were put in a camp called Camp Lucky Strike, named after one of our heroic cigarette companies. We were issued fresh cotton uniforms. And if you've ever been on the channel coast, you know that's a pretty cool climate, and we'd had some real bad weather. We were pretty badly run down and just practically freezing to death. So we didn't hardly dare get out into the air at all with the cotton uniforms. Apparently, whoever was in charge of the rehabilitation of the prisoners of war just simply hadn't made any realistic plans at all. They would run us through a chow line, and then at the end of the chow line an officer would hand out peppermint candy for extra energy. But the stuff they served us in the chow line was simply inedible. It was pork chops and mashed potatoes and gravy and things like that, and our stomachs simply couldn't tolerate it. We survived by going over to the Red Cross canteen and eating cheese sandwiches and malted milk. That seemed to be palatable, but the regular army food was simply not designed for people like us at all. It was odd that so little preparation had been made for people who were badly run down physically.

BASIAGO: Do you look back with any bitterness in terms of American leadership?

WYSS: No, no, not really. Americans are never prepared for a war. They always come into a war long after it has started and they're never really ready for it. Our whole experience in World War II was that we were always two or three weeks ahead of our supplies. Nothing ever seemed to quite catch up with us. Some of the combat outfits had worked up to a high degree of efficiency, but in our particular division nothing worked according to plan. It was just a sort of catch as catch can operation.

BASIAGO: You saw such inefficiency in the American war effort. Why do you think we beat the Germans?

WYSS: We just simply outmanned them, and we outbombed them, and we outproduced them. The German economy was badly shattered. Yet we were almost convinced we were going to lose the war when we were in prison camp, because when we were in the Ardennes, why, this V1 rocket was in evidence and it was sort of a frightening thing. When we were walking back in prison columns into Germany we would hear a great big roar and we would look off to one side, and that was our first view of a V2 rocket. These great big tremendous V2 rockets were coming up out of some launching area somewhere near where we were marching. We had never heard of a V2 rocket, and these V2 rockets would

gradually get up out of sight and turn over towards England, and apparently they were being used to bombard England from tremendous distance. We had never even known there was such a rocket. We were concerned that if the Germans were that far ahead of us in rocketry, how would we ever win this war? And then in Czechoslovakia we were surprised one day to hear a great big roar, and a jet plane came up over a ridge and came down our valley coasting, and then he would turn on his jet motors and go up over the next ridge. We had never even heard that there was a jet plane. So here the Germans had two types of long-range rockets and a jet plane, and we had never even heard of them. We figured, gee gods, how can we ever whip the Germans when they're so far ahead of us technologically? Well, it turned out that one of the reasons that we were able to win was that our bombing groups were able to pinpoint the factories where the V2 rockets were being made, and the jet planes were being made, and the ball bearing factories, and things like that. They were able to keep their production so low that the Germans were never able to really get into full production. Then the German high command in the aviation field--they had a bunch of party luminaries there that were simply not good soldiers. They didn't use these jet planes in a way that was very effective, and as a matter of fact they held them

back towards the end of the war when they might have been very decisive. Our regular propeller-driven planes would have been no match for jet planes at all, but the Germans didn't commit them to combat and apparently held back on their using them heavily until it was too late. At some place, I think we just almost lucked our way through it.

BASIAGO: So your view of the "good war," as it has been called, is that we were actually kind of lucky to have won it. That it wasn't such a glorious--

WYSS: We were just simply lucky to be tremendously powerful economically to be able to outlast the Germans.

BASIAGO: I guess also the fact that we weren't on a land mass with Europe that we--

WYSS: That's right. We were, we had--

BASIAGO: --had our physical plants back here.

WYSS: --we had invulnerable production facilities that could work at high efficiency, and theirs were being bombed continuously. They actually did an amazing job to keep the war going as long as they did, considering their lack of basic facilities and minerals and things.

BASIAGO: So what was the period after the war like?

WYSS: Well, when we first got back to this country they put us in a rehabilitation program. They assigned us to areas that were quiet where we would have a chance to get back into condition. They assigned me up to Angel Island

in the San Francisco Bay, and we had pretty fair facilities there. Although again, the army forgot all about a few of the fundamentals. We had light cotton summer outfits, and the San Francisco Bay area can get awfully cold when the fog rolls in. So we found out that once the fog rolled in we had to get indoors, because we were not in any shape to stand up to that kind of weather. But the army did one good thing: They set up a rest and rehabilitation program at the Santa Barbara Biltmore. We were assigned there for two or three weeks and our wives were able to go along with us, so that gave us a chance to get back into shape. Then when I was discharged from Fort McDowell in Angel Island, I went back to work in the department [Los Angeles City Department of Water and Power]. And by that time I was in reasonably good condition. The work in the department was not too stressful at the time. There was a period right after the war when they were trying to catch up with a lot of back maintenance, so it was a time when we were just shifting back into a peacetime regime from a war regime. During the war the department was not able to get hardly any pipe and other fittings that would be used better elsewhere in the war effort. So we had a large pent-up program for rebuilding the system that had deteriorated during the war.

BASIAGO: I was wondering if you-- Well, you went to work for the department then, right after the war?

WYSS: Yes, I went right back to work with the department then.

BASIAGO: What were some of the things you were recouping there? I guess the pipefittings had--

WYSS: Well, we had a lot of developed areas that had new materials installed in the expansion of the facilities, but there were an awful lot of old areas that were deteriorating badly. Our problem was to analyze all of the old areas to determine the portion of the system that most needed rehabilitation, so that what pipe we were able to get hold of would be put to the best use.

BASIAGO: Were a lot of the people who rose in the hierarchy in the department after the war combat veterans such as yourself?

WYSS: No, quite a few of them were excused for military service. There weren't too many of us that were combat veterans after the war. Also, during the war there were very few promotions made, so we all started on pretty much of an even basis after the war. I thought that the three years I was gone would have a serious adverse effect on my department career, but it really didn't.

BASIAGO: Things were kind of starting from square one again?

WYSS: That's right.

BASIAGO: Everybody's lives had been--

WYSS: That was the impression we got.

BASIAGO: --set off track?

WYSS: I think that was pretty close. Everything was almost held in a status quo condition during the war. A lot of the engineering that was being done before the war for expanding the system just had to stop cold, because we had to concentrate on servicing all the war industries. That took a top priority over everything.

BASIAGO: We talk about Rosie the Riveter: This was the first time a lot of American women entered the work force. In a sense, the department has always been dominated by male employees. Were a lot of department positions administered by women during the war?

WYSS: No, they didn't seem to take hold during the war, and after the war it wasn't until they started a big affirmative action program that women starting moving into areas that had been dominated by men.

BASIAGO: But during the war it was still a male-dominated institution?

WYSS: The war production industries took women in on positions that were formerly dominated by males a whole lot more than the department. The department was pretty much holding its own, whereas the war industries were expanding at a tremendous rate.

BASIAGO: I'm surprised. It seems that the less vigorous positions, let's say, in the department administration, might have been given to women, whereas more of the men who stayed home would have been sent into shipbuilding or something--

WYSS: Apparently it didn't--

BASIAGO: --physical.

WYSS: --work out that way so much. A lot of the department's engineering activities that were involved in expansion of the distribution system were simply put on hold until after the war. So the demand for manpower in the department was nowhere near as intense as in the war industries.

BASIAGO: So what did you do for the department after the war? I guess for a while there you were associated with the waterworks.

WYSS: Yeah, I stayed in the water engineering design division and just simply took up where the war ended. I was in charge of the distribution design in the San Fernando Valley. Then I was promoted to a waterworks position, division, where I was in charge of the design of all of the city. And then eventually I was promoted to senior waterworks engineer and was in charge of all of the planning, both public works and distribution designs. That was a rather interesting point there. Before the senior

waterworks exam was taken, I was unfortunately hit by lightning when we were on a trip in the High Sierras. Four of us had taken burros, and we were going up the John Muir Trail. About the last day before we were going to come out of the mountains--we were staying at Baxter Lake which was around 13,000 feet elevation--this storm moved in on us. So we made a fairly cozy camp and started a big fire against the log, and we stayed fairly comfortable that night. Then the next morning a couple of us decided we were going to go fishing, because fishermen aren't very smart anyway, so we got out and there was a chilly rain falling. We went out to Baxter Lake anyway, and caught limits of trout for the rest of us to carry out.

We started up over Baxter Pass to come back down into the valley. We had two burros, one of them a big one and one a small one, but the big burro was the type of animal that just quit. We'd load it up with camping duffel and its legs would just fold out from under it. So we figured we would have to hand-carry a good portion of our camping equipment over Baxter Pass, and we used the little burro to carry the rest. The big burro, we were going to take it up over empty and see if it would go downhill with a load on it. So we were going up over Baxter Pass. I was carrying a load of material, and another fellow was behind me about fifty or sixty feet. Apparently, when I got up to the top

of the pass I stopped to take my camera out and take a picture of the rock that marked the summit of the pass. And a short while after that I got hit directly by lightning. Then I was unconscious for twenty-four hours. So I didn't know anything more after that, but the fellow that was behind me said this lightning blast hit me and blew me right up into the air, and I came down and lit on my face and I was out cold. He got knocked off his feet, but when he came up he could see that I was badly burned and unconscious. So he got the other fellows and they put me on the one little burro we had that was the good one, and carried me down to the valleyside of the pass to the first timberline around 12,000 feet. Then they made a fire and stuck me in a wet sleeping bag, because everything was soaked by that time. One fellow, Val Lund, took off for the valley floor to get some help. The other two stayed with me and tried to keep warm with the camp fire. Val went down to the town of Independence and he got ahold of the sheriff, and the sheriff got ahold of the doctor. And the doctor said, "There's nothing we can do for him this afternoon, we can't get up there before dark"--it had been storming quite a bit--"so the sheriff will go up in the morning and bring him down." Val had to stay there overnight, and the next day the sheriff came up with a pack train and carried me down. By that time I had come to and I was just a little bit out of my mind, but--

BASIAGO: Naturally.

WYSS: --fairly healthy, considering everything. So they brought me down, and the doctor down there says, "I don't think I can do anything for him, so you better take him back to Los Angeles." So they did, and my wife took me down to the Ross Loos clinic and they couldn't find anything wrong with me. I had a lot of burns on me, but they couldn't find anything that had been seriously damaged. What was interesting about this was that I was out of work for about a month recuperating. When I came back down to the department we had to get ready for the senior waterworks exam. I think I was concerned with whether or not any of my mental capacities had been fried in this incident, and I think some of the other engineers were too, because there was quite a bit of attention paid to how we came out on the senior waterworks exam. Fortunately for me, I was able to hit number one on the exam, so that settled that part of it. I might have been physically damaged, but at least mentally I was able to get by all right.

BASIAGO: Did the lightning rearrange any of your memories at all?

WYSS: Yes. It was rather odd the way it happened. It completely erased everything in my mind from the time we left our camp until we got halfway down to the valley

floor. I couldn't remember crossing over the pass, or anything like that, and yet I knew I had taken a picture of this rock cairn. It was on my camera but I couldn't remember any part of that.

BASIAGO: It knocked out your short-term memory then.

WYSS: Yeah, and then strangely enough, some things cropped back into my memory from my childhood days, from thirty, forty years back.

BASIAGO: When you try to think of climbing the summit?

WYSS: No, no, they just kind of drifted into my consciousness. Songs that we would sing in grammar school, and going out on hikes with the kids in the Los Angeles area out in the farm country. Things that I had never even thought about.

BASIAGO: So you're saying that the lightning incident jogged these memories?

WYSS: It did, yes.

BASIAGO: So that you hadn't thought of them--

WYSS: It blotted out some and retrieved some others. It's very unusual. I went down to the high-voltage experts in the power system and they reviewed the physical evidence of this lightning strike, and they could only conclude that there's no reason in the world why I was alive. I should have been burned to a frazzle, because it was not only a tremendous voltage but quite a bit of amperage. The

electricity had run in through my hat and burned me around the skull and fused one corner of my lenses in my glasses, ran down through my clothes and melted some coins that were in my pocket, ran down on one side where I was carrying an all-steel hand ax, and it ran down, halfway down the ax, and then shorted out into the ground and left a big notch on the side of the ax. This type of evidence, as far as the experts were concerned, had such high voltage that there's no explaining why I survived. The only thing they can say is that instead of going through my body it must have gone through my wet clothes around the body and shorted out into the ground, without destroying my nervous system and other organs that are usually damaged by electricity.

BASIAGO: What do you think? It seems like you were loaded down with metal. Do you think that's maybe why you were--

WYSS: No, I don't think so. I think I just happened to be in the wrong place at the right time.

BASIAGO: You mentioned you had a wire rim around your stetson.

WYSS: I had a wire rim around my hat, and that might have had some bearing on it too.

BASIAGO: And then a knife and an ax and change in your pocket.

WYSS: And I had a sheath knife on my right side, and the lightning kind of exploded under that and left a big bruise on my hip. The same shape identically as the sheath knife.

BASIAGO: So, it sounds like it did go through your clothes then, because when it hit that metal--

WYSS: It must have.

BASIAGO: --it knocked it against you. I'm not clear about how it played around with your memory. That sounds very curious. When did these childhood memories get jogged? After the incident?

WYSS: Yes, after the incident. I wouldn't be thinking of anything in particular, and then one of these memories would come back from childhood, incidents that I had forgotten completely about.

BASIAGO: That's interesting. Maybe it filled in where the short-term memory or something--

WYSS: I think it did. I think it eliminated some part of the memory bank and refreshed another part.

BASIAGO: That's very interesting.

WYSS: Not recommended, though.

BASIAGO: Listen, there's a question that I think is very natural for me to ask now. You've had two or three very serious traumatic incidents: this tunnel flooding, then being captured during the war, and then being struck by lightning. How did this affect your general philosophy about life? Are you a very religious person?

WYSS: Well, yes, I'm quite religious, but I just simply had to conclude that I must have been put on earth here for some reason and I hadn't completed it yet. It had something to do with my retiring early, because one of the things the lightning did was to finish destroying the nerves in my right ear, so I have no hearing left in the right ear at all. In the battle of the Ardennes, my right ear was damaged by concussion from the shooting in combat, and then when I got hit by lightning apparently it sliced the eardrum and completely destroyed the hearing nerves. So it was difficult to get into these various conferences and be able to hear half of the things that were said, because if a person got on my right-hand side, and they didn't speak loud, I couldn't understand them at all. Besides that, my wife and I figured that we had had so many close shaves that there was no use working on dying with my boots on at the department. So I decided to retire at sixty when it was permissible.

BASIAGO: What were some of the things you accomplished for the department after the war that were a good reason to stay on earth for? Anything that you look back on as accomplishments that you're very proud of?

WYSS: Well, nothing very exciting happened.

BASIAGO: Don't be too humble.

WYSS: I had a pretty responsible position in the department, and one of the things that I wanted to do when I retired was to take on some kind of a task that would be intensive enough to make the transition from active employment into retirement bearable. So I bought a piece of property up in Idaho. A friend of mine had quite a bit of other property around there, so when I retired I moved up to Idaho and helped him subdivide the area. We put in the power system, the water system, the telephone system, and everything like that, and it worked out quite well. It was a real satisfactory transition. Now we spend six months of the year up in Idaho and six months down here, so we have a rather unusual program now. We don't live long enough in either area to do any very extensive work.

BASIAGO: You worked on several developments in the postwar period for the department. You worked on fire-hydrant efficiency and rights-of-ways for the department in terms of transportation and work-area safety on streets and highways. What were some of those projects about?

WYSS: Well, in the department, because we have such a large operation and cover so many fields, we have become pretty authoritative in these areas and we have done quite a bit of research in them. Like work-area safety, for instance: We found out that one of the real problems on safeguarding the work area on the public streets is that if

you're anywhere near a freeway, the people that have been driving on the freeway are used to driving at fifty miles an hour, with nothing in their way, and it actually takes them some time after they get back on the surface streets to realize that they've got to slow down to thirty-five miles an hour. So we developed a lot of safety programs, and types of safety--I guess you'd call this stuff--

BASIAGO: Standards?

WYSS: --traffic handling facilities to safeguard the work area. One of the things that we found out is that you had to establish some warning signs that were pretty effective a long ways ahead of the work area, and then put enough cones to direct the traffic once you have their attention, and then place any heavy equipment between the traffic and the work area itself so that we could be reasonably sure that the department men would be protected. We found out that when a contractor does a job he wouldn't take half the safety precautions we would, because he would gamble on keeping the costs down. But we were concerned particularly with safeguarding the health and welfare of our workers. When we developed all these safety programs and work-area procedures, it became evident that the waterworks industry--which has a very high mortality rate--needed some information on that. So I wrote up a paper, in conjunction with our safety engineer, to present to the American Water Works

Association so that the whole American waterworks industry could benefit by this. Actually we developed--

BASIAGO: Did you actually design some of the traffic control signs or just apply ones that were already in use?

WYSS: Well, we designed some.

BASIAGO: Which ones were those?

WYSS: Particularly, the multiple flag arrangement. We found out that unless you could get a flag way up in the air, people wouldn't pay any attention to it. So we developed this multiple flag arrangement, where flags would be at various angles and flutter around enough in the wind to get everybody's attention.

TAPE NUMBER: II, SIDE TWO

DECEMBER 2, 1985

BASIAGO: With all this combat experience during the war, I'm wondering, does that ever bother you that you were historically thrust into this situation in which you had to kill other people?

WYSS: No, that's a strange, strange factor. I thought that after the war I would have hallucinations and nightmares and that sort of thing, but apparently when you are fighting in a war like World War II, where's there no question that the enemy is an antisocial group that simply had to be whipped, then just about everything that happens you can justify. It doesn't seem to have had a lingering affect. I thought that just killing other people would leave an indelible stain on your memory, but it hasn't.

BASIAGO: That's interesting.

WYSS: You just simply rationalize what has to be done.

BASIAGO: You later became host to some Japanese exchange students.

WYSS: We didn't have so many Japanese exchange students, but we had quite a large number of Japanese trade missions that came over to this country. As a matter of fact, we had trade missions from quite a few other countries, but the Japanese missions impressed me far more than most of the others. Almost invariably the Japanese knew exactly

what they were looking for. When they would come over to a big water utility, like the Department of Water and Power, they wanted to find out just what we produced, or what we needed that they could produce, and just what were we looking for in the area of quality. They took real careful notes of it, and apparently when they went back to Japan they put everything they learned into use. They simply produced a good high quality export product. We had to buy from the lowest responsible bidder in the department, and that quite often was Japanese-manufactured material. At first we were a little skeptical and concerned about it, but it wasn't very long before we found out that the Japanese were turning out not only high quality, but producing it at a relatively low cost. We found out that a lot of their manufactured waterworks parts, like sleeves and couplings, and things like that, were actually considerably superior to the American-manufactured products.

BASIAGO: What I was going to ask is, did that ever make you feel thankful that you were given the opportunity to host Japanese individuals in your home? In the sense that this was another enemy that we have been at war with?

WYSS: Well--

BASIAGO: Was that kind of strange to consider?

WYSS: It was rather strange, but it's just an economic fact of life that we had to live with and it--

BASIAGO: Was there any resentment among some of the Pacific GI's in the department?

WYSS: Well, yes, there was, and I suspect that it bothered them for a while, but those animosities die away after a while. And this is another generation that we're living with too. The trade missions that came from Japan were very polite and very thorough, and when they left they always gave you a little going away present. One of the missions gave the engineers that worked with them little, short, four- or five-inch slide rules, and they were some of the finest little slide rules available. We'd never seen anything quite like them. A lot of trade missions from some of the other countries would come through and they would pump us for all the information they could get, and they wouldn't even thank us for our time that we spent with them.

BASIAGO: When did the Japanese first start coming to the department to check out your operations?

WYSS: Well, it wasn't very long after World War II that they started coming in.

BASIAGO: Early fifties?

WYSS: Yeah.

BASIAGO: How would they go about their tour? What were they most interested in learning?

WYSS: Well, some of them came over to see how we managed water utilities, as far as functions are concerned, and others were concerned with construction practices. But most of them seemed to be concerned with just what we consumed as a waterworks industry.

BASIAGO: In order to supply to you?

WYSS: Yes, right, and how they could get into the market for supplying us.

BASIAGO: Ultimately, what are some of the things that they supplied you with?

WYSS: Well, the main things that they supplied us with were steel products, and that involved all kinds of couplings and slip-on flanges, as well as the steel pipe; they got pretty heavily into galvanized iron pipe too. They were extremely effective and they turned out a good product. Apparently, they developed some quality control procedures that guaranteed that anything that was exported met high quality standards.

BASIAGO: As opposed to those for domestic use? Was there a difference?

WYSS: Yes, there was quite a bit. A lot of the domestic pipe fittings, for instance, had real rough finishes on them, and the same type of equipment from Japan was very

well finished--much better machined and to closer tolerances.

BASIAGO: What do you think the strategy of the Japanese was in supplying the U.S. with better products than those being consumed domestically?

WYSS: Well, I think they concluded that they would be able to outdo the domestic qualities, or the domestic materials, if they were to meet two criteria: One of them was quality, and the other one was price. Apparently, they worked pretty diligently to excel in both areas, and they were successful.

BASIAGO: So they were just sacrificing at home while they were putting out a damned good product overseas that was--

WYSS: I really don't know. I understand that the emphasis was all on exports and that they were willing to sacrifice supplies and material at home to develop a strong export market.

BASIAGO: Was there any reciprocal use of ideas, or products, or practices? Has the department ever contracted with Japan for know-how or material?

WYSS: No. I don't think we ever found any particular need to go to Japan to improve on our standards of waterworks operations. I think we felt that we were quite a ways ahead of the Japanese in that respect.

BASIAGO: I also understand in your private life that you've been host to a Japanese woman. How did that come about?

WYSS: Well, my wife was a sponsor for a religious missionary in Japan, and it turned out that this missionary went to a Japanese doctor who was very fond of people who were willing to sacrifice their own future for the helping of mankind. At one time, this Japanese doctor asked this missionary if he had any idea where his daughter could reside in the United States for a period, while she learned the way Americans do things and what their various living standards are. This missionary said, "I think I know just the person." So he wrote my wife, and my wife acceded. The next thing we knew, why, this Japanese doctor had sent his daughter over from Japan to stay with us for a period of time. They offered to pay her way, but we felt that it was a little bit awkward to charge them for something like this when he had done so much good for the missionaries in taking care of them medically at no charge. So this young lady came over to stay with us, and it turned out to be a very worthwhile reciprocal agreement. We learned a lot about Japan, and she learned a great deal about the American way of doing things.

BASIAGO: What were some things you learned about the Japanese economy, or culture, that you think are very

relevant now that Japan is doing so well economically and is challenging a lot of our domestic markets?

WYSS: Well, the Japanese apparently have a labor force which is very much interested in the welfare of the organization they work for. They don't feel that they're being exploited by the organization, and many of them even go to work when they could be taking a holiday off. Apparently, they're very, very concerned with the welfare of the company they work for, and they're willing to make a lot of personal sacrifices to make sure the company prospers. That's an attitude on the part of the work force that makes for quite a competitive edge against the concept in America where the worker joins the union and gets all he can extract out of an industry. Any time the cost of a product goes up in the United States, without a compensating increase in unit production, we fall farther behind in the competitive race with the Japanese.

BASIAGO: What do you think we should do in the United States to compete with them, now that you've seen essentially how an American work force--?

WYSS: The only way that we'll ever be able to compete with them is for the working-class people and management to work as a team and not as competitors. There has to be a meeting of the minds on how to produce a larger volume, and higher quality, at lower cost. In order to compete

internationally there must be some way that this can be achieved, but it will not be achieved by any adversary relationship between management and labor. It puts us at a terrible disadvantage if there is any competition or battle between management and labor.

BASIAGO: Were there ever any incidents at the department that, for you, exemplified some of the problems of the American work force?

WYSS: Well, yes. We in the management area had a problem in accepting unionization of professional engineers. We never felt that they needed any particular representation, because they were all civil service employees and had full protection of the civil service system. It was felt by most of us that it was completely unnecessary to join professional organizations, which were in reality just a high-class labor union. To our way of thinking, it split the loyalty of the employee between the department and the labor union. And we felt that that was a deleterious factor that really, in a professional field, just simply hadn't much excuse for being.

BASIAGO: Did you ever travel to Japan in a reciprocal trade team?

WYSS: No, I never have. The Japanese seem to have a one-way operation that way. They all traveled to all the other countries, but hardly anybody ever travels to Japan.

Although I understand that some of the American industrialists now are finding out that they better go to Japan and find out how the Japanese are doing things to compete so successfully.

BASIAGO: Is there an individual at the department, or was there, who did become your Armand Hammer at the department in that regard, going to Japan and other countries?

WYSS: No, I don't think we ever developed any. We always took the position that we'd be glad to help any other country, or any other utility that came to us for help. But there never seemed to be any particular reason why we should develop any real close relationship with the foreign utilities for the benefit of the department.

BASIAGO: It was always a master-apprentice relationship.

WYSS: That's right.

BASIAGO: Is that still true in the field?

WYSS: I think it is. I think that the department, and the American waterworks industry in general, are really world leaders in the production of high quality water at a reasonable cost. I believe most countries are still looking to the United States for leadership.

BASIAGO: What are some of the countries that have most benefitted by the instruction the department has given, in terms of setting up waterworks administration?

WYSS: Well, I think quite a few of the utilities in South America and Central America have greatly benefitted by learning from the American way of doing things. And the state of Israel has sent quite a few representatives to the department to learn about the way the waterworks industry can cope with arid conditions. Southern California has a climate quite a bit like Israel, and a lot of the facilities that we've developed for distributing and storing water in Southern California have an application in Israel. The Israelis have been very innovative themselves, but they've also found that we have quite a few things that they can use for developing their own water system.

BASIAGO: Any other Mediterranean countries-- Have South Africa or Australia sent representatives here?

WYSS: We've had just a very few visitors from some of the African countries but nobody seems to have used any of these visits in any positive way. It appears that most of the African countries, water supply can only be developed by international agencies working in the country, and quite a few of the improvements are made by missionaries working in the country in developing local water supplies, and things of that sort. But there's very little that has been done on a real large-scale basis.

BASIAGO: We read a lot about the drought in the Sahel. Is there anything that has been learned about waterworks

engineering in Southern California--which is naturally a desert--that is applicable?

WYSS: Yes, there is. The African countries in the arid areas are overpopulated. They have a tendency to denude the land, both of trees for fuel, and grazing land that is over-grazed to the point where wind storms can destroy them. And apparently, until they start developing, or redeveloping, forests like they had in past generations, and controlling their rangeland and the number of animals that use this rangeland, they'll never lick the problem. A great deal of the problem in Africa is climatic in nature, but a good portion of that problem is man-made and could be rectified if they had a central government that could control the country and convince the people that it is in their own best interests to adopt environmental control of procedures.

BASIAGO: What are some of the areas that the department has instructed, let's say, international agencies in waterworks development in Africa. Did you have any involvement there?

WYSS: No, we didn't have any involvement in that that I know of.

BASIAGO: Let's talk about dams. One of your subspecialties is earth-filled dam construction. Weren't you at the Baldwin Hills Dam when it burst on December 14, 1963?

WYSS: Well, I was one of the first employees to respond to the emergency. I wasn't there at the time. When the problem developed there was only one man on duty, and he was the reservoir keeper. I might point out that on all of our reservoirs we have a reservoir keeper, and his responsibility is to patrol the reservoir regularly and be particularly observant in any area where there is a potential for damage. In the Baldwin [Hills] Reservoir, for instance, this reservoir was designed to be earthquake-proof, and every precaution that could be built into an earth-filled reservoir was applied here. In spite of the fact that we considered the reservoir virtually earthquake-proof, it was still patrolled thoroughly by responsible reservoir keepers. This was a rather interesting case in the requirement for quality employees.

Our reservoir keeper at Baldwin Reservoir was an ex-paratrooper who was a very intelligent and capable person. And it was due to his keen sense of observation that he was able to detect the fact that something had gone awry before it developed into an uncontrolled catastrophe. He was able to call in for help as soon as he found out that something was going wrong. In this particular case, he was out on a routine along the periphery road on the top of the reservoir, and he passed a manhole and he noticed that a sound in the manhole was a little different from

normal. Not much, but just enough to be suspicious. So he listened carefully and he became convinced something was happening that was a little out of the ordinary. This manhole was over a water drainage system that fed down into a manhole where he could observe the actual flow of water. There is always a little bit of seepage in any reservoir, and as long as everything is kept under thorough control, the seepage is natural and there is not any reason to feel concerned. But he went down into this manhole where he could look down into the channel, and there was considerably more waste flowing in that channel than he had ever seen before. Then he went to the tunnel portal that led in under the reservoir, and under the reservoir we had an inspection gallery, with pipes going off in all directions under the reservoir. Each pipe had a little orifice that dropped into a common trough, and if everything was normal there would be a little drippage from each one of these pipes indicating normal seepage. But when he went into this gallery under the reservoir, he found out that there was water on the floor of the gallery, which had never happened before, and that some of these pipes, instead of dripping, were spurting water. He knew right away something was wrong, and he immediately went to the phone and called the district superintendent for whom he worked, Pat [Patrick] Doherty.

Pat Doherty recognized from what he heard that there was something serious happening and he called his gate foreman, Oscar Graf, and the two of them went up to the reservoir. When they got up to the reservoir, at the tunnel portal, they met Revere Wells coming out. He was barefooted and had trod around in the water that was on the lower floor and determined there was some silt on the floor that had never been there before. He conveyed this to Doherty, and Doherty knew immediately that something radically was going wrong. He called me at home, and this was just before 12:00 on Saturday, December 14. Fortunately I was home, and I live just about a half mile from the reservoir. I had my department car, radio-equipped, at home because I had to respond in an emergency. So in a matter of minutes I was up there and met Doherty and Oscar Graf just coming out of the tunnel. The water had already starting rising in the tunnel. Oscar Graf volunteered to go back into the tunnel, in spite of the fact that the water was rising, and get a chart that was hanging on the wall to show where all the underdrains were so we could analyze what was happening. Pat Doherty and I just took one look at what was happening and recognized that something serious was developing, and that we had to take the reservoir out of service immediately and start draining it. Pat called his men out to the field.

He did this by calling the trouble board in the western district. The clerk on the trouble board called various gatemen and regulator men out. They all had department radio-equipped cars at home, because they were all on emergency call. So they responded out to the various areas in the field where they would have to operate to take this reservoir out of service.

In the meantime, I called the various supervisors above my level. At this time I was the assistant division head in the water operating division. So I called the division head, Richard E. Hemborg, and he called Sam [Samuel B.] Nelson, who was the chief engineer at the time, and told him that something was developing out there and they didn't know how bad it was. Sam told him to go ahead and report out to the reservoir and take care of everything, and Sam would stay there and coordinate everything at a higher level. He felt that those of us that were directly in charge of the reservoir could take care of anything that had to be done. So, when Dick Hemborg got there, I told him what had happened and that this reservoir simply had to be taken out of service, because something was going radically wrong within the embankment in the reservoir. I called the man who was in charge of the design of the reservoir to get his feelings on what might go wrong. He had me call out Bud Tate, who

was involved in the design of the reservoir. Bud Tate lived in an area just below the reservoir and responded immediately. When Bud got there, he went down with Revere Wells to look at the face of the embankment, and he found a damp spot on the downstream face of the embankment, which was very disquieting. He came back right away and told Dick Hemborg and I that it looked like water had seeped through to the face of the dam. So I went down there immediately with Revere Wells, and climbed up to this damp spot and found an area in the middle where water was seeping out and carrying silt.

Well, it was obvious to me that the dam was already breached, and it was only a question of time before it would erode away. So there was only one thing to do, and that was to dump all the water out of the reservoir as quickly as we could. I went back and told Dick Hemborg what was happening, and he started calling Max [K.] Socha and Sam Nelson, acquainting them with what was happening, and got an okay from Sam Nelson to call the [Los Angeles City] Police Department to see about evacuating the area down below, which I strongly recommended. Then Pat Doherty and I shut off the valve leading water into the reservoir. This was a 36-inch valve in a 54-inch line. We could shut it off by electricity, and that turned the inflow off in the reservoir. Then we manipulated all of

the regulators and valves out in the system to put the largest area that we could on the reservoir to help drain it down as quickly as possible. At this time the water had kept rising in the tunnel, until a large volume of water was flowing out of the tunnel. We decided that probably the next best thing we could do to drain the water out of the reservoir was to take the inlet line and isolate it down to where there was a large relief valve at a lower level, and use the inlet line to drain the reservoir even further, in addition to the domestic load that was put on it. So we had to close off some valves on the inlet line, and then open this 36-inch valve that had been closed electrically. Well, it turned out that the electrical supply had been shorted out, so Pat Doherty and I and Revere Wells had to open this valve by hand, and there were 1,200 turns. When we got to the valve we found out that the wire cage that enclosed the valve was just about full of water rushing out of the portal of the tunnels, so we had to take turns going under the water and spinning the valve handle to open this valve up. After a rather hairy experience diving under the water and taking turns we got this valve open, so that the inlet line would then carry a large quantity of water back out and dump it into a local storm drain.

While we were doing this, Dick Hemborg got ahold of Max Socha and he showed up there, and they called the police department and referred them to Nelson to verify the fact that this was not a hoax, that this was a real problem and developing into a catastrophe. Well, the police department couldn't quite believe it at first. One sergeant came up there and asked what the problem was, and I took him right down on the face of the dam and I showed them that hole that we'd seen a short while ago that was actually running water pretty strong now. I pointed out to him that that entire canyon below us was going to have a great big wall of water rolling down it in about one hour or less, and if the police department didn't get down there and evacuate all the people within a certain area they were going to have to be responsible for it. As I recall, this sergeant said, "My god, I'll get going right now." He apparently called back to the administration of the police department and convinced them that they had better move, and fast. They swung into action and really did a remarkable job of evacuating all the people down below. Max Socha, as soon as he got out there, told the police just how much of an area would be inundated; and he hit it very accurately. When the police moved the people out, they got most of them out, and a few people drowned, but it wasn't the fault of the police. Two women in a car defied

the police orders to move out, and moved down one street where the water was already hub deep. They ran into an excavation hole, and the car just disappeared and they drowned. Things like that were almost impossible to control.

We called people out from the western district office, and quite a few field crews came out with a lot of sand and sandbags. They let men down on the face of the dam right over this hole that was opening up in the paved face of the dam, and while they were in imminent danger of getting swallowed in the hole, they tried dropping sandbags in there to block up whatever water passage had developed. It turned out that the water had eroded a hole in the dam big enough so that it just swallowed all of the sandbags, and as the hole enlarged the men were ordered away from the break before it caved in under them.

We had, by this time, put the entire southwest part of the distribution system in Los Angeles on the reservoir to help drain it, plus opening up all the drains that we could. Then we had to completely reverse it and open up all the regulators feeding into the system just before the dam collapsed, because the entire southwest part of Los Angeles would have been dry without fire protection then. So I stationed myself up on the reservoir where I could see about how fast the failure of the embankment was taking place. When it got to a point where I felt it was

absolutely hopeless, I ran back to where Pat Doherty was and had him order all his regulator people to completely reverse the supply to the southwest part of Los Angeles, and put it back in a normal demand pattern and cut off the reservoir. This was all done without anybody in the southwest even knowing what was happening. I thought it was a remarkable job for a bunch of professional men to operate coolly and without any panic under really terrible conditions. The [Los Angeles City] Fire Department was called out and we kept the fire department briefed on where there was liable to be a water shortage, because we had a very close cooperative operation with the fire department on making sure there was plenty of water for any fires, and if not, what the situation was. So, Chief Harold N. Johnson, in charge of the hydrant bureau, was kept apprised of the development so he would know just where the fire department would have to bring in equipment in areas that might be out of water. Then they could pounce on the fire just using their stored water in their pumpers to control it before it got out of control. This was a rather interesting area here because most of the people never did realize that all the time that we were trying to save the reservoir, or minimize the amount of damage, we were also concerned with keeping the whole area supplied with water and making sure the fire department had enough fire

protection available for all of their responsibilities on public fire protection.

When the police moved most of the people out--it happened just a short while before the final collapse of the dam. It was a rather terrible sight to see the last part of the embankment just give way and a big wall of water roll down the Cloverdale Canyon. We felt at the time that we had done everything possible to minimize the damage, and when we look back on it, we couldn't find any area where we could have improved on our operation. The thing that was most impressive to me was the fact that every man that was called out was a professional man who knew what he was doing, and they never panicked. They did everything they were told, no questions asked, no arguments. They did everything quickly, efficiently, and this whole operation was handled in a very professional way. We felt that, under the circumstances, we had kept the damages down to an absolute minimum.

As an aftermath, there was a great deal of concern about all the property damage that had been done down below this dam. The department management and their insurance agencies got together with the people that had been damaged, and they worked out an equitable recompense for all the damage that was done. This was handled in such a short order, and without any particular fighting between

the parties, that there weren't any lawsuits involved. Within a very few days the insurance companies were working hard to settle the claim and get the people all reorganized who had been badly damaged by the catastrophe. After the dam had failed there was still an awful lot of cleanup to do. Our forces had to go out and cut and plug all the pipes that were in the damaged area, and they worked under considerable hardship. We felt they did an outstanding job too.

BASIAGO: Was there any attempt right after the dam burst to get together and knock heads and arrive at a legal position?

WYSS: Yes.

BASIAGO: These things always result in such extensive suits.

WYSS: In a short while after the dam collapsed and there was nothing more that any of us could do, we all went down to the department headquarters downtown and were sequestered in a room without any access to the press. We went over very thoroughly with our attorneys everything that had happened, to see any areas where the department might have been at fault or where they might have been able to improve their response. We were not able to pick any serious flaws in the way the job was conducted, but the attorneys took a real thorough deposition from everybody

that was involved to assist in any future litigation. As it turned out, there was such an amicable resolution of the problem between the department and their insurance agencies and the people that were damaged, that I think it was an outstanding job of minimizing the damage and any legal action that could have resulted from it.

BASIAGO: Did you ever find out why the dam burst?

WYSS: Yes, we went into that very thoroughly, and we found out that over the years the oil companies that owned all the oil fields in the Baldwin Hills had used various types of oil recovery systems. One of the ones that they used was the injection of brine into the oil fields to push the oil ahead of it and recover it. Some time after the Baldwin Reservoir was built we found out that our outlet line looked like it might have a problem, because there was some water extruding out of the surface. We checked thoroughly and couldn't find any leak in our pipe, and we analyzed the water and found out that it was a heavy brine. Apparently, the oil companies were injecting brine under such high pressure that it was lubricating all of the fault surfaces in the hills; and the hills were a real complex geological formation with a great many fault-gouge surfaces in there. These apparently had been opened and lubricated by the brine injected under high pressure, and they caused the movement to start taking place along these

various fault planes. This was one feature that had never been considered in the design of the dam, because it had never happened before. The dam was designed to withstand a considerable earthquake, but nobody had ever considered they would have fault blocks moving up on a fault plane under the pressure of a brine injection program.

BASIAGO: Did the oil companies share in the liability settlement?

WYSS: Well, I was coming to that. The oil companies of course denied any fault whatever. But after a lot of evidence was developed to prove that they were very much involved with it, an out of court settlement, as I understand, was achieved, where the oil companies did not admit any guilt but paid off the damages. That legally didn't bind them, but I think it was pretty obvious that they recognized that they were the culprits in causing and creating the conditions that led to this. We were awfully happy that we were not only warned at the very early stages of this catastrophe, but that everybody who had to respond was available and responded promptly and effectively. Within minutes of the time the problem was realized we had already decided on the procedure to minimize the damage.

BASIAGO: How did your command leadership work under the stress of the dam about to burst? You called the office when you arrived at the scene?

WYSS: Yeah, I think that was a good example of how delegation of leadership was very effective. When I first got there, Pat Doherty and I, on our level, had decided that the reservoir had to be taken out of service and drained. When my boss, the division head, Dick Hemborg, got there, he concurred with our decision and told us to go ahead and take care of all of the physical operations, and he would then take care of notifying all the higher levels of management and the other governmental agencies that were involved. When he called Sam Nelson, why, Sam Nelson says, "All right you take care of all of that stuff out in the field there, and I'm going to stay here so I can talk to any governmental agency that wants to get ahold of me. I can't do anything out on the field that you aren't already doing, so I'll stay here and be available for consultation, or discussion, or decisions on anything that you want to raise. But you take care of your area and I have complete faith in you."

BASIAGO: Did you call the police from the field, or did the front office?

WYSS: Dick Hemborg did. Dick Hemborg called the trouble board, and the trouble board put him through to the police department, and some girl answered the phone there and she turned him over to a man. The record isn't quite clear here, but I feel that the police department was very

skeptical of the whole thing at the time because they're subject to all kinds of--

BASIAGO: Phonies.

WYSS: --hoaxes and false alarms. They have to be awfully careful they don't make fools of themselves, or do a lot more damage than good by responding too quickly. But Max Socha showed up a short while after Dick Hemborg did, and he talked to the chief of police and assured him that this was a bona fide emergency, and that if there was any question about it to call Sam Nelson. I'm not quite sure just what calls went back and forth, but certainly after I had a chance to talk to the police sergeant the police really swung into action. When they did swing into action they responded very, very effectively.

TAPE NUMBER: III, SIDE ONE

DECEMBER 2, 1985

BASIAGO: Tell me how you were bobbing under water to turn that valve 1,200 turns. That was the backside of the valve. You were in the area behind the [Baldwin Hills] Dam at this point? Where was the valve?

WYSS: This valve had two ways of being operated; it had an electrical operator backed up by a manual operator. The manual operator was a worm drive where this big 36-inch rotor would be moved by a small 12-inch handwheel, but it was geared way up to where it took 1,200 turns of the handwheel to completely open or close the valve. When we decided to open this valve and drain and use the inlet line to drain the [Baldwin Hills] Reservoir faster, by that time the water was pouring out of the tunnel portal and running right through this wire cage that enclosed the valve. For security reasons, any valve like that that was above ground was enclosed in a chain-link fence to keep any trespassers from doing any damage there and creating any security problem. There was only one gate leading into this enclosure, and we had to go inside the enclosure to operate this handwheel. We took turns ducking in under the water and spinning the wheel, and then when we ran out of air we would step aside and another man would step in. So we ran relays on this thing, and it was kind of a weird feeling

because every time you went into this cage you felt like a rat in a trap because the water was rising all the time, and you were hanging on with one hand against the flow of the water and spinning the wheel with the other one.

BASIAGO: So your heads were above water?

WYSS: Yes.

BASIAGO: Did you later sit in at the insurance settlement? Who was the team that gathered? Who gathered to knock heads about your strategy?

WYSS: That was the legal division [of the Los Angeles City Department of Water and Power]. Once they had all our depositions, we were pretty much out of the picture and the legal division handled all the rest of it.

BASIAGO: So when you returned to the department right after the dam broke, you were sequestered by the legal division?

WYSS: Yes, that's right, the same day. I don't think we ate until about 8:00 that night when we had a hamburger and a malted milk. They took a great deal of testimony from each one of us on just what happened. They tried to hit every area that might be a problem in any legal settlement later. The last thing in the world they wanted was for any reporter to talk to the wrong people and get some kind of a distorted view of what had happened. As far as all the details of what happened, they weren't at all sure that

public knowledge of any of them would help us in the event of any extended litigation. We've had so much litigation in the waterworks industry--some of it downright frivolous in nature, but all potentially expensive--that we decided that, the legal division rather, decided the best thing to do was simply play down every element of this, and only have official news releases that wouldn't jeopardize any legal action that took place. I think, as it turned out, this was one of the few times when we had any catastrophe like this where we really didn't have any serious litigation. I think that, in itself, was a good example of progressive management.

BASIAGO: Did you learn anything instructive about emergency operations from that incident that later was implemented?

WYSS: We learned one thing, and that was that the procedure we had where all key men took a department radio car home was justified. We felt that if we didn't have another incident like this for a hundred years, everything that happened here justified the practice of having key people take vehicles home. Now we've been criticized in the past for that, and sometimes we're told that that's just simply a special fringe benefit for people who wanted to get some free transportation, and that sort of thing. But actually, we were quite careful about who was assigned

a company car with a radio in it, and we felt that it was justified before this Baldwin incident. Afterwards, there was simply no question in our mind that in a public utility, where there's a potential for tremendous damage, that it's in the public interest to have every key man available in the most prompt way. If everybody who responded to this Baldwin emergency had had to go from his home to the local yard and then get a radio car out and then respond to the reservoir, we feel that it would have been of inestimable damage compared to what actually happened. This was a case where just minutes counted. It's interesting to note that our reservoir keeper found out at 11:00 that something was wrong, and by 12:00 some of the key operating people were there and agreed something was wrong, and at 4:38 the dam finished its final collapse. So, in a matter of just about four hours we had to completely take a reservoir out of service, and revise the entire water supply for the southwest part of Los Angeles. And then reverse the whole process just about the time the dam collapsed. Everything involved split-second timing.

BASIAGO: What do you mean reverse the process? The water was being--

WYSS: The entire southwest part of Los Angeles was served through regulator stations, and we closed down the

regulator stations and put all of these areas on the Baldwin line to use the consumption for draining the reservoir. Then we opened up every flood control relief valve that we had and drained them in that respect, then we reversed the inlet line and used that for a discharge line to blow off the reservoir, in addition to the consumptive demand. What was really critical was that once we put the entire southwest on the reservoir we had to, in a matter of minutes, shut off the supply from the reservoir to the service area and put it all back on the original feed through regulators completely separate from the reservoir. It had to be done in such a way that we shut off the supply from the reservoir before a lot of silt got out in the line and plugged up a lot of our water lines, and created a lot of problems in some of the industries that were taking water from the system. Still, we had to keep the reservoir on service to get the last drop of water we could out of it, to minimize the water that flowed down into the drainage area of the reservoir.

BASIAGO: You certainly have experienced a number of very traumatic emergencies: that tunnel panic, being captured in war, being struck by lightning, and witnessing and serving in an emergency capacity during a dam break. What are some of the things that you've learned about how to survive such experiences?

WYSS: Well, that's hard to say. It indicates the necessity of being very careful of the people who were put in the position of responsibility to respond to emergencies, to make sure that they're levelheaded and capable, and can act on their own responsibility. It calls for picking strong-minded and confident people in responsible positions, so that they would not hesitate to act in the best interests of the department in an emergency.

BASIAGO: What do you think are the virtues of leadership in order? Churchill said that courage was the first, because it assured all the others. What do you think of these?

WYSS: Well, in the first place, they have to be competent. They have to have enough background in the operation, management, and design of the water system to have knowledge of how to take care of a problem. Secondly, they have to be relatively strong-willed, and they have to be decision makers. Because they never know at what level they will have to make very serious decisions, and they must have confidence in their own capacity to be able to make these decisions. In the third place, they have to have a hierarchy where every man can take care of all the problems at his own level, or below it, and have the confidence of the management leaders at a higher level that

they can delegate the responsibility to the lower level parties.

BASIAGO: Who were some leaders in your time who you admire for these traits? Any in the department who you think have been particularly remarkable?

WYSS: Oh, we had some fine leaders. H. [Harvey] A. Van Norman was a leader in my time for whom I had the highest regard. And another, Charles Itter, who was the engineer of design, had confidence in all of the men he selected and was willing to delegate responsibility to them and not question their decisions, providing they had good reason for making those decisions. [Norman] Imbertson was another excellent leader, and one in whom you had considerable confidence. Max K. Socha did a remarkable job as the chief engineer of the water system, and he was another who had faith in any of his subordinates that he felt could do the job and never questioned their judgement. [Samuel B.] Nelson was another man who just simply did an excellent job of delegating. He was the sort of man who never seemed to lose the common touch and with whom you feel right at home, and yet for whom you felt the greatest amount of respect.

BASIAGO: Do you think in the sense that America hasn't been in a world war for many years, that we're not going to be producing these kinds of individuals who are competent, strong-willed, decisive, and encourage respect and self-sufficiency at the lower levels?

WYSS: Yes, I'm afraid I have a few reservations that way. It's disturbing to me that a lot of the positions in government are being filled by people on an ethnic or some other political basis, rather than on sheer personal ability. For instance, the civil service system is a merit system, and everybody who is appointed from a civil service list is supposed to be the best man on that list. But now apparently, we're getting into an area where affirmative action and a man's ethnic background, or sex, or something like that, has more to do with filling a position than sheer ability. I think we're taking a step backwards in filling a position on any basis other than absolute qualification.

BASIAGO: What's your opinion of the various classes of college students you've seen, let's say from the 1950s on? I mean, you've seen various crops of college graduates: how have those applicants for the department changed?

WYSS: Well, I think in the older days the average engineering class with which I'm most familiar had to fight for everything they could get. So they were used to being self-sufficient and self-reliant, and nowadays I think things are changing in a way that leaves me just a little bit disturbed. The younger engineers now are selecting jobs not so much for fulfilling their desire to serve the

country, or the organization, as to simply provide a good standard of living. I'm just a little afraid that some of the younger engineers are getting a job that doesn't represent a real challenge to them, other than a solution for economic problems.

BASIAGO: So are you saying they're not competent, or that they don't view their job in the same way?

WYSS: I think they're competent, in the sense that they're well educated, but I think that there's a tendency now not to put them through the ringer like they did in the earlier days. For instance, when I first got into the engineering field, everybody who wanted to be an engineer had to start out as a draftsman or a rear chainman, and he had to work in the field for quite a few years in all kinds of construction projects before he was ever considered to get into the engineering level. Now they step right out of college into a professional or semiprofessional engineering level on design, or something like that, without having any construction background. I think there's a big gap in here that's pretty hard to overcome. Now it may not be a problem; maybe we don't have the engineering problems and the construction problems that we used to. Maybe we're a maturing society and that sort of thing can be adopted without any problems, but I'm a little skeptical.

BASIAGO: So you would favor bringing people along from the bottom ranks?

WYSS: I think that would be preferable wherever it's possible. Maybe our whole economic system has changed to the point where we can't do things like that anymore. I feel that professional engineers who have never worked with their hands, and have never worked out in construction work, have missed an awful important part of their background and training.

BASIAGO: When did the shift change from this idea of being brought along in the company, learning the business from the bottom up, to essentially the meritocracy. When was the big shift? Right after the war?

WYSS: It seemed to develop after the war. It also apparently developed when the department more or less matured. All of the big construction projects were developed before the war, and it may not be that important anymore if we're concerned more with maintenance and operation than we are in heavy construction.

BASIAGO: Have there ever been any accidents or problems created by engineers who didn't learn the ropes?

WYSS: No, I don't know of any. It's an area that's hard to put your finger on, and it's hard to prove statistically that you have a problem there. It's just--

BASIAGO: Kind of a gut feeling?

WYSS: Yeah, it's just, let's say-- A gut feeling is the answer for it. And the gut feeling is not a very good measure for any reforms.

BASIAGO: You've experienced the two major eras of the department: the tail end of the construction era in which tunnels and pipes were still being installed, and then the postwar era where more qualitative things were considered, primarily just the upkeep and maintenance of the existing infrastructure. Do you see a third era that will be arising, some innovative areas the department might be getting into?

WYSS: I don't think there is an area like that where the water system so much will get into, because I think that just about all the areas that could be developed for water supply on the level of the Los Angeles water system have pretty well been exploited. I think the power system probably has quite a few areas where they're getting into new technologies and new cooperative areas, where there could very well be some challenging future.

BASIAGO: Do you see anything in the future for, let's say, reusing water?

WYSS: That's an area that sounds like it has a lot of promise, and theoretically it has, until you get to the bottom line and that is the cost of power. At one time power was going to be developed by nuclear plants, and it

would be so cheap that you could use power for everything. The desalination of water, or treatment of sewage effluent, all takes a great deal of power, and the cost of power apparently keeps going up and up; and the scarcity of power becomes a problem too. So, I'm afraid that there isn't any future foreseeable for any large-scale desalination of water. I don't think it would be economically feasible to use it for agriculture, and it's some question about whether or not it could even be used in industry and manufacturing.

BASIAGO: Were you involved at all in the Bolsa Island project, where there would be a nuclear plant with some desalination going on?

WYSS: No, I never got into that.

BASIAGO: What about the retreatment of waste water?

WYSS: Well that, I think, has quite a bit of possibility in Southern California, where irrigation represents a large part of the water demand. I think there are some real possibilities for that. But I think at the present time it would be very difficult to sell the reclamation of water for domestic consumption.

BASIAGO: Very early in our discussion you mentioned how early construction wasn't hamstrung by very elaborate environmental controls. If you could dictate the environmental policy that the Department of Water and Power

would be bound to, what would be the limits that you would draw?

WYSS: Well, I would insist that every engineer in the department that has anything to do with any of the development be fully aware of the environmental consequences of all kinds of design and construction. So that anything they propose would be within tolerable limits of acceptability. But, I also think that it would be extremely important for engineers to develop a background in the need for water, and the justification for the different types of projects that are necessary to develop and provide the water. It's extremely important that engineers are fully aware of the problems that will develop when they propose and construct a project, and try to anticipate all of the potential opposition before it develops. I think it's also very important that the engineers learn the limitations of selling a project without having the news media on their side. It's important for the engineers to be fully aware of all of the public relations problems necessary to proceed in their field.

BASIAGO: Do you think that in order to conserve water--considering that PR campaigns have traditionally been pretty unsuccessful in motivating people to curtail their water consumption in times of drought--that perhaps

residential users should be charged an arithmetic rate, rather than a flat rate? In other words, the more you use the more you pay per unit. Would you support that? Do you think that's wise?

WYSS: Well, I think that's the sort of thing that would be considered pretty radical unless it were absolutely necessary. It would appear that we're drifting in that direction, that there will have to be some measure put in the water rates that would reflect the conservation of water. This becomes not just an economic, but a highly charged political problem. It couldn't be developed without a great deal of study and public relations development to make sure that everybody understood what all the problems were.

BASIAGO: The reason I mention this is because during the '77 drought only 17 percent of Southern California homes participated in voluntary rationing. Which is kind of amazing, considering that their very existence depended on a little bit more sensible use of water.

WYSS: Yeah, that's a depressing thought. It illustrates the fact that the average water consumer in Southern California doesn't realize what a real potential problem water supply is for Southern California. I think that the news media and the politicians are at fault here, because they don't seem to be able, or find it expedient, to take

up a good public relations campaign on what the potential water supply problems are. They seem to rather try to stand back and take an abstract position on whether or not we have a problem. It's perfectly obvious in geological and historical time that we very definitely have a problem; not only here but all over the world. It's illustrated by the problem of fuel supply for automobiles. Right now there are an awful lot of people who scoff at the fact that we might have a fuel shortage. It's just common logic that if we have a finite supply of fuel, sooner or later you are going to run out of it. And yet, a lot of people are laboring under the misapprehension that that is just a plot put out by the oil companies. And apparently, the news media are not really doing very much to bring out the real facts of the picture. Just because we have plenty of gasoline for the next five years doesn't mean the following five years isn't going to be a real critical period. We're living in a fool's world, not only on the gasoline supply, but on the water supply. Because people haven't had the water stop coming out of their faucets, you have a hard time convincing them that there is a problem. The more effective the water utilities are in providing a reliable supply of water, the more of a false sense of confidence the customers develop.

BASIAGO: You have quite an educational and personal background in geology. Are you of the opinion that in the broad scheme of things we are entering a period in which there will be more water shortages worldwide? You seem to have just suggested that.

WYSS: Well, I think there's no question about it. In geological time, the study of the earth's crust points out times when we've had tremendous dry spells that run through years and years of time. We've been fortunate in recent time that that hasn't happened, and the fact that we hold a relatively large reserve supply of water helps ameliorate any real dry spell that we have. Sooner or later, we're going to have a prolonged dry spell and we're going to be running out of water in all of our sources. Then we'll have to ration water.

BASIAGO: Do you think, in the sense that the planet has been cooling several degrees a century, that more is being trapped in ice for one thing?

WYSS: Yeah, I think that's a very definite possibility. It seems kind of farfetched, but geological history has pointed out that this has happened in the past. And it's certainly not inconceivable that it could happen in the future.

BASIAGO: Is there any forecasting that goes on in the department in this regard--predicting the big picture?

WYSS: No, I don't think we've ever gone into real long-range possibilities. What we try to do is to provide enough surface and underground storage to where we could ride out almost any conceivable dry spell, and still keep the domestic supply and industrial demand under reasonable control. I think one thing that people forget in water supply limitations is that it's not just a matter of getting water to the customer for his home use, but every time you produce a ton of steel or wash a ton of vegetables it takes quite a few tons of water. And if the water supply for industry is turned off, there aren't any jobs. People could maybe flush their toilets at home all right, but they might find out that the factory that they worked at has simply gone out of production because there isn't enough water to keep it going.

BASIAGO: The department has about an eighteen-man legal force. Does it have any meteorological team for forecasting for the next several months or years?

WYSS: No, I don't think so. I think we depend on the government for that. The federal government has so much expertise in the field, and I think anything we would do would be simply duplicating their work at probably a less effective level.

BASIAGO: Where has innovation tended to come from at the department? From the ranks, in a gradual process, or have

there been any real leaps of innovation or very creative people who've been given free rein?

WYSS: Well, I think this is a sort of dichotomy on new developments. We have in the department the process of advancing through the ranks, so most of the people in a responsible position have worked previously in areas where they were directly familiar with a lot of the department problems. I think they are in a position to create innovative ideas when problems develop. Then, on the other hand, the department has a suggestion plan which, in theory at least, is an excellent idea. Because then anybody, at any level, who comes up with what he thinks is a good idea, or one that will save the department money or improve their operations, he can feel free to put this in the suggestion plan. And the suggestion plan is managed in a way that every suggestion is given thorough consideration. I think this has a tendency to create an innovative atmosphere in the lower working level, and at the same time the higher levels of management are perfectly capable of coming up with new ideas themselves as conditions change.

BASIAGO: You mentioned the inability of the news media to publicize the need to conserve and value water as much as it should be. Are there any myths that are perpetuated by local reporting about the water situation? That's a tough one, but one--

WYSS: That's a tough question. I can answer that generally. The media seems to be a whole lot more concerned with things that are sensational than things that are long-range trends. And they don't find anything very exciting in talking about a potential water shortage about twenty or thirty years hence. I think that some current chain murder is far more interesting to them. I think there is an area here where the editorial staffs on papers should be spending a lot more attention on long-range problems than on short-range problems. This apparently is a phenomenon that permeates our whole organization. Big corporations are concerned with profit for the next two or three years, and the Japanese counterparts are concerned with what happens over the next generation. This illustrates that the news media are as shortsighted as a lot of our corporation executives in planning and concern for the distant future.

BASIAGO: Were there ever any decisions that were made during your tenure with the department that you were unhappy about because they represented short-term thinking?

WYSS: No, I don't think so. I think in the department we had a great deal of rapport between different divisions, and different sections within a division, to work out dissident views on a lot of these subjects. I don't think anybody arbitrarily pushed an idea on the department that wasn't pretty thoroughly investigated by all responsible levels.

BASIAGO: If you had to select and number on one hand the visionaries in the department who have tended to keep the long view in mind, who would they be, and why?

WYSS: You mean individuals?

BASIAGO: Yeah, there have apparently been a few individuals who have had the long vision in seeing where the department should be going to maintain the water supply. Who might they be, and what are their accomplishments?

WYSS: Well, one of them certainly was Bill [William] Mulholland. He envisaged a lot of the future problems, and I think his vision was very accurate. And [Ezra F.] Scattergood was pretty much in the same class in his concern with the future of power supplies.

BASIAGO: Anybody in the modern era that has been a standout? Sam Nelson with the Snake River Project connection?

WYSS: Yeah, Sam Nelson was able to look pretty far into the future, and--

BASIAGO: Anyone else?

WYSS: Yeah, Max Socha had a lot of ideas on long-range problems and solutions.

BASIAGO: You mentioned the poor quality of the reporting that the media has supplied in the Los Angeles area on the water issues. Anybody that you worked with in the press who you've particularly admired?

WYSS: I'd like to say that, but I find it rather difficult. I had to work with the television media, and one reporter that I was very much impressed with was Fred Anderson. I was out with him on two or three occasions where problems had developed in the water system, and he showed a great deal of perception and responsibility in his reporting. I felt that he was an exceptionally good reporter. Many of the other ones appeared to be concerned more with getting something sensational that would get their name well advertised. He is sort of a sandy-haired fellow and he's got a nice smile, and he has a good logical approach to all of his reporting. He's just a real competent journalist.

BASIAGO: Did you work with Clete Roberts at all?

WYSS: No, I never had a chance to work with him.

BASIAGO: I wondered about the fact that the whole city of Los Angeles, and all of Southern California, is dependent for its very life on the water supply. In 1977 we were watching those reservoirs sink lower and lower. Usually they are almost full and you don't have to worry, but then it was half full, and a quarter full by the time the rains finally came. What has the department done to really plan for the kinds of social dislocations which might occur if the water just ran out? Has it worked with the FBI or the CIA or anybody else?

WYSS: No, I don't think we've ever worked in that area. Our position has always been that we will always be able to provide enough water for household use, and if worse comes to worse people are not going to die of thirst. But the economy can choke up pretty badly; and that brings us back to the problem of bringing water in from the north through the delta area. This is another area where I feel that the news media has been absolutely irresponsible. They stand back and try to take a neutral position, as though they were watching a wrestling match, and they can't seem to conceive of the idea that they're talking about the future lifeblood of Southern California. They're not really talking about north versus south, they're concerned with the south versus starvation. They can't quite seem to see the picture, and I don't get the implication that they're trying very hard to. I think they're living on the spur of the moment and refusing to face the facts of long-range problems. I can't see any reason why a news agency in Southern California should lean over backwards and try to provide information on the water supply problems of Northern California when they're nonexistent. One of the problems that we're facing all the time with the north is that the north said that the south is trying to dry them up. Nothing could be farther from the fact, because no responsible engineer that I've ever talked to in the south

has talked about importing anything but surplus water. And surplus water is not drying anybody up. Yet the news media quoted people from the north talking about the south robbing them of their water. Nobody's going to try to rob anybody of any water. They could never do it legally, or ethically, under any circumstances, and yet they talk about surplus water as though we were actually cutting the water supplies into their cities.

BASIAGO: In certain areas agricultural use takes first priority--let's say, the Imperial Valley--before humans. In the L.A. Basin human beings come first, then which comes second? Is it industry or agriculture, or do they rank?

WYSS: I don't think we've ever gotten to the point where it was one or the other. I think that in the Los Angeles Basin the high cost of water pretty much takes care of the problem. When we first brought in the water supply from the Owens Valley and the second [Los Angeles Aqueduct] barrel, we had enough high quality water that we were attracting breweries in here. They brought in a lot of investment funds and provided a lot of jobs, and now nobody is trying to get a brewery in here because no brewery could afford to pay the cost of water. When we first were promoting the use of water for industry, the different breweries and other large water-consuming manufacturing concerns were interested in the Los Angeles area because

they had a good supply of water and a good supply of labor. The department had a rate structure that gave a considerable break to the manufacturers who used a large quantity of water. The department logic, I thought, was quite sound; because once you put a water system in to provide a factory, the more water you sell them the more money you make, because it isn't going to cost a penny more for the supply facilities than it did when it was first installed. So the incremental blocks of water could be sold at a lower rate and still benefit the department. But politicians have decided that that isn't fair, that anybody who is using water for sprinkling his garden shouldn't have to pay any more than a brewery who's providing jobs for hundreds of people. They have cut down on those rate blocks to the point where you almost have a universal charge per unit of water. That serves to drive away big industry, but it does act as a conservation measure because the larger industries that have to pay the higher price for water have got to adopt conservation practices and recirculation of water. So it has benefits and disadvantages.

BASIAGO: You mentioned breweries. Olympia Beer always bragged that it's the water, and Coors always brags about its Rocky Mountain spring water. Do you think L.A.'s water is as fine for beer?

WYSS: Water from the High Sierras, I think, is just about as good as any water you can find. There have been some contests carried on by some of the television stations where the people sampled bottled water and tap water and that sort of thing, and quite often people have decided the sample that they like best, unknown to them, comes right out of the tap of the Los Angeles water supply. However, we're talking about Owens Valley water, and that's far higher quality than most groundwater or Metropolitan [Water District of Southern California (MWD)] Colorado River water.

TAPE NUMBER: III, SIDE TWO

DECEMBER 2, 1985

BASIAGO: You mentioned that MWD water and water from the Colorado is not as fine as that which comes from the fresh Sierra snowmelt and the Owens Valley Aqueduct. Do you think that Coors can't really stand by its claim when it talks about its Rocky Mountain spring water, or is that--?

WYSS: Well, I think they're right in that their claim of having real high quality water is valid. But what they're probably not saying is that a lot of other breweries have high quality water too, and they just haven't gotten into the advertising campaign. There are an awful lot of areas in the country that have a water supply that's very high in salt concentration, and they simply wouldn't be suitable at all for any kind of prepared drink, either beer or soda pop.

BASIAGO: What areas are those?

WYSS: Well, the mid-continental area where they depend on groundwater entirely. Quite a bit of that water is a little saline in nature. All over the Colorado desert the water has a tendency to be quite salty. The entire Texas panhandle area, for instance, is underlain by a lime formation and the water is quite salty there. In some areas of Texas it's like taking a dose of salts to drink some of the local water. If a person that isn't used to it drinks very heavily of it, he regrets it.

BASIAGO: Were you involved at all in the contingency planning for nuclear war that the department has done?

WYSS: No.

BASIAGO: The fresh snowmelt that comes off the Sierras is used for a myriad of uses in the city, both potable and nonpotable uses. Do you think policy should favor one or the other? Do you think that the water we should be drinking should be sprayed on our lawns or used to wash our cars?

WYSS: Well, we're not in any position to segregate it. It just about has to be a one-shot operation.

BASIAGO: Excuse me, couldn't there be some technology that could change that. Some way of routing quality water for the drinker?

WYSS: No, I don't think there is, because the capital cost for putting in dual systems is astronomical nowadays. One of the reasons that we are able to provide water very economically now is that we put in a distribution system maybe fifty or a hundred years ago. If we were to try to duplicate that now, with breaking pavement and meeting all of the traffic limitation standards, the cost of a second distribution system would be astronomical.

BASIAGO: Do you think there would be some possible way of retrofitting individual homes, so that coming through the faucet would be quality water that people would drink and

use for cooking and perhaps even for laundry? And then once it was utilized for hygienic uses, such as cooking, it could then be used to water their lawn?

WYSS: Oh yes, it could be set up that way. But the cost-effect of everything like that always is the bottom line. Then you have to recognize too, that every time water is used it picks up salts and grease and things like that. Unless a very expensive rehabilitation program were used, the water that you would be using out on your garden probably wouldn't be too beneficial for it.

BASIAGO: Considering the value of inexpensive filters for things like home recycling or for desalination plants, do you think that we should have like a Manhattan Project in the filter field, in that we're really lacking inexpensive high quality filtration systems?

WYSS: No, I don't think that's necessary, because the average quality of water in the larger municipal systems in the United States is relatively high. I doubt very much if any system for improving it marginally would ever pay off.

BASIAGO: Did you ever experience any incidence of sabotage of the system when you were working for the department?

WYSS: No organized sabotage, but we were always concerned with nuisance types of sabotage where neighborhood kids would get in our reservoir areas and damage things that they could break. We've had a few threats of poisoning to

the water supply, but they have never been verified. That is not to say it couldn't happen. A big water system like Los Angeles has a tremendous degree of vulnerability--if a person wanted to sabotage it and knew exactly where all of the weak points were, and knew how to exploit them. We try to keep all of our key facilities out of sight and locked up, and hopefully out of the reach of terrorists. But nothing is invulnerable, if a terrorist is willing to take whatever measures are necessary to damage something.

BASIAGO: Do you think the department's water supply is prone to chronic poisoning by saboteurs, if they could really set up a system?

WYSS: No, I think it would be extremely difficult to do that. It has such large reservoirs that it would take a tremendous concentration of poison in the reservoir to saturate the reservoir at a level that would be poisonous. The actual outright volume and magnitude of the amount of poison that would be required in a large reservoir would almost preclude that. It could be possible to do it on a relatively small scale, but other than some type of nuclear poisoning, it's pretty hard to see how it could be done effectively.

BASIAGO: I was worrying about the possibility--since there are so many KGB agents in America--of chronic low-level poisoning by psychoactive drug or something of that order.

I know the Army Research and Development Command has been doing a lot of prophylaxis for that kind of poisoning. I've often wondered what other sectors of society have become concerned about it.

WYSS: Well, I don't think we've ever gotten into that yet, but with the terrorist activity that's going on in the world nowadays, and some of the major powers that are backing the terrorists, it's probably a field that should be given a lot of consideration. There are so many different poison compounds now that could be used in various ways. It is really something that the government antiterrorist experts ought to get together with the utilities on, just to keep them informed and to make sure that every precaution is taken to preclude any type of poisoning like that.

BASIAGO: What do you think is going to happen in Los Angeles, now that central Arizona has gotten its share of Colorado River water, and the north has successfully blocked our attempt to bring Sacramento River water down here?

WYSS: Well, I think that it simply dictates a conservation program that we can't ever let up on. Right now, apparently, they have a very effective conservation program, and it appears to be succeeding; but it's a sort of thing where we can't rest on our laurels. This really

raises a very important question: How do you keep the momentum of something like that going, unless all the news media gets behind it; unless periodically somebody writes a responsible article on the potential problems of a shortage of water, and how it affects not only their taking a shower, but holding a job? The loss of the Arizona supply should be a flag to our news media to start pushing for a solution to the Southern California water supply. This seems so strange to me because we already have the [Colorado River] Aqueduct, and the California Water Resources Department has a responsibility to provide us with the water. Yet, the news media seems to take the position that this is something that has some alternatives--and there are none. I think the loss of water to the Central Arizona Project ought to make them aware, if anything could. But I don't see anything in the newspaper where they've developed any concern over the result of that. They just report it as though it were just another murder that hadn't been solved.

BASIAGO: In the area of water conservation you did a lot of work in the late fifties on fire-hydrant efficiency. I imagine fire hydrants had been a source of a lot of water wastage.

WYSS: No, not really.

BASIAGO: No.

WYSS: The fire-hydrant efficiency that we were concerned with was the efficiency of getting water out of the distribution system in large enough quantities to put a fire out before it got out of control. Our objective was to develop both fire hydrants and local distribution networks that would make the fire hydrant efficient in delivering large quantities of water, if the fire department needed them. It wasn't a matter of economizing on the amount of water that was used by fire hydrants, because that's considered something that's just completely expendable. The cost of water is so low compared to the cost of the loss of buildings and structures, we don't even consider the economizing on the use of water.

BASIAGO: I was just envisioning a lot of those East Coast cities in the summers, where the kids have their showers and--

WYSS: Oh yeah, that's really a potential catastrophe. We're fortunate that we don't have that problem here. That becomes a political problem, and the politicians are not responsible for putting out fires, they're only responsible for being popular. That leaves the poor water utility with the problem of having to keep enough water for fighting fires and not squandering it by just keeping kids cool in the streets.

BASIAGO: Wasn't one of the problems in Los Angeles, in terms of fighting fires, the fact that a lot of the mains were only four inches wide?

WYSS: Yes, that was a problem, but I think we pretty well licked it. We made a study at one time of all the areas that were lacking in capacity. We would actually take a hydrant and flow it in that area and find out just what we had in the line of capacity out of the hydrant, then we would get together with the fire department and determine how that fitted in with their need for water for fighting fires, and the type of development they had there. And it turned out that we not only had a problem in the distribution system, but a lot of our hydrants were outdated and too small. So we set up a policy of rebuilding the local distribution system and installing higher capacity fire hydrants. I think we have pretty well eliminated in Los Angeles any serious deficiency in fire protection.

BASIAGO: How are the new hydrants better?

WYSS: Well, a lot of the old hydrants were simply inefficient. They were small in size and they had too high a head loss in them, and a lot of them had valves that were not very efficient. The new fire hydrants were developed in conjunction with the manufacturers of hydrants and the American Water Works Association, who set up a hydrant

design committee. This committee worked extensively with the utilities and the manufacturers to develop fire hydrants that had minimum head losses and maximum amount of reliability, in case of damage or something in actual use.

BASIAGO: Considering this background you had with Walter Burns in the late fifties--

WYSS: Yes.

BASIAGO: --looking at fire-hydrant efficiency--

WYSS: Yes.

BASIAGO: --did you later do any consulting, or give any expert testimony regarding the problem there during the Bel-Air fire where they had the low pressure?

WYSS: No, no, that never became a problem. The Bel-Air fire was simply one of those things that developed where there was simply not enough water in the world to put it out.

BASIAGO: It wasn't a matter of poor--

WYSS: I was in the middle of that fire and we were at the fire department command post in--I forget the name of the street--but anyway, we were at a command post where we could watch this fire developing beyond us. And the first thing we knew, the fire was on the house right behind the command post, and what had happened was that apparently embers from the fire in the distance had come right over the command post and lit on the wood shingle roof right

next to the command post, and it burned to the ground. It gives you an idea how impossible it is to control a brushfire when it's simply beyond control. If you have high winds and low humidity and the high fuel factor that we have in the Los Angeles brush areas, once a fire gets underway there is simply no way to stop it. All you can do is try to control it and surround it.

BASIAGO: I know you mentioned earlier it is too expensive to replace all those 4-inch mains. Has the department ever started a policy of trying to gradually update the size of the mains?

WYSS: Oh yes, yes, we've had that for the last thirty or forty years.

BASIAGO: I guess we can afford it in this city.

WYSS: Well, we attack the problem by setting a certain amount aside in the budget for main replacement, and then we put a priority value on each area. The areas that are most deficient are the ones that get the first attention. But it's not a simple problem, because almost invariably the areas that have a deficiency in the distribution system are in an older area with concrete streets. And the cost of replacement is very high, and that means that your budget can only take care of so many thousands of feet a year. So it becomes an awfully long-range problem. That's one reason why we developed a program in a lot of those

areas of just replacing the mains in an intersection to make the local supply system more efficient, so that it can be fed by three or four 4-inch mains. It turned out that that was one solution that worked quite well in an awful lot of areas, particularly residential areas where the fire demand isn't too extreme.

BASIAGO: Explain this. You were replacing intersection pipes. From what to what?

WYSS: For instance, if you have an intersection in a system of 4-inch mains, the fire hydrant would be on a 4-inch main. No matter how big a fire hydrant you put in there you would still have an awful choke getting into the 4-inch main. So we would replace all the 4-inch mains in the intersection with 6-inch or 8-inch mains, and the fire hydrant then is on a large main fed by four 4-inch mains, and then it became relatively efficient.

BASIAGO: A couple of times you have talked about the difference between supplying water to domestic consumers and to industry. Do you think industry should be subsidized with lower rates when it uses a lot more?

WYSS: Well, this is a question of whether or not you're really subsidizing them. The politicians call it a subsidy, but the water system looks at it this way: When an industry moves into the town, you charge them say $10,000 for putting a 6-inch domestic service in, and then

they start using water through that 6-inch domestic service. Well, suppose they only use the first rate block, and you get $100 a month revenue. Well, then you have all of this capacity to provide a whole lot more water in there and it's not being used. So suppose they use another unit of water and they get it for a little lower cost. The water costs you practically nothing to develop if you've got your system in, so all of the incremental blocks of water they use cost you hardly anything, but you do get quite a bit more revenue from it. So you can make a strong argument for the fact that a descending rate block is not a bad feature, practically speaking. But the politicians consider that pure poison because they say that you're subsidizing big industry at the expense of their poor constituents. And their poor constituents have a lot of votes and the industry doesn't have any votes, so guess who wins.

BASIAGO: Do you think in the Southwest, in general, there are any legislative forces in effect that are encouraging farmers to waste water? Are there any policies that are pretty backwards?

WYSS: Yes, I think so. In the first place, when water is as cheap as it is down in the All-American Canal. (The cost in the Imperial Valley is $2-3 per acre foot; in the L.A. Basin the cost is $20-50 per acre foot.) There isn't

any reason for economizing on the use of water, or improving the distribution facilities for the water. So the cheaper water is, the more the chances are that there will be abuses in the use of water. I think the Metropolitan Water District has a pretty good approach to that, and that is that they're offering to line the ditches in the Coachella Valley area if the water that is saved by lining these ditches can be used by the Metropolitan Water District. I think that is a pretty practical approach and a pretty good politics. But if they decide to charge the farmers in the Coachella Valley the same as they do the people that live in the city of Los Angeles, you're going to find out all of the food that they raise down in the Coachella Valley is going to multiply so immensely in price that I think the economic cost to the public is going to be far higher than anything they save in the water. Because water is not an abstract thing. Water is used for industry, for growing things, and for sanitary protection. Every one of those uses is important. You can't just cut off the use for agriculture and for manufacturing so you can say there's more water for flushing toilets, because there won't be any need to flush toilets if the people don't have jobs.

BASIAGO: Throughout the Southwest, farmers are operating under the premise of "use it or lose it," and they will

even pour water away when they don't have crops on which to pour it. What is the policy for the remaining agricultural areas of Los Angeles? I know there are few, now that the city has been heavily industrialized and turned into a residential area, but are there any "use it or lose it" clauses for, let's say, Southern California agriculture?

WYSS: I think you're referring probably to riparian rights, and I'm not sure how much that applies here in Southern California. But it's a serious problem where any kind of accepted water law promotes a waste of water. There has to be some way found out to keep water from being wasted. This becomes a real political problem; it's not so much a waterworks problem as it is a problem in legality and in politics.

BASIAGO: It seems like throughout your career you've developed somewhat of an opinion that the water field has been reported poorly, and perhaps there hasn't been the right kind of political leadership. Has there been any political person who's been particularly well informed about water policy, in your mind, in the city? Any real friend of the department or sensible public official who has come through for the department?

WYSS: Well, yeah, Mayor [Samuel W.] Yorty was a pretty good friend of the department, and I thought he was pretty responsive to the needs of the department. I think it was

[Fletcher] Bowron, who was before him, and at one time Bowron was very suspicious of the department because he thought they were a big political mammoth and not to be trusted. After he was in for a while he found out that the department was really just trying to do a good job of providing water to the city of Los Angeles. He became a pretty good friend of the department, and helped the department promote a good responsible use of the water.

BASIAGO: Was that Fletcher Bowron, or--

WYSS: Fletcher Bowron, yeah.

BASIAGO: --are you thinking of Norris Poulson perhaps? He was--

WYSS: I didn't know too much about Poulson. I'm not familiar too much with him.

BASIAGO: Did you work with anybody in the department who later went into politics?

WYSS: I can't say that I have. I think most of them stuck to their knitting. I know one of the department attorneys had tried quite often to win an election, for either attorney general or--not attorney general, city attorney--or acquiring a judgeship. He's still working for the department as an attorney, so the only one I know of hasn't simply cut the mustard yet.

BASIAGO: Is there any kind of employee or division that you think the department would profit by adding? Any area

of the chain of command that has been particularly weak or that could benefit from a new department being formed?

WYSS: No, I don't think so. I think the department has evolved through the years as an interdepartment structure that has worked pretty effectively. I think the only modification that might be desirable are changes that are made by changing economic conditions. I think they've consolidated stores for water and power and things like that, and I think there is a certain measure of justification for that type of development. But I can't think of any entirely new structure within the department that you can justify too well.

BASIAGO: You mentioned that during the Baldwin Hills Reservoir break you decided to call the trouble board before you even called the police. What is the trouble board about?

WYSS: Yeah, I think that is a good question, and it illustrates a real important point in the structure of the department and operation and maintenance in response to emergencies. The department has five construction districts, and each one of them is headed by a district superintendent who is a craft person and who has come up through the craft ranks. He is familiar with all of the distribution systems, the pumping plants, regulator stations, and things like that in his district. So we have

five specialists--each one of them in charge of a district that he's thoroughly familiar with. Each one of these districts has a headquarters building, and it's staffed by a wide variety of people, from the district superintendent down to storekeepers. Each headquarters also has what we call a trouble board, and this is manned twenty-four hours a day. This is a switchboard where anybody calls in who has any kind of problems. If a main break is out in the street, somebody calls in, or the police calls in, to the trouble board, and the trouble board then-- The clerk has the numbers of all the responsible people right before them, and they can call them out immediately. If the police department has a problem, they contact the trouble board to get ahold of somebody in the department if it's necessary. This is a process of decentralization so that one man doesn't have to cover too wide a field, and it also has a function of delegation. All of the operations and problems within the district are delegated to the district superintendent, to the extent he's capable of handling it. And his responsibility is when he gets into any kind of a problem over his head he calls his supervisor, and that goes right up through the ranks until it gets up to the chief of engineers, if necessary. The ideal situation is that nothing ever gets out of the district. If it's a big main break or something like that and there's going to

be a lot of publicity-- The district superintendents pride themselves on handling anything in their own district without bothering anybody higher than them, if it's possible. Now when they have any extensive damage like a big main break with a big hole in the street, and there's going to be a lot of publicity, then they will call the field operation superintendent who is a superintendent in charge of all of the district. He's a registered engineer, a professional engineer, and it's his responsibility then to get ahold of public relations, or the chief engineer, or anybody else who would be concerned with it. In modern times now, if you had--let's say an airplane falls in a reservoir, you're pretty sure that within a very short time there's going to be a television crew out there. That's the time when they call for help and they get somebody from the central office--in my case, I used to do that quite a bit when I was the assistant chief engineer--to go out and meet with the television crews to make sure that any questions they asked would be handled with regard to general department policies. If they talked to a reservoir keeper, why, all they'll get is his slant of something within his own field.

BASIAGO: Was the idea so that you wouldn't create any public panics?

WYSS: Exactly so. We wanted to keep all of the news reports on a reasonable basis. We wanted to give the public all the facts, but not load them up with all kinds of speculation. For instance, an airplane fell in the reservoir; okay, is that going to poison everybody in the area? Well, the first thing that the field reporter asks in the interview with the department representative is just what effect does this have in the way of poisoning anybody? Of course, we could tell them that it's simply no problem and the public health is going to be very carefully preserved by just simply taking the reservoir out of service, and making sure that everything is thoroughly reviewed and no sanitary problem develops before we put it back into service--no problem. But if they talk to a laborer, or something like that, he's liable to say, "I don't know, but it sure looks awful doesn't it?" And that's all they need, you know, to get in something sensational. We try to keep everything on a level and reasonable basis. Most television reporters are willing to go along with you on that, except that they always point out to you that all they can do is report the news. They'll talk to you for a half an hour, and their editor in the office will take that and go over it and boil it down into fifteen or twenty seconds on their news program. You can take any fifteen-second increment out of any kind of a

story and completely reverse the story itself--if you wish to. So we have the job of trying to influence the reporter to act with a little bit of guidance, as far as his editor takes care of it. It's a ticklish problem. The press is always concerned with freedom of the press, and we're always concerned with somebody yelling fire in the theater. And somewhere in between we have to work out kind of a reasonable-- Fred Anderson! Fred Anderson is the man. Fred Anderson is the type of a person who is very reasonable and he could see your point of view. And he didn't want to commit the station to any indiscreet news releases either, so we always found him an exceptionally competent man to work with. It's a pleasure when you find experts and competent people in any organization.

BASIAGO: He was an expert actually on water issues?

WYSS: Well, he handled it as though he were an expert. He didn't have any particular expertise in that field, but he was just a competent enough general journalist that he could grasp any of these problems very readily.

BASIAGO: For our last area of discussion let's talk about the third major disaster directly related to the department that you experienced. The first, of course, was the Baldwin Hills Reservoir break, and then a year later the Bel-Air fire. What happened that day of the 1971 Sylmar earthquake?

WYSS: That was an area that, strangely enough, I didn't get too concerned with, because I was the assistant chief engineer at the time and unfortunately I was in bed with the flu when it happened. I got called right away and I came down anyway, but Bob [Robert V.] Phillips apparently was concerned with my physical well-being so he didn't send me out on the field on any particular problem. I acted as his assistant to follow up on all of the problems that developed. As time went on, my problem was to get out in the field and make sure that everybody who was handling any particular portion of the problem was thoroughly versed in the problem, and had all the information and materials and equipment that was needed. Bob Phillips took care of all the general management problems, and I tried to take care of all the problems in the field where different individuals were working more or less independently.

This is another area where independent expertise was extremely important, because some of the engineers in the aqueduct division were operating by hand portions of the aqueduct that were partially damaged, or where they had bypassed water, and they were operating by hand and by radio contact with other experts working in their particular field. Instead of having one big integrated operation that operated automatically--which is what a good gravity system does--this was being handled on a small

scale by knowledgeable people in many areas. My problem was to get around to just about every one of these areas, and make sure that everything was coordinated and anything that needed some attention right away would be taken care of.

BASIAGO: So you were in bed the day of the earthquake, I guess. When did you finally get out of bed? A few days later?

WYSS: I got out of bed right after the news came over the air, and as soon as I could get dressed, I went downtown. It was one of these cases where you were thankful that you have a lot of people to back up others, because I found out that I could barely walk. I apparently had a pretty wicked attack of the flu. Bob Phillips apparently recognized it right off the bat, because he didn't send me out in the field, whereas ordinarily I would have gone right out immediately. As the days went on I was able to get around a whole lot more and make sure that everything that could be done to rehabilitate the water system was being done as effectively as possible. There was just a tremendous variety of things happening then. The dams were damaged. Water lines were broken and filled full of mud. Regulator stations had cracked up. In a lot of areas pipes had actually snapped apart, and services were pulled right off. There was an inconceivable amount of damage done. In

the Sylmar area, the telephone exchange was torn apart by the earthquake and there was practically no telephone communication at all. This indicated the importance of our own two-way radio system, because we were able to conduct almost everything by our radio. We would have a department car alongside an area or station where people were working, and one man would sit in the car and keep things coordinated while the other man carried out any gate operations or anything like that that was necessary.

This was a case where we improvised all kinds of water structures that we had never even considered doing before. In one case, we had to connect a couple of trunk lines, and we simply had no big pipes. So we took a whole series of 12-inch pipes and tapped them on, and added enough 12-inch pipe to convert the water from one trunk line to another, and things of that sort. There was just a tremendous amount of activity going on by men in all areas of the [San Fernando] Valley. We brought in crews from other areas too, and they had to be broken in. And a lot of the supplies had to be brought in from other districts. So it was a matter of coordinating the effort through the whole department. The two San Fernando districts were practically inundated with problems, so we brought in a lot of supplies and crews from the other three districts. When they'd take two crews from the western

district out to the Valley, they would move up one crew from the harbor up to the western district, you know, to cover the western district. It was just a matter of improvising all over the system to keep everything functioning, and then, of course, right on top of the whole thing we had a couple of damaged reservoirs that were within a foot or two of being breached and the--

BASIAGO: Were you up there at the--

WYSS: Oh, yes. The problem at the reservoir in the San Fernando Valley was a thousand times as potentially damaging as the Baldwin break. We not only had all the problems of trying to rehabilitate the system, but we had the [Army] Corps of Engineers offering to help us in ways that would do no good at all, and a lot of harm, and we couldn't tell them to get lost because that would be most impolitic. So we had to try to put them to work in areas where they would actually contribute something positive, rather than just being in the way. They came up with the idea of putting in gang pumps to pump the reservoir down. Well, it would take three or four days to get the pump set up there, and then they would have such a limited capacity that it wouldn't have done the job.

So we did something that was much more practical: We had a big trunkline going right across the flood control channels, so we set our welders out there and just burned a

big hole on the side of the pipe and let the thing pour right down the flood control channel. That took us about an hour, as compared with having the corps of engineers come in and spend a week moving their equipment in and everything. So one of my jobs was to coordinate all of this work going on between five different districts.

Bob Phillips was taking care of all the overall problems and all of the contact with all of the public agencies that offered to help. And, of course, all of the politicians were getting in on the act too. They would fly over the area in a helicopter, and all at once the local councilman would have the solution to the problem. [laughter] You can imagine how impractical some of the politicians' solutions were. They all had to be handled carefully and courteously. They were trying to help, but a water system is such a complex thing that it's complicated enough to have a bunch of experts working on it, without having advice and help--

BASIAGO: Did they prove an obstruction at any point?

WYSS: Not really. No, not really. They were-- It's just a typical political approach to a lot of problems, and a lot of times they were more concerned with getting in front of a camera than they were in getting something solved. Besides that, most of them didn't really know what a solution was to it. They were offering to help come up

with a solution, but they didn't know what the right solution was. Usually they were willing to step aside when you pointed out to them that that particular area was being taken care of as quickly as we could. We thanked them for their help and everything, and they would bow out and get out of the way. But I think the corps of engineers was one of the ones that we had the hardest time dealing with. They're used to dealing with all kinds of catastrophes, but not operating a water distribution system that's composed of all kinds of reservoirs, pipelines, pumping plants, and chlorination plants, all of which have to be handled simultaneously.

BASIAGO: What do you think has been the most enjoyable thing about working for the department?

WYSS: Well, I think there are two areas that have given me the most satisfaction in working for the department. One of them is the fact that you are providing a public service, an absolutely essential public service, and every day you go to work you know that you're doing something for a social benefit. The other thing that I liked best about it was that I was working with thoroughly competent and dedicated people, and the amount of cooperation that we had within the department, to me, was always of just an exceptional quality. I don't think you could ask for much more than that. We had pretty good working conditions,

because everybody tried to make the workplace a desirable spot. And we got adequate pay; we weren't getting as much pay or as big a retirement plan as some other public agencies, or some private outfits, but we had enough to justify what we were doing and it was adequate to live comfortably. We just found that it was an outstanding place to work and it was a highly satisfactory work environment. I would like to emphasize that if I were to start all over again, I would start right in with the department and pursue exactly the same career that I have.

INDEX

Affirmative action, 69, 114
Africa, water issues, 90-91
All-American Canal, 143
American Water Works Association, 79-80, 139-40
Anderson, Fred, 127, 151
Arizona, water claims, 136-37

Baldwin Hills Dam failure, 91-111, 147, 151, 155; discovery of leak, 92-96; legal position of DWP, 101-4, 108-9; legal position of oil companies, 103-4; response of DWP, 96-101, 104-11
Baxter Lake, 71
Baxter Pass, 71-74
Beckmeyer, Bill, 43, 45, 49-50, 52
Bel-Air fire, 140-41, 151
Boen, Doyle F., 18-19
Bolsa Island, 118
Bowron, Fletcher, 145-46

California: north-south rivalry, 128-29
California Department of Fish and Game, 17
California Water Resources Department, 137
Central Arizona Project, 137
Civil service system, 88, 114
Coachella Valley, 144
Colorado River, 131-32, 136
Colorado River Aqueduct, 137
Coors beer, 130, 132
Crowley Reservoir, 17

Dams, 31. **See also** Baldwin Hills Dam failure
Desalination, 118
Doherty, Patrick, 93-99, 105
Droughts, 90-91, 120-23, 127-28

Energy shortages, 121
Engineering training, 114-17
Environmentalism, 12-17

Fire hydrants, 78, 137-42

Graf, Oscar, 94
Grant, Burton S., 4
Grant Lake Dam, 13-14, 17

Hemborg, Richard E., 95-96, 98, 105-6

Idaho, 78
Imberston, Norman, 4-5, 9, 18, 113
Imperial Valley, 129, 143
International Geophysics, 32
Israel, water issues, 89-90
Itter, Charles, 113

Japanese business, 81-89
Johnson, Harold N., 100
Journalism and water issues, 119-21, 124-29, 137, 149-51

Labor-management issues, 86-88
Leadership qualities, 4-5, 11-12, 18, 100-1, 104-5, 109, 112-14
Lippincott, Joseph Barlow, 14
Los Angeles Aqueduct, second, 12, 129, 132
Los Angeles Basin, 129

Los Angeles City Department of Water and Power (DWP), 1, 3-32, 67-70, 73-74, 77-84, 88-113, 116; aqueduct division, 152; city government and, 145-46, 156-57; district structure, 147-49; environmental issues and, 14-17, 118-19; future technological progress and, 117-18, 133-34, 141; hydrant bureau, 100; innovation and, 123-24, 126; Japanese-manufactured products, use of, 82, 84-85; Japanese trade missions, relationship with, 81-85; labor-management relations, 87-88; legal division, 108-9, 123; male domination of, 69-70; promotions policy, 115-16, 124, 147; senior waterworks exam, 73; trouble boards, 94-95, 105, 147-48; visionaries of, 126; water engineering design division, 70; water supply for fighting fires and, 137-42; waterworks division, 70, 95; work-area safety, 78-80
Los Angeles City Fire Department, 100-1, 139
Los Angeles City Police Department, 96, 98-99, 101, 105-6, 147-48
Los Angeles Polytechnic High School, 3
Lund, Val, 72

Manhattan Project, 34, 36
Manual Arts High School (Los Angeles), 2-3
Metropolitan Water District of Southern California (MWD), 1, 3, 131-32, 144
Mono Basin, 3-4, 13-14, 17
Mono Basin Project, 4-30
Mono Craters Tunnel, 5-11, 13, 19-30; collapse of the west portal, 19-27; dangers of working on, 5-11, 20-26, 29-30
Mono Lake, 13, 15, 19
Mulholland, William, 14, 126

Nelson, Samuel B., 95-98, 105-6, 113, 126
Nuclear power, 118

Occupational safety issues, 78-80
Olympia Beer, 130-31
Owens Lake, 15
Owens Valley, 17, 129, 131
Owens Valley Aqueduct. See Los Angeles Aqueducts

Phillips, Robert V., 152-53, 156
Poulson, Norris, 146
Public relations, 119-21, 149-50

Roberts, Clete, 127
Ross Loos clinic, 73
Rush Creek, 13-14

Sabotage prevention planning, 134-36
Sacramento River, 136
San Fernando Valley, 70, 154-55
Scattergood, Ezra F., 126
Socha, Max K., 96, 98, 106, 113, 126
Soil mechanics, 7-11, 29-31, 103-4
Sylmar earthquake (1971), 151-57

Tabor, Loring, 9
Tate, Bud, 95-96
Tennessee Valley Authority, 37

Terrorism. **See** Sabotage prevention planning
Tunnel engineering, 5-11, 19-32

Union of Soviet Socialist Republics, 53-54, 58-60, 62
United States Army: Corps of Engineers, 155-57; engineering training, 33-39; 106th Division, 38-39. **See also** World War II
University of Tennessee, 33-37

Van Norman, Harvey A., 11-12, 113

Water and agriculture, 143-45
Water and industry, 123, 128-31, 142-44
Water conservation and waste, 136-37, 143-45
Water filtration systems, 134
Water quality, 130-34
Water-rate pricing, 119-20, 129-31, 142-44
Water rationing, 119-22
Water reclamation, 117-18, 133-34
Water rights law, 144-45
Water supply problems and shortages, 119-25, 127-129, 133-34, 136-37
Wells, Revere, 94, 96-97
World War II, 33-70, 81; American preparedness for, 63-64, 66; Ardennes, Battle of the, 38, 40-49, 64, 77; German technological superiority, 62, 64-66; why Allies won, 64-66; Wyss's capture and imprisonment, 48-63

Yorty, Samuel W., 145