ORAL HISTORY INTERVIEW

Larry Boll

♦ ♦ ♦ ♦ ♦ ♦

STATUS OF INTERVIEW:
OPEN FOR RESEARCH

♦ ♦ ♦ ♦ ♦ ♦

Interviews Conducted and Edited by:
George Petershagen
Desktop published by:
Brit Allan Storey, Senior Historian
Bureau of Reclamation

♦ ♦ ♦ ♦ ♦ ♦

Interviews conducted–1994
Interview edited and published–2009

Oral History Program
Bureau of Reclamation
Denver, Colorado

SUGGESTED CITATION:

Boll, Larry. ORAL HISTORY INTERVIEW. Transcript of tape-recorded Bureau of Reclamation Oral History Interviews conducted and edited by George Petershagen, Historian, Bureau of Reclamation, in Sacramento, California, in 1994. Desktop published by Brit Allan Storey. Repository for the record copy of the interview transcript is the National Archives and Records Administration in College Park, Maryland.

Record copies of this transcript are printed on 20 lb., 100% cotton, archival quality paper. All other copies are printed on normal duplicating paper.

Table of Contents

STATEMENT OF DONATION
OF ORAL HISTORY INTERVIEW OF
LARRY BOLL

1. In accordance with the provisions of Chapter 21 of Title 44, United States Code, and subject to the terms, conditions, and restrictions set forth in this instrument, I, Larry Boll, (hereinafter referred to as "the Donor"), of 2324 Via Cavina, Carmichael CA 95608 do hereby give, donate, and convey to the National Archives and Records Administration (hereinafter referred to as "the National Archives), acting for and on behalf of the United States of America, all of my rights and title to, and interest in the information and responses (hereinafter referred to as "the Donated Materials") provided during the interview conducted on Sept 2, at Sacramento and prepared for deposit with the National Archives and Records Administration in the following format: cassette tape. This donation includes, but is not limited to, all copyright interests I now possess in the Donated Materials.

2. Title to the Donated Materials remains with the Donor until acceptance of the Donated Materials by the Archivist of the United States. The Archivist shall accept by signing below.

3. a. It is the intention of the Archivist to make Donated Materials available for display and research as soon as possible, and the Donor places no restrictions upon their use.

   b. The Archivist may, subject only to restrictions placed upon him by law or regulation, provide for the preservation, arrangement, repair, and rehabilitation, duplication, and reproduction, description, exhibition, display, and servicing of the Donated Materials as may be needful and appropriate.

   c. For Donated Materials with restrictions, the National Archives will provide access to the Bureau of Reclamation, if the Bureau of Reclamation presents written permission of the Donor specifying the types of information and proposed uses of said information.

4. Copies of the Donated Materials that do not have Donor restrictions on their use, may be deposited in or loaned to institutions other than the National Archives, including the Bureau of Reclamation. Copies of unrestricted Donated Materials may also may be provided to researchers. The Bureau of Reclamation may retain copies of tapes, transcripts, and other materials if there are no Donor restrictions on their use, and Reclamation may obtain copies of tapes, transcripts, and other materials at the time that Donor restrictions on the use of the materials ends.

5. The Archivist may dispose of Donated Materials at any time after title passes to the National Archives.

Date: Sept. 2, 1994 Signed: Larry Boll
DONOR'S NAME

INTERVIEWER: Brit Allan Storey

Having determined that the materials donated above by ______________________
are appropriate for preservation as evidence of the United States Government's organization, functions, policies, decisions, procedures, and transactions, and considering it to be in the public interest to accept these materials for deposit with the National Archives and Records Administration, I accept this gift on behalf of the United States of America, subject to the terms, conditions, and restrictions set forth in the above instrument.

Date: ______________ Signed: ______________________
Archivist of the United States

Introduction

In 1988, Reclamation began to create a history program. While headquartered in Denver, the history program was developed as a bureau-wide program.

One component of Reclamation's history program is its oral history activity. The primary objectives of Reclamation's oral history activities are: preservation of historical data not normally available through Reclamation records (supplementing already available data on the whole range of Reclamation's history); making the preserved data available to researchers inside and outside Reclamation.

The senior historian of the Bureau of Reclamation developed and directs the oral history program. Questions, comments, and suggestions may be addressed to the senior historian.

Brit Allan Storey
Senior Historian
Land Resources Office (84-53000)
Office of Program and Policy Services
Bureau of Reclamation
P. O. Box 25007
Denver, Colorado 80225-0007
(303) 445-2918
FAX: (720) 544-0639
E-mail: bstorey@do.usbr.gov

Interviewer's Introduction of Larry Boll

Larry Boll was born in Sheldon, Iowa, in 1938. He attended Sheldon schools, graduated from Sheldon High School, and earned a Bachelor of Science in Mechanical Engineering and Liberal Arts from the University of Iowa. Recruited by the Mid-Pacific Region out of college, he joined the Bureau for a few months before an active duty interruption with the U. S. Army. Following training at Fort Belvoir, Virginia, Boll reported to his permanent assignment in Germany.

Two years later Boll resumed his Bureau of Reclamation career with an assignment to the Trinity River Division, then under construction. As with many of the Region's junior engineers he began as an inspector of facilities. Two of the Division's powerplants employed foreign made generating equipment, a new situation for many Reclamation personnel. Over the next few years Boll learned other aspects of Central Valley Project operations with assignments at power and pumping plants.

Returning to Sacramento in time to experience the consolidation of the Mid-Pacific Region's staff and activities into a new Federal Building in Sacramento, Boll had a number of assignments within the Power Division largely in Operations and Maintenance (O & M), the more unusual of these including a stint on the Region's dive team. He eventually rose to Chief of the Power O & M

Branch. His experience with the New Melones Project and, later, as Project Superintendent at Folsom served as the context for in-depth discussions on cooperative projects with the Corps of Engineers, flood control, and the Auburn Dam controversy. This interview also contains a discussion of the potential vulnerability of power grids to natural disaster or human activity, an evaluation of state vs. federal operation of the Central Valley Project, and the effects of creating the Western Area Power Administration.

Boll completed his Bureau of Reclamation career with an assignment in Washington, D. C. as the Regional Liaison Officer for the Mid-Pacific Region. The interview contains a description of the duties of this relatively new position and some of Boll's views on working with VIP's and Congressional staffs. Larry Boll retired from the Bureau of Reclamation in 1993, about a year prior to the interview.

George Petershagen, Bureau of Reclamation historian, interviewed Larry Boll at the Mid-Pacific Region Headquarters in the Federal Building, 2800 Cottage Way, Sacramento, California, on September 2, 1994. Barbara Heginbottom Jardee transcribed the interview, and Petershagen accomplished the editing.

Oral History Interview
Larry Boll

Petershagen: This is George Petershagen conducting an interview of Larry Boll on behalf of the Bureau of Reclamation. Today is September 2, 1994, and we are in the Mid-Pacific Region Headquarters in the Federal Building on Cottage Way in Sacramento. Mr. Boll has held a number of positions in the Bureau over his career, including having been Project Superintendent at Folsom and having been Chief of the Power O&M Branch and finally finished his career as the Regional Liaison Officer in Washington prior to his retirement just about a year before this interview. This is Tape 1, Side 1.

Larry, as I mentioned before we went on the tape the first question for you is will you please acknowledge that you understand this is being tape recorded.

Boll: I understand we're being taped, George, and I consent.

Petershagen: Thank you. And also that you understand that you've given up your copyrights to this interview and have made it a gift to the

United States, and it becomes government property.

Boll: I've done that.

Petershagen: Thank you. Now with that, let's get started with where and when were you born, please?

Born in 1938 in Northwest Iowa

Boll: Born in 1938 in a little town in northwest Iowa, the little farming community of Sheldon. Grew up there, went through high school there, then went on to college at Iowa and graduated from University of Iowa in '56. (Pause)

Graduated from the University of Iowa in 1962 in Mechanical Engineering and Liberal Arts

No, that was high school. Graduated from college in '62! (Laughs) In '62.

Petershagen: I had to stop and do a little math there. I was wondering how you got through it so quickly. (Laughter)

Boll: That was my daughters that went through it so quick, not me. (Chuckles)

Petershagen: And the high school you went to is Sheldon High School?

Boll: Yes.

Petershagen: Your degree from the University of Iowa is in?

Boll: Is in Mechanical Engineering *and* Liberal Arts.

Petershagen: Well now *that's* an interesting combination! Is there any sort of a specialty associated with your ME degree?

Boll: No.

Petershagen: And you stopped at the B.S. level, or do you have an advanced degree?

Boll: No, I stopped at . . . I have some advanced credits with that, but I stopped at the B.S. level. I also went through the ROTC [Reserve Officer Training Corps][1] program

1. Note that in the text of these interviews, as opposed to headings, information in parentheses, ( ), is actually on the tape. Information in brackets, [ ], has been added to the tape either by the editor to clarify meaning or at the request of the interviewee in order to correct, enlarge, or clarify the interview as it was originally spoken.

(continued...)

while in college, while going to school, and that takes about every non-tech elective you have in an engineering curriculum. So I decided, "Well, while I'm here, getting some non-tech subjects is probably good to round out an engineer a bit because they tend to get a little narrowly focused sometimes, I've heard," and am still reminded. And so I did go on and get a Liberal Arts degree and take some subjects that I was not real familiar with. Gee, I worked hard in some of those! They were a lot tougher than any engineering course I ever took! (Laughter)

Petershagen: Well, it probably served you well, I would think, in your later years with the Bureau as you became more and more of a management type and probably less and less specialized in technical?

---

1. (...continued)
Words have sometimes been struck out by editor or interviewee in order to clarify meaning or eliminate repetition. In the case of strikeouts, that material has been printed at 50% density to aid in reading the interviews but assuring that the struckout material is readable.

The transcriber and editor have removed some extraneous words such as false starts and repetitions without indicating their removal. The meaning of the interview has not been changed by this editing.

Boll: I would hope so. I don't know. I would hope it had some.

Petershagen: Now, did you take a commission as a result of your ROTC training?

Boll: Yes.

Petershagen: In what branch of the service?

Went into the Corps of Engineers upon Graduation and spent 1962 to 1964 in Germany

Boll: In the Corps of Engineers. That's the Army.

Petershagen: And did you serve with the Corps?

Went to Work for Reclamation in 1962

Boll: I was two years in Germany from '62 to '64. I went to work for the Bureau . . . . The Bureau was hiring a lot of folks in '62.

Reclamation ". . . needed some mechanical engineers, and I could also go to work for them, and when the time came to fulfill my two-year obligation for the military obligation, why, I would remain in federal employment during that time. There would be benefits to that, and that sounded pretty good. . ."

We had a big construction program going on, and the folks from the Sacramento Office were out on the Iowa campus interviewing, and I interviewed with them, and it sounded kind of interesting. Hydroelectric projects are an exciting place to be. If you've ever been around a big Bureau construction job that's a fun place to be. And they were offering me that position–they were hiring. They needed some mechanical engineers, and I could also go to work for them, and when the time came to fulfill my two-year obligation for the military obligation, why, I would remain in federal employment during that time. There would be benefits to that, and that sounded pretty good, and I liked California at that point. That sounded like a fun place to go to work. So my wife and I decided, "Let's do that!"

Petershagen: And was that your first contact with the Bureau, when you saw the recruiters coming around the campus?

". . . I didn't know much about the Bureau of Reclamation. I'd heard the name, but really didn't know much about them until I interviewed. . . ."

Boll: Uh-huh, that is. We're west of the Mississippi, but in Iowa the Bureau hasn't done much, and I didn't know much about the Bureau of Reclamation. I'd heard the name, but really didn't know much about them until I interviewed. And then I started looking into it a little more before I accepted employment with them.

Petershagen: Do you recall who those recruiters were? Perhaps people that maybe you worked for later on?

Boll: I forget who the guy conducting the interview was. The Personnel Specialist here in this Office was Bill Hickerson that I worked with. I don't think it was Bill that I was interviewing with in Iowa. But I don't remember who that was either.

Petershagen: What was going on in the Bureau at the time you were first hired? I guess the basis for my question is if you look at the '50s and '60s there were kind of peaks and valleys in hirings, and then there'd be RIFs [reductions in force] and then they'd be out hiring again. What was going on in the '60s?

Worked on the Judge Francis Carr Powerplant on the Trinity River Division Before Going into the

Boll: Yeah, in ‘62 the construction of the Trinity River Division, west of Redding, was in full swing, and so there was just a beehive of activity at the Trinity Dam, and Judge Francis Carr Powerplant and Whiskeytown Dam and Spring Creek Powerplant–major contracts going on–a beehive, and they needed workers. So it was a time when the Bureau was hiring. The early ‘60s–you’ll find there are a lot of people that were coming to work for the Bureau at that time. And I was just there . . . I was at the Judge Francis Carr Powerplant during construction of that plant for four months before I went into the service.

Petershagen: Did you have some time here in Sacramento before you went up there, or you went straight there from Iowa?

Boll: Straight to Redding. Stopped by Seattle and the World’s Fair on the way.

Petershagen: What were your first impressions when you got there? Were you ready to turn around and go back home?

“. . . we packed up everything in the car, right out

of college–and spent the night before coming to Redding on the coast in Crescent City. . . ."

Boll: No, it was interesting. We had come down the coast from Seattle–I mean, you know, we packed up everything in the car, right out of college–and spent the night before coming to Redding on the coast in Crescent City. And I remember getting up that morning, and the breeze off the ocean, it was probably in the low fifties, and it was *cold*, a cold, wet breeze off the ocean, you know. Get in the car, we get on [State Highway] 299, of course, and the old 299 before it was rebuilt in the early '60s was a lot tougher road than it is today. That was a good four-hour trip from Crescent City to Redding. Pulled into Redding and it was 112 degrees! (Laughs)

Petershagen: Just a bit of a contrast with Crescent City! (Laughter)

Boll: I thought, "*Boy*, this is where I'm going to work?" (Laughter) So that was quite an introduction to Redding.

Petershagen: Then where . . . The Bureau had some office someplace that you worked in? Or were you out at the powerhouse site?

Boll: Yeah, I was at the powerhouse site. I lived in Redding those four months and then just commuted out to the powerplant. The main project office was over in Lewiston.

Petershagen: I realize you were only there for a few months, (Boll: Yeah.) but what kinds of things did you do during that period of time?

Worked in Construction Inspection

Boll: I was working with the construction inspectors on the powerplant. In the powerplant, pretty much, the concrete work was finished, but we were putting in the penstocks.

"We were installing turbines, and these were the first Japanese turbines to be installed in the United States--the Hitachi turbines that are in the powerplant. . . ."

We were installing turbines, and these were the first Japanese turbines to be installed in the United States--the Hitachi turbines that are in the powerplant. So that was an interesting experience. And then comparing *those* turbines with what was going in at Spring Creek, the English Electric, and then up at Trinity. No. At Trinity it's the

English Electric, and at Spring Creek it's the Allis-Chalmers. So we had a variety, and we were comparing technically with one another the differences in those and the technology and how the Japanese stacked up with that.

Petershagen: Interesting. Then you went to Germany to fulfill your obligation with the military. What sort of duties did you have with the Corps?

After Training at Fort Belvoir Worked in a Maintenance Supply Company That Operated a Depot and Did O&M of Engineering Equipment

Boll: Well, let's see, I first went, of course, to Fort Belvoir, Virginia, is the Engineer School for the Basic Officer Training Course. Then over in Germany I was with a maintenance supply company that had both a depot operation and a maintenance function of engineering equipment. And I worked in that the whole time I was there.

Petershagen: And that consumed the two years of active duty?

Boll: Right. And then I came back. I was still in Active Reserves when I came back. And

then I was Company Commander of an engineering outfit here in Sacramento, a similar maintenance and supply engineering outfit for a number of years before I was done with the military obligation.

Petershagen: Did you stay on after your obligation?

Boll: No, I resigned the commission. I decided that was taking too much time from the family, and before the extra paycheck got to be a habit I decided I'm going to resign this. It's more important to spend time with the family than to get tied up into that.

Petershagen: I see. What do you think about that two years? The reason I'm asking, just to give this a little context, is a couple of fellows have indicated that World War II was kind of an interruption in their life, and they felt like they had to scramble a little bit to catch up with those that didn't have to serve. Are there feelings like that associated with those two years?

Toured as Much as Possible in Europe During His Time with the Corps

Boll: No, no. We felt that the two years in Germany was a good experience–spent

every nickel touring Europe. You have quite a bit of leave time in the military, and living in Germany at that time, the exchange rate was very favorable, four marks to the buck where today it's like 1.75. And so you could live pretty well over there. As a matter of fact, I'm not convinced I'm living any better today than I did when I was living over there! (Laughter) You know, we did alright on our basic pay of $222 a month–found I got along quite well. Our first son was born over there, and we had a good time, we really did. It was a good experience–got to see Europe. My dad was born and raised in Switzerland, so when we were over there, why, Mom and Dad came over and toured a little bit of Switzerland where he had grown up. So it was a good time.

Petershagen: Okay, then with your active duty obligation taken care of, then what? You came back to work for the Bureau?

Assigned to Construction Inspection at the San Luis Pump-Generating Plant upon Returning from Europe

Boll: Then we came back to work for the Bureau, and we came back on construction again,

but it was down to San Luis. The San Luis Pump Generating Plant was under construction, so I went there.

After Four Months Was Reassigned to the Tracy Office for Another Four Month Stint Before Transfer to the Region in Sacramento

And again, I was there, I guess, in late ‘64, for about four months and then went to the Tracy Office for a stint looking at the operation and maintenance of an ongoing project and spent three, four months there before coming to the Regional Office in Sacramento. I did that in early ‘65.

Moved to the Power Division after a Couple of Years in the Design Branch in the Design and Construction Division

Then I spent a couple of years in the Design Branch and in Design and Construction before going to the Power Division.

Petershagen: Who did you work for at Tracy?

Boll: At Tracy, the project supe [Superintendent] was Herb Thompson at that point, and head of maintenance was George Schaefer– interesting fellows.

Petershagen: Would you care to expound on that?

Boll: Well, a lot of the Bureau heads are real characters. You know, you just really learn a lot from them, and both Herb and George were different types–strong opinions, hard-driving men, good at what they did. I mean, a lot of respect for the technical capabilities of the engineers in the Bureau. I've learned a whole bunch from them. I don't know if you've talked to Herb or have seen Herb. (Chuckles) (Petershagen: No, I haven't.) Herb . . . . (Chuckles) Some interesting things would always come out.

"They got a couple of new sedans in, a couple of Ford Fairlanes, back in '65, '64, and the station wagon had a V-8 in it, and the sedan had a six. Well, George had a heavy foot, and he liked the sedan, but he liked the V-8. He swapped engines! . . ."

But Herb . . . They got a couple of new sedans in, a couple of Ford Fairlanes, back in '65, '64, and the station wagon had a V-8 in it, and the sedan had a six. Well, George had a heavy foot, and he liked the sedan, but he liked the V-8. He swapped engines! (Laughter) Yeah. GSA [General Services Administration], when they found out, they

just really didn't like that. (Laughter) Funny! Yeah, Herb liked to get somewhere in a hurry. (Laughter)

Petershagen: So you spent three years in Tracy, you said?

Boll: No, three, four months. (Petershagen: Three, four months, I'm sorry.) Short time there.

Petershagen: And then you came here to Sacramento?

Boll: Then I came to Sacramento in the Design and Construction Division.

Petershagen: What attracted you here? Was that somebody recruiting you to come to work here? Were you looking to come to work in Sacramento?

Boll: Sacramento was the regional office, and putting in some time in the regional office was going to be good for rounding myself out for some knowledge. I'd had some, now, construction experience, and seeing what the regional office was like was good. And they needed some mechanicals [mechanical engineers] in the Design and Construction Division at that time. And I was convinced that some design time was

probably beneficial. So I agreed to come here and do that.

Petershagen: And we're right about the time, I think, when things were moved into this office building, correct?

Boll: In '69, I think, we moved into here.

Petershagen: So you were already in Sacramento before the move was made into this building.

Worked on the Committee for Moving from the Fulton Avenue Office Building to the New Federal Building in Sacramento on Cottage Way

Boll: Right. Yeah, it was at the old Fulton Avenue Building and, in fact, was one of a committee that was involved with the transition between the old and new building. And I remember coming over here, and we did walk through and inspect it and looked at it for safety and for adaptability and what we saw as helping coordinate the move as we came into the new building. That was an interesting time.

Petershagen: Were there some turf battles, little in-fights over office space, who was going to be located where in the building, anything like

that going on?

Boll: Not that I . . . There probably were. I mean, that's human nature, but I'm not aware of those.

Petershagen: Did anybody, I'll say, at the working level, have any real say about maybe how offices were going to be laid out, or anything like that? (Boll: No.) It was just a "We're going to move and you're going to like it" kind of a thing?

Boll: Yeah. I think at that point the Bureau was pretty much a top-down organization, and what the boss said went. I think that was typical not *just* of the Bureau at that point, but it certainly was of the Bureau. My recollection of those in leadership positions at that time were strong personalities. They were strong leaders. So there must have been some juicy stories about turf. There *had* to be. Knowing the people involved, I can't believe there *weren't*, George, (Chuckles) but I'm not privy to them.

Petershagen: Okay. Then who did you work for when you came here to Sacramento?

Boll: [William] McCrystle was the Division

Chief, Head of D&C [Design and Construction], and Tony Gonzales headed up the Mechanical Unit in the Design Section. I worked for Tony, then, for the two years I was there in design before I transferred to the Power Division.

Transferred to the Power Division for a Promotion

Petershagen: And what led you to the Power Division?

Boll: They had an opening there. It was a promotion opportunity, and I knew the fellow that was leaving, that was moving, Tom Spiker was moving on, and Tom said, "Hey, Larry, here's a position I think you ought to look hard at. I think you could do a good job in here. And so I was selected for that. It was a staff position, technical support for basically the powerplants and large pumping plants in the region. And so from there and, as the one mechanical engineer in there, why, every major mechanical maintenance activity we had going on in the plants, I was intimately involved with. And so I'd get up to Redding frequently and down to Tracy and Folsom.

Worked with the Corps of Engineers on New Melones beginning in 1967

[I] started reviewing and working with the Corps of Engineers on New Melones in ‘67, and that was on design criteria. And then through construction of New Melones. And then the transfer of that facility as the Corps built it from construction to O&M [Operations and Maintenance] and we took it over. So I worked with New Melones from paper to the finished product.

Started Reviewing Auburn Plans in the Later 1960s

[I] started reviewing the drawings and plans for Auburn back in the late ‘60s.

Petershagen: Everybody’s had a chance to do something with Auburn, I think. (Chuckles)

Boll: I did a whole bunch with Auburn. We’ll get to that point sometime, I’m sure, George.

Petershagen: Yes, we’ll talk about that in a few minutes.

Boll: Being as unopinionated as I am, why . . . . (Laughter)

Petershagen: Let’s look at New Melones for a few minutes. I’m kind of interested in this idea that the Corps builds it and then turns it over

to another agency who is then responsible for operation. How did that go? Those of us on the outside reading the newspapers know about the political flaps associated with it and everything, but . . .

". . . the division line there [New Melones] is that the Corps handles flood control projects, and the Bureau handles water supply basically. . . ."

Boll: But then of course the division line there is that the Corps handles flood control projects, and the Bureau handles water supply basically.

". . . there's a little different philosophies in design and construction inspection between the Corps and the Bureau. . . ."

Folsom . . . . You know, the Corps built Folsom Dam. The *Bureau* built Folsom Powerplant, so there was a mixed jurisdiction, and how that came about was even interesting. But there's a little different philosophies in design and construction inspection between the Corps and the Bureau. I'm not sure that you can say one's good and one's bad, but they're different, and there's pluses and minuses to each. Some of the basic designs of the

Corps are just a little different than the Bureau. Having looked at both Corps drawings and Bureau drawings, the Bureau engineering organization in Denver is one of the premier world engineering offices, *period*–at least it was. You know, it's tapered off considerably now. But back then, in the '60s, why, it was one of the giants of the engineering world, no question about it–quite an assembly of talent, and they did an excellent job, a real professional job. And the drawings and the designs of the Bureau I think–well, they're a standard for the world today in hydro projects.

And so looking at the quality of the design of the Bureau compared with the Corps, I think the Bureau had a notch up. The Corps is good. I'm not trying to put down the Corps in any way. The Bureau was an excellent . . . The more I worked with them, the more respect I had for them–especially at that time, in the heyday. Those were some good folks. It was an assembly of some of the top talent *period*. And it was a premier organization, engineering organization. The Corps was good, not as good.

". . . in construction inspection for the Bureau, we

would have about three times as many inspectors on a construction job as the Corps did. . . ."

And in construction inspection for the Bureau, we would have about three times as many inspectors on a construction job as the Corps did. So the Corps would put a lot of the inspection responsibility on the contractor they had contracted with, and, in fact, the contractor had to also have a subcontractor do quality control for him. Well, that's a little bit like the fox watching the chicken coop and did not have the same motivation and consequently do as good a job on inspection as, say, the Bureau inspectors did.

The Folsom Powerplant "came on line. It had some construction problems . . . we said we wanted some things corrected, and was driving hard to try to bring those up to what I felt was the Bureau standard, and the Corps was trying to unload the facility on the Bureau. . . . we rewired the entire control boards after we took over that plant. . . ."

So the plant was built and came on line. It had some construction problems, no doubt, and some that we–especially me–were not very happy with, and we had

some . . . Going from Construction to O&M, as we took over, we said we wanted some things corrected, and was driving hard to try to bring those up to what I felt was the Bureau standard, and the Corps was trying to unload the facility on the Bureau. So some of the things that would not have come from Construction to O&M in the condition they were, if it had been a Bureau plant, did come that way with the Corps plant. For example, we rewired the entire control boards after we took over that plant. We felt the electrical work in it was sloppy, not well documented. The wiring nest in those control boards was just not a professional job. It was sloppy stuff. We stripped them and redid them correctly. That's a lot of work. The Bureau standard for that is a mighty tight one. I mean, you look at those control boards today, and you'll see a very professional job.

Petershagen: The Bureau paid for that? Did the bill go back to the Corps?

Boll: We did it in-house. We did it with our own people. We did it for our own purposes. But it's a good facility. I mean, New Melones Dam and Powerplant are a good facility. Those are just some of the little

idiosyncrasies of the job when it came through. It was fun working with the Corps. It was a good working relationship, all the way from design through the construction, and then the transfer from construction to O&M. So I was able to see the whole gamut of it–an interesting job. And it's a good plant, a good facility.

Petershagen: Now, over your career with the Bureau, it looks to me like at least at various times you were less and less of a mechanical engineer and approaching becoming an electrical engineer. Is there a lot of that kind of cross-training, cross-breeding, in the Bureau?

"You know, in the powerplant, I always kept the electricals in line, because the turbine drives the generators. So unless us mechanicals gave them the shaft, they'd be completely out of business. (Laughter) Oh, well, a lot of friendly competition between electricals and mechanicals. . . ."

Boll: Sure. And especially . . . You know, there are more electricals than mechanicals. (Chuckles) You know, in the powerplant, I always kept the electricals in line, because the turbine drives the generators. So unless us mechanicals gave them the shaft, they'd be completely out of business. (Laughter)

Oh, well, a lot of friendly competition between electricals and mechanicals.

But you have to know both ends of that shaft, and you have to really understand the electrical end of things if you're going to know something about powerplants and the electrical grid and where the energy goes and how it goes. And you really have to learn that. And especially, then, after working as strictly a mechanical engineer, but working with the electricals all the time, and then becoming a branch chief where most of them are electricals under you, you have to learn that end of it, no doubt–at least a good working knowledge of the electrical end of things, which I was fortunate and had some good people to work with, and I did learn that. Of course, that served me well.

Petershagen: Does the Bureau do anything to aid in that sort of training, or is it pretty much up to the individual?

Boll: I would say most of that is the individual. Not too much . . . I think at that point the individual growth and what you learned was your motivation to do so. I think they were cooperative in that effort, but they weren't leading the charge. It was the individual's

motivation to learn that. I've been real fortunate to work with some just *quality* engineers on the electrical side that I've been able to work with–good friends–and learn a lot from, and it stimulated me to learn more. That was certainly a real benefit to me to do that.

Petershagen: As you look back over your career at the Bureau, is there maybe one or two or three gentlemen that you might point to, that you would consider mentors?

Del Tucker

Boll: (Pause) Well, one real good friend, Del Tucker, that's still working down in D&C now. Del and I sat next to each other. We were kind of equals. And Del is just technically first-rate, and I just learned a real lot about the electrical end of things from Del, and we worked together on a number of things.

Speculating about the Vulnerability of the Power Grid in the West

It was even fun kicking back once in a while at four o'clock in the afternoon, after learning a little something about it . . . I

shouldn't even tell you this, George, but we were plotting (Laughs) in a friendly sense of the word, but just interesting speculation . . . I forget when the big blackout was in New York City–you know, the East Coast Blackout? (Petershagen: Oh yeah!) Remember that? (Petershagen: Yeah.) Well, we got to thinking about the vulnerability of the power system of the West, you see, and that stimulated a lot of thinking about, "Hey, how vulnerable are we to that kind of thing?"

And then there was something of–it was the sabotage era–and some thinking about how vulnerable are we to this from the outside? And so I forget how much we got into that, but we were doing some thinking and brainstorming about that. And one of the ways we did that, we said, "Well, if you gave us the unlimited resources and somebody came to us and said, 'We want to black out the West Coast, Larry and Del . . . .'" I don't mean to get you into this Del. (Laughter) "Could you do it?" And, yes, we thought we could blackout the West Coast, and then after blacking it out, essentially shutting down and at least isolating it, though some little pockets might still be up, we thought we could keep it

down for some period of time then–twenty-four hours, a week.

Petershagen: That's interesting.

Boll: That's not interesting –that's *scary*, George!

Petershagen: It's a terrible place to do this, but the tape is going to go off on us, so I have to turn it over here.

END OF SIDE 1, TAPE 1. SEPTEMBER 2, 1994.
BEGINNING OF SIDE 2, TAPE 1. SEPTEMBER 2, 1994.

Petershagen: Larry, before we stopped the tape, you were speculating on, or you were telling the story, I guess, of you and Del speculating on your ability or the ability somebody might develop to shutdown the West Coast electrically. And I wonder, did you take these thoughts to any of your supervisors or anything like that, and say, "Hey, have you guys ever thought about this?"

Boll: I think we shared it enough to convince people that we were very vulnerable to that, and the means of protecting against it were also very difficult. I mean, there were some bombings of substations there going on back

then in the ‘70s, you know. But the people that were doing it obviously didn’t have a good knowledge of what they were doing. I mean, they were doing it in some isolated places, and the consequence of it was not very great.

Petershagen: Yeah, really making a statement rather than doing any damage.

Boll: Right. And if you had put some real thought into it, to make the statement, you could have really done it in spades. So we had done some thinking.

Some Changes Were Made to Protect the Power Grid

We made some protection changes to the system, as I recall, on some things we did. But what we really came away with was we were very vulnerable to that, and we are today.

Petershagen: Yeah, it strikes me that still there’s not much you can do to design sabotage out of something like the power grid.

E. Richard (Dick) Klinke

Boll: Nope. No, sure isn't. Anyway, Del was one that I learned a lot from. Let's see, certainly having worked with [E. Richard Klinke] Dick Klinke for . . . How many years was it? I guess some fourteen, fifteen years. Dick [was] an excellent engineer, technically, very good. I learned a lot from Dick. (Pause)

Petershagen: I can see you thinking and trying to reach back.

Jim Andrews

Boll: You know, who else had that big an influence on me? I guess there's another . . . . People. Jim Andrews was one I'd worked with a lot. Jim, a civil engineer, but sharp. I mean, these are some *quality* people.

Served on the Region's Diving Team

Jim was a regional engineer and grew up in design, and I was also on the diving team, on the underwater examination team we had. For fifteen years I was on that team, and Jim was on it for fifteen years as well. We had some good engineers on that diving team. We put technical expertise underwater rather than relying . . .

Trained Engineers as Divers in Order to Accurately Assess the Situation Underwater

We first relied on divers to come up and then interface with us on the surface. And we found that there was a *tremendous* communication gap between the diver and the engineer. We said, "What if we train some engineers and put them down there?" And so we *did* that, and when we came up with the story it was entirely different. And we found out that maybe we just didn't want to live with that difference, that we wanted to know what's *really* underwater, since we have so much of our structures underwater, some major equipment, and we were not getting very good reports from commercial divers until we put our own people down there. And when we did, we not only could see what was down there, but we could evaluate it and make some good recommendations as to what to do about it quickly. And so that diving team became a very big asset for us when we did that.

Petershagen: What sort of equipment did you use? Was this pretty much self-contained, (Boll: Yeah.) or did you do hard hat diving?

Boll: No, we were scuba. Did a little hard hat . . .

We played with that, but we weren't using it. It was just primarily scuba.

Petershagen: And where did you train to become divers?

Boll: Well, we'd use a commercial shop here in town to become just a diver, but then the diving with the Bureau was real different than what you're going to do elsewhere. A lot of it is low or zero visibility diving. You've got to learn to start "looking through your fingers." It takes you–I think for me, anyway–it took me a year or two on the team probably before I was real good because you're first going down worried about staying alive, not examining. I mean, it's different stuff. You know, we put together a team of expertise that included mechanical engineers, civil engineers, geologists, and then later added some biologists or environmental-type people. So we could put technical expertise underwater to really put together a team of what we wanted to examine. And it was association with those folks that I also learned a lot from. And Jim was one that . . . Jim could look at an engineering drawing of a plan, profile, elevation and have it 3-D in his mind quicker than *anybody* I ever saw. He'd look at that drawing and he'd be–after

a short period of time, he was looking at Detail "D," because "What's the detail of this thing?" because he already had it in three dimensions, and I'm sitting here still trying to figure out what this dumb thing looks like, you know, (Petershagen laughs) and he's on Detail "D," and that was real impressive to me. So Jim taught me a lot about the civil end of things and the construction business, because he was the construction branch there for a while. And then diving together, we learned a lot from each other. It was a good team.

Petershagen: When you were active in the diving business, what percentage of your time– what level of effort–did it take?

Boll: Ten percent of the job. It was an additional duty kind of thing, and it was about ten percent. But we always put in a lot of time whenever we left. And I was dive team leader for four of those years, and I just *expected* ten-hour days from the fellows, or longer. I mean, overtime wasn't an issue for us. We were doing the job at that point, and whatever it took to get the job done, if it took a ten-hour day, it took a twelve-hour day–whatever–that was a given. That was just part of the job of being on the dive

team.

Petershagen: Most of what you did, I'm sure, was pretty shallow, but what's about the deepest you . . .

Boll: We were 140 feet. Basically, we had to dive within the "no decompression" limits, and 140 feet you can spend ten minutes, so that's kind of the limit of the depth you can go without having decompression. And then OSHA [Occupational Safety and Health Administration] guidelines came along later, after we'd been on the team a while, and here OSHA came and OSHA said, "Well, you can't go beyond 100 feet with scuba unless you have a recompression chamber on site." So after OSHA regulations came on, we had to adapt, and we limited ourselves to 100 feet, unless the rare time came we'd bring a chamber on site and could go down longer. After that it was just 100 feet. But that took care of most of the diving anyway. It's just that when we got into a drought, like we did in '76-'77, why, we were diving on all the intake structures, and I've been at the bottom of about every reservoir in the CVP [Central Valley Project] during that drought.

Petershagen: It's a little bit different view than most of us have had of those structures, I'm sure! Let's jump shift here a little bit, I guess. Talk about Auburn. You mentioned before when we were talking about New Melones that we would want to talk about that sooner or later. Where did you first stumble across the Auburn Project?

Became Project Superintendent of the Folsom Office in 1984

Boll: I was in the Power O&M Branch reviewing powerplant drawings of Auburn that Denver had made, and doing that in the late '60s. Auburn was going then, so we were looking at powerplant details, and just reviewing them from an operation and maintenance perspective after the designers had designed them. And then I didn't really get that much into it until I became Project Superintendent of the Folsom Office in '84, and, of course, Auburn at that point . . .

The Oroville Earthquake in 1975 Caused Reclamation to Question the Design Criteria for Everything on the West Slope of the Sierras

The earthquake at Oroville in '75[2] is what really had caused a review of the seismic design criteria of everything on the . . . We didn't expect that big a quake on the west slope of the Sierras, and so we were questioning the design criteria of anything built on the west slope of the Sierras, because wherever you have some hills and where you're going to build a dam, just the nature of how they were formed, you're going to have faulting in the soils and in the rocks. It's the nature of the beast, and you're always going to have some faults around a dam site, because that's where you build the dam. And then so the design criteria . . . What is the *potential* for earthquakes and offsets and accelerations there raised that question, and so it underwent *layers* of review.

At Auburn Dam it Was Decided to Shift from a Thin Arch Concrete Dam to a Gravity Concrete Dam and That Changed the Economics of the Dam

And then the decision was made, okay, we'll adopt a more stringent design criteria, and therefore we're going to have to change the design of the dam from a thin arch

2. The Oroville Earthquake occurred August 1, 1975.

concrete dam to a gravity dam that can withstand the greater seismic activity that we'll design to.

And that decision was made. What it did was cause a delay, and, of course, we solved it by just doubling the amount of concrete in the dam, basically, going from a thin arch to a good old-fashioned concrete gravity dam.

" Carter Administration came in . . . and they didn't want to have any new projects going forward–and so they basically studied it to death. That's the way you do it politically . . ."

So the economics of it changed, and then you have a new administration coming in–the Carter Administration came in–who really–you know, they had the so-called "hit list" of water projects in the West, and they didn't want to have any new projects going forward–and so they basically studied it to death. That's the way you do it politically–you conduct some more studies and reviews.

". . . when the Reagan Administration came in they gave good rhetoric to water projects in the West, saying 'the war with the West is over,' but they gave lip service to it but . . . never really

pushed anything . . ."

And then, when the Reagan Administration came in they gave good rhetoric to water projects in the West, saying "the war with the West is over," but they gave lip service to it but never went forward with any–never really pushed anything–because they were trying to deal with budget matters as much as anything then.

". . . Auburn was able to be stonewalled for a variety of reasons, not the least of which was . . . very good leadership from the Bureau. . . ."

So Auburn was able to be stonewalled for a variety of reasons, not the least of which was, I think in retrospect, not very good leadership from the Bureau. I think the Bureau had the chance to do some things different back in the '70s than we did that really led to it becoming the stalemate it did.

Headed the Folsom Office in 1984 and the Auburn Office Was Put under That Office in 1985

When I took over Auburn in '84 and Folsom in '84, the Auburn Office was put under the Folsom Office in '85.

At the Direction of Regional Director David Houston Spent Twenty-five Percent of His Time for Several Years Trying to Get Auburn Going Again

And so I then became head of it, and Dave Houston then became the regional director–was regional director– and he wanted me to put in maybe twenty-five percent of my time. "Let's see if we can get Auburn going." So I spent about twenty-five percent of my time for, I don't know, four or five years, trying to get Auburn going again. So I put in major effort on that, convinced in my own mind that it was the *right* thing to do, that we needed the water supply, [that] we needed the additional flood control benefits from it, that if I looked at just the primary functions of Folsom, for all the reasons that Folsom was a good facility, each of the major attributes of Folsom wanted a common thing, and that was more.

Folsom Dam Provided Many Benefits on the American River and in the Delta

Folsom provides a water supply. It provides flood control. It provides recreation. It provides Lower American River flows of a constant nature. It provides

a good fishery resource. [It] helps maintain Delta water quality because Folsom is one day travel time for the water to get from Folsom to the Delta. If you try to bring it from Shasta, you're five days travel time. If you try to bring it from the state's project at Oroville, you're three days away. So for short-term fluctuations and immediate responses in the Delta, since it's a very actively managed water quality system, Folsom was very important in that because of its ability to get water down there and respond quickly to short-term water fluctuations, which you always have in the Delta with tidal fluctuations and a variety of water coming in and out of that system.

"In fact, I used to say I had to run Folsom to make everybody mad, and I was *very* successful! . . ."

And Folsom was being asked to do more and more and more, and it was now becoming clear that all these advantages of Folsom were in conflict with one another– the water supply and the power generation and the recreation interests–and we're all competing for how we managed Folsom, and it was becoming a series of compromises in which there was more and more competition and more and more

compromises being made. In fact, I used to say I had to run Folsom to make everybody mad, and I was *very* successful! (Laughter by both) And I said, "What we *really* need is–everybody wants a bigger slice of the pie. Everybody wants a bigger say-so in how Folsom is operated.

"Because [Auburn increases] all the advantages of Folsom, ~~Auburn increases~~: the flood control, the water supply, the power generation, the recreation benefits, the Delta water quality, ability to do that . . . the fishery that's becoming a more and more important thing. . . ."

The answer to that is start with a bigger piece of pie. That's called Auburn." Because all the advantages of Folsom, Auburn increases: the flood control, the water supply, the power generation, the recreation benefits, the Delta water quality, ability to do that–to tweak it–the fishery that's becoming a more and more important thing. You need to manage that, and you need to manage the flows. You need to manage the cold water. And you can do that with an Auburn.

Petershagen: So to the layman such as myself, I can take what you said, I think, and say that Folsom

is just too small to really fulfill our expectations for it.

". . . every dam we've built in California, as far as I know, has one thing in common, we build them too small. . . ."

Boll: And if you really look at the history of Folsom you can see that–and not just Folsom, but other water projects–because every dam we've built in California, as far as I know, has one thing in common, we build them too small. That's why you have Hogan and *New* Hogan. That's why you have Melones and *New* Melones–Exchequer and *New* Exchequer–is because they've taken the old and built . . . Melones had an old dam there, and New Melones dwarfed it. We submerged it. It was upstream and we made it . . .

"When Shasta was designed the best one at that point was, I think, an 8½ million acre-foot reservoir . . . Well, 4½ million was all we could bite off at the time in the '30s to do it. So we built it as big as we thought we could. . . ."

When Shasta was designed the best one at that point was, I think, an 8½ million acre-foot reservoir was the one we really wanted.

Well, 4½ million was all we could bite off at the time in the '30s to do it. So we built it as big as we thought we could.

". . . it's interesting that one of the most attractive projects we have on the books for planning purposes is an enlarged Shasta that goes to 14 million acre-feet. . . ."

And it's interesting that one of the most attractive projects we have on the books for planning purposes is an enlarged Shasta that goes to 14 million acre-feet. That's one of the more attractive ones we have on the books today.

If you look at the history of Folsom, when the Corps first designed Folsom, it was a flood control only facility, about 370,000 acre-feet from the Flood Control Act of 1944 was it's basic authorization. Well, the Bureau then got some money to start looking at the American River for planning purposes and started looking at that and said, "You know, if we would just increase Folsom and make it a multi-purpose reservoir instead of a single-purpose, flood control only that you would drain in the summer and keep down for flood control and then let it come

up in the spring, we could make it a multi-purpose and have water purposes; we could generate power; we'd have some recreation resources. We think it makes good sense." And so we went to the Corps of Engineers and said, "Hey, we think doubling Folsom to maybe like an 800,000 acre-foot reservoir makes good sense for these reasons." And the Corps said, "Yeah, we agree. Let's go back to Congress and see what we can do." [We] went back to Congress–and this is now after World War II–and Congress is trying to put folks back to work after the war.

How Folsom Dam Was Sized by the Congress During a Hearing

And so when it came time for a key committee hearing–and Joe Gomez was the old Corps Planning Officer in Sacramento involved with it–he got back in committee and was making the pitch to double the size of the reservoir, make it multi-purpose, and the committee said, "It sounds pretty good, but tell me, Joe, just how *big* could you build Folsom?" Joe says, "My God, I hadn't expected this question," you know. He says, "I don't know, maybe a million acre-feet." "Do it!" *That's* how Folsom got to be the

size it is today. That's all the "technical studies" that built up to the million acre-feet. "What's the biggest you could do it, Joe?" And Joe didn't know, but he thought about a million. And the Congress said, "Okay."

Though it Was Supposed to Contain a 200-year Flood, in December of 1955 Folsom Dam Filled in Four Days

Well, you see, when Folsom was first built it was designed for supposedly a 200-year-plus flood, and that was with 370,000 acre-feet. Well, even when it was nearing completion in December of '55 we had the so-called Marysville Flood in the valley, and Folsom filled in like four days. Some folks looked at that and said, "Whoa! This thing fills in four days!" In fact, it was *after* that so-called Marysville Flood in '55, and they saw what happened on the American River, and Folsom saved Sacramento . . . .

"In fact, Folsom paid for itself that . . . Christmas week of '55. And the flood control benefits attributed to Folsom are just under $5 billion to date, which is pretty good for a facility that cost $90 million to build. . . ."

In fact, Folsom paid for itself that one week of Christmas week of '55. And the flood control benefits attributed to Folsom are just under $5 billion to date, which is pretty good for a facility that cost $90 million to build. I wish my own investments had been doing that well, George, in addition to the $350 million we've made on water and power revenues from Folsom. So, in retrospect, it looks like an absolute bargain.

". . . every major hydro facility in California I'm aware of, when you build it everybody says it's so doggone expensive, how can we afford it? And twenty years after it's built you look back and say, 'It was an absolute bargain. . . .'"

In fact, every major hydro facility in California I'm aware of, when you build it everybody says it's so doggone expensive, how can we afford it? And twenty years after it's built you look back and say, "It was an absolute bargain." Those are the range of emotions. That's true with Auburn. It looks *expensive*. If we look back, after building it, in twenty years we would say, "Boy, this was a bargain." And then we had the flood of '86. February '86 is the flood of record on the American River. It's a seventy-year event. I even got ahead of

myself there a little bit.

So we're looking at flood control on the American River, and we said 370,000 acre-feet was going to provide 200-year flood protection. Well, after that '55 flood, you again look at the hydrology on the American River–and we only have good hydrology from 1904 to the present, so it's a pure statistical treatment of those numbers–and they said, "Well, Folsom isn't providing 200-plus-year flood protection anymore." "It's providing about 120-year flood protection," they thought. You know, it had been continuing down as we gathered more hydrology on the river because we had major events now, and '55 was the big one.

We had another one in '64 that washed out Hell Hole Dam that was further upstream on the Middle Fork of the American, that Placer County Water Agency was constructing. It was under construction, not completed, and we had this major flood in '64 that washed out this partially completed dam and brought major inflow into Folsom, and Folsom again saved Sacramento's bacon. And so that added some other hydrology to the data base.

The 1986 Flood Was the Flood of Record on the American River and for a Day Reclamation Ran 15,000 cfs More than the Levees Were Designed for below Folsom Dam

And then the flood of ‘86 was the flood of record, where you had about forty inches of rain in the American River watershed above Folsom within a week– forty inches. And Folsom filled, of course, and we had to increase releases to the designed release of 115,000 in the river. That was insufficient, and we ended up going even to 130,000 cfs release for twenty-four hours. The levee system, by the grace of God, held. I think there were fifty-six boils in levees in the Sacramento area during that week in February ‘86 when this happened, and I’m out at Folsom at this time, a pretty exciting time.

During the 1986 Flood, the Construction Dam at Auburn Dam Failed as it Was Designed to do

We also had the cofferdam, the construction dam at Auburn that gave way during that time.

News Media Sensationalized the Failure of the Auburn Construction Dam

And of course that's the one that all the TV media captured, because that was quite an event, capture a dam failing. Well, we knew it was going to fail, it was designed to fail. After all, it was a temporary construction dam, designed to hold back about a thirty-year flood. This was a seventy-year flood, and it had no spillway, so when it filled and overtopped, it was designed to fail over time, and in fact failed exactly as it was designed. When we had a good video tape–and I made sure we had *good* video tape of this thing, the photo lab, I told them when it was going to overtop, we set up cameras, video tape, thirty-five millimeters, even then had a helicopter up in the air. And if you haven't seen that video tape, there's a ten-minute version of it (Petershagen: I have.) and it's a very excellent video of what happened. And there's also about a thirty-minute version.

When we showed the thirty-minute version to Denver designers they (claps hands in applause) failed *exactly* as they had designed it to fail–I mean, this was textbook. And you know, had the soft plug as to where it was going to fail, and how it would fail, and it would fail over–not just catastrophically–but over a period of time,

over six, ten hours, which it did. It had no impact on the flood operation at Folsom, because any water stored behind the cofferdam we always treated as though it were already *in* Folsom Reservoir, because it just was going to end up there sooner or later. So we always held that space in Folsom. But that's what everybody captured and said, "Oh, if it hadn't failed, we would have been okay." Well, baloney! That was not a dam designed for flood control. It just wasn't. But that generated a whole new set of issues to deal with.

Flood of 1986 Showed Folsom Provided 70-year Flood Protection Rather than 200-year Flood Protection

Here's the flood of record on the American River, and now when you run this new data into the hydrology data base, Folsom is providing seventy-year flood protection, not even 100-year FEMA [Federal Emergency Management Agency] flood protection for a major portion of the Sacramento suburban area. And you have, let's see, what do we have? Somewhere around thirty-some billion dollars' worth of infrastructure in the flood plain.

Petershagen: I think that's about the usual number, is about $30 billion.

"Well, now you have *major* infrastructure, major unprotected, insufficiently protected area from floods . . . Well, the obvious answer is Folsom can no longer provide it, gives a big push to Auburn. . . ."

Boll: Well, now you have *major* infrastructure, major unprotected, insufficiently protected area from floods that you've got to deal with, and how do you do it? Well, the obvious answer is Folsom can no longer provide it, gives a big push to Auburn. Everybody agreed that you ought to have at least 200-year flood protection for that major metropolitan area. The County of Sacramento certainly felt that. The State of California certainly felt that. The City of Sacramento did. Corps of Engineers certainly did. And it gave new impetus to Auburn, that we need to get Auburn going. And of course working hard on Auburn for that, why, we were in the midst of . . . I've spoken to every SIRS group and Comstock Club and Rotary group and Kiwanis group I think in the Sacramento area during that time. I had a set of slides that was a knockout from that, and gave a good pitch

as to why we ought to get Auburn going. And I was on the soapbox preaching it, and did so in spades, and felt that was the right thing to do. We need to get it going and had good reasons for doing it: not just flood control, but certainly including flood control, but also for water supply, and environmental reasons of Delta water quality and for fishery purposes and recreation purposes. And if you're not convinced, I'll take more time to convince you, George! (Laughter) Obviously, I have some feelings on this. In fact, I still work today on some folks on the issue, because it's still the right thing to do.

Petershagen: Well, I guess the counters to that are that you say "recreation," but you're destroying recreation à la the natural white water area.

Boll: Sure, and those are tradeoffs.

Petershagen: Those recreation folks would make that argument.

Boll: Sure.

Petershagen: And other people would say, "Well, we don't need the electricity for anything, we can conserve." And I guess that same

argument is made about the water. I'm not quite sure how anybody would argue against the flood control aspects of it, certainly. But as you said, when we look at it twenty years from now, we're going to call it a bargain, if it's built. I guess we could make the statement another way. If we look at it twenty years from now, we're going to say, "Why didn't we build it when we had the chance?"

"Bigger floods than Folsom can handle are going to come. It's only a question of when. . . ."

.

Boll: I think there's some truth to that, too. Bigger floods than Folsom can handle are going to come. It's only a question of when. '86 could have killed a whole bunch of people in Sacramento. Those of us involved with it are *well* aware of that. By the grace of God, it didn't. I mean, Folsom's full, and it stopped raining. If the rain continues, and maybe it's only another three or four or five hours, with a full reservoir you've got to release what comes in. And that was going to be more than the capacity of the levee system. In fact, the levee system could not have handled another twenty-four hours of the 130,000 cubic feet per second we had flowing downstream. And you looked at the

damage to those levees after the fact, everybody shook their heads and they just couldn't have stood another twenty-four hours of that–absolutely not. In fact, the levee system that gave way on the Yuba River that flooded the little towns of Linda and Olivehurst, that levee was thought to be in much better condition than the American River levees. It had a freeboard of ten feet, we were running five feet–even less in some places, and it managed to stay together.

"I just hope we don't have to kill people in Sacramento before we build Auburn. . . ."

I just hope we don't have to kill people in Sacramento before we build Auburn.

Petershagen: How do we stop from having to kill people?

Boll: Well, you're not going to be able to move them all out of the flood plain at this point, not with the development that has occurred, not $30 billion worth of infrastructure. What you could have said a hundred years ago was, "Maybe we shouldn't have built in the flood plain." And that's probably some rationale, but we didn't know the extent to what that was a flood plain at that point. You didn't have all the hydrology numbers

you needed. I would have loved to have seen the 1862 flood and to have seen the extent of the water and to be able to go on a boat from, say, Lincoln to Woodland. (Laughs) Would have been a fun boat trip for me.

Petershagen: Let me stop you here while you're pausing, because I have to change the tape again.

Boll: Sure.

END SIDE 2, TAPE 1. SEPTEMBER 2, 1994.
BEGIN SIDE 1, TAPE 2. SEPTEMBER 2, 1994.

Petershagen: Larry, as we finished up the previous tape, we were discussing the flood control danger. My question to you was, I guess, how do we scare people sufficiently to raise the level of concern to understand that there *is* a serious flood danger here in Sacramento?

". . . short term, we're talking about reoperating Folsom to provide additional flood control. . . . There's some costs to it, and some tradeoffs for it . . ."

Boll: And I think most of the people would agree there is. What to do about it is the controversial issue. For the short term,

we're talking about reoperating Folsom to provide additional flood control. And there's a reoperation scheme to do so that's a good one, that certainly I agree with should be done. There's some costs to it, and some tradeoffs for it, but probably the right thing to do at this point, until you have something in place like an Auburn. So short-term, you'll increase flood protection to the hundred-year level on the American River by reoperating Folsom, and doing so in conjunction with some reservoirs upstream higher in the watershed, and watching the levels of those reservoirs, because they can contribute–you don't control them, but you do know what's going on up there.

". . . that scheme, I think, will be adopted . . . and the cost for doing that . . . will be borne by the Sacramento Flood Control Agency, the beneficiaries of it . . . There's a lot of secondary cost to it that will not be repaid. . . ."

And so that scheme, I think, will be adopted, put in place, and the cost for doing that–that is, the cost in power generation and the cost in some recreational costs, some additional pumping costs of pumping water to customers that will increase as a result of

that reoperation, will be borne by the Sacramento Flood Control Agency, the beneficiaries of it, which ought to be–after all, those that get the benefit ought to pay the cost, at least the direct cost. There's a lot of secondary cost to it that will not be repaid. And so that will help it to a hundred-year.

". . . hundred-year flood protection for the major metropolitan areas is just not sufficient, and sooner or later that needs to be increased. . . ."

But a hundred-year flood protection for the major metropolitan areas is just not sufficient, and sooner or later that needs to be increased.

Dams Are Preferable to Levees for Flood Protection

You can probably increase the levees to carry a higher flow down the river, to increase it, but levees are a poor flood control structure compared to a dam. Levees fail. Dams do not fail. And levees are a big maintenance chore. They also do a lot of environmental damage to *build* the levee, to build them higher. You've got to control vegetation. You've got to dredge

out a very scenic American River Parkway and do some additional work in there that will be very environmentally destructive and cause a lot of concerns.

"In fact, I think the Bureau built Hoover Dam in five-and-a-half years. We couldn't even write an Environmental Document for Auburn in five-and-a-half years today. . . ."

But you also have a big environmental movement now with a lot of environmental laws, and the books that make building any dam very, very difficult. In fact, I think the Bureau built Hoover Dam in five-and-a-half years. We couldn't even write an Environmental Document for Auburn in five-and-a-half years today. (Petershagen: Right.)

"And after we *did* it, then we got to spend a couple more years in court, convincing folks we did it. . . . It's so easy to stop anything, and very difficult to do anything today. . . ."

And after we *did* it, then we got to spend a couple more years in court, convincing folks we did it. I mean, just *protracted* paperwork and legal battles. The pendulum is *way* over here. [Hands and arms to one side.] It's so

easy to stop anything, and very difficult to do anything today.

And sooner or later that's going to have to change. The pendulum will change. It will. You can't build a big powerplant in California today. You couldn't build a new nuclear plant. You couldn't build a coal-fired plant. ~~You~~ So you're doing with wind plants and solar plants and little co-generation plants, but the day is coming when we're going to have some brownouts. We scheduled it. It's only a question of *when*, not *if*. And when that comes, it's going to upset people. But you don't build a big powerplant in eighteen months–it takes a while to bring one on line.

"I think the pendulum will change, it'll swing back, and of course when it does it always tends to swing too far. I think when the Bureau was in its heyday of building we didn't take *enough* concern of environmental issues when we were building. I think that's a fair criticism of the Bureau. . . ."

I think the pendulum will change, it'll swing back, and of course when it does it always tends to swing too far. I think when the Bureau was in its heyday of building we didn't take *enough* concern of

environmental issues when we were building. I think that's a fair criticism of the Bureau. *Cadillac Desert*[3] has some good things to say. I don't agree with everything in it, obviously. I think it goes too far. Some of the criticism of the Bureau is justified. Now the pendulum is all the way over here, and to say every dam is always only bad, and that everything the Bureau did is bad, you know, and bashing the Bureau is in vogue, and that obviously is not the case either. And the middle ground will never stay around, the pendulum will swing right through it and go back the other way and we will be blasting environmentalists within twenty years. But that's not today, but that time will come.

". . . so we have a difficulty in this society of finding some middle ground on it [environmental issues], I think. We will eventually get there, but the process sure is painful. . . ."

And so we have a difficulty in this society of finding some middle ground on it, I think. We will eventually get there, but the process sure is painful. (Chuckles) Sure is!

3. Marc Reisner, *Cadillac Desert: The American West and Its Disappearing Water*. New York: Viking Press, 1986.

Petershagen: Is it fair to say that maybe the Bureau was too quiet in its own defense (Boll: No question about it.) say, twenty years ago?

Boll: And not just the Bureau, but I think it's true of the water industry as a whole–the water districts and those involved with water, not just the Bureau. They were very good at what they did, but they were conservative people. They were not good at PR [public relations] work, they were not good at standing up to their own defense. That was an arena that they did not function in. That was not their forte. And that's true of many of the little water districts, even around the area today that I've worked with so long. [I] said, "Folks, you need to start standing up and be more aggressive in your stance, or you're going to get run over." And they're starting to learn that, and the Bureau as well. But again, the Bureau as a federal agency has a limit to how much it can do in its own defense, too, because by nature, water is a political thing, and you have to be subservient to the administration that's in power. Trying to make California water decisions in D.C. is idiotic.

Petershagen: Is that as generous as you can be? (Laughter)

"You got to remember, this is basically the California Water Project that we operate here. That was the way it was designed to be in the 1920s . . ."

Boll: Probably could use stronger words. You got to remember, this is basically the California Water Project that we operate here. That was the way it was designed to be in the 1920s, and the only reason that it got to be a federal project is the state couldn't float their revenue bonds in the '30s, and turned to the federal government for help.

Believes California Ought to Run the Central Valley Project

Well today that's not the case–California ought to be able to take care of its own. Central Valley Project is just a California project. It doesn't impact surrounding states. The watershed does not go out of the state, so there's no reason why the federal government should be running it. It ought to be run from Sacramento, not D.C. But to even make that process happen today, I mean, the environmental impact statement would be five years and $50 million. Then you got a couple of years of lawsuits, because there's winners and losers. And

then you got to get it through Congress! And it would expand over into two administrations. And so those involved with the political decisions aren't highly motivated to do it. It's something that *ought* to be done, but the process probably is too difficult to make it happen.

Petershagen: When you say, "it's something that ought to be done," I'm going to try to pin you down here now, you're saying that the state should assume control of the Central Valley Project?

"Why let a state project and a federal project run side-by-side, decisions of one in Sacramento, another in Washington, D.C. . . ."

Boll: Absolutely, yeah. Why let a state project and a federal project run side-by-side, decisions of one in Sacramento, another in Washington, D.C., being made and let it to be a political football in D.C.? That's dumb. Some politicians make their living trying to kick the football that's in vogue, and that's called the Bureau of Reclamation. Well, I'm getting tired of being the football being kicked. As an engineer, I think we ought to be running the project in a logical, reasonable manner, not being kicked around

by political types. That's a real frustration, and you ought to get out of that game and play a different game and get the stadium removed from D.C. and get it out to Sacramento. That would be a good first step, but the process to that is very burdensome and expensive and probably won't happen.

Petershagen: I think of the people I've interviewed so far, you are the first–you're certainly the most outspoken–on the side of state control of the CVP.

Boll: I am, huh? That's somewhat surprising. I'm sure there's others that share my view–have to be. Some people will say that the state wouldn't make good water decisions. But gee whiz . . . (Petershagen: I guess the real cynic would say . . .) You got to be making decisions closer to where the action is, and not in afar D.C., that have some other motivations, and where outside interests have greater influence on those decisions. You need to get them down to the lowest level of government that can make a responsible decision.

Petershagen: I guess the real cynic would say, "What makes you think that the California

Assembly and State Senate can make better decisions than those in Washington?

Boll: Sure, and "those clowns." It's easy to see that side of it. But it is closer to the way it should be. Yeah, they're a bunch of clowns here–the circus in D.C. isn't pretty either. (both chuckle) Having been there for the last year in D.C. and seeing the mentality in the Beltway, (Chuckles) I don't like *either*, George, but I'm convinced the decisions ought to be made as locally as you can make them.

Petershagen: Okay! Well, we talked a whole lot about your shepherding the Auburn Project as the project manager, the project superintendent, at Folsom. What other kind of things go along with that job?

Folsom Is in a Major Metropolitan Area and Therefore Has Special Issues

Boll: Here's a major water development within a metropolitan area. Most of our major projects in the Bureau are somewhat remote: Shasta Dam is quite a ways outside of Redding, and Redding at that point was a much smaller little town than it is today, too. I know Trinity Dam is far removed. And

you look at some other *major* projects of the Bureau–in fact, we *built* towns around them: Page, Arizona, and Grand Coulee, Washington, and Hoover Dam created its own Boulder City community there. And so there was very little interaction of a major metropolitan area around the projects we built.

Folsom is right within a major metropolitan area. And so, as such, you're really in a fish bowl. I mean, you're a *major* part of the community in the decisions you're making, and what's going on, and the operation of that facility. Everybody is helping you run that place. And so the interface with the public is very important in that job. You need to be a spokesman for that facility there and people want to have good information flow, and you're dealing with many other public agencies that are influenced, that are very interested in what's going on. So dealing with the public, twenty, thirty years ago, you didn't worry much about Project Superintendents being good PR people, they were there to run a project, and they were engineers that came up through the ranks and ran it. Now you need a manager that is also skilled in public relations and interfacing with the media.

And *that* was an education! How do you interface with the media? And learning to do that successfully is a learning process. And we're now training managers to be able to do that. But twenty-, thirty- years ago in the Bureau, why, that wasn't the criteria, or you didn't give much thought to that–that was kind of a sidelight after the fact, minor part of the thing, in some managers.

Petershagen: Were you trained to do that, or was it largely the school of hard knocks for you?

Boll: It was a combination. I did get some good training, apart from the school of hard knocks, but also very much within it. I mean, this project really does have a lot of visibility. And then, of course, pushing Auburn, talk about being in the center of the storm, why, that was it! And it was something that I enjoyed. I mean, if you didn't, you don't belong in the kitchen, right? If you don't like the heat, get out of the kitchen. And I found that was something that I enjoyed doing. I'm comfortable in that environment. I'm comfortable before a group, talking. It's kind of fun. I used to be scared to death of it, (Chuckles) but I find that it was something that I could do and work in that

environment and enjoyed doing it.

Petershagen: In a way, you anticipated my next question, I guess, because I've noticed as we've talked here, that you speak with a good deal of confidence, and you're certainly not ashamed of any of your opinions! Is that something that comes natural, or is that something that you learned in conjunction with your Folsom experience.

Boll: If you ask my wife, she would say I've always been like this and I just found the theater to perform in. (Laughter) I don't know. I never thought of myself as being that strongly opinionated or expressing it as strongly as people tell me I do. So I've come to try to, and my wife has convinced me that I really am that way, so I must be. (Chuckles) And I guess I do have strong opinions. I do express them strongly, and not as strongly as I think I do. But I don't see myself as well as others do, and I learn to see it that way, and yeah, I guess I must confess that I hold some pretty strong opinions and express them that way, and apparently with a lot of confidence, because I can be threatening to people.

Petershagen: To follow up on that a little bit, how did

living in the fish bowl like that affect your personal life? How do you go home from work from your Folsom job and not want to kick the dog, for example? Or maybe you did, I don't know.

Dealing with Job Stress

Boll: No, I could do that. I could learn to leave the job and come home and relax, usually. You know, once in a while I'm sure I'd take it out on my wife or whatever, or I'd find a release. Physical exercise was always a *great* stress reliever for me. I mean, go swim for forty-five minutes, or go to the track and have a good forty-five-minute workout. And that was just a great stress-reliever, because the job carried a lot of stress with it. There's always two aspects to that. One is the stress that the job has, and the other is what you do with it as a person, how do you handle that. You can't do much about the job, but if that's getting to you, you'd better find another job. But you *can* handle what you do with it. I've always been able to let that go. Work hard, come home, get some exercise and let it go and sleep well at night. Even in the midst of the turmoil I was able to do that, so I found I could handle that pretty well. It didn't get to

me physically or mentally, the strain of it. Challenging job, though.

Petershagen: Let's take you out of that then and take you back to Washington for a while. (Boll: Uh-huh!) Now, I'm sure that your success at Folsom probably had a good deal to do with your selection for that job, but what in the world does this Region's liaison officer do in Washington? Why do we even need one? Let's start there.

Regional Liaison Positions in Washington, D.C.

Boll: Liaison positions were established a couple of years ago. Don Glaser established them. Having some experience, he said, "You know, if we really had a good spokesman for the regions in Washington, one that had a good knowledge of not only the facilities in the region, but also a good interface with the managers and the regional director and a hand on the pulse out there, in Washington, it would really help in the communication of issues that are being dealt with in Washington, to lend insight to them, to give briefings to people that want to know of this issue in more detail from someone that's closer to it, to bring a fresh viewpoint from the field into that Beltway environment." It

really is a different environment. They were established to rotate like every two years so that the person coming in was fresh from the region.

Also, when [they] communicate on the phone back here to the regional office with whoever you're talking with, it's not just talking to a position, but you had some real rapport with the individual, and you were a real support. You really worked for the Commissioner as well as regional director–you worked for both, and you were the regional director's spokesman in Washington on many issues, as well as providing a source of contact for people in the Beltway for the California water issues that were, and *are*, humdingers. It turned out to be, I think, a real successful thing. I think Roger [Regional Director Roger Patterson] feels that that position has been a real help, and the commissioner has felt that the liaison has been a real help.

Served as Regional Liaison During a Change of Administration

And I was there through the changeover of a new administration, where that's true in spades, because you have a

whole bunch of new people coming in that want to get brought up to speed on some major issues, quickly, and that person, the liaison for the region, whichever the region the big issue is, can provide a quick on-the-spot access to current information on those issues. And you may be called to go give a briefing to congressional staff tomorrow on an issue. Well, you don't have much time to get ready for it. You have to *be* ready, and that kind of person usually is, to be able to do that.

When visitors come to the Washington Office, as they do, you can usually go in with the commissioner, be in those meetings, and then be someone that is *very* familiar with the issue, firsthand knowledge of it frequently, and really lend some credence to the issue and some good feeling that the people, "Hey, these folks here in Washington really do understand what we're talking about, and have an intimate knowledge of it." And they would feel that, the liaison could provide that. And certainly having spent my career, thirty years, in the CVP before I went to Washington, and having been on the diving team, every facility in the region (Chuckles) I've been on, personally, and felt, above

water and underwater, as well as knowing the managers and worked with them, and so was able to function in that role.

". . . as the new administration comes in, some new people come in that many times know zip. . . ."

And then as the new administration comes in, some new people come in that many times know zip. I mean, Dan Beard certainly is a very knowledgeable water person of the West, but some of the key political appointees under him had no more knowledge of water than the man in the moon, and they came in with a lot of ability, and a lot of zeal, and ready to run, but weren't sure which direction. (Laughs) So they have a real education process, and trying to bring those people up to speed and to make some intelligent decisions quickly, was a challenge. And then during the process of the change of administration, there was a period of time where major decisions are just kind of put on hold, and things are sort of running and waiting for some major decisions to happen. It's a very interesting time to be back there.

Retired at the End of the Liaison Assignment and

Will Retire to California

Petershagen: Now that was your final "tour of duty," so to speak, with the Bureau. (Boll: Yeah.) Any thoughts along the way of perhaps staying back there after you retire?

Boll: No. No, we were ready to come back and live in California. It was time for us, we felt. My wife had just graduated from college in December–she finished college–only took her forty years! (Laughs) Grandma went back to school and graduated with honors. (Petershagen: Well, good for her!) I mean, she's just an excellent student.

Petershagen: From where?

Boll: From Sac. State [California State University, Sacramento] here. She didn't miss a beat. She's one of those people you hated in college: She sets the curve. (Laughs) And whatever she did, she just does well. That's part of what keeps Grandma young. So she was graduating, and it was time for us to think about what we're going to do now, the next phase of our lives here. Living in Washington was not . . . Staying back there another year would have been interesting, the job was,

but we felt it was time to move on and do something else.

Petershagen: I'm sure it's the kind of a job, though, that if you wanted to, you could devote your energies in the right directions to lead up to some sort of consulting, lobbying, that kind of a job in Washington.

Boll: Oh, I suppose. That's not what I enjoy. But it probably could.

Petershagen: A lot of contact with the senators and the congressional delegation from California itself back there?

Boll: Yes. You get to know some of the staffers real well. The water community, those people dealing with water issues in California, in the Beltway, is not a large community. You look at the lobbyists, the key Senate staffers, and the key congressmen dealing with that legislation is not a big bunch of people. It's amazingly small. And so you get to know most of the real movers and shakers back there and what's driving them. It's an interesting dynamic for sure. Oh, that was an education!

Petershagen: My guess is then that you would have spent probably a lot of time with Congressman Miller's staff?

Boll: Interfaced with Congressman [George] Miller's staff, with Congressman [Victor-Vic] Fazio's staff, as a key person in it. And in the San Joaquin Valley, the Congressmen [Calvin–Cal] Dooley and [Richard] Lehman are key people in it. And then the committee that Congressman Miller chairs and that Senator [Bill] Bradley chairs on the Senate side, the two key committees dealing with water issues and the staffers involved with that, we deal with.

Petershagen: Now, we've really gotten all this out of any sort of chronological order.

Boll: Oh yeah, we sure did, George! We've run around the table! (Laughter)

Succeeds Dick Klinke as Branch Chief

Petershagen: Let me try to bring you back to Sacramento. You took over as Branch Chief from Dick Klinke at about the time that the Western Area Power Administration was coming about?

Creation of the Western Area Power Administration in the Department of Energy and its Effects on Reclamation

Boll: It was a little after. I think that was '77, was when the Department of Energy was formed under the Carter administration. And then of course it took some time for that, but then the Power Division was really split in two. When Western was formed here in Sacramento and the Western Office was established, why, it just split the Power Division. Those people went to Western, and it was a jagged tear in the Bureau when that happened, because some of the facilities went to Western as well. If it had just been a power marketing function, and so just the paperwork and the contracts had gone, but you left all the physical portions of it together, instead of trying to separate them, it would have been a much cleaner thing.

But you see, most of the switchyards went. And a switchyard and a powerplant are *intimately* related, and to try to separate them is . . . *idiotic*! I mean, we were literally in that process saying, "Well, this wire is a Bureau wire, and this wire is a Western wire. And the interface in this switchyard between Bureau and Western is

the top of this bushing of this transformer where they come together." That's dumb and it lent itself to some poor decisions, a lot of additional construction of control facilities to operate the switchyards, as opposed to the powerplants. And the cost of doing that is picked up by the power customers, the people using the electricity have to repay for that. And there's not many people that really grab ahold of that of the public, but their power bills went up because some additional facilities and costs were added, because of how that happened.

Well, on the Bureau's side, when you take the power function out of the Bureau that way, a couple of things happened: one, it created some hard feelings, in part because now people that had been working together are really competing for some of the same resources. There was, I'm sure, some jealousy and enmity.

Western Tended to Have a Higher Grade than Did Reclamation for the Same Work

Western tended to have a grade increase on the Bureau, and so most of the people went

over there with a grade raise, doing much the same work, and so that left some hard feelings. And it created some difficult working.

And it depended very much on the people involved. Some people adapted to that readily and tried to make it work. Others carried some hard feelings with them. There was some friction in there. And when I became branch chief, a lot of my *real* good friends, had worked with for years, were now with Western, and maintained that friendship. And I made a very conscious decision that I needed to, as the primary power spokesman in the regional office, as the branch chief for Power O&M, and so the main interface with Western was through that staff position, that I needed to really facilitate a healing relationship with them, and work hard to bridge that gap and make it work, because it needed to work. I mean, egos and jealousies have no place in that at all, and there needed to be some very conscious effort to make that relationship work and work well. And I worked hard at doing that, and came up with some real agreements, the Coordinated Operation Agreement with Western was one that we put together in the branch while I

was branch chief. I worked hard to make that a conciliatory relationship. "It wasn't the right way to do it, but it was done, and let's make it work, gang. It's time to move on."

Petershagen: Let's stop right here and I'll turn the tape over.

END SIDE 1, TAPE 2. SEPTEMBER 2, 1994.
BEGIN SIDE 2, TAPE 2. SEPTEMBER 2, 1994.

Petershagen: Larry, as we wrapped up the other side of the tape, we were talking about this ripping out of one part of the Bureau and the creation of the WAPA organization and everything that meant in here. In some of what you said there was at least a hint of some personal difficulties that came about. Do you think that by now most of any personal hard feelings that were created have been overcome?

The Way Reclamation Facilities Were Split up Was Unfortunate

Boll: Yeah, I think so. I think time is a real healer of wounds, and I think that's probably happened, George. I think it's unfortunate *how* it happened and how the division was

made. I think if, as I said, you'd just taken the power marketing function, instead of some of the hardware facilities with it, it would have been a much better division than it was. Or, if you have to go further, you should have taken the whole power system, including the powerplants and made them part of Western–one or the other. But I think how it happened is unfortunate, but it did, and we'll make it work at this point.

Petershagen: Would just leaving things alone have been a better option in your mind?

Boll: I'm not sure I can speak to the benefits that have been created by Western. You know, there are other power marketing organizations–the Southwest, the Bonneville, Alaskan Power Administration–that they were patterned after, especially Bonneville. Whether there are some benefits now as a result of Western working closer with those, especially with Bonneville, and I don't know the advantages of that. I'm not in a position to really tell if that has had some distinct advantages or not. I see the downside of how it happened with facilities. There's, I'm sure, some positive upside to it, and whether it outweighed it or not, or what would have happened had it

remained with the Bureau, I don't think I can speak to competently to really give you a good feel for that.

Petershagen: As far as things were going here in Sacramento, there was really no need to make this division, right? Would you agree with that?

Boll: I think that's probably true.

Petershagen: I mean, it really was a political decision made in Washington (Boll: Absolutely.) to establish a new energy posture nationally.

Boll: Oh yeah, it really was. And just how that fell out is the unfortunate part. And some decisions made in a closed room in D.C. no doubt had major influence. And maybe there's some reason to do that with other regions more than Central Valley Project, because this is such a tight project with headquarters in the Sacramento area, that I think the functions would have happened much the same way had it remained with the Bureau here. Probably not too much difference here. Maybe other regions there were some other good reasons for doing it.

Petershagen: Are there any other specific projects that we

should talk about, perhaps?

Boll: (pause) Have you had a good feeling for the Newlands and the Washoe Project and Truckee River issues?

Petershagen: Well, no, I want to leave those out, because they're being covered separately.

"Truckee River issues are just a good way to look at all of the Bureau issues throughout the West. . . . You've got it all there, and if you begin to get a grasp of those, you get a grasp of all the major issues elsewhere within the Bureau. . . ."

Boll: Okay. Truckee River issues are just a good way to look at all of the Bureau issues throughout the West. If you just look at Truckee River, because there you're dealing with all the issues in the world. You're dealing with Indian tribes and endangered species and Lake Tahoe and *two* states. I mean, you've got it all–Reno-Sparks, a major growing area. You've got groundwater problems. You've got pollution with that. You've got it all there, and if you begin to get a grasp of those, you get a grasp of all the major issues elsewhere within the Bureau. CVP has them, too. They're just on a much bigger scale. That

little Truckee River has them all. It's a humdinger, as well as the first dam the Bureau–D.C. 1, Derby Dam. But that's a good issue.

Petershagen: If you could sum up what you think the Bureau of Reclamation has done for California, in the Central Valley Project, in a few words–and I don't mean that to limit you, but–how would you describe that?

Reclamation Was Charged with Developing the West and It Did That

Boll: I think from the Bureau, and then maybe from a personal viewpoint, too, as an engineer in this organization the Bureau was established to help settle the West, to develop the arid West. That's what our marching orders were, and that's what we did, and we did it *well*. In fact, some people would say we did it too well. We certainly did! This Central Valley was a desert, and we made the desert bloom, and it is the most productive agricultural valley in the world, period. Excellent soil, dependable water supply, growing season, makes you grow a *huge* variety of crops. I think, what is it, twenty-five percent of all the fruits and vegetables in the United States come from

this valley. Just you can grow everything here. So we certainly made the Central Valley the productive valley it is today.

". . . to blame all the problems of the environment on the Bureau of Reclamation is idiotic. I mean, we're not the only ones that have caused it. We've contributed to some of the major environmental problems, no doubt. So have others, that are not being given their fair due. . . ."

I'm sure if we had done it over today, we would have done a whole bunch of things different, but to blame all the problems of the environment on the Bureau of Reclamation is idiotic. I mean, we're not the only ones that have caused it. We've contributed to some of the major environmental problems, no doubt. So have others, that are not being given their fair due. And the solution should not just involve the Bureau of Reclamation, therefore. It ought to involve all those that are part of it, and there's an undue burden being placed on the Bureau to solve all the so-called environmental ills, and the Bureau is not able to do that. And therefore, for the environmentalists, it's their favorite football to kick, and they love to play the game.

"The solutions to those problems are much more difficult than some folks would like to make them [out] to be. . . ."

The solutions to those problems are much more difficult than some folks would like to make them [out] to be. I mean, if you didn't have the dams, you'd still have the problems, but no wherewithal for the solution. Neither would you have water for the farms or for people, and you need both. In an open society like we have, it's a very difficult thing to try to run water policy in the public involvement process–very, very difficult to do, very expensive, time-consuming, and the process is easy to attack. And doing things are very difficult to do. It's a tough environment to work in right now, as Roger [Patterson] would readily attest to. *Very* difficult, and it's not getting better.

Liked Having a Diversity of Engineering Work When He Came to Reclamation

From just an engineering, from a personal viewpoint, what an excellent career. As an engineer today, you quickly get into a very specialized, narrow technical field for ninety percent of the engineers.

Here, as a mechanical engineer coming to work for the Bureau, and I deal with everything from mechanical equipment that have shafts on them that are six feet in diameter, to microcomputers. And everything in between! Boy, talk about a jack of all trades, master of none! I mean, you're *really* stretched technically as an engineer to deal with the variety of technical issues you deal with. And I've been able to work in all of those areas, from every powerplant and major facility we have in the Central Valley Project. So it was anything but boring. It was always an interesting adventure, always new, exciting place to be around. And then with just a *fun* group of people to work with. It has been a blessing to work with the people I've had to work with, in the *variety* of jobs–it's *fun* going to work, and has been. Enjoying what you do is a blessing. It's a gift, and I've just really appreciated it.

Petershagen: When you first came to work for the Bureau, it must have *really* seemed exciting to a young man from Iowa. You've studied engineering. Now you're assigned to a construction project, all this stuff going on around you. (Boll: Yeah.) But over the years those construction projects have

become fewer and farther between. Did you notice that having an effect on the Bureau, on the people?

Boll: Well, yeah. If you've ever been in the midst of a Bureau construction project, it is one of the most exciting, rewarding places to be, to see the *major* structure being built, the major project coming to fruition, and working with some of the biggest equipment and some of the best contractors around is just a real trip. The people who were in the construction end of the Bureau, of course, are being phased out, and there's fewer and fewer of them around, but those people were real characters, and living and working in that environment, it's unique. They're a unique group of people that just knew how to get things done, to work with the contractors and boy, there were some characters!

Big Construction at Reclamation Is Coming to an End

And the project construction engineers were a little god. I mean, they made decisions that at that point carried *enormous* impact of what they would say. Today you couldn't even begin to do that, especially on some of

the big projects in Page, Arizona, or Hoover Dam, I'm sure. They were the mayor of the city (Laughs) that was there. I mean, their job was a twenty-four-hour-a-day job, no question about it, in everything they did. That part of the Bureau is coming to an end. The day of the big Bureau construction is drawing to a close, never to be revived, as it has been. But as one of the foremost engineering outfits in the world, and to see the structures they've built, that was the Bureau's heyday, no doubt.

Reclamation "turned from this big construction organization now into a resource manager in the transition that's been going on for twenty years . . ."

And it turned from this big construction organization now into a resource manager in the transition that's been going on for twenty years, and to the point where construction is continuing to diminish and we will do very little of it, probably, in the future.

Petershagen: Was there a day that you might have awakened where you noticed that no longer is this a resource development kind of a place, but now it's a resource management

agency? Was there a time you could put your finger on?

"Growing up in the organization, I was always around the big construction as well as bringing the facilities that *had* been constructed into an operating and maintenance organization, and that transition was a fun thing to do . . ."

Boll: Yeah, I think that was an evolutionary thing. Growing up in the organization, I was always around the big construction as well as bringing the facilities that *had* been constructed into an operating and maintenance organization, and that transition was a fun thing to do–a *lot* of work involved with bringing the Trinity River Project, to bringing New Melones, to bringing San Luis–to see them completed and then to bring them into an operating and maintenance engineering organization. And to work out the invariable bugs and the problems with them, and to correct those things to make them part. And that's not happening anymore.

Frustrated That He Couldn't Get Auburn Dam Going

And you know some of the frustrations I

feel, of course–one was certainly Auburn, having put in so much, and coming that close a couple of times to seeing that Auburn was going to go, and then to see it fall flat, was frustrating, to see one political vote change it. I mean, I was really wrapped up in that one, George, to the extent of the contacts that I had with people that I'm not going to make part of the record, but working with the political types involved with it so intimately as I had and was, and trying to orchestrate that thing through the process, and *almost* having it, and then seeing it fall apart was frustrating. And the Bureau's not going to be able to orchestrate that kind of thing in the future. We gave it a best shot to doing it, and almost pulled it off and didn't make it.

"The Bureau's going to continue to be a resource manager and a major player in California water politics. As the biggest water purveyor in the state, it obviously will continue. . . ."

The Bureau's going to continue to be a resource manager and a major player in California water politics. As the biggest water purveyor in the state, it obviously will continue. You need to be a real people person in the decision process to make that

work, as Roger [Patterson] is, to work with people well, because you're not going to do anything apart from that.

Water Is a Political Issue That Has Been Used by No-growthers

Water is such a political issue. You know, the no-growthers grab it as, "Hey, we finally got a hold on something that we can use to limit growth. Here's something, we think," and they're not about ready to open up their grip on it. And they've been looking for that tool for a long time, and now they think they have a hold of something they can use for that purpose.

Concerned That Farmers Are Being Hurt

Growing up as a farm boy in a small farming community, farmers are not very good at speaking up for themselves, they're very much the rugged individualists–have to be to survive it. People in California think groceries come from the grocery store, not from the farm. They don't make that connection. Maybe intellectually they do, but they don't really make that connection. And so until we see that real impact in the grocery store, they're not going to

understand too much of what's happening. Farmers are a victim of their own success in many ways because they've known the hard work and the technology of farming and how to make that work is really, for the last thirty years, has really been a thing to behold. Those in the industry are just remarkable, with the increase in productivity, and the advances that we've made in efficiency and farming practices, and how to get the most out of it. We pay less for groceries in the United States as a percentage of our income as any nation in the world. And we're spoiled. And until we see that percentage increase dramatically, are we going to really appreciate what the farmer has done? And now, we're seeing farmers going bankrupt in the valley, and there's really talk about an unfair taking of the livelihood of a farmer by the government. And the way it's happening, it's just unfortunate to see the hard-working farmer be the guy taking the brunt of it. It just isn't fair. It just isn't right. And that's a frustration, something that I feel acutely.

Views on Groundwater Management in the Central Valley

I also see us overdrawing our

groundwater table in the valley. We're not good groundwater managers. And the technology and our knowledge of managing groundwater basins, we're kind of in first grade on that issue, and we've abused the groundwater table by overdrawing it as well as by the pollutants that we've allowed to flow into the groundwater. And trying to clean up a groundwater that's become polluted is a very, very, very difficult thing. So managing it well becomes of prime importance, and we're just starting to learn to do that.

Petershagen: Do you see that as perhaps a major role for the Bureau to take up for the future?

Boll: It's something that certainly needs to be done. We *need* to be groundwater managers and the Bureau needs to be involved with that. Should the Bureau be the ones involved with it or not, I think is an issue I'm not sure. Again, it ought to be the public organization/government that's closest to it to make the responsible decision, ought to be the ones managing it– certainly not the federal government, then, but those that draw from it. The closest ones to it have the greatest incentive to do it, and to do it well, and to keep it well. And

while the Bureau's incentive for that is certainly I think a good one, you need to get the people involved locally with it to do it. And the federal government has been some of the biggest polluters of it: the military bases and the irresponsible dumping that they did of polluting groundwater around the major bases throughout the country.

We Need to Deal with Agricultural Drainage in the San Joaquin Valley

We need to deal with agricultural drainage. We know some of the answers for how to do it, but implementing those answers is very difficult because of the environmental hold and the environmental laws we've created. It's easy to stop anything, just add another choke point.

"You cut off the drainage of a valley, you've consigned the valley to death. The only question is "when," not "if." . . ."

You cut off the drainage of a valley, you've consigned the valley to death. The only question is "when," not "if." History teaches us that, but history also teaches us that mankind learns nothing from history, unfortunately. And so not being able to

drain a valley, well, you've consigned that valley to death, and, boy, that's irresponsible. I mean, that's worse than that, and that's not a strong enough word for it at all.

So as a resource manager, there's just a real . . . It's *crying* for good leadership, and the Bureau's trying to provide some of that leadership, but it's constrained by the environmental laws and by the organization we have developed to do it. And for a federal government agency controlled out of Washington, D.C., to try to be a resource manager of the Central Valley–hmm, that process is unwieldy. It's just–I don't think it's the right one. It's a *huge* job, and you need to have a good organization set up to be able to deal with it, and it's not there. And what the right one ought to be, I'm smart enough to know, I don't think. We're behind the curve on it, no doubt.

Petershagen: What other issues might you want to talk about?

Expectations for Reclamation's Future

Boll: It's much more difficult in this environment

of water development today than probably when I first came to work for the Bureau. And so new people coming in . . . It's still, I think, a good place to work. There's still a real role for Reclamation. It's a different role than I saw during my career. What I went through won't be repeated for the new people coming in. It's going to be a different ball game, still challenging, still exciting, still a good place. Frustrations are going to be somewhat more, I think. We write reports instead of build projects now. (Chuckles) It's fun to see the fruition of something you've worked on and designed and constructed, and we're not going to see that kind of thing too much anymore, but it's still going to have its own challenges and rewards. But hard work always carries it's own reward with it, and those that labor at it will see the fruit of it.

Petershagen: My son is a junior at Chico State [California state University, Chico] in mechanical engineering. Would you have some advice for him?

Find a Job You Enjoy Doing

Boll: Well, it's the same I'd give to anybody: When you find an area that you like to work

in, whether it's engineering or accounting or environmental or whatever it is, find a job that you enjoy doing. Life's too short not to work someplace that you enjoy. And when you are enjoying it, you're also a much more productive person, because your motivations and your energies flow readily to what you're doing. And you need to find that. Fortunately, I had one that I could do that with. And finding a job that's drudgery now would just be, (Laughs) having seen the other side of it, is just . . . Sometimes people are forced into that, I'm sure, George. Fortunately, I had one that was not. And I would hope that young people today ought to find something and do something that they really enjoy doing. And when you do, pour yourself into it, invest yourself into it. It's not just a job, it's part of your life–treat it as such.

Petershagen: Good words! I want to thank you very much, Larry, for taking the time to share your thoughts in this fashion.

I don't want to shut this recorder off and leave more thoughts on the table without your opportunity to bring them up. Is there anything else?

Boll: No, I think we've had a good time together, George. We've covered a lot of things, and it's kind of fun, having just retired, to reflect a bit on what I did do, and where the Bureau has been and where I think it's going. It's fun, having been very much a part of that culture and working here for thirty years as part of the Central Valley Project, and seeing it come up. It's fun just to reflect and talk about it.

Petershagen: Well, I'm sure that anybody that listens to the tape can hear that you've had fun, just in the way you talk. But I've also been able to witness your body language and your facial expressions, and it looked to me like you were enjoying yourself. Thanks once again, and with that, we'll conclude the interview. I just need once again to have you verify that you did sign that Deed of Gift and you understand this interview becomes the property of the U.S. government.

Boll: I do. (Petershagen: You're nodding your head.) Yup, that's right, I did do that, unfortunately. (Laughs)

Petershagen: Thank you very much.

END SIDE 2, TAPE 2. SEPTEMBER 2, 1994.

END OF INTERVIEW