

ORAL HISTORY INTERVIEWS

EDMUND (ED) BARBOUR



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**STATEMENT OF DONATION
OF ORAL HISTORY INTERVIEW OF
EDMUND BARBOUR**

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, Edmund Barbour, (hereinafter referred to as "the Donor"), of Denver, Colorado, do hereby give, donate, and convey to the Bureau of Reclamation and 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 June 10 and 24, 2003, at Building 67, Denver Federal Center, and prepared for deposit with the National Archives and Records Administration in the following format: cassette tapes and transcripts. This donation includes, but is not limited to, all copyright interests I now possess in the Donated Materials.
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Date: 6/24/03

Signed: Edmund Barbour
Edmund Barbour

INTERVIEWER: _____
Brit Allan Storey

Having determined that the materials donated above by Edmund Barbour 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.

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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.

In the case of this interview, the interviewee suggested numerous changes to the text to clarify his meaning. The result is that the text is extensively altered and normal oral history practices to indicate additions and deletions result in difficult reading. As a result, there are two versions of the transcript in this volume. "Version 1" contains the text virtually clear of strikeouts and brackets, [], indicating new material. "Version 2" contains the entire text, including all strikeouts and brackets.

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.

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Oral History Interviews: Version 1–Clean Copy
Edmund Barbour

Storey: This is Brit Allan Storey, Senior Historian with the Bureau of Reclamation, interviewing Edmund “Ed” Barbour in the Bureau of Reclamation’s Denver office in Building 67, on June 10, 2003, at about two o’clock in the afternoon. This is tape one.

Let me¹ begin by my asking you where you were born, and raised, and educated, and how you ended up at Reclamation Mr. Barbour?

Born and Raised in Port Arthur, Texas

Barbour: Okay. Well, I was born in Port Arthur, Texas. I went to school there. I spent a little time at the business college waiting to get drafted in the Army since my dad wouldn’t let me volunteer.

Drafted into the Air Force

So, I got drafted when I was nineteen, ended up in the Air Force, and spent time in the Air Force. Spent a little time in France, and Germany.

Enrolled in the University of Denver

And then when I returned, I decided I was going to go to school, which I tried to get in the University of Texas but they were on the semester system. So I decided to enroll at the University of Denver, because I could get there quickly (Laugh) and start for the following semester. So, I went and started at the University of Denver, never been to Denver before in my life.

Earned a Master’s Degree in Economics

Went on the Texas Zephyr. And, went to University of Denver, and liked it there, and got my master’s degree there, in economics. And, after graduating there, why I had three offers to go to work, and times were tough in those days, in 1950, getting a job.

Accepted Job Offer from the Bureau of Reclamation

One was with the Bureau of Reclamation and one was with the Bank of America, and the other was with Prudential Insurance Company in their investment department. I thought it’d be more *fun* to get into water resources. So, I accepted the job with the Bureau of Reclamation as an economist, and since I had a master’s they started me out

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. 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.

as a GS-9, instead of a seven, I guess, which was really nice.

Learned to Do Benefit-Cost Analyses in Denver

And I went to work in the Denver office for several months, learning how to do benefit-cost analysis, payout studies, and those sort of things under Harold Davis, who was Chief Economist in those days, and Ray Ahlberg² who was the Chief Reports person, smartest, one of the smartest guys I ever ran into.

Sent to Indianola, Nebraska, to Work in the Kansas River District Office

So, I ended up in Indianola, Nebraska, which was head of the Kansas River, which was the headquarters of the Kansas River District Office, as a neophyte. And they put me in charge of the economic studies for the Definite Plan Reports. If you're kind of interested in those days, these projects, the Definite Plan Reports were required in order to proceed with construction, but these projects were already under construction. We were writing the report as construction went along. (Storey: Um hmm.) Both the Frenchman-Cambridge Division, and the Bostwick Division.

“We did a lot of projects out of that office . . .”

We did a lot of projects out of that office, Kirwin, Webster. We did a lot of the economic studies there, but nothing too exciting happened there, except some of the controversies we had with the subsidy for irrigation and how the Missouri River Basin Project Payout Study evolved, and the fact that the irrigation projects in Nebraska, although they were authorized, were quite costly, and the subsidy was quite high per acre. And one of the reasons were some of the funny economics we had on the main stem projects.

Cost Allocation on the Pick-Sloan Missouri Basin Program

So, one of the first controversies I got involved in was the cost allocation on the Missouri Basin Project, where we felt the Corps of Engineers didn't treat us fairly. They didn't give us enough reimbursable allocations, so we ended up allocating more than we thought to irrigation and power than we needed to.

“ . . . cost allocations were always the *bane* of our lives . . . ”

But, cost allocations were always the *bane* of our lives, because—well multiple-purpose projects, you had to divvy up the costs, and the way you divvied them up impacted what people had to pay, and what the power rates were, and what municipal water rates were.

“ . . . cost allocation, in essence, is . . . *unavoidably arbitrary* . . . ”

And, since cost allocation, in essence, is *arbitrary, unavoidably arbitrary* because

2. In 1950 both Davis and Ahlberg worked in the Region 7 office, later known as the Lower Missouri Region.

you're allocating, you know, multiple-purpose costs, which supposedly are indivisible. So I had a lot of fun with that, analyzing, and *arguing* about what was the proper allocation to the various purposes on those major projects on the Missouri River Basin.³ The Corps built most of them, obviously, and we had the irrigation and the power part of it.

Power Costs Caused Problems with Benefit-Cost Ratios in the Missouri River Basin

We had some, one of the interesting things that happened, as I recall, is that when we did a pump project, we were assigned a part of the cost of the main stem, part of the power costs. And, the power costs were so high that it really impacted our benefit-cost ratios, and we had a *heck* of a time getting to unity, one-to-one. And one of the problems was the big suballocation that they made, on those major projects, to irrigation.

Sent a Blue Envelope to Jim Casey Suggesting We Build a Steam Generation Electric Plant Rather Than Use High-Cost Hydropower on a Project

So, I wrote in a blue envelope to Washington, as I recall, saying, "Look. Just let us build our own steam powerplant, a coal-fired plant. It's a lot cheaper than the cost allocation assigned to our project." And I sent that to a guy by the name of Jim Casey. I don't know whether you remember Jim Casey or not?

Storey: No. I've never met him.

Barbour: He was in Washington. And I told him that what they did was suballocated the powerplant part to commercial power and part to irrigation pumping. Although, there was no irrigation pumping. (Storey: Um hmm.) Consequently, the part allocated to irrigation was non-interest bearing. So, you can see that, in the payout study, if you had a big chunk of the power assigned to irrigation, and you didn't have to use any of the power for pumping, and all of that was non-reimbursable—was non-interest bearing, it was a very positive impact on the payout studies.

Storey: Was this the Intake Project?

Barbour: No, these were a number of [irrigation] pumping projects (Storey: Okay.) in the Missouri River Basin Project, in the early project. (Storey: Um hmm.) They're pumping out of the river, and anyone that wanted to use power—and you know they had a very cheap rate of 2½ mills for pumping power. And there was an allocation—that you had to accept this large allocation to go along with the cheap power, which made the economics tough, to me.

“So, I made the comment that, ‘Why, heck, irrigation is really subsidizing power, because of the way this allocation was made.’”

3. Several different names are applied to the Pick-Sloan Missouri Basin Program during the interview. This is one of them.

So, I made the comment that, “Why, heck, irrigation is really subsidizing power, because of the way this allocation was made.” And I wrote a blue envelope to Jim Casey in Washington, and he thought that was pretty good. So he accepted it as his own idea and he presented before a meeting. And, of course, the *political* ramifications of that were tremendous, because what you had to do, in order to change the allocation you had to increase the power rates, and no one’s going to tolerate increasing power rates. And, not only that, the cost of power increased, so you didn’t have the large subsidy, which was used, *ultimately*, to pay off the irrigation projects. So I remember, he called me. He says, “Ed.” He says, “Get rid of that blue envelope that you wrote me.” (Laugh) He says, “That got me in more trouble.”

“That was the first controversial thing I got into, was in McCook. Otherwise, we were building these irrigation projects, and we barely could keep ahead of the construction. . . .”

That was the first controversial thing I got into, was in McCook. Otherwise, we were building these irrigation projects, and we barely could keep ahead of the construction.

Lived in the Reclamation Camp at Indianola in a Converted German Prisoner of War Camp

We had a good time in those days because we stayed at the prisoner of war camp there. They had a German prisoner of war camp they converted to living facilities, and offices.

“. . . we had . . . up to 500 people working there. And we’re building . . . all those projects in the Kansas River Basin. We had lots of money. . . . one of the largest construction programs. . . .”

And we had something like up to 500 people working there. And we’re building all those projects, you know, Frenchman-Cambridge, Bostwick, all those projects in the Kansas River Basin. We had lots of money. (Storey: Um-hmm) We had one of the largest construction programs.

Storey: This was in ‘50, ‘51?

“. . . we lived . . . like a commune there, because we had a garden plot that was all shared, and we had little plots that we grew vegetables in. And it was an interesting society that we operated under . . .”

Barbour: ‘50 through ‘56 is the time I spent in McCook. (Storey: Um-hmm.) And we lived—it’s like a commune there, because we had a garden plot that was all shared, and we had little plots that we grew vegetables in. And it was an interesting society that we operated under, with the manager having the best, depending on your status, the kind of living quarters that you were entitled to.

“. . . the higher up you were, in status, the better living quarters you got. . . .”

So, the higher up you were, in status, the better living quarters you got. (Storey: Um-hmm.) But, we had good times in those days. That's the early years.

Accident While Duck Hunting on Trenton Reservoir

And, one thing I remember there had nothing to do with the work, except my buddy and I nearly met our maker in Trenton Reservoir. We were out duck hunting and got swamped and had to float into shore on decoys.

Storey: Which buddy was that?

Barbour: Hank Wilson, who ended up as Programs Chief in Washington. Yeah, he and I tested out the recreational aspects of Trenton Reservoir, which is now called Swanson Lake. One windy day, we got swamped, and we didn't have life jackets, so we floated in on decoys. It was kind of interesting. But there's a long story there. (Laugh) I won't go into that. It has nothing to do with Bureau of Reclamation history, except we got a good taste of the reservoir. (Storey: Um-hmm.)

Transferred into the Chief Engineer's Office

But, after that, I transferred into the Chief Engineer's office.

Storey: That would have been '56?

Barbour: '56. And, worked for Ira Watson and Earl Fogarty. And that's where I began to develop a reputation for working on special projects.

Worked on Drainage Issues on the Riverton Project

The first one was drainage at Riverton Project. I don't know if you've ever heard of the problems that we had on the Riverton Project. (Storey: Um-hmm.) So, one of the first studies I did was developing procedures for determining which drains were justifiable, which drains they could build, and which they would not. So, from there, I got a lot of interesting special studies.

Cost Allocation on Glen Canyon Dam

One was the cost allocation, on Glen Canyon, for example. (Storey: Um-hmm.)

Randy Riter Didn't like to Travel by Air

Which, I worked with Randy [John R.] Riter in those days. Dear Randy. He didn't like to go by air. So, when we went up to the regional office to discuss cost allocation, how we would revise the Glen Canyon cost allocation, that was big stuff for me in those days. That was one of the largest projects we had. And, he wanted to go by train. "Oh, you'll enjoy it." And, it was overnight by train to Salt Lake City. I swore I'd never do that again. He *slept* all the way through. But every stop, you know, you'd wake up, hear clacking of rails—but I did that for dear old Randy. He was a

great guy. He worked on all of those major studies, you know. He was the top hydrologist, in the Bureau of Reclamation.

Emil Lindseth's "Dirty Seven" Studied New Technologies

But some of the interesting things, I guess that's what we want to talk about huh? (Storey: Um-hmm.) I got to do special assignments, like Emil Lindseth organized a group and he had engineers, and estimators, Tom Hollearin, and "Big" Howard Cohan was a member of that group. He called it the "Dirty Seven." And, we looked at all the new technologies.

Studied the Economics of Nuclear Power and Desalting

And so, they sent a team of us over to Oakridge National Laboratories to learn about atomic energy and nuclear powerplants, and desalting of sea water using nuclear power as the power source, combined electrical powerplants with desalting plants. So, we spent a week up there, at Oakridge, learning the terminology and looking at some of the economics. Then later we got to apply them.

"It was a lot like science fiction in those days. . . ."

It was a lot like science fiction in those days. I guess I had the science fiction desk, because we began to do alternative studies using nuclear desalting. And, we had people come from General Electric, and Westinghouse, and we worked with the Atomic Energy Commission. And, in those days, they had an Office of Saline Water. A guy by the name of Hunter was the head of that.

We would get together with " . . . Atomic Energy Commission, Office of Saline Water, and put together *plans* for *major* nuclear desalting to *solve* the water supply problems in the Colorado River. . . ."

And, Atomic Energy Commission, Office of Saline Water, and put together *plans* for *major* nuclear desalting to *solve* the water supply problems in the Colorado River.

Bolsa Island Project Overseen by Manuel "Manny" Lopez

In fact, at one time, you know, we had a project called Bolsa Island. It came very close to being constructed.

Storey: Bulls Island?

Barbour: Bolsa Island.

Storey: B-U-L-L-S?

Barbour: B-O-L-S-A. Bolsa Island.

Storey: Oh. Bolsa Island.

Barbour: And it was an artificial island, to be built off the coast of southern California. It was to have two large nuclear reactors. And, of course you have to have one from Westinghouse, and one from G-E. One was a pressurized-water reactor, and the other was a light-water reactor. See, those were competing concepts in those days. So, we put one of each in. And then we used Oakridge National Laboratory's plans for building these *large* distillation plants. So it would take the residual heat, before you used *all* the energy in the turbines, we'd pull it off and still maintain some heat value, and use that to boil water and convert ocean water into fresh water, and very very salty wastewater-brine. (Storey: Um-hmm.) And, the plans were put together, and we selected an engineer to oversee it, which was Manuel Lopez.⁴ Did you ever hear of Manuel Lopez?

Storey: Yeah. I've interviewed Manny.

Barbour: Yeah? He was to be the leader there. We did a report on it, showing how much water we could produce, how much power. And, we thought we had both the utilities on board and the Los Angeles Department of Water and Power? Whatever their title is. And we were going to build it—had the plans.

Storey: M-W-D,⁵ huh?

Barbour: Yeah. And in one plan we were going to build this thing, and the island was like a large concrete donut, offshore. And I think it was to be *float*ed out, several miles from the shoreline, and then *sunk*, and backfilled. And two nuclear plants and the desalting plant were to be put on that island.

“ . . . just before we got construction, the utilities didn't like the idea of the federal government being involved in generating plants . . . And, the politics caught up with us, and, before we could get the thing underway, it was canceled. . . . ”

Well, just before we got construction, the utilities didn't like the idea of the federal government being involved in generating plants—nuclear generating plants. And, the politics caught up with us, and, before we could get the thing underway, it was canceled. But, someplace, somewhere, is a report, which we put together, on the economics of using nuclear desalting. In those days, you know, this was in the '60s, in the early '70s, (Storey: Um-hmm.) nuclear power was the thing.

Westwide Studies

When we were doing the Westwide Studies, which I did all the economic studies for *later*, we were projecting nuclear power by year 2000 would provide fifty percent of the total power. I think it's providing, maybe, eleven or twelve, thirteen percent now, to give you a idea. It fell out of grace, obviously, when they had the problems. But, not only were we going to be using current technology, which was the pressurized and light-water reactors, and we were going to consider fast breeders. And those were projected to be online, by the Atomic Energy Commission, by 1990.

4. Interviewed for Reclamation's oral history program.

5. The official title is the Metropolitan Water District of Southern California.

And, the benefit of fast breeders was that it generated more fuel than it consumed. Actually, when you produce power, you have plutonium, enriched plutonium left over, and you could sell it and recover all your operating and fuel costs.

“At one time, using our low interest rates, I got really in a bind because all my numbers showed that we’d have a *negative* energy cost. We made more money on selling plutonium, than we had to pay for the energy output. . . .”

At one time, using our low interest rates, I got really in a bind because all my numbers showed that we’d have a *negative* energy cost. We made more money on selling plutonium, than we had to pay for the energy output. And I said to myself, “This will never work,” so we just arbitrarily assigned 1 mil as the cost of energy for the fast breeder.

Planning to Augment the Colorado River by 10,000,000 Acre Feet

And, when we—we’re kind of skipping around a little bit, and, but talking about fast breeders, we did a hush-hush study for the secretary. And, Lindseth headed it out, Jim Douglas. I don’t know whether you remember Jim Douglas or not? He was assistant director, Region Seven. Jim Douglas and Emil Lindseth headed up the group. I did the economics. Charlie LeMoyné helped with engineering. And, this was part of the politics of the time. We developed a plan to augment the Colorado River by ten million acre-feet. And one way we were going to do it is *divert* water out of the Columbia River, and *move* it all the way into Lake Mead. So, this study was very confidential. And we had the opportunity and Emil Lindseth and Jim Douglas, and I, and one of the estimators—to present this to the Secretary of Interior, *on* a Saturday, *after hours*. *Because* it was, of course, very sensitive.

“Nobody’s going to fool around with Scoop Jackson’s river . . . He was head of the Interior Insular Affairs Committee. . . .”

Nobody’s going to fool around with Scoop Jackson’s river (Laugh) you know, in those days. He was head of the Interior Insular Affairs Committee.

Storey: Um-hmm. This would have been Stuart Udall?

Hearings on the Central Arizona Project

Barbour: Oh yes. Secretary was Stuart Udall. He was interested, of course, in the Central Arizona Project. That’s his home state. (Storey: Um-hmm.) And, they had been working to get that project for years, and years, and years.

Central Arizona Project Was a Birthday Present to Carl Hayden

And, it wasn’t until Senator Carl Hayden, you know, finally on his what, 93rd or 94th birthday, he got the Central Arizona as a project. I was *there* in the hearings when they introduced the old gentleman. And Scoop Jackson had the hearings, in Hayden’s Appropriations Committee Room, because it was a lot *larger* than Senator Jackson’s

Interior Committee hearing room. (Storey: Um-hmm.) So, that's another story. But, I remember that when they got the old gentleman, and led him down, and sat him down, Scoop Jackson did. And then we had our team, and Secretary of the Interior Stewart L. Udall, Kenneth Holum, assistant secretary, and Ed Weinburg, legal counsel and then Commissioner Floyd Dominy backing him up. And then Arleigh West, the regional director. And then we were about five or six deep. And, of course, we always had the witness statements, which Dan Dreyfus and I handled, with all of the supportive data, in case somebody asked a question.

Storey: Um-hmm. You were talking about this briefing?

Barbour: Going back –let's go back to that briefing. I'm getting this out of order.

Storey: That's okay.

Barbour: Wandering here.

Storey: We'll cover all of this.

Presentation to the Secretary on Colorado River Augmentation Was Very Secret and Was to Be Held on Saturday

Barbour: Wandering here. But, anyway, so the—on a Saturday—the night before, of course, we put all the, we got there the night before and (Laugh), this is very interesting. The night before, Jim Douglas and the boys celebrated a little bit. We had all the numbers and we're getting ready to make this big presentation. It was going to be in the secretary's office, on a Saturday. And, it was a very confidential meeting. We were not supposed to say anything about it. There were only *five* copies of the report made. And, they were watched very carefully. I tried to get hold of one and I never did end up with one. Charlie LeMoyné had one, and I don't know who has got the other. They may be in the files someplace. Small report.

Discussed Moving 10,000,000 Acre Feet of Water and Using Nuclear Powerplant/Desalting Plant on the Pacific Coast

And, not only did we discuss moving ten million acre-feet, using nuclear desalting, either at, on the coast, either at Camp Pendleton or one of the *coastal* situation, and hauling the water in and dumping it in Lake Mead.

“... we ... planned this canal, from the ... lowest dam in the Columbia River, and we pumped out a measly—I think to net ten million acre-feet—we had to pump about twelve or thirteen million acre-feet ...”

But then, we planned this canal, from the lowest dam in the Columbia River, and we pumped out a measly—I think to net ten million acre-feet—we had to pump about twelve or thirteen million acre-feet, (Storey: Um-hmm.) out of the Columbia River. It took tremendous amount of power, and I can't remember the total head. To me it seemed like it was 2000 feet, (Storey: Um-hmm.) total lift.

“ . . . you get the Columbia River water and *dump* it in Lake Mead. Now that was a big canal. . . . And, the pumping was costly. . . . ”

By the time you get the Columbia River water and *dump* it in Lake Mead. Now that was a big canal. (Storey: Yeah.) And it had a lot of pumping plants on it. And, the pumping was costly.

Studied Alternatives for Providing Power to Transport Columbia River Water to the Colorado River

So first, we analyzed using coal-fired plants, and then the conventional light-water–Westinghouse and General Electric nuclear powerplants. And, we had gotten good data from both GE, we had them come over, and Westinghouse and make presentation to us about what the costs would be and projection of yellow cake fuel which you had to project way out in time, and that was also interesting.

“So we decided that one of the alternatives was put fast breeders along the big ditch. . . . ”

So we decided that one of the alternatives was put fast breeders along the big ditch. And, did the estimates. And then we had all these pump lifts and we had to cost it out, and little report, and we put it on a chart, and we took it into the office and Stew, Stewart, I shouldn't call him–Udall, in those days, very friendly guy.

Stewart Udall “ . . . was in a sports shirt, and loafers, and he's sitting in front of the fireplace there. . . . And he had a rocking chair, sitting in a straight-backed rocking chair. . . . *Exactly* like Kennedy. (Laugh) You know, and Emil said, you know, ‘The showoff,’ he says, ‘he's got one, he's got a chair just exactly like Kennedy's.’ ”

And, he was in a sports shirt, and loafers, and he's sitting in front of the fireplace there. There was a fireplace in the Secretary's office. I don't know if you've ever been there or not?

Storey: No. I've never been in.

Barbour: And he had a rocking chair, sitting in a straight-backed rocking chair.

Storey: Just like Kennedy.

Barbour: *Exactly* like Kennedy. (Laugh) You know, and Emil said, you know, “The showoff,” he says, “he's got one, he's got a chair just exactly like Kennedy's.” Because Kennedy had a bad back. (Storey: Yeah.) And so, he walked in there, and of course we were nervous, you know. Here is the presentation for the secretary. He was so friendly and disarming. So, we made the presentation and Emil laid out the plan.

Briefing Assistant Secretary Kenneth Holum on the Study Before Presenting to Stewart Udall

It was kind of interesting, that day—let’s see, it was the morning before, we went to make a little presentation to Ken Holum, who was assistant secretary, and we were explaining some of the things. And Jim Douglas, who had imbibed a little bit too much the night before, and it got kind of boring after a while, and he fell asleep.

Storey: In Holum's office?

Barbour: In this meeting in Holum’s office.

Storey: This was Kenneth Holum, I believe?

Emil Lindseth Offered Jobs in Washington, D.C.

Barbour: Yeah. Ken Holum. And Lindseth was there. And, Lindseth he was so fast on his feet. He’s such a diplomat, you know. Wonderful man. Everybody loved him. They wanted him, you know, as assistant secretary before Holum, but he didn’t want to move to Washington. My understanding, and he mentioned to me that they wanted him there as assistant secretary but he didn’t want to take the job. He didn’t want to leave Denver. He was, remember, assistant to the chief engineer in Denver. He liked the job. (Storey: Um-hmm.)

“... they *always* called on him [Emil Lindseth] for special studies. And that’s why he *organized* this little group . . . I did all the economic studies for—the “Dirty Seven . . .”

But they *always* called on him for special studies. And that’s why he *organized* this little group, of which I was a member. I did all the economic studies for—the “Dirty Seven,” they used to call us. (Storey: Um-hmm.)

“We took all the hot projects, you know. We had *all* the fun. We had what we called ‘the science fiction desk. . . .’”

We took all the hot projects, you know. We had *all* the fun. We had what we called “the science fiction desk.”

Secretary Udall Kept the Chart That Went with the Presentation to Show to Scoop Jackson and Seek Money for the Westwide Studies

But anyway, so we make the presentation and Stew asked a lot of interesting questions, and after we were through he thanked us, and he says, “Don’t take that chart Emil.” He says, “Put it behind the sofa there. I don’t want anybody to see it. I’m going to show that to Scoop Jackson.” See, in the back of his mind we were working on augmentation of the Colorado River, and we were trying to get *money* in those days to do the Westwide Study. (Storey: Um-hmm.) Which, when we estimated, it’s going to cost, I don’t know, \$20 million or so. And, so we wanted to show him, we wanted to do other study. We were doing using nuclear alternatives to desalt water and haul it in. We were looking at getting 2½ million acre feet out of northern California, and

dump it in the river, and then we were going to do a lot of desalination.

We “were going to do all these exotic alternatives to get water in the river, but . . . the strategy was to go to the Columbia and get it. And, then we were going to give everybody fresh water on the way. We were going to restore Pyramid Lake, and do all kinds of things. . . .”

And, were going to do all these exotic alternatives to get water in the river, but we thought the strategy was to go to the Columbia and get it. And, then we were going to give everybody fresh water on the way. We were going to restore Pyramid Lake, and do all kinds of things. And, the strategy was to get Scoop to help authorize money to study other alternatives. So we include his river, you know, it might make him a little nervous, I think. So he Secretary Udall says, “I’ll just show Scoop that. Just leave it there.” Well, we finally got money, you know, to do the Westwide Studies. Initially, I think, we got like \$4 or \$5 million we spent on it. We were supposed to spend \$20 million. We had to cut the study short. They cut us off, (Laugh) you know, before we completed the study. And that was another interesting, interesting study that we did here in this building.

Storey: What was the relationship of all this to the Pacific Northwest, Pacific Southwest plans and so on? Which were ultimately published? Do you know?

Barbour: Well, we did—this was in the ‘70s, and of course Central Arizona Project was the start of it, you know? At the beginning they had the lower Colorado River Basin Project.

Storey: It would have been the ‘60s, right?

Westwide Study Authorized in 1968

Barbour: That was in the ‘60s. It got authorized in 1968. But, all these augmentation studies came later, and then we finally did the Westwide study. We had representatives from the eleven western states, and we set up offices in this building, on the thirteenth floor. We were an independent group and we had Fish and Wildlife, Bureau of Outdoor Recreation, we had people from most *all* the agencies, including the Corps of Engineers.

Storey: And Terry Lynott?⁶

Staffing the Westwide Study

Barbour: In this particular, in this office (Storey: Yeah.) working on the Westwide plan. And then we had state representatives come in and we had them working closely with the Water Resources Council. Don Maughn was head of the Water Resources Council. And, in those days they were developing the Principles and Standards. And, we were, and I was given the job of developing, implementing procedures for the Principles and

6. Terry Lynott was interviewed for Reclamation’s oral history program.

Standards, try them out to see how they work . . .

END SIDE 1, TAPE 1. JUNE 10, 2003.

BEGIN SIDE 2, TAPE 1. JUNE 10, 2003.

Storey: Principles and Standards, and did test studies?

Work with the Water Resources Council

Barbour: That was during the Westwide Studies, because we had to *use* those, and those were being developed. The Water Resources Council was very active in those days, and I was a consultant to the Water Resources Council. And, I used to go to Washington and work with those guys on how to develop the procedures.

Development of the *Principles and Standards* for Multiple-objective Planning

And, finally, in order to do implementing procedures, I organized a *group*, an interagency group, and I think there were thirty or forty of us. And, we began writing guidelines, which were ultimately called the “Yellow Book.” (Storey: Um-hmm.) And, I put it together, as editor, and wrote some various segments of it, and I edited the whole thing. It was to be the guidelines for implementing the Principles and Standards. And, that was the days of “Multiple-Objective Planning.” You plan for more than one objective. This was the thing, the new thing, is multiple-objective planning, because then we had *more* than one objective. In the past we had simply a national economic efficiency objective. That was always an objective. Regional development, was also a major objective. And both of those were always an objective. Do you remember direct benefits and indirect benefits? I don’t know whether you’re familiar with those terms? But in project economics you had the direct benefits, those were impacts on income, and then you had the secondary benefits, were the impacts on businesses and employment and so forth.

Four Basic Objectives of the *Principles and Standards*

“ . . . sometimes you want to build a project *just* for the social impacts . . . ”

The new Principles and Standards developed four basic objectives, which were: National Economic Development, Regional Economic Development, Social Well-Being because sometimes you want to build a project *just* for the social impacts, like unemployment, you know, or an Indian project.

Strictly for social aspect. And then we had, of course, the biggie, Environmental Quality was an objective. So, we had a four-account system, and it was our job, and I headed up the group, to develop procedures to evaluate each one of those four basic objectives. (Storey: Um-hmm.) And the most fun we had was Environmental Quality.

George Wallen and Darrell Adams Came to the Westwide Study

And George Wallen was working—I got him, stole him from the Fish and Wildlife

Service, and brought him into Westwide, and he developed. Dr. Darrell Adams, who is a social psychologist, and he did these evaluation procedures. So, we developed a numerical system to evaluate environmental impacts, and, we put it all in the “Yellow Book.”

“So, we had a four-account system on how to evaluate different projects, and when you planned a project . . . you planned several alternatives that would maximize one of these objectives. . . .”

So, we had a four-account system on how to evaluate different projects, and when you planned a project, you didn’t plan just *one* alternative, you planned several alternatives that would maximize one of these objectives. So, you might have four alternatives. And it could be different. It could be very efficient. That might be the smallest project. And, if you added regional development, you know, it’d provide more jobs. If it served social well-being, you might have serve some unemployed or underemployed people. For environmental quality, you might have different features, or reduce it or change it. So these plans would be evaluated with this four-account system.

Taking Multipurpose Planning out to the World Community

And, the world liked it. The International Water Resources Group, IWR, whatever it was. I had done the work, and so they asked me to talk. The United Nations had a group, and they met in New Delhi, India. They had an international symposium, and I made a presentation on multiple-purpose and multiple-objective planning in the United States. It was interesting. We had, Mrs. Gandhi there to introduce the symposium. About 900 people attended discussing multiple-objective water resources planning. (Storey: Uh-huh.) Worked with the Indian folks. And then they [U.N.] liked it so much they set up another conference in Manila, and we did the same thing there. We presented multiple-objective planning for the world. *Everybody* thought this was the thing, until the Reagan administration decided, “Well” They whacked, the conservatives whacked it down and whacked it down until all we had left was National Economic Development. The projects had to pay for itself, you know? These other things, regional development, social well being, oh you could evaluate them, but you couldn’t design a *project* to explicitly serve them. Environmental Quality, you could sure measure it, and you might consider Environmental Quality. So it was reduced it down to dual objectives. And we had four objectives, but that was the *politics* of it. (Storey: Um-hmm.) That’s how it evolved. And finally, they did away with the Water Resources Council. You remember? (Storey: Um-hmm.)

Big National Meeting to Talk about Multipurpose Planning and Had Trips to Rainbow Bridge and Glen Canyon

But, we had, just staying with that subject a little bit, we had this big national meeting, and we invited *everyone*, Audubon Society, Sierra Club, and we treat them to a big trip to Glen Canyon.

Warren Fairchild Thought Big

We had a big national conference with representatives from the U.S. Chamber of Commerce. Warren Fairchild was heading those, he was the Assistant then, and he thought big. I mean we had everybody at this meeting, helping us formulate approaches to good water resources planning. And we had seminars. And then we treated them all to a trip to Rainbow Bridge. (Storey: Um-hmm.) And so the National Park Service put us in boats (Laugh). We get a look at Rainbow Bridge. And the one fun thing I had there is when we went up to Rainbow Bridge we had all these Sierra Club guys.

Developing Procedures for Evaluating Environmental Quality

They were always giving us a fit, but I knew these guys quite well, you know, because environmental quality was also an objective, so I needed to use them, and they helped us develop procedures for evaluating environmental quality. (Storey: Um-hmm.) For example in measuring open and green space we used a numerical system, one to ten. One was kind of the worst thing you saw. Ten was the best thing you'd ever knew. In fact, we wrote it up and George Wallen and I, and I had a friend who was the head of Scoop Jackson's technical committee, Dan Dreyfus, who had helped me on the Central Arizona Project, Incidentally. So, He got it published as a Senate Document. So, I and several of my associates had a senate document that was printed and distributed all over the place on how to evaluate environmental quality, which we developed here in the Bureau of Reclamation. So, we did some real good work in environmental quality in those days.

Weather Modification for the Colorado River

Well, getting back to that other thing, on the augmenting the Colorado River. Of course, you know, there was weather modification, rain-making.

“ . . . the desalination thing was really active. We *nearly* did something there. *Very close. . . .*”

That was always a part, a big part of it. And, the desalination thing was really active. We *nearly* did something there. *Very close*. And then we did—I don't know whether you've seen the reports, or if you studied history of what went on in those days?

Worked Jointly with Mexico on a Nuclear Powerplant and Desalting Plant Located near Yuma, Arizona

We joined with Mexico and sited one on the border, a large nuclear desalting plant. (Storey: Uh-huh.) And, we shared the power, and that report is somewhere around here. I did some of the economic studies on it, and we shared the power with Mexico, and we shared the water also. And, we sited it there near Yuma, Arizona. And because we had to get rid of the brine, we proposed to excavate a channel into the Baja, California, and it was big enough that it could be navigated.

“We were going to make a port out of Yuma. . . .”

We were going to make a port out of Yuma. (Laugh) We always kidded about that. (Storey: Um-hmm.) That was needed to get rid of, the brine left after producing all that water—I’ve forgotten the ratio between fresh water and brine. But again, those were the science fiction days. So, there is a study on joining with Mexico and building a dual-purpose nuclear desalting plant.

Storey: How were we going . . . ?

Barbour: And running the water back up. We shared it with Mexico. (Storey: Uh-huh.) Because Mexico was short, you know. They never did seem to get their share of the Colorado River. And, when they *did* get it, it was a little on the salty side, as you recall? (Storey: Um-hmm.) You know, built the reverse-osmosis plant. I don’t know if they’re still operating. Reclamation did all the studies. We got all that data from Oakridge National Laboratory for the different processes, and Office of Saline Water. Membrane, reverse osmosis, and the distillation were the two *major* ways to desalt water. And, we used to lecture about the economics of various alternatives—and now they’re doing more in the field of reverse osmosis, I think. (Storey: Um-hmm.) Although they’re still doing distillation plants. Israel has some very large distillation plants. And, when I made this little trip to the Philippines, and made a presentation about multiple objective planning and so forth, I met a guy from China who *headed* the distillation plants in China. And, they were building the distillation plants. (Storey: Um-hmm.) And that was, he was an interesting guy. That’s another story.

But anyway, getting back to, to our meeting with Udall. After that meeting discussing use of Columbia River water is when we got money to do the Westwide Studies. And then that’s when we organized and spent three or four years putting the study together. And, we put out the report. You’ve seen *The Critical Water Problems of the West*, the Westwide Study?⁷

Storey: I’ve heard about it.

Westwide Study Was Cut Short and Staff Had to Be Integrated Back into the Regular Reclamation Staff

Barbour: It’s a report about so thick. And I think we spent \$5 to \$6 million doing that study. We cut it short. We ran out of funds. And, here we were, a whole special group, and

7. These documents may be of particular interest. All are found in the Bureau of Reclamation’s library at the Denver Federal Center. United States Department of the Interior, Bureau of Reclamation, “Western U. S. Water Plan. Proposed Plan of Study” Official Review Draft, April 1, 1971; United States Department of the Interior, Bureau of Reclamation, “Executive Summary: The Critical Water Problems Facing the Eleven Western States: Westwide Study,” Review draft, May 1974; United States Department of the Interior, Bureau of Reclamation, *Executive Summary: The Critical Water Problems Facing the Eleven Western States: Westwide Study*, April 1975; United States Department of the Interior, Bureau of Reclamation, “Westwide Study Report on: The Critical Water Problems Facing the Eleven Western States,” Review Draft, May 1974; United States Department of the Interior, Bureau of Reclamation, *Westwide Study Report on: The Critical Water Problems Facing the Eleven Western States*, April 1975; and United States Department of the Interior, Bureau of Reclamation, *State Comments: The Critical Water Problems Facing the Eleven Western States: Westwide Study Report*, June 1976.

they had to integrate us back into the Bureau of Reclamation.

“ . . . Dominy had *ordered* several of us to leave the jobs we had and to be reassigned to the Westwide Group. . . . ”

Well, Dominy had *ordered* several of us to leave the jobs we had and to be reassigned to the Westwide Group. (Storey: Um-hmm.) And, so, when Westwide was over, then we had to be integrated back to the Bureau of Reclamation, and that didn't make a lot of people happy. Because here we had positions over there, and so we were competing with guys that had existing positions over here. And, so there was a little bit of strife. So I ended up , I worked with Warren Fairchild in reorganizing the Bureau, and *integrating* Westwide people with the regular Bureau of Reclamation (Storey: Uh-huh.) forces.

“ . . . the Westwide Study was really a new thing for the Bureau, and a lot of the agencies, I think, were a little jealous of the Bureau of Reclamation taking the leadership on that. . . . ”

The Westwide Study was really a new thing for the Bureau, and a lot of the agencies, I think, were a little jealous of the Bureau of Reclamation taking the leadership on that. Of course, we were given the leadership. And, Wally Christiansen headed it up, and we staffed up, and we had a nice budget you know. Spending a million dollars a year you could—and we had *all* the western states. All the states sent some of their best people. And we had state study teams, each state. And then there was a water plan developed for each of the states. Some of the states were very cooperative, some weren't. California was tough to work with. *Idaho* was very cooperative, and, some of the other states. But, the plan includes the eleven western states and their critical water problems, and they're reported there as best we could, and we got the states to review it and help us write it. And, if you'll go to the reports, you'll see that we made projections of what might happen in the future. One of the things, of course, we assumed was the sources of energy . Nuclear power was a big part of the solution there.

The other, you know, I was just thinking of some of the highlights, some of the fun things we did in those days, when the Bureau was really perking. (Laugh) (Storey: Um-hmm.) But, we had a lot of things to do, and we are recognized as an agency, and because, I think, mostly because of Emil Lindseth. Of course, we were a great design group, construction group. We were always the greatest there. But, we weren't the big planners. But, with Lindseth coming in and looking at all these new technologies and getting us involved with the Office of Saline Water and the Atomic Energy Commission. We'd have meetings with these people, at high levels. Some of the top people providing data for the Bureau of Reclamation to do these big studies. (Storey: Yeah.)

Central Arizona Project Was Fun

Now, also involved was Central Arizona Project. Now that was probably, the most fun we had was working on that project until authorization.

Met with the Secretary over the Central Arizona Project

And, that was the other—I only had *two* meetings with Secretary of Interior. The first was alternatives for augmenting the Colorado River, including the Columbia River. The other meeting I had with him was on the Central Arizona Project— where we put together all the alternative plans.

About Thirty-four Alternatives Studied for the Central Arizona Project

There was something like *thirty-four* alternative plans, were put together for the Lower Colorado Basin Project, which was *primarily* the Central Arizona Project.

Looking for a “Cash Register” for the Central Arizona Project

Because it needed a cash register. So, where was the cash register? The cash register had to be where? Bridge Canyon? Marble Canyon?

Bridge Canyon Dam’s Name Changed to Walapai Dam

Bridge Canyon, you know, the name was changed to Walapai Dam. Did you know that? (Storey: Um-hmm.) Because there’s a little Indian reservation in the canyon, and apparently it was thought by changing the name we’d get a little more support for it. *Only* reason it was changed. So, it became Walapai Dam, right in the middle of all of our studies. And, it was a mess trying to change *all* those studies to Walapai Dam. Well, a lot of people couldn’t spell it, and hardly pronounce it. But, we spent a lot of time in Phoenix, with some of the people. We had Bruce Blanchard there, and the Secretary’s office, the regional offices, *all* involved, trying to evolve a plan that would include enough revenues to pay for the project.

Central Arizona Project Cost More than Any Other Reclamation Project

I mean the Central Arizona Project was the *very largest* project, as far as cost-wise, (Storey: Um-hmm.) that the Bureau has ever built. And we had to have a way to pay for it.

Controversy about Bridge Canyon Dam and the Grand Canyon National Park

Well, you know, we always used big hydropower plants as a cash register, correct? Missouri Basin and Hoover. So, first we tried to borrow funds from Hoover. We thought that might be a good way to go. But we didn’t get a lot of revenues there, so we had to consider building a new project, so we were going to build Bridge Canyon, high Bridge Canyon, in the canyon to provide power revenues. But it had] a little problem is, it backed up a little water into the park, (Storey: Um-hmm.) the Grand Canyon Park. Well, Sierra Club didn’t like that. In fact, they had so much—I don’t want to call it propaganda, but *information* out that my daughter came home from school and says, “Daddy, why are you damming up the Grand Canyon? You know we go there every summer!”

“They had all the school kids believing that the Bureau of Reclamation was going to flood the Grand Canyon, with Bridge Canyon Dam. . . . we were just going to encroach a little bit . . . and there was no overlook where you would ever see the upper end of the lake. . . .”

They had all the school kids believing that the Bureau of Reclamation was going to flood the Grand Canyon, with Bridge Canyon Dam. And we were just going to encroach a little bit, on the park, and there was no overlook where you would ever see the upper end of the lake. But, that was one of the studies that we did. Bridge Canyon was a natural. Another high dam in the canyon. Produce a lot of power. Get lots of money. A lot of revenues. Pay for the project. Great!

David Brower

Except, our friend Dave Bower?

Storey: Brower.

Barbour: With the Sierra Club, he didn't like it, of course, needless to say— I'll tell you about Dave once. He was sitting at my elbow once, in the hearings. And I didn't know who he was. He was *looking* at my witness book. And, Dan Dreyfus says, “Close your book, Ed.” I said, “Why?” He said, “That's Dave Brower sitting—he's looking at your witness statements.” You know. These are statements we prepared for the Commissioner. At a question the Commissioner would turn around and stick his hand out.

Storey: We're talking Dominy, now?

Barbour: Yes. And, Dan McCarthy sat right behind. And, if *McCarthy* didn't have the answer, he reached back and that's where we were. (Storey: Uh-huh.) And, if it was hydrology or design, Cliff Pugh was head of the district office, he had all the technical stuff. Dan Dreyfus had all the programming, and a lot of the general stuff. And, I had all economics. So, we had sheets of paper.

“ . . . friendly congressmen, you see, would call the commissioner, or the commissioner's office, the day before, and tell them the questions they might ask in the hearings. . . .”

And, a lot of the friendly congressmen, you see, would call the commissioner, or the commissioner's office, the day before, and tell them the questions they might ask in the hearings.

John Saylor Was an Unfriendly Member of Congress

Except, the unfriendly ones, like John Saylor, who hated the Bureau of Reclamation, you know, from Pennsylvania. I remember the Commissioner mentioned he should give Saylor a piece of his mind. We were in a restroom and Saylor was giving him a hard time. He was talking to Ed (Eddie) Weinberg, chief solicitor. He and Weinberg

were sitting next to the Secretary.

Storey: Ed Weinberg?

Barbour: Yeah. Weinberg, and they were sitting next to each other, and of course, we were way in the third row. And, he was talking to Weinberg there, at the urinal, and he was giving Saylor hell. And Ed Weinberg just kept saying, "Floyd, forget it. Forget it. It's not going to help you anything to tell him off."

The Congressional Hearings Were Very Exciting to Attend

Forget it." (Laugh) But, you know we were—the hearings were very exciting to attend. So, we had developed these thirty-four plans with all the hot shot staff in Phoenix. And, we just got our new Honeywell computers here.

Doing Payout Studies on Reclamation's New Computers

Darrell Webber headed up the group. So I had Darrell work with one of my young guys that were helping me do all the payout studies on the computer. (Storey: Uh-huh.) You know those old computer sheets. Well, with thirty-four different kind of combinations, you know, in a meeting, boy, it felt very impressive. I'd bring in these stacks of stuff—computer print outs. They'd ask you a question, you know, they'd look at it and it was *very impressive*. They had a lot of junk in there (Laugh) you know. A lot of *assumption* in there. I shouldn't call it junk. You have to make a lot of assumptions. So, there was a lot of information in there. But, then we'd summarize it. And, so we reported on all the plans. But, they develop even more plans, because everybody had a different idea. And we had twelve basic plans, and then modifications of the plans, so we ended up with *thirty-four different* plans including the economics and the financial plans. And so, I stopped by to pick them up from Darrell, and go immediately to Washington, because we had a presentation to make to the Secretary of Interior. And Dan Dreyfus was the coordinator then. Brilliant guy. Shaved his head. You could never miss Dan Dreyfus. He ended up, I mention this, as Senator Scoop Jackson's, the chief of his technical staff. And, he's still somewhere in Washington, D.C. I'll have to go see him. But, we had some wonderful memories. There's a guy you ought to talk to. (Laugh) (Storey: Uh-huh.) He has some wonderful memories. He participated in all these studies. Anyway, so we spent, we had all of these plans and the thing we had to do is get it down to fewer plans.

Meeting to Reduce the Number of Alternatives to Be Presented to the Secretary for the Central Arizona Project

So, we had some of the people from the Secretary's office come in, six or seven, and said, "Look, we can't show that many plans to the Secretary, we got to get it down to a reasonable few."

Whittled the Alternatives down to Seven—None Including a Coal-fired Powerplant

And so we had a meeting that night and they whittled it down, I think, to seven plans,

major plans. *Except* they had left out one of the plans that had a coal-fired plant site. I can't remember the name of the plan. But, I'll tell you what it is now.

Worked with Dan Dreyfus and a Draftsman to Develop a Very Large Chart Presenting the Seven Alternative Plans for the Central Arizona Project

But anyway, so, we had the plans, and they selected seven, and then Dan Dreyfus and I with a draftsman worked all morning to put out a gorgeous chart. It was huge. It had a hinge in the middle to get it in the elevator. So, we meet with the Secretary in the afternoon to present all these plans, right? And, so, the night before we were going to brief the Commissioner, and we were working late, Dan Dreyfus and I.

Briefing Floyd Dominy on the Alternatives for the Central Arizona Project

And, Floyd Dominy called us into his office. He wanted a little briefing. And, he really wasn't too much interested in all this damn thermal plant. We had also included a nuclear powerplant similar to the one at Camp Pendleton. We had them located along the lower Colorado River. We also had mine-mouth coal-fired plants as a source of energy. We had pump storage combined with nuclear power. We had pump storage alone. We had all kinds of different combinations (Storey: Uh-huh) to provide a source of power and revenues. And in *one* we had *no* powerplants at all, but assumed an ad valorem tax to recover costs. We had to recover costs, because we had to meet the reimbursable requirements of Reclamation law. So, we needed money. We needed *lots* of money, because you're not going to get a lot of money out of the irrigators. You never could, never would—they couldn't afford it.

Needed to Find a Big Cash Register for the Central Arizona Project

So, we needed to have a big, big cash register. So, we had all of these plans. And, we had a high Bridge Canyon, a low Bridge Canyon, a low low Bridge Canyon, a Marble Canyon, a low Bridge plus a low Marble Canyon, and then we had pump storage plus steam plant. We had *all* of these plans.

They Were Very Proud of Their Chart of Alternatives for the Central Arizona Project

Anyway the Interior team got it down to roughly seven plans, and we draftsmen were so proud. It's going to the Secretary. You know he's going to put out a pretty chart, right? (Storey: Uh-huh.) And we had jillions of columns on costs and power and water rates and allocations and how long it took to pay out, and surpluses available to pay for all these other related projects, the Indian projects and so forth. But, anyway, —then we needed to brief the commissioner. He called us in. It was late.

Commissioner Dominy Didn't Think There Was Any Chance of a Thermal Powerplant

So Dan and I went out to see the commissioner was in his office. He had a bed in there. He would sleep in there sometimes. So, we were briefing him. He wanted to

know—he didn’t care about those thermal plants. He didn’t think there was *any chance* we’d get any kind of a thermal plant.

Dominy Was Only interested in the Hydro Plants

He was interested in the hydro plants. So he asked me about Marble Canyon, and Bridge Canyon, and low Bridge Canyon. Those are the three things he was interested in. And, I told him Marble Canyon didn’t stand up too well, when you compare it to Bridge, either low Bridge or high Bridge.

Commissioner Dominy Agreed to Eliminate Marble Canyon Dam as Not Economically Practical

And, as far as I was concerned he probably wanted to eliminate Marble Canyon. So, he said, “That sounds reasonable.” And so then it was down to the selection of a dam. He and Brower had gone down the river, and he had taken pictures of that river, of all the talus slopes. He said, “Those *ugly* talus slopes down the canyon. You think it’s beautiful?” he says. (Laugh) That’s kind of interesting, because he had a lot of slides.

Commissioner Dominy and Wayne Aspinall Agree on the High Bridge Canyon Alternative

But anyway, we were looking at low Bridge Canyon and high Bridge Canyon, and all of a sudden the phone rings. And we were discussing it. And he says, “Hello. Oh. Wayne.” And, we couldn’t hear the other end of the conversation. “Yeah. Yeah. Yeah. I’d agree with that. I would agree with that. Yeah. I’ll, see you tomorrow Wayne” or “Talk to you tomorrow” or something, you know. And so, he turned to us and he said it’s high Bridge Canyon. He said that was Wayne Aspinall. You know he was head of (Storey: Uh-huh.) the House Committee that reviewed our projects? So, we *knew* high Bridge Canyon was one of the alternatives. No question, it was going to be on the list. And it was. So, after the secretary’s staff went through all these plans and selected seven, and we didn’t have much input. We only put the studies together—we weren’t making all the big decisions.

Staff Objected to Elimination of the Steam Generating Plant from Alternatives to Be Presented to the Secretary

And, we objected to the fact that they left off the steam plant there, using Navajo coal, and taking water out of the plant that you have right now, Navajo Powerplant. That’s the one.

Storey: Yeah. Navajo is a steam generating plant.

Barbour: So, the secretary’s team left that out. So, when I went, we went to brief the next day, and the next afternoon went to brief the secretary, and we got all of our stuff together and the big chart.

Storey: Brief the secretary?

Barbour: I mean the secretary, excuse me, (storey: yeah.) with the commissioner. And, we were, Dan Dreyfus and I, and Dan McCarthy were in the elevator, and the commissioner joins us, and we have this big chart in there.

Commissioner Dominy Knew He Wanted the High Bridge Canyon Dam

And, the Commissioner walks in—he never looked at our charts, with at least 10 different alternatives in it. He knew the one he wanted was high Bridge Canyon. And so he brings a box of slides, a projector, and a screen. And that’s what he brings to the meeting. He gets in the elevator with us. So, we all get off on the, what is it the seventh, sixth floor? Seventh floor?

Storey: Sixth floor for the secretary.

Assistant Secretary Ken Holum Requests Quick Look at the Chart for Alternatives on the Central Arizona Project

Barbour: Sixth floor. Secretary. Whatever floor it is. We all get off there and we go in the outer office and then Holum comes up to me, he says, “Ed. Have you got the numbers? I’d like to take a look.” I said, “we got them on this big chart.”

Assistant Secretary Holum Places the Navajo Steam Generating Plant as Alternative Number One on the Chart Using a Ball Point Pen

So Dan and I get this big chart and Kenneth looked at it and says, “Where’s the coal-fired plant? Uses Navajo coal?”

I says, “They threw it out last night.”

He says, “Oh my god!” He says, “We’ve got to have that plan. I’ve got some current information that, you know, I think that one might go.” He asked, “You’ve got the numbers?”

I said, “Yes. I have the numbers.”

He says, “You give them to me.” And he took out his ballpoint pen, and he took this gorgeous chart that we had, and he marked it up. He put that as plan number one. That’s the plan that got built. (Storey: Uh-huh.) Would you believe it? That’s the plan that got built. We go in the office and it was really exciting. We went through and the deputy secretary asked some great questions—because he knew thermal power. And I was the only one in the room that knew anything about thermal. I had all the numbers, you know, the heat units, and kind of a plants, and how you’d cool the plants, and the economics of hauling coal, you know, the length of the railroad versus the length of the pipeline to provide water to the plant.

“There’s where we made the big mistake. We should have moved the damn thing and put it as close to the coal sources as we could, and haul the water there . . .”

There's where we made the big mistake. We should have moved the damn thing and put it as close to the coal sources as we could, and haul the water there, because you know what's happened there, you know the environmental problems with Navajo Powerplant and how much money they've had to spend there? (Storey: Yeah.) Bad siting. But, we always said, there would have been a little tiny bitty dam you couldn't see from space, as opposed to these large smoke stacks that, with smoke coming out that the astronauts can see for miles and miles. (Storey: Yeah.)

Storey: At Bridge Canyon?

“You could *tell* that something had happened politically, and they had decided to build a thermal plant. . . .”

Barbour: But anyway, we had a good meeting. You could *tell* that something had happened politically, and they had decided to build a thermal plant, or go for the thermal plant. Apparently they got the Sierra Club to go along with the steam plant, to avoid any structure in the Colorado River. That was the compromise. Give up Bridge Canyon and get a thermal plant, but they wouldn't let the government build it, but have the Salt River Project build and operate and own it. (Storey: Um-hmm.) This was going on in the background in the meantime, and they had pretty well decided on this alternative. But, anyway, we went through the meeting, and the secretary complimented us for all the in-depth work that we'd had done, and so forth and so on. The deputy secretary, who was familiar with thermal power, when he knew I had put together the thermal studies, asked me “Are you an engineer working with thermal plants?” I said, “No. I'm an economist.” (Laugh) It kind of shocked him a little bit. But, I had done the economics work on it.

Commissioner Dominy Made a Slide Presentation in Support of Bridge Canyon Dam

But, afterwards, then the commissioner says, “Okay, Mr. Secretary, it's my turn.” After we got all through all the plans and the discussion. And so, he put up the screen, got out his slides, and we sat there and had a slide show. And the commissioner showed his slides of his trip down the Colorado River, the talus slopes, and so forth, saying that “You're not going to lose much here. Look. It isn't that gorgeous in the canyon.” And, he was still stuck on Bridge Canyon, and he still thought the politic was such, *regardless* of what the secretary decided, you know, he was always an independent guy anyway, and had his own political support, Dominy. (Storey: Um-hmm.)

Commissioner Dominy Thought He'd Get His Dam at Bridge Canyon

And he thought he'd get his dam. Of course, he didn't get it. When it was authorized, it was Navajo Powerplant that was selected—it was very exciting. We worked on that project. Started in 1961 and it was finally authorized in 1968. Of course planning really started in 1947. And, it took that many years to get the project authorized. And then when . . .

END SIDE 2, TAPE 1. JUNE 10, 2003.
 BEGIN SIDE 1, TAPE 2. JUNE 10, 2003

Storey: Tape two of an interview by Brit Storey with Edmund Barbour, on June the 10th, 2003.

Presentation at the House? And the Senate?

Barbour: Yeah. And I got to attend, that's where the hearings were really interesting. One thing that really stands out in my mind. Of course, it was very exciting. It was crowded, and we had Saylor there. There was a lot of opposition to the project. The Sierra Club was there, and that's when David Brower was its head.

“They’d call it the ‘football team,’ but it was three, three, three. Nine of us. . . . And, it would be interior solicitor Eddie Weinberg, and the commissioner, and the secretary, in the first row. And then, behind him, would be the regional director, Arleigh West, Dan McCarthy, and I think Randy Riter. . . . And then, it was me, and Dan Dreyfus, and Cliff Pugh, who was project manager of the Phoenix office. And, we were all armed with these big witness books . . .”

They’d call it the “football team,” but it was three, three, three. Nine of us. . . . And, it would be interior solicitor Eddie Weinberg, and the commissioner, and the secretary, in the first row. And then, behind him, would be the regional director, Arleigh West, Dan McCarthy, and I think Randy Riter. . . . And then, it was me, and Dan Dreyfus, and Cliff Pugh, who was project manager of the Phoenix office. And, we were all armed with these big witness books, to handle any question that came up or, even, might come up. And, boy, with looseleaf notebooks we were ready with sheets of paper that we had worked *all night* getting ready for the Commissioner. The only guy who got to answer a question was Randy Riter, on a some hydrology point, and then what the cost of pump lift was per foot, per foot of lift. And, Cliff Pugh was sitting next to me, and he had that thing memorized. He just jumped up like a cork, like a cork in a pan of water, you know, and he announced what it was. So many dollars per foot of lift, I think. I don’t know who asked the question. Some representative showing off his engineering ability. “What was the cost of a pump lift there?” You know, we lifted a heck of a lot of water to get it (Storey: Yeah.) into the Central Arizona Project.

Storey: Several hundred feet, I think?

Barbour: Yeah, but, that was pretty exciting. And during the meeting, the governor of Arizona was testifying.

Governor of Arizona Addressed Wayne Aspinall as “Aspenwall”

Of course, he favored the project. And we had given him a lot of information. And he made the terrible mistake of addressing Aspinall as “Aspenwall.” (Laughter) Well, you know, Aspinall, was short, and he had a temper. He got very upset and angry at that. You could tell the sparks were flying. When you’re the governor of Arizona and

couldn't pronounce the chairman of the Interior Insular Affairs Committee, who had the life and death hold on this project, and you couldn't pronounce his name correctly. And the poor governor, he's just sweating blood in that chair. Well, we all swallowed hard. (Laugh) We couldn't help but snicker a little bit. But anyway, those were the days. That was the Central Arizona Project, when we had a lot of fun.

Bob Young of the University of Arizona Opposed the Central Arizona Project

Storey: Before we do that, there was a professor in the agriculture school, I believe, or maybe in economics at the University of Arizona, I believe?

Barbour: Yes.

Storey: Who said that the economics of the project weren't any good?

Barbour: Absolutely. His name, let me see. (Drumming fingers on table.) I know. We were always battling him. And he and another guy, both wrote papers on the subject. And, some of were quite good. He talked about the subsidy. And, it was a big subsidy. No question about it. We had to project repayment *way out* in the future. (Storey: Um.) And some of those assumptions—you know, they're assumptions, and you could challenge those.

Storey: I've forgotten his name. He claimed that he was denied tenure because of this, because he opposed the project.

Barbour: Right. And, he moved to CSU [Colorado State University]. [Subsequently identifies him as Bob Young. See page 57, 172.]

Storey: Oh, he did?

Barbour: And you might be interested to know that I hired him as a consultant.

Storey: (Laughter) Oh you did? (Laughter)

Later Hired Bob Young as a Consultant

Barbour: I'd call him up. I was doing a study when I was working with Tudor Engineering Company. Nelson Jacobs and I worked on studies of the Poudre River. You know, I don't know of any plants and projects that were actually built on the Poudre River. And we were doing this study for the state of Colorado, and I needed some information on the value of water that was available for sale.

Storey: This was after you left Reclamation?

Barbour: Oh yeah. I was working for a consultant. I was working for Tudor Engineering. When I left the Bureau in '81, I went to work, half time, and was their Chief Economist, for some of their studies. And the Poudre River was a study we had. And, I, I'm trying to think of his name. I called him up and he had assistants that worked

for him. And, he was good on water. And I asked him to do a little job for me. And I can't remember what I paid him to do an evaluation of the value of water if it were converted from irrigation to municipal industrial water use. (Storey: Um-hmm.) And, he's a smart guy. He just opposed . . . a lot of people opposed the Central Arizona Project. That was an *extremely* controversial project. (Storey: Um-hmm.)

“ . . . there was *no way* they were going to deny Senator Carl Hayden, because he was chairman of the Appropriation's Committee, and it was his turn to get a project. And, he allowed all the other projects to go through. All the California projects. And they knew it. And he had earned points. Everybody got their project. . . . ”

But, there was *no way* they were going to deny Senator Carl Hayden, because he was chairman of the Appropriation's Committee, and it was his turn to get a project. And, he allowed all the other projects to go through. All the California projects. And they knew it. And he had earned points. Everybody got their project. And, the Upper Basin got their projects, and now it was time for him to get the Central Arizona Project, and he wouldn't be denied, and *nobody* was going to deny him.

“That was his birthday present, the Central Arizona Project. . . . ”

That was his birthday present, the Central Arizona Project. He was going to get *some kind* of project. (Storey: Um-hmm.) And he was, *I think*, ninety-three. It was, I remember they talked about, “This is his birthday present.”

Storey: Who talked about it?

Barbour: Well, the guys. Commissioner, Dan McCarthy, all the Washington guys.

Dan McCarthy

Dan McCarthy was the *top* planner, the head in Washington. He was a great writer, and spoke well. And, was a real diplomat. And, he worked on *all* of those controversial studies. And, he helped us with the Westwide studies. He had retired and we hired him back to write the “executive summary” for the Westwide report. If you go back and look at the Westwide report, that little slick document, we paid Dan McCarthy to do that.

Storey: Um-hmm. So, it's more than just an introduction, it was a . . .

Barbour: Sort of a summary.

Storey: Of the whole thing?

Barbour: Right.

Storey: Yeah.

Barbour: Executive summary, (Storey: Yeah.) of the whole thing. And, it was well done. But that report's about this thick. I don't know if you've ever looked at it or not?

Storey: A couple inches, huh?

Barbour: We spent, oh, three or four years doing that study. (Storey: Yeah.) And we had a *lot* of people working on it.

Terry Lynott on the Westwide Study

Storey: Terry Lynott was on that study if I recall?

Barbour: Terry was our head of reports. Wally Christiansen headed it up. I had the economics and resource analysis part. And, George Wallen had the environmental part. And we had several engineers involved. I don't remember all of them.

Wally Christiansen

Wally Christiansen, incidentally, is still alive, who headed up the study.

Storey: Oh. Where is he?

Barbour: He's down in California. And several years ago I went to visit him. He's moved since then. *He* would be a great guy to talk to. He's got a pacemaker, and I don't know how well he is. He's had a pacemaker, I don't know, ten or fifteen years, but he's a *great* guy to talk to. (Storey: Hmm.) He had a wonderful experience and shepherded the Westwide studies through to the end. You know.

Storey: You don't know where he's living though?

Barbour: He's in California. And, I could probably get his address. I get a Christmas *card* from him every year. I notice that he has moved from where he was before. (Storey: Yeah.) I had a relative down in San Diego, and we'd drop by and visit with him, and we'd talk about the old times. (Storey: Um-hmm.)

Economic Studies of the Third Powerhouse at Grand Coulee

Some other things that we can talk about, that I think are of interest, was—I did the economic studies on the Third Powerplant at Grand Coulee. That was a big controversy. Harold Arthur asked me, they couldn't agree on whether they'd go with the big units. You remember the Russians built these huge units?

Storey: Yeah.

Barbour: Six hundred-megawatt units? And so, they proposed, of course, they wanted to keep up with the Russians, so they proposed to do, like, 500 megawatt units for the Third Powerplant. The initial *design* was based on 300 megawatt units that operated at a lower speed, consequently they're more efficient.

Some People Wanted 600 Megawatt Units at Third Powerhouse

And, there was a group of people that were pushing the large units, the 600 megawatts,⁸ which had to operate, to equal the output, at higher speeds. And the question was, “How’d the economics stack up?” (Storey: Um-hmm.)

Old School Reclamation Staff Wanted to Build 300-megawatt Units in the Third Powerhouse

And they had a lot of arguments between the old school, who wanted to build a 300-megawatt units, which were like the existing 300-megawatt units. They were conservative and they ran at a lower specific speed, those are the revolutionary speeds, as opposed to the big units that were being designed for the Russians, which *operated* at *higher* speed, because they were *so big*, you know get a greater output that way. (Storey: Um-hmm.) So the question, “Which one to build?” And so he called me and said, “Ed, could you do an economic study? I can’t get these guys to agree. Could you check the economics out on it?” I said, “Oh that sounds like fun.”

Storey: Harold Arthur called you?

Fred Ruud, Harold Arthur, and Studies on the Units to Go into the Third Powerhouse at Grand Coulee

Barbour: Fred Ruud wanted me to work with Harold Arthur . Fred Ruud had come around, and he asked “You have any economic experience?”

I said, “Yes.”

“Do you do economic studies?” he says. And I looked around, it was Fred Ruud.

I said, “Sure.”

He says, “We got an interesting—are you willing to work on it?”

I said, “Sure. What is it?”

And he explained it to me. Pretty soon I get a call from Harold Arthur. “Do the study.” He says, “You can have the run of the place. Just ask any question. Get any numbers you want.”

“ . . . then there was Fred Ruud representing the technocrats, who wanted the big units, high-speed units, you know—to compete with the Russians. . . .”

Bates, I think, was head of turbines in those days. He was very concerned. He *hated* those big units. And then there was Fred Ruud representing the technocrats,

8. See also Reclamation’s oral history of Theodore “Ted” Mermel who also played a part in this debate.

who wanted the big units, high-speed units, you know—to compete with the Russians.

“I said, ‘If all these technical assumptions, all this information I got from your experts . . . are, you know, as they say, the economics leans toward the larger units . . .’”

So, I did the study and conclusions I reached, I said, “If all these technical assumptions, all this information I got from your experts about specific speeds and the relative efficiencies . . .” They gave the higher units a lower rated efficiency, overall efficiency, than the low-speed conservative unit, little, smaller units. “If all these factors are, you know, as they say, the economics leans toward the larger units, strictly on economics.” So, I sent that in a memo to him.

“ . . . they were beginning to do detail design on 300 megawatt units. . . . then, all of a sudden, the orders came down to switch to 700 megawatt units. . . . Fred Ruud said, ‘Oh, it just happened that your memo ended up on Ken Holum’s desk. . . .’ they wanted to *compete*. . . . So they *junked* about three months worth of design, to go to the higher speed units. . . .”

Harold Arthur thanked me, and I heard that they were beginning to do detail design on 300 megawatt units. And that proceeded for about three months, then, all of a sudden, the orders came down to switch to 700 megawatt units. I wondered what happened, and Fred Ruud said, “Oh, it just happened that your memo ended up on Ken Holum’s desk.” (Storey: Um-hmm.) I suspect, I think, if you’ll ask Fred, I think he sent a copy of my memo to the assistant secretary. And, they wanted to *compete*. They found no reason why we couldn’t have as big a units as the Russians, and so they said, “Start the design all over.” So they *junked* about three months worth of design, to go to the higher speed units. And that’s what’s there. And, it’s kind of interesting. I guess they did have some problems. And I think Fred Ruud had some kind of problems with those high-speed—and Fred Ruud was, I think later hired to straighten out something about them. They had some vibration problems.

Develops Replacement Manual for Hydroelectric Facilities as a Consultant after Leaving Reclamation

But, I did a special study for the Bureau of Reclamation, when I was a consultant, on replacement lives. I went around to all the Reclamation offices getting lives of facilities, generators, turbines, etcetera. Are you familiar with the replacement manual that they have here?

Storey: No. I’m not, actually.

Barbour: That’s established service lives, so that you can put *replacement* costs as a part of the repayment analysis. (Storey: Uh-huh.) So you can set up funds to replace units. And I had done one of the earlier reports, and it needed to be *upgraded*. So, Stone & Webster got the contract, and they hired me to help with the study. So, I got to go around Reclamation interviewing all these old timers about, for example, “How long does a turbine last? And how long does this part or this part last?” But, one of the

questions involved turbines. But, so, I was there at Grand Coulee, and we had our meeting with all the old timers. And then they said, “Hey Ed. I understand you worked on the Third Powerplant?”

I said, “Yeah.”

He said, “One of the units is open. You want to see it?” I said, “Oh gosh. I do.” So, they were working on one of those large units, and they had a *ladder* going down into the thing. (Storey: Uh-huh.) So, I went down the, half way down the ladder, and looked in that. Can you imagine the size, the interior? Now, there’s a picture of the interior. Have you seen those paintings that Commissioner Dominy had commissioned?

Storey: The paintings. Yeah.

Barbour: Commissioned all those paintings.

Storey: Inside the turbine?

Barbour: One of them is inside the turbine.

Storey: Yeah, that hangs in the Department of Interior Museum in Washington.

Barbour: I have a copy.

Storey: The original . . .

Barbour: Remember they gave copies to everybody that wanted them.

Storey: Yeah.

Barbour: I wanted a set.

Storey: We just disposed of the last set of those prints, maybe two years ago.

Westwide Meeting and Trip to Rainbow Bridge

Barbour: Well, I have a set. I kept that one. I wanted to tell you, you know, I, we were talking about this big national meeting we had, on Westwide, which we invited everyone. (Storey: Um-hmm.) And it was a very high-level meeting with all the *major agencies* attending, including Audubon Society, Sierra Club, and so forth. And, so we went up to see Bridge Canyon. I wanted to finish that story. The Rainbow Bridge. And, we boated up as far as you could. You had to walk in there, because the water wasn’t under the bridge. (Storey: Um-hmm.) And Don Maughn, I don’t know whether you knew it or not, he was, he couldn’t walk. He was crippled.

Storey: Um-hmm.

Barbour: And, he operated in a wheel chair. He was head of the Water Resources Council. The Bureau wanted to get him up there, so they designed a special chair. They took an office chair and put wheels, bicycle wheels, on it, and we wheeled him up to see Rainbow Bridge. And, I've got a picture of that. But, when I got there, I had my old Rollie Rolleiflex camera there, and I was going to get a picture of that Rainbow Bridge. So, I got back and I saw some of the guys climbing up on top. And it was one of the Sierra Club guys. And so, I'm down below, and I'd taken a picture of as many guys as I could get, on the base, not with the Rainbow Bridge in the background, and I got *most* of the people that participated in the meeting, which I still have, incidentally, hanging in my office. And then, I took a picture of Rainbow Bridge. There was nice clouds in the background. It was a gorgeous picture. And, up on top, was one of our guys from the regional office, that had shown a small group how to get up there. And they didn't invite me. I was really peeved. They had climbed up and there they were standing on top of Rainbow Bridge. (Storey: Um-hmm.) And one of the Sierra Club guys, so I say, I hollered at him. I says, "Hey, I'm taking your picture." I says, "I want you to smile." I said, "Now take two steps backwards." (Laughter) They gave me a hard time. But, so I have that picture. (Storey: Uh-huh.) Our photography group here blew it up for me. And, I framed it, and I gave it to the Commissioner, and he had it in his office for a while. I still have my copy.

Storey: Yeah. I haven't seen it around here.

Barbour: We had some real neat, exciting times at Bureau of Reclamation. Involved in about all the water resources planning, in those days.

"That's the days before Jimmy Carter came in and gave us a hard time, you know. Jimmy Carter didn't seem to like the Bureau or the Corps of Engineers. . . ."

That's the days before Jimmy Carter came in and gave us a hard time, you know. Jimmy Carter didn't seem to like the Bureau or the Corps of Engineers.

Storey: Let's see. That was before Ronald Reagan.

Barbour: Yeah.

Storey: I'm trying to think. Under Johnson? A lot of this was going in under Johnson.

Commissioner Ellis Armstrong

Barbour: Well, Reagan came in after that. The commissioners there, after Dominy, there was Armstrong. And I knew Ellis quite well, because when he was a construction engineer, way back when in McCook, Nebraska, he was working on Trenton Dam. He was the construction engineer for Trenton Dam.

And he came over and sat at my desk. He said, "You're an economist, aren't you?"

And I said, "Yeah."

He says, "I'm the construction engineer, and I'm trying to write a justification for getting material to build this damn railroad bypass." And he says, "And I want you to do an economic study of what it means to delay it, and so forth and so on, you know. But, if I could get the material and construct it as opposed to delaying the thing for such and such a period of time." And so I did a little economic study for him. But, he had never forgot that. Because, when he was commissioner over there, he had me come in and do some special studies.

Ellis Armstrong requested "a comparative analysis of the estimates made for authorization purposes, as opposed to the final construction costs. . . ."

And, *one* of them was a comparative analysis of the estimates made for authorization purposes, as opposed to the final construction costs. (Storey: Uh-huh.) So, I did that study, and had to go back and dig up the costs that was in the authorization documents, of a *number* of projects. I don't know how many projects were compared, and then I had to try to justify, you know, everything's going to increase in costs, right? So, I developed factors such as for price escalation and for design problems, and so forth and so on. So, I took a whole list of projects, because the Bureau of the Budget was criticizing the Bureau of Reclamation, you know, for saying it's going to cost one thing at authorization, and the final projects' costs were significantly greater. And so I took that study to Washington, and Ellis Armstrong liked it, and he says, "We're going to have to go and present this report before the Bureau of the Budget." And, they set me up to make the presentation. The next thing I know, he decided to go with me. And, he didn't know a thing about the study, but it was kind of interesting that he would take the time to go over there. And we had a nice meeting with the Bureau of the Budget, but Ellis was bored, and I think took a little nap. It's now something else. What is it now?

Storey: Oh, it's . . . golly.

Barbour: He used to refer to us as "kiddy-car economists." (Laugh) Sometimes.

Storey: Who's that?

Barbour: Ellis Armstrong. (Laugh)

Storey: Oh. "Kiddy-car economists?"

Barbour: Especially if we didn't agree with some of his projects. He's a good guy.

Storey: Now it's O-M-B, the Office of Management and Budget.

Barbour: And Budget. Right. I used to work with them.

Storey: After Ellis, was the man who came in from Boise?

Barbour: Yes.

Gil Stamm and the Fruitland Mesa Project in Colorado

Storey: Stamm?

Barbour: No. No. No. Before Stamm. Gil Stamm was assistant to Armstrong and he ended up as commissioner.

Storey: As commissioner, right.

Barbour: I thought he was going to fire me once for what I had to say about Fruitland Mesa. I don't know if you know where that . . . ?

Storey: Here in, that's here in Colorado, I believe?

Identified a Subsidy over \$1,000,000 per Farmer on the Fruitland Mesa Project

Barbour: Yeah. I wrote a memo saying, that the subsidy was over a million dollars for each farmer. And, that was a hard one to justify, hard one to swallow. Well, the *governor* wanted it, Governor Love, I guess, at that point in time. And, I write this memo saying that, you know, "The economics was not very good, and the subsidy was extremely high per farmer." (Storey: Um-hmm.) Over a million dollars, in those days. (Storey: Yeah.)

Every Promotion Received Was Ordered from the Washington, D.C., Office

Well, he didn't appreciate that, and I learned later that I could've gotten fired over it, but I had a lot of support in the secretary's office, in those days. (Storey: Uh-huh.) I had a better reputation in the secretary's office, in Washington than I did in my own office. Every promotion I got was ordered from Washington. I didn't get it through here. After the meeting with the secretary that we had on the Central Arizona Project, and all the alternatives, Jim Casey told the Commissioner that I was the guy in the room with the lowest grade. I was a thirteen. And Dan was a fourteen. He says, "What, call out to Denver and tell them to give him a raise." Of course, they didn't like it here, obviously. My boss was a fourteen, Ira Watson. Of course, I did all the tough assignments and Ira sat back and supervised. He didn't supervise me very much because I did work that he, you know, wasn't qualified to do. I did all the thermal power stuff and so forth. (Storey: Um-hmm.) And so, that wasn't a very happy situation, but *I didn't mind*. I laughed all the way to the bank. (Laugh) So, that's how I got my promotion. The Commissioner calls and says, "Give that . . ." and they said, "Oh, he's young. And he hasn't been in the job that long. And . . ." I was a GS-13 at that time.

So, I says, "Well, that was a nice Christmas present." (Storey: Um-hmm.) *But*, I didn't have any of the trappings of the office or anything. I had a little desk in the corner, and so forth, but that's where I operated and did many special economic studies.

Storey: This would have been Floyd Dominy?

Barbour: Yeah.

Storey: Who called and . . .

Barbour: Oh yeah.

Storey: Said, "Take care of this."

Barbour: Yeah.

Storey: So, what . . . ?

Charlie Lemoyne Was Left out of the Meeting with the Secretary

Barbour: When I got back, when we got back from Washington—Charlie LeMoyne with me. You remember LeMoyne?

Storey: No.

Barbour: He was assistant chief of the planning here. He was kind of a tough—he was a colonel in the Army. And he's that kind of guy that'd look at your travel report, and if you spent too much money he'd let you know. Mileage, maybe he'd check the mileage or something. But, he went with me to Washington on the CAP review. He reviewed the engineering part of it. Well, they had to select just a few people to meet with the secretary. Well, McCarthy's going to take care of all the engineering, and Randy Riter was going to take care of all of the hydrology, and LeMoyne couldn't have the economics, so they left him out of the meeting, (Storey: Uh-huh.) and he felt pretty darn bad about it. I felt bad about it too, because I had to work with him. So, I get to go and meet with the secretary, and the under-secretary and his staff all of these wonderful people, you know, and he has to sit it out. So, as soon as I get back he asked me what all went on. And I gave him an oral report in great detail. Also I wrote the memo for the trip in which Charlie LeMoyne put his name first. I still have the memo. And I still have a table, with all the thirty-four alternatives on it. And so, he comes in, and so he goes up to, as soon as we get back he goes up to Harold Arthur to report on the meetings that we had with secretary of interior. Well, they chatted a while, then Harold apparently says, "Well, how was it there in the meeting?" And then he had to admit he wasn't there. He says, "Well, who was there?" He says, "Ed Barbour was there." And, he says, "Well, why isn't he reporting on the meeting?" So I got a hurry-up call. I think Charlie kind of felt bad about it you know.

Harold was such a wonderful guy. "Ed," he said, "I heard that you attended the meeting. How was it? Tell me all about it." (Storey: Uh-huh.) And, I tell him all the story about the secretary's review committee leaving one of the plans out which Holum penciled in and that was the one that got authorized. Ken was such a wonderful guy. So easy to talk to. You know, he ended up heading up some big coal association after he left Interior. And Bruce Blanchard ended up heading the New York Power Authority, or something or other? (Storey: Hmm)

Testified on the 160 Acre Limitation in California Where the Government Was Making the Case There Was a Federal Interest and the Limitation Applied

And I also did another job for Stewart Udall. Couple of more jobs. One was, I testified for Jim Flannery who was his chief economist, and they needed someone to testify for the secretary on the 160 acre limitation. Jim said he did not want to do it.

Stewart Udall, During the Kennedy Administration Decided to Sue the Imperial Irrigation District to Impose the 160 Acre Limitation

The *Kennedy* Administration, decided to sue the Imperial Irrigation District and impose the 160 acre limitation. Those were big corporate *farmers*, in the Imperial Irrigation District, and if he imposed a 160 acre limitation then a husband and wife could only own 320. That was extremely valuable land. So, it was a very controversial big trial in District Court with large owners opposing it and smaller farmers supporting it.

Nobody in Washington, D.C., Wanted to Touch the Imperial Irrigation District Law Suit

And, nobody in Washington wanted to touch it. It was very controversial. So, Jim Flannery says, "Send Ed out there." So, Eddie Weinberg sent one of his lawyers out there, and together we developed testimony, and I went to the Imperial Irrigation District and dug out all their old files to see how much of a subsidy they received, since the inception of the Hoover Project.

Government Lawyer Wanted to Show How Much Subsidy the Imperial Irrigation District Had Received

Because the lawyer wanted us to show how much of a subsidy farmers had received. And, they received all kind of subsidy, powerplants revenues, and they pay very little for the water.

"And, my testimony was to demonstrate that the federal government had provided a large subsidy and had an interest, and, consequently the 160 acre limitation should apply. . . ."

And, my testimony was to demonstrate that the federal government had provided a large subsidy and had an interest, and, consequently the 160 acre limitation should apply.

". . . we lost the trial because the court ruled that a statute of limitations applied. . . ."

So we developed testimony, and I testified as an expert witness for the secretary of interior, but we lost the trial because the court ruled that a statute of limitations applied. It didn't specifically mention acreage limitations in the authorizing act of the Hoover Dam, *but* the law was on the books at that time. I thought Kennedy was right.

It applied. But the ruling and the politics were so heavy on it, that the statute of limitations applied. Boy that was, I tell you that was an interesting assignment.

Storey: Now, one version of this story I heard was that Ray Lyman Wilbur, who of course was a Californian, was secretary of the interior at the time Hoover was being built, and he exempted them. You know anything about that?

Reclamation Had Never Implemented the Restriction on the Imperial Irrigation District

Barbour: No. No. I recall the opposition couldn't prove, it was never exempted. The authorizing legislation did *not* exempt them in the fact. Acreage limitation just had not been implemented.

Storey: By inaction?

Barbour: By inaction.

Storey: And so then the court ruled that because the . . . ?

“He did not implement it, and time had lapsed—sort of like a statute of limitation. But, there’s no question in my mind, that it applied. . . .”

Barbour: He did not implement it, and time had lapsed— sort of like a statute of limitation. But, there’s no question in my mind, that it applied. (Storey: Uh-huh.) When you go back and study what happened, I think the supporters *purposefully*, from what I understood, did not discuss it on the floor, when they discussed the bill. (Storey: Uh-huh.) *Purposefully* omitted discussion.

Storey: When they authorized the money to build it?

Barbour: Yeah. When they authorized the project, it wasn't mentioned, but the *law* was on the books.

Storey: Yeah, well, it was 1902.⁹

Barbour: And Kennedy maintained, and I think he was correct, that it did apply. (Storey: Yeah.) And, I think, legally, it did apply. I don't how that worked, but the court did rule that a statute of limitations applied. The defendants had some highly paid California lawyers.

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Storey: Weren't very popular?

9. The Reclamation Act of June 17, 1902, ch. 10 93, 32 Stat. 3880. Section 5 of the act imposed the 160 acre limitation.

Imperial Irrigation Strategy During the Trial

Barbour: I wasn't very popular, because some of those old timers would testify, of course they didn't get all the corporation farmers up there. They got the guys up there that were sort of like homesteaders. And, one of the old gentlemen talked about when he was young, he rode in in the boxcar, and he got off there at the Imperial Valley and he looked around. He says, "It was so hot and miserable he nearly went home, but decided he might apply for one of those farms." (Laugh) This was an old timer, you know. And so, he had built up, I don't know how many acres. I think he owned six or eight hundred acres, or something like that. (Storey: Uh-huh.) Of course, they *selected* him purposely, *to testify*. You know, to get sympathy from the court. And the old timer told about *all* the investment he had made, and a lot of it, you know, was *given* to him through the government subsidies. He said he did it all himself. He "didn't get any help from the government." So forth and so on. And so, I punched the interior lawyer. I says, "When you cross examine him," I said, "You ought to ask him these questions." And I wrote some questions out for him about the subsidies the farmer had received. He punched me back and he says, "Man I wouldn't touch that with a ten-foot pole." When they came around to our lawyer and the judge asked "Do you have any questions for him?" And, our lawyer says, "No sir, I don't." (Laugh) He didn't ask him a single question, because the poor old gentleman up there, you know, they helped him up to the witness chair, swore him in, and he was telling his history, you know, and how he built up his farm from scratch and, you know, finally got up to, I think it was eight hundred acres or whatever it was. But, he didn't talk about these big corporate farmers that had ten thousand acres. (Storey: Uh-huh.) And they'd have combines, you know, four or five in a row, going down the fields. (Storey: Hmm.) Combining cotton. (Storey: Yeah.) But that was, that was another interesting, the Imperial Irrigation District. We did something else. And we did, Manny Manuel Lopez and I did some studies on using the geothermal *steam* for developing power there in the Imperial Valley.

Worked with Manny Lopez on Studies for Geothermal Steam Plants in the Imperial Valley

Storey: Oh, are there geothermal features there?

Barbour: Oh yeah. And, we did, oh what, what did Manny call it? Dante's Inferno. Anyway, we did a study of using geothermal steam as a source of power. But the problem there is that steam just corroded the heck out of everything. (Storey: Um-hmm.) And, there *are* some geothermal plants in the area, but Imperial Valley had a great source of it, but the water was so bad that we finally gave that study up. But, there's a report on that. I think Manny Lopez worked on that, and he would call it, the report had red flames on it, and he called it Dante's Inferno, Inferno report, or something or another.

Middle Snake River Controversy around Hell's Canyon

And then there was the Middle Snake controversy. High Mountain Sheep. Did you ever hear about that?

Storey: That sounds vaguely familiar?

Barbour: Hell's Canyon.

Storey: Yeah.

Reclamation Had a Single Dam Plan at Hell's Canyon—High Mountain Sheep

Barbour: And we had a plan, you know, of course, Snake River, Hell's Canyon was screwed up earlier, by politics. You know, the Bureau had a single dam plan there, at Hell's Canyon. (Storey: Uh-huh.) *One* high dam. And, the politics were such, in my estimation, although there was some controversy about it I think the best solution was a single high dam on the river.

Eisenhower Administration Let Idaho Power and Light Build Low Dams in Hell's Canyon

I think it was the Eisenhower Administration, you know, which was oriented toward private development, and ended up giving the right to build dams to Idaho Power and Light, which ended up with the three dams, Brownlee, Ox Bow, and Hell's Canyon—all *low* dams.

“So, instead of developing one high dam, they have three existing *low* dams, which did *not* maximize use of the site, and were not deep enough to get *temperature* control to keep that water cool, and, consequently, you know what's happened to the salmon runs. . . .”

So, instead of developing one high dam, they have three existing *low* dams, which did *not* maximize use of the site, and were not deep enough to get *temperature* control to keep that water cool, and, consequently, you know what's happened to the salmon runs. (Storey: Um-hmm.) The Bureau of Reclamation's plan was *much superior* to that. But, politics, there's where politics, I think, was a real bad decision as far as water resources development. But later, then, we looked at other sites there. There's a—what's the name of the dam? Anyway, there was, we looked at another dam site there, and it was . . . High Mountain Sheep.

Storey: In Hell's Canyon, or on the Salmon?

High Mountain Sheep Dam Proposal Was Complicated

Barbour: In Hell's Canyon. *Above* the Salmon River (Storey: Uh-huh.) Junction with the Nemaha As I recall Salmon's on one side and the Nemaha is on the other, and they were *both* terrific salmon streams. It was called High Mountain Sheep. (Storey: Um-hmm.) It was awarded to a private group, or a quasi-private group, and a challenge went all the way up to the Supreme Court. And the Supreme Court deferred it to the Federal Power Commission, so that they could make the decision. (Storey: Um-hmm.) And, at that time, Udall was convinced that maybe a high dam, Mountain Sheep Dam, one single dam there, would help make up for the fact that we didn't have the storage

on that river. And, of course it involved salmon fishery, and Fish and Wildlife Service, and all these people, so the Federal Power Commission had hearings on it. (Storey: Um-hmm.) And, the secretary's office asked me to be an expert witness on the economics. So that we could qualify ourselves as good witnesses, they took us up the canyon. And so, we made a trip up and a group of us visited the site. And someone asked "why are you sending Barbour up there? He's just an economist." The response was "He's going to testify. We want him to be able to say he saw the site." That was great. (Laugh) Because we took a mail boat up there. There's no other way you can get up the canyon, Hell's Canyon. (Storey: Yeah.) Gosh it was exciting. We looked at those sites. Climbed around there. And, spent the day.

Storey: Uh-huh. Now, when would this have been?

Barbour: This was in '70s. The Department of Agriculture, and the Forest Service, and a lot of people, all the environmentalists, wanted it to be declared a national recreation river. So that was the alternative. And, that was really the best solution for it. But, the Secretary, at that time, Udall had supported a High Mountain Sheep. He didn't want *private* development of it. He thought we could do a lot better, because we could spend the money and provide temperature control and enhance the salmon fishery. The salmon fishery was always pretty much a loss. You couldn't get them around those Idaho Power and Light dams. They never could, successfully, haul them around. (Storey: Um-hmm.) So, we thought that was one way we could enhance it, so we had all kind of experts at the hearing.

Storey: Get them up to these two rivers, where they spawned a lot. Huh?

Testifying on High Mountain Sheep Dam Before the Federal Power Commission

Barbour: Yeah. So, I got to testify, and it's kind of interesting, if you ever sat in a Federal Power Commission hearing. You know the commissioner conducting the hearing is judge, and jury. The Commissioner. And he swears you in. (Laugh) "Do you swear to tell the whole truth, nothing but the truth?" Can you imagine having to say, "I do," and still have to testify on the economics of a project? (Laugh) When a lot of it was a matter of opinion? Oh, I tell you, the lawyer for the power interests, just grilled me, just terribly on the stand. It was a peaking plant, and I had used combustion turbines, which we and the Federal Power Commission *always* used as a surrogate value for the power values. (Storey: Uh-huh.) And, the opponents were just grilling the hell out of me, and guess who came to my defense? The guy from the Sierra Club. (Laugh) My lawyer was letting me get *murdered* up there, (Storey: Uh-huh) when the guy from the Sierra Club jumped up and he said, "Yes. It's correct. That's what they do use." He says, "You mean you use combustion turbines as a measure of the value?" "How are you going to measure the value of a peaking facility unless you use the same kind of alternative that was a peaking facility?" I had worked with the Federal Power Commission years before that helping to develop procedures for evaluating hydropower projects. (Storey: Um-hmm.) And, we did use combustion turbines and base-load plants, and combinations of those to evaluate pump storage.

And that's another story where we developed a manual, for the Federal Power

Commission. We worked *very* closely with them, on how to evaluate power. And I used to go around the country holding meetings and working with the Federal Power Commission on. We helped them put out the *Power Values Manual*. And, that's someplace. I also did a special study for Western Area Power Administration on that subject. (Storey: Hmm.) We just had a lot of fun in those days.

Storey: Tell me what, how did separation of Western Area Power Administration from Reclamation affect us? In your work?

Considered Working for the Western Area Power Administration Which Did Repayment Studies

Barbour: Well, they ended up with the repayment studies over there, and, for the marketing. I *considered* going over there. The Department of the Interior had a real problem on who was going to do the planning studies and the economic studies. So they set up separate group for economic studies over there. And, I think that's one of the problems we had, the payout studies, which we did. In fact, I did them in my office—someone from the Power Division and someone from my office. We did an annual report on *all* the payout studies for the Bureau of Reclamation. We didn't think they had really the experience in doing the cost allocations and we had the experience in that. So we *resisted* moving the project studies over there.

Storey: They were doing our cost allocations?

Barbour: They would take our cost allocations, but sometimes we felt they didn't understand how they were used. We would give them allocated costs, but they would do the payout studies. And that had been our responsibility. And, there are a lot of intricacies in how you deal with surplus revenues. And, you see we also had municipal/industrial water supply revenues, and it was all consolidated into single payout studies. Power revenues were just a part of it. (Storey: Uh-huh.) So, we had some discussions about that. I had an opportunity to go, transfer, over there, I decided to stay with the Bureau. Although I'd have probably done better as far as grade structure, over there. Their grade structure was one grade higher than ours.

Storey: Why did you decide not to go? A lot of people did.

Barbour: I liked what we were doing. It was exciting. We were doing a lot of things. The power part was only one small part of it. (Storey: Um-hmm.) You know we were looking at all kinds of projects. See, I had the technical review responsibility for all the reports, (Storey: Um-hmm.) projects. And we reviewed them here for technical adequacy. And, I had the economics, and the environmental, and the lands part. And, in those days, we were looking at the social impacts, and public involvement, which Darrell Adams was our expert on that subject. (Storey: Uh-huh.) He was with me on Westwide. And he was in my branch.

“... we set up a Resource Analysis Branch in the Bureau. It was the first time ever we, the Bureau, had a multi-disciplinary group. . . .”

When we moved back to Reclamation from Westwide Studies, we set up a Resource Analysis Branch in the Bureau. It was the first time *ever* we, the Bureau, had a multi-disciplinary group. And, in my Resources Analysis Branch, I had the environmental studies, which George Wallen, headed those up. And, then we had the social, or the, what we called the Social Impact Studies and Public Participation Branch, and Darrell Adams headed that up. And then I had an economics group, and it was headed up by Dr. Alan P. Kleinman. Kleinman headed that up, and then later he left and someone else took that over. Glen Masters took that over. And *then*, they put the land resources in that branch. So, we had a very interesting multi-disciplinary group, and our staff meetings were always very interesting. Because we had economists, environmentalists, and soil scientists there, and social psychologists there. (Laugh) And, at one time, when they were looking at land-use planning, and the Bureau almost got involved in land use planning, I had a land-use planner. But that didn't last long, until they decided the Bureau of Reclamation wasn't going to get involved in land-use planning. (Storey: Um-hmm.) So, we lost that function. But it was challenging, really very exciting. We had a lot of different projects.

Storey: When did you become the head of that branch?

Integrating Staff from the Westwide Study Back into Reclamation

Barbour: Well, I headed it up in Westwide, and the question was, how are we going to organize the Bureau when the Westwide people were through? And, Warren Fairchild, the new assistant commissioner, had worked with us so closely on the Westwide studies, and so Fairchild had much of the say, and he asked me to help organize the offices here, (Storey: Um-hmm) and so obviously I set (laugh) it up so, which I thought was a reasonable way to do it, the way we had it at Westwide. So, at that time, I think, who was head of economics? Maybe Bob Struthers. Ira Watson was took over research. And I took over that branch.

Storey: When would that have been?

Barbour: It was fun. Oh, this was early '70s. After Westwide, after we completed the Westwide report. (Storey: Uh-huh.) We reorganized and brought in all the Westwide people. George Wallen moved over and, with me, as part of my branch. And Darrell Adams, worked over there, was part of the branch. And then, they integrated the land resources into our group. That was a separate group. Bill Peters was the head of that. And, we did, mine reclamation studies in those days too. Land use studies, and reclamation of mine sites. That sort of thing. It was quite interesting. The department would involve us in all these special studies. We jokingly called it the "science fiction" desk over there. Anything that came along, the big transport job of water from the Canadian Rockies in the United States, worked on that, and worked on a huge transmission inter-tie, from the Northwest to the Southwest. (Storey: Um-hmm.) That never flew. That was one of Assistant Secretary Kenneth Holum's¹⁰ things.

Pacific Northwest-Pacific Southwest Intertie Proposal

10. Assistant Secretary of the Interior for Water and Power Development Kenneth Holum served in the period 1961 to 1969.

The big inter-tie between the Columbia in the Northwest, and the Missouri Basin Project, to integrate all that power to take advantage of diversity of electricity demand, (Storey: Um-hmm.) you know? That was a major study.

And, of course we did desalination studies.

Then we got involved, of course, with all the controversial projects. The Grand Coulee thing Third Powerhouse sizing question, you know. And special assignments. (Storey: Um-hmm.) The 160 acre limitation special assignment. And, the Middle Snake special studies on building High Mountain Sheep Dam.

Worked on the Proposed Peripheral Canal Around the Sacramento-San Joaquin Delta in California

And then, they sent me out on the Peripheral Canal study. We were going to move water from northern California into southern California. And we had this big canal that we were going to build. And they sent me up there to help work out the economics.

Trying to Increase Water Rates to Westland Irrigation District

And then, when we had the big hassle with the Westlands Irrigation District, probably one of the most politically *powerful* water groups in the country, in California, and we tried to increase their rates when Guy Martin¹¹ came in as Assistant Secretary, and he was dealing with a very powerful group.

“ . . . they didn’t have anybody in Washington that would go on that assignment, so they sent me out there to testify on what a *big* subsidy it was the Westland irrigators were receiving and how little they paid. . . .”

Nobody, they didn’t have anybody in Washington that would go on that assignment, so they sent me out there to testify on what a *big* subsidy it was the Westland irrigators were receiving and how little they paid. (Storey: Uh-huh.) Oh, I was not very popular there. But, they needed somebody from the outside to do it. The local regional director did not want to do it. They had to work with those guys. And, because of the economics, you know, you had to do a financial study. *It* was more important than benefit-cost analysis, because it decided who paid what, and involved cost allocation, and that happened to be my thing.

“ . . . I admitted immediately that it was somewhat arbitrary. I could tell them how we did it in as fair a way as the procedure would allow. . . .”

Although, I admitted immediately that it was somewhat arbitrary. I could tell them how we did it in as fair a way as the procedures would allow. Because, we had several procedures, including the Separable Cost Remaining Benefits Method. And, we had

11. Assistant Secretary of the Interior for Land and Water Resources Guy Martin served in the period 1977 to 1981.

Alternative Justifiable Expenditure Method. We had different kinds of methodologies for allocating costs. And everybody argued about them. And wrote papers about them. We argued with the Corps, on how do you allocate a multiple-purpose project. Because part of it was non-reimbursable, and part had to be repaid with interest, and part had to be repaid without interest, and the power part could support the irrigation part, (Storey: Um-hmm.) and the irrigation part was non-interest bearing, and the power part was interest bearing, and the municipal industrial water supply part was interest bearing. And also there were interest rates involved, and there were repayment contracts that had to be negotiated.

“So, when you allocated costs and divvied up the costs, of course the constituency would run to the regional director and say, ‘Hey! They’re allocating too much cost to us.’ So, it was *always* controversial. . . .”

So, when you allocated costs and divvied up the costs, of course the constituency would run to the regional director and say, “Hey! They’re allocating too much cost to us.” So, it was *always* controversial. (Storey: Um-hmm.) And, I used to lecture on the subjects to get all these foreign trainees in here.

How Project Water Users Might Be Charged Without Allocating Costs to the Various users

And what they, foreign visitors, want to know is how to allocate-multiple purpose costs. I says, “You know, the solution to that would be just don’t allocate them.” It’d shake them up. I would say, “You really don’t have to allocate them.” They would ask, “Well what would you do?” He says, “Well, what you do is, you decide what’s a reasonable rate to charge,” (Storey: And charge it.) “Charge all the users and see how much of the project you can pay. If you’ve got a good paying project, you might have some funds left over to build another project, *or* you recover all the costs, *or* that part you don’t recover, and you think it’s in the national interest, just call it non-reimbursable. And if you’re doing flood control . . .” You may determine that flood control costs are non-reimbursable. *Navigation* costs are reimbursable. And then there were arguments about fish and wildlife. At one point in time, it was non-reimbursable. And at another point in time it was partially reimbursable. Separable costs were reimbursable. “What’s a separable cost? What’s a specific cost? What’s a joint cost?”

“. . . we’d get a project, . . . primarily authorized for, say, municipal/industrial water supply, and it’s to serve a city . . . that was going to enjoy *all* of the recreation benefits . . . and half the costs were allocated to recreation as non-reimbursable, I said, ‘Wait a minute. Somehow that doesn’t make sense. . . .’”

So they would *argue* that, and it was, it was rather arbitrary, but nevertheless, it had to be done following procedures. And we’d get a project, and when it come through me, and I see the project, when it was primarily authorized for, say, municipal/industrial water supply, and it’s to serve a city, and that city was going to enjoy *all* of the recreation benefits. When it came to me and half the costs were allocated to recreation as non-reimbursable, I said, “Wait a minute. Somehow that

doesn't make sense since the purpose of that project is municipal industrial water supply. I know you want to treat your constituencies nice, and don't charge them much for water." Because that allocation influenced what they had to pay since they had to return full costs, with interest, in fifty years. (Storey: Um-hmm.)

“So, the allocation became very very controversial, and political–politicized. . . .”

So, the allocation became very very controversial, and political–politicized. And so, you said, “Well, there's a lot of ways to do that.” But, we used to argue about that, and it's admittedly very arbitrary. Since the Bureau is not building many new projects, so we don't have too many allocation questions. I guess you could go back and reallocate costs. And most of the payout studies, now, that are still being cranked out, are based on some kind of cost allocation, whether it's good, bad, or indifferent. (Storey: Um-hmm.)

Cost Allocation for Glen Canyon Dam

Glen Canyon. Cost allocation was *very important* to determine the payout and how much money's available for all the participating projects. That's how I first got involved in cost allocation, when I looked at it it seemed a little peculiar to me, and I mentioned it to Randy Riter. Randy Riter agreed, and so he sent me out there to help revise the cost allocation to something I thought was more reasonable. That didn't make me very popular. But, we, we had some fun interesting times.

Decision to Retire

Storey: Tell me why you decided to retire. We're getting toward the end of our two hours.

Barbour: Oh, well. I guess, things had changed considerably. We had different people in Washington, and I didn't like the politics. And, some of the guys who I thought were top-flight had left, and we had people who took their place who I thought did not have a lot of imagination, and expertise—were inexperienced and naive. And, with everybody changing there, I felt that all the work that I had done wasn't quite appreciated. And I had been promised a grade raise and, because I had the responsibilities of—I had gotten all of my people grade increases, fourteens. And I was also a fourteen, and I thought I was entitled. And, one of the other guys had gotten a fifteen, and I thought didn't have the responsibility in the multi-disciplinary that I had, and I was having a little difficulty getting that next grade. And, although I had support in the assistant secretary, in the secretary's office, I didn't have support in the Bureau anymore, because there were a lot of changes of people. And there were people there, and they didn't like some of the economic decisions I had made, or studies I had made. Some of these projects I thought were not economically sound and the fact that we kind of laid it on the line, I always thought an administrator ought to really know more about the economics. But all of those things sort of got together, and then I had an opportunity to go and be, be chief economist in this engineering firm. And, I thought, I had my years in, and I didn't particularly like the politics in the Bureau in those days. And, I could make as much money. I could work and earn My Social Security, and get my retirement, so I resigned. Apparently when they found out I was going to

retire, somehow they worked out that they started processing papers for a fifteen. And I went down to personnel and says, "Well, I think I'm going to do something else." So, I gave them less than two weeks notice, and said I was going to retire, because I had this other job.

Left Reclamation and Worked at Tudor Engineering

So, I went to work with Tudor Engineering Company at that time. And, I spent about nine or ten years in the private sector, (Storey: Um-hmm.) which, I really enjoyed. And, I did special studies there. We did pump storage studies, and hydropower, and steam power studies.

Went out on His Own and Worked a Lot for Stone and Webster

And, I worked for Tudor, and then I went on my own and did a lot of work for Stone and Webster. I was fifty-seven, and I wasn't quite ready to retire, so I kept tapering off. I worked half time. And then I tapered off to a quarter time. And then I'd take jobs occasionally. And then, when I hit seventy I didn't accept any more jobs.

"The last major job I worked on was helping with that Glen Canyon study on the environmental releases . . ."

The last major job I worked on was helping with that Glen Canyon study on the environmental releases and hydropower production. (Storey: Uh-huh.) It got to be very controversial and by then I was kind of losing my patience with some of the people there, I guess I didn't get along as *well* with the group as I probably should have, and the Environmental Defense Fund didn't particularly like what I had to say, because they were trying to *downplay* the power effects, and tried to tell me, of course, how to measure *power* benefits, which I had been doing for most of my career. And, they were claiming that the power benefits loss from the *modified* flow out of Glen Canyon were only equal to the cost of burning coal at a steam plant. I just wanted them to do a good job and show them what the power benefits foregone actually would be. And they claimed that since there was surplus power in that area, and there was some surplus power in some coal fired steam plants, because they had over-sized some of the steam plants, that the hydropower capacity given up had no value because there was replacement power out there. I couldn't believe they only wanted to recognize only what they called the energy component, which was very small. Glen Canyon was a peaking facility, and that capacity's worth a lot of money—significantly more than simply the cost of burning coal. (Storey: Um-hmm.) I didn't agree with them, and I guess I was, at that point in time, I was losing my patience. I didn't get along *too well* in that group. And, I thought they were somewhat arrogant and I thought the Bureau was too lenient. Mike Roluti was running the study for the Bureau.

Storey: Mike Roluti?

Barbour: But, so the studies, when they were finally completed, I couldn't endorse them. I did write the executive summary for that, and included questions about the power benefits lost, which they left in. I think I got Mike in a little bit of trouble (laugh) on it. And,

I did a paper on the subject, and then presented it to the . . . annual (Storey: Um-hmm.)– International Conference on Hydropower with the Corps of Engineers. So, I did a paper and put Mike’s name on it too, and I guess I had a few comments in there regarding the possible under-valuation of Glen Canyon peaking Power that I don’t think were too well appreciated. But, that’s when Stone & Webster was the contractor for the study, and I was working for Stone & Webster and consequently could put in my own views. But, you know, I enjoyed working with people. It was a multi-disciplinary group that studied Glen Canyon, you know, but I thought the study really under evaluated power benefits foregone. But, it didn’t matter–the environmental water releases were going to be made anyway]. They were going to do it anyway. And that was okay. I just wanted to be sure the numbers were (Storey: Yeah) at least half way reasonable.

Storey: Well, why don’t we save further discussion for later and let me ask . . .

Barbour: Well, okay.

Storey: Whether or not you’re willing for information on these tapes, and the resulting transcripts to be used by researchers?

Barbour: Oh, I don’t mind?

Storey: That’s a ‘yes’ I take it?

Barbour: Have I said anything out-of-school?

Storey: I hope not.

Barbour: I don’t know.

Storey: That’s a yes, I think?

Barbour: Huh?

Storey: You’re saying yes?

Barbour: Yeah, I, I don’t, you know . . .

Storey: Good. Well, thank you very much.

END OF SIDE 2, TAPE 2. JUNE 10, 2003.

BEGIN SIDE 1, TAPE 1. JUNE 24, 2003.

Storey: This is Brit Storey, Senior Historian of the Bureau of Reclamation, interviewing Edmund Barbour on June the 24th, 2003, at about two o’clock in the afternoon in Building 67 on the Denver Federal Center. This is tape one.

Harold Davis, Ray Ahlberg, and Economic Studies

Let's talk about Harold Davis and Ray Ahlberg.

Barbour: Oh.

Storey: First of all. They were the first people you worked with, right?

Barbour: Um-hmm. Yeah. Great guys. Harold was the chief economist for Region Seven, and he gave me my initial training—I didn't know from anything, I had just earned my *master's* degree at the *University* of Denver. (Storey: Um-hmm.) And so he said I'm going to do economic studies, benefit-cost ratios, cost allocation, payout studies, that sort of thing, in McCook, Nebraska. They were going to train me for about three or four months. And Ray Ahlberg was the head of reports, probably one of the finest reports writers that the Bureau ever had. I mean he could *cut* to the chase immediately. And he had great analytical powers, and he could understand all aspects of it. (Storey: Um-hmm.) And, he used to come around and review our reports. I was then assigned to the Kansas River District Office, and that was at Indianola, Nebraska. That's the old prisoner of war camp there.

So Ray used to come out and review the reports, and he always called it straight. Always. We used to have fun with him. Occasionally I'd plant something in the Appendix that didn't make any sense, and see if he could find it. And he would. (Storey: Um-hmm.) He was a talented guy.

Taking Ray Ahlberg Fishing on Harry Strunk Reservoir

He enjoys going fishing too, so sometime he'd spend the weekend and we'd take him out in a tiny boat out to Harry Strunk Reservoir. You ever hear of Harry Strunk? He's the editor of the *McCook Gazette*. He was one of the *big boosters* of the Bureau of Reclamation. In fact, you could probably give him a lot of credit for the amount of money we got in the Kansas River District. We were one of the fattest districts there. We had a *huge* construction program there. (Storey: Uh-huh.) I remember once I called him up, and I didn't get my *Gazette*, my *McCook Gazette*, and I called to complain about it. And it wasn't twenty minutes later and Harry delivered it in person. (Laugh) Oh, he was great guy. He really supported us. He did a lot for the Bureau.

Well, getting back to—Ray was a great reports man.

Storey: But this was a Reclamation reservoir?

Medicine Creek Dam

Barbour: Oh yes. Yes. Medicine Creek Dam.

Storey: Yeah, how was the fishing?

Barbour: The fishing was good early, you know—in the new reservoir it’s always good. (Storey: Um-hmm.) We were head-on to construction in those days.

There Was a Lot of Construction in the McCook Office

Just finished Bonny Reservoir. Trenton Dam was under construction. Medicine Creek had been completed. Red Willow Dam was, they were studying at Red Willow Dam. They hadn’t started construction yet. The Corps was building Harlan County Reservoir. Just a lot of activity going on after the war. You know, this was to keep us employed, we had something like 500 people, and a *large* budget, very large budget. We spent several hundred million dollars on dams and water supply projects as part of the Missouri River Basin Project. (Storey: Um-hmm.) All those dams were authorized after they had the Republican River Flood. I think it was in 1913,¹² and I think they lost a hundred and something lives. My recollection, when I wrote about it, it was 113 lives. I’m not sure. But, I had an old timer tell me that the Republican River was so high that he went out in his little boat rescuing some of the farmers out of the tops of trees. (Storey: Um-hmm.) But that was the ‘35 flood, and then there was another one in the ‘40s on the south fork of the Republican River which resulted in all those dams being authorized, and that’s why we got all that money. We built all those projects, primarily flood control, with quite a bit of irrigation involved. (Storey: Um-hmm.)

I worked with Harold Davis, chief regional economist, and Ray Ahlberg all the years I was in the field office.

Storey: They were in the region?

Barbour: They were in the regional office.

Storey: In Denver? But you were in McCook?

Barbour: And I was in the McCook. The Kansas River District Office. (Storey: Uh-huh.) I worked there for six years, and then transferred to the Chief Engineer’s Office.

Storey: Tell me about living in the Reclamation town there.

Set up Housekeeping in Indianola, Nebraska

Barbour: Oh it was wonderful. It was a new experience. I had just gotten married. We’d had *nothing*. We had a car, that we were in hock for, and we bought a card table, and just our clothes over there. And we had no furniture, whatsoever. I had just gotten out of college. And, they gave us one of these tar-paper-sided barracks, that they had set up for the German prisoner of war camp. And, Reclamation divided the barracks up in one and two-bedroom units. And so that’s where most of us lived, because there was

12. Note that Ed Barbour later says the flood was in 1935. Apparently the 1935 date is correct. The Nebraska Department of Natural Resources identifies that other significant flood events on the Republican occurred in 1885, 1903, 1905, 1915, and 1947. In 1826 there is evidence of another major flood. Information found at <http://www.dnr.state.ne.us/floodplain/mitigation/1935flood.html> on January 9, 2009, about 3:00 in the afternoon.

no housing in McCook. And with 500 people out there, we had a lot of families living there.

Storey: How many units in a . . . ?

Barbour: Well, there might be the, I'd say maybe three or four units. And there were a number of these buildings. And then there was the hospital area, which was *much* nicer. And, that's where they treated the German prisoners. And also, that's where all the administrative personnel stayed, that administered the camp, the war camp. (Storey: Um-hmm.)

The "Hospital Area" Was Where the VIPS Lived

And of course, when they *all* moved out, the best quarters were called the 'hospital area', and all the VIPS got to live there. And then us peons, lower graded people, lived in the barracks, the tar-paper barracks.

"But it was great. It was cheap. My recollection is they charged us either \$20 or \$23 a month. . . ."

But it was great. It was cheap. My recollection is they charged us either \$20 or \$23 a month. And we got electric stove, and electric refrigerator, included. We had a one-bedroom apartment. (Storey: Um-hmm.) So, I set up with a card table and two apple boxes. That's how we got started. And then we went over and bought a convertible sofa. You could sit on it during the day, and sleep on it at night, because we were just starting out, in debt, you know.

Started at a GS-7 Rather than the Normal GS-5

Fortunately, and since I had gotten my Masters degree, I got started at a Grade Seven. *Normally* they started everybody at Grade Five. So I was feeling pretty good about that. So, we bought a few things. I remember then, when, there's a furniture company in McCook called Pade's Furniture, and I went over there and bought some furniture, and they hauled it out in a truck. And, incidentally, I still have the bedroom *set*. It was an oak, one of these white-oak bedroom sets.

Ken Kauffman Helped Unload Some New Furniture

And when they were unloading it a guy by the name of Ken Kauffman came over to help me. He had just moved in not too long ago, before I had. We both started in 1950, in McCook, Nebraska. (Storey: Um-hmm.) And he helped me unload. Now that was in 1950. He invited me to go hunting that fall, as I recall, because his wife was pregnant, and she was overdue, and she, being a nurse, suggested if he ran her across those bumpy roads, hunting pheasant, that she might give birth to their first son, who happened to be Mark. So, I can remember that first fall, and that we were out there, on the countryside, bouncy roads, seeing if we could help Laurel (Laugh) go into labor, (Storey: Hmm.) as we hunted. That was the first hunting trip. And to this day, we're still hunting and fishing together. (Storey: Hmm.) So that's fifty-three

years. He's a guy you might want to talk to, and you might do an oral history.

Storey: Did you ever meet the Budd family there?

Barbour: The Budd?

Storey: Um-hmm.

Barbour: Oh yeah.

Storey: B-U-D-D.

Barbour: Oh yeah.

Storey: Tell me about them.

Barbour: Oh yeah. I didn't know them too well. Let me think of his first name. For some reason, short name. Ah, he was an engineer. Was he in Survey? Can't remember. (Storey: Um-hmm.) I didn't know him too well. I knew a guy by the name of Frank Best, in engineering. And there was a Lipmann, I think, who was head of engineering estimates. Um. . . Um. . . I'm trying to think. Robinson was the district manager at that time. Al Redman was the planning engineer, and I worked for him. Boy it's hard to remember all those names.

The Gym Was a Social and Activities Center

Anyway, we had a good office. It was kind of family-oriented. You were kind of accepted in the Reclamation family, those who all lived close together. We used the old gym that they had for the prisoners of war. And, we'd play volleyball once or twice a week there, and we'd have our parties there. It was sort of a communal life. We all helped each other. (Storey: Um-hmm.) It was, it was a good time. Everybody was fairly young, getting started together.

Storey: You mentioned a garden, I think?

The Garden at Indianola

Barbour: Oh yeah. Well, we had to have a garden so Hubb Robinson, the district manager, had this plot. He would get it cultivated every year, and then divide up in little *plots*, just like a communal farm. And you could sign up for one plot or two plots. If you had a larger family you could sign up for more than that. And then every spring you'd go out there and plant it. It was gravity irrigated, Except for Hubb, he had a little sprinkler system, because he was the closest (Laugh) one to the water supply. (Storey: Um-hmm.) But, we'd go out there and it'd be like a bunch of coolies out there We'd all be visiting, and planting potatoes, and lord knows what. But that didn't last very long, you know, everybody in the spring wanted to plant. Pretty soon, by the middle of July, weeds were all over the place, and by August you could hardly find your plot for the weeds. (Storey: Um-hmm.) They'd be doing other things. But, we had a good

time in those days. We don't do that anymore, I don't think, in any of the Reclamation offices. (Storey: Yeah.) But, in those days, you know, those big budgets, and the Reclamation program was very active. We had a large construction program all over the United States. And, Reclamation was the place to work. (Storey: Um-hmm.) Very desirable.

Storey: Now, what were you doing exactly? Were you doing studies for future projects? Or were you looking at existing projects?

Working on a Plan for the Kansas River Basin

Barbour: Well, actually, most of the work there we were doing a Kansas River Basin Plan.

Most of Our Effort Was Definite Plan Reports

We spent some time on future projects, but most of the time was spent on doing the Definite Plan Reports for projects that were already under construction, but the plans weren't completed. So that was kind of interesting—trying to keep ahead so they could go into the design phase.

Negotiating Repayment Contracts with Irrigators

So much of it was dealing with the irrigators, negotiating repayment contracts, as I was on the *economics* end of it. (Storey: Um-hmm.) I would *assist* in doing the studies.

Use of Ability to Pay Studies to Determine Repayment Charges

We had agricultural economists do what they called the Ability to Pay Studies, determine how much a farmer could afford to pay. And then, I used their results to project repayment, and how much the districts would have to pay, how much they could return, how much subsidy they required. And those projects required a lot of subsidies because they could afford to pay only a relatively small portion of the costs. Actually we were pretty easy on the irrigators, I thought, and probably necessarily so. We didn't charge very much for water. (Storey: Um-hmm.)

“ . . . the subsidy was substantial per acre . . . we had the big cash registers . . . Those revenues were used to show repayment for irrigation . . . ”

And, the subsidy was substantial per acre, but that was the history of Reclamation in those days. We theoretically had a big basin account, we had the big cash registers, Missouri River Project, *all* the mainstem reservoirs produced power, and that went into a fund, the Power Fund. Those revenues were used to show repayment for irrigation, and we'd do these long complicated payout studies. I remember one went over about 130 years, to pay out the whole basin project. The rules were that you had to pay each project out separately within fifty years, some with interest, some without interest—depending on the purpose. (Storey: Um-hmm.)

Had to Move to McCook, Nebraska

But, I spent six years in McCook. We moved out of Indianola, after they completed a new office in McCook, and then we were *all* required to move into McCook, after they closed down the prisoner of war camp. So, we had to find places to live, and it was kind of difficult to do, but, we managed, and we had good times in McCook.

Storey: Hmm. What kind of subsidies are we talking about here?

Subsidies for Projects

Barbour: Oh, you know, we used to have limits. It's, it's hard for me to remember but there would be, sometimes subsidies would be, oh, \$500-\$1,000 an acre, and we tried to establish a limit in those days, and I can't recall what the limit was. *But* the politics were such that if you got support, and you got money to build it, there were not significant limits. Then we just leaned more on power surpluses to pay for the project. So long as they thought we were making a reasonable charge to the irrigators, and they at best were covering their own operating costs. That was the important thing. And my recollection is we were charging irrigators \$1.60 an acre for construction costs, in those days. That was just kind of a standard thing. And to this day they were forty-year contracts. So that had to be in the fifties. They probably have renegotiated the contracts.

Storey: That's repayment or that's maintenance?

Barbour: That's repayment of construction costs— operation and maintenance costs were recovered.

Storey: That's repayment. Yeah.

Barbour: They have to pay their own maintenance costs. (Storey: Uh-huh.) And, the maintenance would run, I'm trying to think, maybe about the same amount, or something of that nature.

Storey: When you say subsidy, what do you mean? Do you mean that. . . ?

Barbour: Well, when you did analysis of a project you allocated the cost to irrigation, and to what other purposes might be identified. Most of these project purposes were irrigation and flood control. *And*, in those days, we were permitted to allocate to recreation, and fish and wildlife. And, at that time, those were considered non-reimbursable. And so, of course, there's a lot of pressure on allocating as much cost as you can to those non-reimbursable purposes that didn't have to be repaid. And we had certain procedures that we used in allocating joint costs, and, they were called the Separable Costs Remaining Benefits Method, and the Alternative Justifiable Expenditure Method, and the Use Facilities Method. These were the three major methods. I used to lecture on cost allocation theory, because I kind of made it a speciality of mine. And, we were *required* to allocate costs, and we were *required* to

follow these procedures. (Storey: Um-hmm.) And I always thought that, well we could do it, and we did it because we had to. But it didn't make a lot of sense, pretty arbitrary. The pressures were to allocate as much as you could, to those project costs that didn't have to be repaid, obviously.

Storey: To a non-reimbursable cost?

Barbour: Yeah. And I, I don't know, probably the same pressures are here today, and you probably use the same methods—if you had new projects. I don't know if you have any new projects.

Storey: And it was . . .

Worked on Animas-La Plata Project

Barbour: I worked on Animas-La Plata. We did that thing way back in the '60s and '70s. I never thought it would be built, looks like it will be. But they have to allocate costs. Now, I believe, the repayment requirements have changed somewhat.

Consultant to Water Resources Council to Develop New Reimbursement Policies

When they brought me on as a consultant to Water Resources Council, to develop new reimbursement policies.

Looked at Increasing Repayment on Projects

And so, I did a little study for Don Maughn, director of the Water Resources Council, on how a project could earn more—well, if they could be repaid at a higher level.

Constituents Applied a Lot of Pressure to Keep Repayment Allocations Low

And so we looked at various ways, but the pressures are so great. The constituents could be an irrigation district *or* a municipality. And there was a lot of pressure, you know, to treat them well, to keep those allocations low. Benefits or single-purpose alternative were eliminated as a *limit* to how much you could allocate to a particular purpose. But they're both theoretical, and the benefits are fairly theoretical, you know, what's water worth? We had our procedures, and a single-purpose alternative had all kinds of problems. Do you use the same site? Does it have to be a *reasonable* alternative? Is it one that you think could be built at all? Is it a *likely* alternative or a theoretical alternative? (Storey: Um-hmm.) You could *argue* for months, years, about it. In fact, I'm sure they're still arguing about it, about cost allocation procedure. And still you have to do it. The Missouri River Basin Project, to this day, I presume they're using some of the same allocations that we put together way back then because we established precedent. And the Upper Colorado River Basin Project had cost allocation controversies. Probably some of the earlier allocations haven't changed. They may simplify indexing some of the cost elements .

Annually Updated Repayment Studies

I and John Eyre—I think John is gone now. I’m not sure. We used to have the responsibility to update the payout studies. Every year we’d update the payout studies. We would have to look at the cost allocation again, and we had devised rules. It was difficult to make any *major changes* in a cost allocation after it’s been authorized by Congress. But, you know there have been modifications, and changes, and so you did the best you could, and still *hopefully* tried to be reasonable about it. I *always* maintain, the test of a good allocation was how reasonable it was. *If* you knew that the legislation that created the project intended this project to be primarily for a particular purpose, if it might be for municipal-industrial water supply, and that was the *whole* emphasis, it’d be kind of crazy if you come up with an allocation with three-fourths of it allocated to recreation, and fish and wildlife, and one-fourth to municipal water supply. (Storey: Um-hmm.) But it happened. (Laugh.) And I got in trouble on one of them. I said “I couldn’t buy it.” There’s no sense for allocating a huge amount to recreational uses . . . even though the benefits were great. And even now today we know that recreation turned out to be a wonderful purpose, and it has provided a lot of benefits, whether it’s paid for or not, there’s a *good social* benefit there. *Still*, we found in some instances those who enjoyed recreation benefits were also those who got the water. It was the municipal folks who got the water supply, so they got *double* benefits. And by virtue of the fact that recreation, in those days, was non-reimbursable, the cities didn’t have to *pay* very much for the water and they got all the benefits from recreation, as well. (Storey: Um-hmm.) So, when I would see one come up, and they didn’t seem fair, since I had the final, technical authority on cost allocations in those days, I tried to check on their reasonableness.

“ . . . there’s, no one really to represent the general public interests, the tax-payer, in a water resources project. . . . ”

But see, *unfortunately*, there’s, no one really to represent the general public interests, the tax-payer, in a water resources project except the reviewers. To say, “Well wait a minute. This is not fair. The water’s too cheap. They can afford to pay more.”

“ . . . you’ll find that for many water projects, Corps projects, Bureau projects, whatever, that the water users get by pretty well, because of these *non-reimbursable* allocations. . . . ”

But you’ll find that for many water projects, Corps projects, Bureau projects, whatever, that the water users get by pretty well, because of these *non-reimbursable* allocations. And, they benefit by it, so do the local communities benefit from the non-reimbursable allocations.

“If they don’t pay as much, they can spend more money locally. And so the economy grows. *Those* are the big benefits from the old Reclamation projects, what it did to the local economies. Not the direct users, but the indirect users. . . . ”

If they don’t pay as much, they can spend more money locally. And so the economy grows. *Those* are the big benefits from the old Reclamation projects, what it did to the

local economies. Not the direct users, but the indirect users. (Storey: Um-hmm.) And there lies a can of worms too, is trying to measure the indirect effects. And, there are all kind of ways to do that, with multiplier effects, and so forth. The first paper I ever wrote was on the multiplier effect, *The Impact of Projects on A Community*. And there's no question about what a project will do. The *secondary* benefits are very very significant.

“Very often that’s a major reason for building a project, is to get the secondary benefits . . .”

Very often that’s a major reason for building a project, is to get the secondary benefits, but you didn’t *provide* for any repayment that way. You couldn’t assess them. And the only way you could assess them is an ad valorem tax, and that means you had to get the local folks to form an irrigation district, conservancy district, and then tax themselves. And, that wasn’t an easy thing to do.

“I often wondered, ‘Well, why do we go through this nonsense?’ . . . we should just say ‘This is what they can afford to pay. Here’s a *reasonable* amount. And the rest is non-reimbursable.’”

So, anyway, the financial aspect was simply saying how much the project costs, and how much would be repaid over what period of time. The fact that you got assistance from another project really didn’t matter too much, it just made it look good. And I often wondered, “Well, why do we go through this nonsense?” We say, “Here’s a project, and it serves primarily irrigation, and recreation, and maybe some flood control. This is what they can afford to pay. Here’s a *reasonable* amount. And the rest is non-reimbursable.” Forget about going through this funny business of taking revenues from one, you know, one project 500 miles away, and assume that those revenues will pay for this project forty years in the future. But those are the kind of things we, as a society, we decide makes us feel better, except we know that what’s going on today and tomorrow are much more important, and not what you project the next forty or fifty years. (Storey: Um-hmm.) But you kind of have to be philosophic about the economic and the financial aspect. I learned that the hard way.

“I took it too seriously to begin with. But Congress just wanted to be sure they had a benefit-cost ratio better than unity. And they all, had all kinds of rules to *help* you do that . . .”

I took it too seriously to begin with. But Congress just wanted to be sure they had a benefit-cost ratio better than unity. And they all, had all kinds of rules to *help* you do that, like a low interest rate, and they liked to see a project repaid, except they had all these subsidies, and *basin* accounts to help accomplish payout.

Storey: What does “better than unity” mean?

Barbour: Better than 1 to 1—\$1 worth of cost supported by \$1 worth of benefits.

Assumed Constant Dollar (No Inflation) in Calculations

And, this requires a financial analysis projected in the future, and which requires the consideration of interest rates and inflation rates. We assumed a constant dollar in the analysis for years and years and years, rather than inflation—assuming that all costs are affected essentially the same by inflation, consequently you were applying it on both sides of the equation. It’s a washout. But, when I got out of government work and went with the private sector, we didn’t do it that way. We projected inflation, because inflation can be different for different kinds of things, especially if you’re doing projections such as we used to do for nuclear power, and for example, project the cost of yellow cake in the future (uranium). How do you handle inflation then? And inflation on oil was a lot different than trying to project inflation for yellow cake, you know, uranium fuel. (Storey: Um-hmm.) Or gas, or coal, or—so, when I left the Bureau, and went to work in the private sector, then I developed inflation *curves* for various types of fuels, construction, and so forth. So, we always used projections into the futures, and cash flow analysis, and sensitivity studies. Say, “Okay, let’s look at a *range of inflation*,” on whatever were the major thing, or all the factors. And that way you could do some sensitivity tests and say, “Okay. If the interest rate and inflation rate were this or that, this is the impact on this project. This is how many years it would take to pay. This is how much you would have to charge for it.” So, I thought, when I got in the private sector, we were more justifiable using more *current* data than we did when, in the Bureau, where we used what Congress pretty well set as the rules. We had criteria that they’d argue about, for years, on interest rates and what they should be, and whether inflation should be included. And then, we were always subject, you know, to controversy because anybody that attacked us—and incidentally, you asked me about one of the guys giving us a hard time on the Central Arizona Project? Bob Young. (Storey: Um-hmm.) Do you remember that name?

Storey: I don’t remember it, no.

Barbour: That was the guy.

Storey: I just remember the story.

Barbour: It was Young and another guy that teamed together and wrote *negative* reports on the Central Arizona Project, which we tried to answer. And it was difficult to answer. You know, that, but nevertheless I think the Central Arizona Project turned out to be okay. (Storey: Um-hmm.) As far as Arizona’s concerned, they wouldn’t have a water supply. They’d be in real bad shape (Storey: Yeah.) without the Central Arizona Project.

But, going back to McCook, those days, those projects, they had a lot of money and there was a lot of support and momentum to build those projects. And when you look at the fact that it did employ a lot of people, you know.

“ . . . although some of the specifics of the analysis may be somewhat in question . . . the overall impacts on the economy of the area, I think the Reclamation Program has proved to be a good investment, in most areas. Oh, we made a few mistakes . . . ”

And those were benefits from that aspect. I think the Reclamation Program, although some of the specifics of the analysis may be somewhat in question, but considering the overall impacts, on the economy of the area, I think the Reclamation Program has proved to be a good investment, in most areas. Oh, we made a few mistakes here and there, and probably spent too much money on some projects, and . . .

END OF SIDE 1, TAPE 1. JUNE 24, 2003.

BEGIN OF SIDE 2, TAPE 1. JUNE 24, 2003.

Storey: [Tape leader cut off beginning of question] range?

Barbour: We had some reservoirs where we, like Bonny Reservoir where it was built for flood control and irrigation, though we could *never* justify irrigating out of Bonny. It was too costly. We looked at gravity projects, and *pump* projects. But, it turns out that it was a great recreation resource. And, I think Bonny cost, what, \$13 or \$14 million? And, over the years the recreation benefits and flood control benefits justified it—a lot of people having fun down there. It's a good place to go. And, it is providing protection for flood control. I don't think we've had a major flood since Bonny was built. We planned for a 100-year flood, now they're talking about 1000-year floods. (Storey: Um-hmm.) So fortunately we developed some pretty good projects, I thought, especially in that part of the world where water was scarce, and *lakes* were scare. And now, it's provided good recreation potentials, and its helped the irrigators. Well, you got any more questions? (Laugh)

Storey: Yeah. You said a couple of times there was a lot of pressure.

Barbour: Oh, from . . .?

Storey: To have low reimbursable costs.

Barbour: Oh sure.

Storey: Talk about the kinds of pressures you're thinking of here.

Water User Pressure to Build Projects and Keep Repayment Low

Barbour: Well, of course, these, you know, projects were supported by whom? The water users. And so, you know, the lower the costs are to the water users the more support you got. So if an initial study was made and the study showed a very low repayment required, and then you did an analysis and find that they can afford to pay more, for example, and you proposed that, and it goes up the ladder, and they have to discuss it with the district people who're not going to be very happy about it. Usually when a new administration would take over they'd look at some of these water rates and say, "Hey. We've got to do something about it." This is what happened when—I'm trying to think of the name. I mentioned it to you before.

Studies Determined Westland Could Pay More for Water

When I testified on the Westland project that “Well, Westland has very low water rates. They can afford to pay more.” In fact, (Laugh) I didn’t know anything about Westland *early* in my career, but I remember one thing about Westland. I remember we had an economist, Don Street, who was in Boise, Idaho, and he was transferred to our office. And this was probably in 1957 or ‘58. And so we did some studies to show that really the Californians just were *not* carrying their share, that we were having trouble showing repayment, and one of the reasons—the water charges were so low. (Storey: Um-hmm.) And so, he was an Ag economist, and he did studies, and he showed, by golly, they could afford to pay at least twice as much for water. And there would be more revenues coming in, they could do more things, it wouldn’t be such a burden on power revenues. So, (Laugh) a planning engineer from Sacramento came in. He was really peeved. In fact, he was giving Don Street a hard, hard time. And then he called Don something or another, like a “dumb accountant” or something like that. I don’t know what he called him. And Don, I had to pull him back. I thought there was going to be a fist fight, *over* water charges for *Westland* Irrigation District. Kind of interesting that years later the assistant secretary—what was his name? Anyway, asked me to testify before a committee, and it had a lot of people from the state, on what those farmers could afford to pay. So, these local guys did the study, and they wanted somebody to present it. Nobody in Washington wanted to face Westland. The Westland Irrigation District is probably one of the most powerful, politically powerful, irrigation districts in the *whole* country, huge district. Are you familiar with Westlands? (Storey: Um-hmm.) So a visitor from the assistant secretary’s office—Beard asked me.

Storey: Dan Beard?

Barbour: Dan Beard.

Storey: He was the commissioner, and he was on that?

Barbour: No, he wasn’t a commissioner, though, he was working over in the assistant secretary’s office in those days.

Storey: Yeah. He was deputy assistant secretary under Carter, I believe.

Barbour: No. This was before that. He was just—I don’t know what his title was over there. But I remember Dan was there, and we were, and several others, and we were deciding how we’re going to make this presentation, and just what numbers we were going to present to show what the farmers could pay. And he wanted to also show the subsidies they received. And nobody likes to hear that, how much subsidy they received, so. Anyway, I recall—did I tell you the story about telling about the, Truman?

Storey: Hmm-Um. I don’t think so.

Barbour: Well, I figured, it was a *lot* of tension, in that meeting, and the Westland’s people were there, the top state people were there, and the assistant secretary was there. I can’t think of his name. Guy Martin? Mart . . .—would that be right?

Storey: That may be right. I'm not sure though.

Barbour: He was chairing the meeting, I think. And so, they had all this thing going. The time come for them, for someone to have some numbers, you know, "Just how much of a subsidy are they receiving? Just how much are they paying?" And they had done the studies out of the regional office, and so they had asked me to make the presentation. And there's all these cameras, and all these people in the room, and I was obviously nervous, and I thought that Dan or somebody else should be doing it, someone from Martin's staff should be doing it. But Jim Flannery was their economist, and he was a real politician. (Laugh) He's not going to do it. (Storey: Um-hmm.) So that's how he asked me to do it. Well, I didn't know any better, I guess. "Sure. I'll do it. I'll go and do it, check the study to see if makes sense, and I'll make the presentation." So I started out, and he called me, and he didn't even know who I was. Beard didn't. But "Now we were going to have this presentation of repayment ability, and repayment, and that sort of thing, and we have Ed Barbour is going to do that." And he didn't know I was sitting there fairly close to him. So, I stood up, and I had a board there, and so I was putting the stuff on the board. So I says, "Well if you notice I'm doing this with one hand—with my right hand." I says, "It reminds me of Truman, when he called economists together to get some advice. And he says, 'Okay, what's going on?' 'Well, Mr. President,' the economist says, 'on the one hand' he says, 'we are nearing full employment. On the other hand investment's low, and I think if we could just increase investments, and it'll improve employment, and things will be a lot better.' And so he sat down.

And the next economist got up and he says, 'Well, Mr. President, he's correct, but on the other hand,' he says, 'I think it's good that we have a little deflation, and maintain prices at a lower level. This will encourage investors and could increase employment.' And he sat down.

And he had a third economist. He got up and he says, 'Well, Mr. President, on the other hand,' and by then he [Truman] had lost his patience. He says 'By god what I need is a one-handed economist!'"

And I says, "If you'll notice," and the guys kind of laughed, you know, they thought it was a pretty good story. That's an old old story. So I says, "If you'll notice, I'll be doing this with my right hand." (Laugh.) You know it was kind of a little bit of aside, and I was sorry I said that.

But anyway, I did get through it okay, but whether they got much more repayment out of Westlands Irrigation District, to this day I don't know. (Storey: Hmm.) But this was always a battle, every time we'd get a new administration, especially a conservative group. "By god we're going to have those reclamation people pay more. All those people that benefit from Reclamation projects should be paying more." And *truly*, they could afford to pay more, but it's tough to do.

In economic analysis they're always hung up on benefit-cost ratios—it was always "Just get it better than 1:1." I was doing one of the first economic studies I ever did in McCook, Nebraska—I didn't know from much. I thought, "Well, I'll do it

like I'm supposed to do it." So, we had a little reservoir by the name of Lovewell. It's a regulating reservoir on the Bostwick Irrigation Project. The canal was so long it needed to have a little regulation towards the end of it. Well, it's going to make a mighty darn good recreation, fish and wildlife reservoir. So Redman, our planning engineer said, "Ed, I want you to do an economic study on this thing, and, we'd like to justify wanting to build a project there." And so I checked. I was new. I went to the engineering section and checked all the cost estimates to see that they looked reasonable, and made sense, and then I checked with the Corps of Engineers, to see if we could get any more flood benefits out of them. Well, it was an off-stream reservoir, you know, canal regulation so they didn't (Storey: Uh-huh.) come through with anything. Talked to the fish and wildlife folks, and they had provided some benefits, and then I called Omaha to the National Park Service. That's before the Bureau of Outdoor Recreation. (Storey: Um-hmm.) So I talked to them and got benefits, recreation benefits, and I put it all together, and prepared a benefit-cost analysis—the benefits that accrue from regulation, more irrigation, stabilized flow, and all that. The best I could do. And I talked to the agricultural economist about what that might do to crop yields by having a better water supply, and how many additional acres might be irrigated. Putting it all together I came up with a benefit-cost ratio, following the rules, of .67 to 1. That means the benefits were only 67 cents for every dollar's worth of cost. So I says, "Well, Al, I made a quick and dirty study like you asked me to and it comes out .67 to 1."

He says, "That's not a good study."

And I says, "Well, it's as objective a study as I could make with all the data, and here's all the data, and I can back up all the data. I got it from all your experts."

He says, "Objective?" He says, "Don't you know the objective is to come out with a benefit-cost ratio of greater than 1 to 1?" (Laugh)

He really meant it. But to this day I'll never forget that. I don't know whether they ever got it back to 1 to 1, but I didn't change my study. I don't know later whether they were able to justify it, or they maybe didn't have to justify it—if the politics were such somebody could put it up for authorization, then they, you know, they swapped projects like they do, and "You vote for my project and I'll vote for yours." Well, they got Lovewell. And it's a *fine* reservoir for regulating, and it's a wonderful reservoir to fish in. (Storey: Um-hmm.) And, looking back, it didn't hurt, you know, (Laugh) it created employment locally, but it was pretty hard to justify using our procedures. Assuming our economics meant anything. (Storey: Hmm.) But, . . . go ahead.

Storey: Was it the same way throughout your career?

“. . . it's *always* controversial. And that's what I fed on anyway—I like controversy. . . .”

Barbour: No, we had some good projects, but it's *always* controversial. And that's what I fed on anyway—I like controversy. (Storey: Um-hmm.) I enjoyed it. And that's why I got

a lot of the special assignments, because if there was a controversial project, or a project didn't make sense to me, well I'd say something about it, and sometimes it wouldn't help, and sometimes it would.

“ . . . taking on some of the tough projects, is why I developed a reputation for being a kind of a special projects guy, and that's why I got all these fun assignments . . . ”

And by doing that, by taking on some of the tough projects, is why I developed a reputation for being a kind of a special projects guy, and that's why I got all these fun assignments from going to Oakridge National Laboratory and learning about nuclear desalting, which the Bureau had *never* done. The assistant chief engineer, Emil Lindseth, set up a small study group and called it the “Dirty Seven.” I told you a little bit about that. And, we talked to the top people in AEC, Atomic Energy Commission, and Office of Saline Water at that time, headed by Dr. Hunter. And we had information on the latest technology, and we had nuclear engineers coming out to this office—well, in the old building. And, we had people from GE General Electric and Westinghouse, giving us their best *estimates* on reactors. And, fortunately, I got to work with them.

Cost Allocation on a Nuclear Reactor Generating Plant

And we'd have, talk about cost allocation. You got a nuclear reactor—you know, we're used to building reservoirs, (Storey: Um-hmm.) dams and reservoirs. Now can you do a cost allocation on that? Find a single-purpose alternative, and measure the benefits. You take the lesser of the two, subtract the separable costs, develop a ratio, and you got the basis for an allocation. Did I leave you there someplace?

Storey: Um-hmm. But don't worry about it.

Single-use Basis in the Benefit-Cost Analysis

Barbour: It's very simple to find. You say, “Okay. If you built this on a single-use basis, how much would it cost?” “Ten million bucks.” “Now what are the benefits worth?” And you capitalize the benefits. You know how to do that? (Storey: Um-mmm.) It's a stream of benefits, you find the present worth of it. So you find a present worth of benefit, “Oh, that's \$6 million.” So we use the lesser of the two which is \$6 million. Right? One's ten, one's six. You do that for every purpose, so you take the lesser of the two, which is called the justifiable expenditure, and develop a ratio. First, you can separate all those costs that you can identify with the purpose, like, its transmission line, the powerplant, the canals, you know, for irrigation, a picnic table for recreation, etc. You could take those out and allocate them directly to those purposes. So now the remaining is what we call the remaining joint costs, and you take the residuals of this, the lesser of the two, which is called the justifiable expenditure, and then you develop a ratio. And it'll be twenty-, thirty-, forty percent, whatever, and you divide up the joint costs that way. (Storey: Um-hmm.)

“We thought we were going to solve all the water problems of the world . . . with nuclear reactors, using the heat for desalination . . .”

Now, if you’re starting in this new field that we were looking at. We thought we were going to solve all the water problems of the world, the Colorado River, and the West, and the water shortage in Arizona, and California with nuclear reactors, using the heat for desalination, large-scale desalination. The desalination part of it used heat. And of course you’d generate electricity with heat. Now, you’ve got to have heat, so you can boil the water. So you have to take it out at a temperature where it’ll boil water. You’re dealing with high temperatures, and high pressures.

“So, what you do is you . . . pull the heat off a *little* bit before you *normally* would. Consequently you disadvantage the power generation . . .”

So, what you do is you pull the heat away from the production of power, you pull the heat off a *little* bit before you *normally* would. Consequently you disadvantage the power generation somewhat, so you can give heat to the water (Storey: Um-hmm.) production. Now the question is, how do you allocate costs of this nuclear reactor between electricity and water. So they asked, “Hey, how are you going to do that?” You know, I said, “Well.” (Laugh) “We’ve never done this before, but I think we can figure out a way.” So, I consulted a heat engineer and I asked, “Well, heat is valuable because it does work. Is that right?” And what is it called, entropy? Or something like that? And I said, “ Now, if you had a generator, and you used *all* the heat right down to where it does no more work, then you exhaust it, I think, at ninety-seven degrees. I can’t remember the number anyway. But now we’re going to withdraw heat . . . What’s boiling water? What’s it take to boil water? A hundred and eighty?”

Storey: Oh, I don’t–212 is it?

Barbour: Two-twelve? Anyway, if you pull it off at 240, or 250, then what are you going to lose is some potential for generating electric power—the ability of heat to do work. And, of course, that ability goes down to practically zero when they exhaust it. (Storey: Um-hmm.) So, they call it entropy, or something or another. So, this is what I developed as a way to allocate the costs between the two using the potential of heat to do work. And I ask, “Okay. How much of this heat did we use in desalting, and how much work could it have done for the electrical part of it?” That could be the basis for using what we called “Use of Facilities Method,” which was one of three methods you could use: the Alternative Justifiable Expenditure Method, the Alternative Separable Cost Method, and then the Use of Facility Method. So, I developed a cost-allocation procedure to deal with these dual-purpose nuclear reactors using the ability of heat to do work as a basis for allocating costs, which was an innovation. Nobody had done it. And the Bureau got involved into these new fields, because of mostly one man, Emil Lindseth, who got us *moving* into these new fields. “Let’s look at these possibilities.” And that’s why, when we did all those alternative studies we looked at nuclear powerplants, and we had desalination plants.

This was in the, these were in those *marvelous* innovative years of the early ‘70s. See, in the ‘60s you had the environmental movement begin to bloom. (Storey:

Um-hmm.) So, you had the Environmental Protection Act. You had the Water Quality Act, towards the end of the '60s. Then you had the Water Resources Council formulating] new procedures.

In the 1970s “Here’s the situation, we’re just about out of water and now we’re developing the most complicated set of rules on how to plan it, after most of it’s already planned and gone. . . .”

Here’s the situation, we’re just about out of water and now we’re developing the most (Laugh) complicated set of rules on how to plan it, after most of it’s already planned and gone. (Storey: Uh-huh.) New sources of water had to be found. We spent a *lot* of time and effort in committees, and *national* groups, and this is one of them. You know, we took them on this little trip here. (taps table)

Storey: Out to Rainbow Bridge? You mentioned that last time.

Barbour: Out to Rainbow. Yeah. We had developed new procedures, you know, very sophisticated procedures that recognized environmental quality, *water* quality as well as the conventional purposes.

“ . . . we were getting very very sophisticated at a point in time when we’re running out of water. . . .”

Social impacts, and we were getting very very sophisticated at a point in time when we’re running out of water. Well, maybe that’s the time to be sophisticated. And so we even set up international groups, the International Water Resources Association got involved, and they thought we were doing a great job.

Development of the Guidelines on How to Implement Multiple Objective Planning¹³

And so, I told you that I got about forty or fifty water resource people got together from all the agencies and we put together what we called the “Yellow Book,” which provided guidelines on how to implement multiple-objective planning.

International Attention for the *Guidelines*

And, the United Nations liked it, and we got *invited* to India, and the Philippines, United Nation’s Water Resource Council’s meetings, and I was asked to make presentations on how you performed multiple-objective planning. How you plan for more than just economic efficiency. You could also plan for regional development to create more jobs; and plan for social well being to help people. Those would be the primary objectives. You could also plan environmental quality. You might build a reservoir just to preserve a rare fishery or something like that. But, that didn’t last long. (Storey: Um-hmm.) We got a group of water resource people together and we

13. In 1973 the U.S. Water Resources Council published the *Guidelines for Implementing Principles and Standards for Multiobjective Planning of Water Resources*.

did several test projects on how that might work, and we evaluated the various plans and effects and sent those forward to the Water Resources Council.

“The Bureau was . . . on the forefront in those days, in water resources planning. . . .”

The Bureau was on the forefront in those days, in water resources planning. And, the Corps, I believe, was jealous of us because of it.

Reclamation Was Given the Westwide Study

And then, when Reclamation was given the Westwide Study, which was to develop water plans for the eleven western states, on a *multi-agency* basis, and we were the lead agency, that really irked them.

Storey: When was that?

Barbour: This was in the late ‘60s, early ‘70s. And, we got this big authorization for money to do it, starting with, I think, several million dollars. It was supposed to ultimately cost closer to \$20 million. Wally Christiansen was selected to head it up and given a staff. And where are they going to get the staff from? Of course, from the Bureau of Reclamation and other agencies. And, so, then several of us were ordered by the commissioner to go serve. We were concerned about this, you know, we knew it couldn’t have a long life. You know, a special study, working with all these agencies—what’s going to happen at the end of it, you know? (Storey: Um-hmm.) Nevertheless, we got orders from the commissioner—“Barbour and Ken Kauffman will be assigned to that; Wally Christiansen would head it up. And we got several other people assigned to this group. So, then we set out as a multi-agency group with representatives from most of the water agencies. We had our offices up on the thirteenth floor.

Storey: Of Building 67?

Barbour: *This* building. And, we had the corner office. The *nice* one, you know, the one that’s at the *northwest* corner. (Storey: Um-hmm.) We had those offices. We had offices for Geological Survey, Fish and Wildlife, National Park Service.

Staffers from Many Agencies and Bureaus Participated in the Westwide Study

We also asked Corps representatives to come in and join us. We were trying to do broad comprehensive plans for the eleven western states. We talked to *all* the state engineers, and heads of the water resources departments, and we had representatives from every state, and we had selected teams for each state. (Storey: Um-hmm.) And, had them write up their critical water problems. It was really an innovation for the Bureau, and showed some leadership in water resources planning.

Scoop Jackson Prevented the Westwide Study Looking at the Columbia River

And we did that from about '69, '70, through about '72, or '73, when finally funding was terminated. It was said, well, the politics wasn't good, and then finally we were looking, (Laugh) we looked at plans of even bringing water from the (Laugh) Columbia River into the Colorado. When that idea came up Senator Henry M. (Scoop) Jackson got this moratorium passed saying "You cannot touch the Columbia. You can study the Colorado River, and you can study all these other alternatives if you want to: rainmaking, and desalination of water, and all those other exotic plans. You could even look at bringing water in from the north." You remember we talked about bringing water from Canada, and then moving water along the coast, and a pipeline from northern California to southern California. (Storey: Uh-huh.) We looked at floating icebergs down from Alaska. Some of us called it "science fiction." The Bureau was doing some fun things in those days.

Storey: And were they using economists in those studies?

Headed Economics, Environmental, and Social Groups

Barbour: Oh, well, that was my job. I had the responsibility for the economic studies. And, I also had the responsibility for an environmental group, and the economics group. George Wallen, I had *helped* bring over from the Fish and Wildlife Service. George headed up the environmental group. And then, we brought in, for the first time for the Bureau, a social psychologist, Dr. Adams. You know Darrell Adams? (Storey: Um-hmm.) We brought him to look at public involvement, and the social aspects, because we had, we were trying to implement the *Principles and Standards*.¹⁴ That was a requirement— when we ran the study we had to implement the *Principles and Standards*, and develop procedures to implement them. That was a part of our effort.

Storey: So, what were the *Principles and Standards*?

Barbour: Well, they are principles and standards of water planning.

Storey: And where did those come from?

Barbour: Well, the Water Resources Council.

Storey: Okay.

Barbour: They were *published*, in the Federal Register, and all agencies, *supposedly*, had to follow them. We were given the job of *interpreting* those in the Westwide Study, and that's when I put together implementing instructions for the *Principles and Standards*. I should have brought you a copy of the "Yellow Book," it's about three-quarters of an inch thick. I edited and put it together at the very end. In fact, for doing that work, I got the Interior Department Silver Medal. It should have been a gold of course. (Laugh) But, that's the top medal, isn't it?

14. U.S. Water Resources Council. *Principles and Standards for Planning Water and Related Land Resources*. 38 *Federal Register* 24778–24862, September 10, 1973.

Storey: This is one of the awards?

Barbour: Yeah. Are you familiar with the silver?

Storey: Something like a Distinguished Service Award?

Barbour: It is, except the highest one is gold, and the silver is second highest. (Storey: Um-hmm.) Also the Bureau can give outstanding performance citations, which I received.

Storey: And you say this, these *Standards* were about an inch thick, huh?

Barbour: Yes—it took a lot of hard work.

Storey: Maybe a little larger?

Barbour: I had about forty or fifty people who working to put it together. I did the economics, edited, and put it together at the very end. And we had procedures for evaluating social well being. And Darrell Adams helped a lot in developing this, in analyzing the use of a scale of one to ten. (Storey: Um-hmm.) Social aspects—those things that you couldn't measure in terms of dollar and cents would be measured on a scale of 0 to 10. And, we would use a system where you'd involve a multi-disciplinary group. For example, if you were going to measure environmental impacts, we'd have categories like "open green space, would be one. And, if you wanted to determine whether this is good, bad, or indifferent, regarding the impacts on open and green space, then you would get a multi-disciplinary group together, (Storey: Um-hmm.) and sit in a room, and say, "Okay. Let's put a value on this. Everybody do it separately. Zero or one being the low, and ten being the highest. Ten if it's the best thing you knew of, and zero if it's the worst."

END OF SIDE 2, TAPE 1. JUNE 24, 2003.

BEGIN SIDE 1, TAPE 2. JUNE 24, 2003

Storey: This is Brit Storey, Senior Historian at the Bureau of Reclamation, interviewing Ed Barbour on June the 24th, 2003. This is tape two.

Don't think it's worth much, you go to a lower rating?

Barbour: Right. We would do that with a multi-disciplinary group, we really emphasized the multi-disciplinary planning, tried to bring all aspects involved, environmental people, biologists, engineers, economists, and so forth. This was the *essence* of multiple-objective planning. You're looking at multiple objectives—and you're looking at all aspects of planning. You could develop a system, which we did, in evaluating environmental quality—a rating system. And then if you got a multi-disciplinary group to do it, it's surprising. You get some central tendencies. If all the ratings are up on the scale, then it must be pretty good. (Storey: Um-hmm.) You have unanimity of opinion. If it's on the lower scale it wasn't so hot. And you could do that for a lot of things you couldn't measure in dollars and cents. Some things you could measure numerically, that you couldn't measure with dollars and cents, like water quality,

things like that. You can go out and, you know, check the quality, and sedimentation, and other factors.

Measured Four Different “Accounts:” National and Regional Economic Development, Environmental Quality, and Social Well-being

We had a four-account system, *one* which was called national economic development, dollar and cents measure of impacts on income; and regional development, which were the secondary effects, jobs and other growth factors. And then we had environmental quality, how did you evaluate that? And then we had social well being, Darrell’s favorite subject, how do you evaluate that? And you could do that through public involvement meetings, and other non-monetary approaches. And that’s, you know, Darrell did very well in public involvement. Do you know he did the manual on it (Storey: Um-hmm.) when we were working together? In fact, he spent several million dollars of our research program on that, developing procedures. He hired, Dave Creighton¹⁵ who has now got his own consulting business. I *still* get his letters. And he’s doing work all over the country, in fact, all over the world, in *public* involvement. And, Darrell got him started with us. Can you imagine that, the Bureau of Reclamation published the best public-involvement manuals that any agency has ever used. (Storey: Um-hmm.)

We did some real good things there in the ‘70s—innovative things. Then, with the change in administration, less emphasis on social effects, and other intangibles, the Principles and Standards were modified so that you could plan mostly for economic development, and some consideration given to environmental quality. But, before, we said, “Look, for example, if there’s an area . . .” and you tried to do two or three plans, one that would emphasize economics, it would be a tight plan, and get high repayment, high benefit-cost ratio. Or you might modify it to include more social effects, more jobs or there might be an Indian reservation, or there might be lots of unemployment. So, its make-work projects you could add. That would be the social well being objective that you were serving and also regional development, which was also to provide income, and jobs, and business development as a secondary effect. We developed an account system to measure all these effects. But, that was abandoned. It was decided that these indirect effects be evaluated, but you did primarily one plan, which emphasized economic efficiency. By that time we had run out of projects anyway. (Storey: Um-hmm.)

You know, by that time there were only two to three major dam sites left, in the country. There’s one on the Columbia River. What’s the name of that site? I thought I’d never forget it. Of course there are ones on the Colorado, that I told you about, that there’s *no way* you’re going to ever develop those, Bridge Canyon, Marble Canyon (or Walapai, they called it). And, on the American River we had Auburn, which was stopped. Remember Auburn site? (Storey: Um-hmm.) Remember we got the foundation ready to go, and everything? I did the *power* studies there to show that

15. Referring to James L. Creighton who authored *Public Involvement Manual : Involving the Public in Water and Power Resources Decisions* (1980); *Procedures for Alternative Futures Planning*, (1976); and, with others, *Public Involvement Techniques : A Reader of Ten Years Experience at the Institute for Water Resources*, (1983).

it was going to be a *good* peaking-power facility. Well, they had Auburn under construction, but it was abandoned.

“ . . . the environmental movement was strong enough, you know, there were not going to be many more dams . . . ”

And then, the environmental movement was strong enough, you know, there were not going to be many more dams, and I don't think we've built any since. So, the whole *outlook* of the Bureau changed, and we were always talking about what goals and objectives should be in the Bureau?" And we finally narrowed them down to water management, you know, and water conservation, with consideration given to environmental quality enhancements, and that sort of thing.

“ . . . where we are today . . . objectives of the Bureau, now it's to get more out of what you've got . . . ”

And where we are today, what, when you look at your objectives of the Bureau, now it's to get more out of what you've got today. (Storey: Um-hmm.) Better water management, better hydroelectric power management, and so forth. And that's, that's because dam sites have been used or are not acceptable.

“ . . . there are still some projects left to be done, but I don't' think the *Bureau* will build them. . . . ”

And there are still some projects left to be done, but I don't' think the *Bureau* will build them. Now, you might, just like we know that the city of, county of Denver had to build Dillon.

“ . . . Reclamation did all the plans for . . . Denver's Dillon Reservoir. . . . ”

The Bureau of Reclamation did all the plans for Denver's Dillon Reservoir. In fact, I worked on one of the first projects, the Blue River-South Platte Project. But, there was no way the Bureau could overcome the objections of the local interests.

Two Forks Was One of Reclamation's Projects

And then when Two Forks came along, that was one of our projects. And, I tell you, when you went to one of those public meetings and you were the Bureau (Laugh) you had to look out. Larry Nelson was telling me, he conducted one of those public meetings, and he “nearly got run out of there,” he said.

Storey: Larry who?

Barbour: Nelson. He was working at the region, and he was doing planning on the Platte River. Well, now they wished they had the project, you know—Two Forks. (Storey: Um-hmm.) They could use it. But the Environmental Protection Agency, you know, finally was the straw that broke the back of the developers. The city and the counties, and everybody got together and they were going to build it, and they prepared an

extremely costly environmental impact statement.

Finally EPA Ruled Against Two Forks

And finally the EPA ruled against it. (Storey: Yeah.) And they couldn't overcome that. That would have been a nice reservoir. And, Denver would be better off. That stretch of the river, which I always fished, which I loved to fish wasn't as much fun as it was anymore, with all those floaters coming down, and crowds of people along the shores, and wild parties. So, it didn't turn out to be as pristine a stretch of river as you might think. (Storey: Hmm.)

“But, those are kind of the heyday, when we were still building projects. Those were the fun days of the Bureau. . . .”

But, those are kind of the heyday, when we were still building projects. Those were the fun days of the Bureau. And, now you know how it is, you are at the Commissioner's level now.

Storey: Well, about three steps removed, yeah.

Grant Bloodgood

Barbour: Yeah. So when did they reorganize the Bureau? You know, we were always separate, apart. And it was headed by the chief engineer. (Storey: Um-hmm.) And he was very very powerful. We had a man by the name of Grant Bloodgood. I guess you've probably heard of Bloodgood.

Storey: Grant Bloodgood.

Barbour: Grant Bloodgood. I had one of my first trips to Washington, I think it was early in the '60s or so. I was working on the Central Arizona Project, which opened a lot of doors for me, because it was a very important project. They sent me to Washington to redo the cost allocation and take a look at the financial analysis. And it was a very sensitive project. So, I would go to Washington and work on it. I had gone to the assistant secretary's office to work with some of their economists on the project, because Stewart Udall, being from Arizona, was very interested in the project.

Bloodgood Told Him to Never Transfer to the Washington, D.C., Office

So, I had been down to the Secretary's Office, and I was in the elevator and Grant Bloodgood, I remember Grant Bloodgood was in there. He said, "Hey. You work in my office?" I said, "Sure I do." I think he knew my name, I'm not sure. He said "Son. I want to give you a little advice. Whatever you do, *never* transfer to this damn place. They'll *drive* you crazy. Hell, every time I come over here I can hardly wait to leave." (Laugh) I'll never forget it. I'm just a young guy, you know. I thought this was really great stuff. He added, "Just stay out of Washington as much as you can." (Laugh) And I had a lot of opportunities to transfer out there—I never did.

Subsidies in Reclamation Projects

Storey: Hmm. Let's talk a little more about subsidy.

Barbour: Subsidies?

Storey: I don't quite understand what subsidy is. You were saying maybe there was \$500, maybe there was a \$1000 subsidy. Does that mean a \$1000 an acre (Barbour: An acre.) that wouldn't be repaid?

Barbour: Someone else would be paying for it, theoretically. If it was a part of a project, a basin project. Then you'd use power revenues, in your payout study, and you had to show that each project would pay out in a certain period of time, (Storey: Um-hmm.) usually fifty years. So, you would normally contract for irrigation repayment for forty years, and then assume that it would extend another ten years. And then, what *wasn't* paid for, you would borrow funds, so to speak from revenues generated by electric power, and thus show a payout of that project. So, *that* was a subsidy. So the irrigators might pay \$1 an acre, \$2 an acre, times forty years, or a total of \$80 an acre. Okay? (Storey: Um-hmm.) And the project costs \$600 an acre to build, or \$1000 an acre, some of them did. So, you see it needed about \$500 or \$900 worth of subsidy.

Storey: Okay.

Barbour: So then, simply, if it was part of the Missouri Basin Project, and we did these long payout studies, we scheduled *all* the projects year by year. When irrigation projects needed help we'd schedule the necessary revenues. In the meantime, we had to pay the power off too, within a *specific* period of time, *with interest*. So, you had to be sure that the revenues were great enough to pay off the power investment, and also pay the irrigation investment. So, one of the first things I did in the Chief's Office was work on the Missouri Basin Project¹⁶ Payout Study, which included several hundred projects. Many of the projects, the powerplants were developed by the Corps of Engineers, but they were part of the Missouri River Basin Project. (Storey: Um-hmm.)

Debate with the Corps of Engineers about How Much of Pick-Sloan Missouri Basin Program Costs to Allocate to Flood Control and Navigation

And so, this is why I told you we had the battle about cost allocation with the Corps of Engineers, on the mainstem. They did not *allocate* as much to flood control as we thought they should—which was non-reimbursable, for the more they allocated to flood control, of course, the less the reimbursable functions had to pay. Less was available to allocate to power, less available to allocate to irrigation. Now, they had navigation and flood control, both of which are non-reimbursable. (Storey: Um-hmm.) What they built was three or four mainstem reservoirs?

Storey: Yeah, like Garrison and Oahe, and Fork Peck.

16. Officially known as the Pick-Sloan Missouri Basin Program (PSMBP).

Barbour: And I used to be able to name them all. So we put all of those in the project. Then, I'd look at the cost allocation and say, "Hey. You know, I don't think this allocation is very fair. How did you minimize these, these allocations to navigation and flood control when the reason you built it, and got authorization was for those *predominant purposes*." (Storey: Um-hmm.) "That's why they had the Corps build these. Now, why is your allocation so minimal to those purposes?" "Well, we assumed that if we had one big dam, we could control most of the floods. And so all of the benefits could be produced by maybe one or two dams, instead of the three or four dams that were actually built." So, when they did the cost allocation, since I told you it was limited by the single-purpose alternative, or the benefits. Well, they assumed only one or two dams that were low cost to build for a single purpose flood control dams when they actually built three or four. So that assumption would establish what you could allocate to flood control.

“ . . . we never did win. Because the Corps was much more powerful than we were. . . . ”

So, we had an argument, a discussion, a very heated discussion, and we had a guy, who was head of Power Division, by the name of Bennett? Assistant—what's his last name? Newcomb B. "Buzz" Bennett? Buzz? Anyway, he was head of the Power Division, and he was assistant commissioner, head of Power. When I told him that, he carried on a correspondence with the Corps arguing about cost allocation, but we never did win. Because the Corps was much more powerful than we were.

Storey: We had to use their allocations?

Barbour: We had to use their flood control benefits, and their allocations.

Storey: Now, . . .

“ . . . their flood control benefits were large, but if you capitalized those benefits you can make a large allocation to flood control, but it was *limited* by the single-purpose alternative that would serve the same purpose. . . . ”

Barbour: But their flood control benefits were large, but if you capitalized those benefits you can make a large allocation to flood control, but it was *limited* by the single-purpose alternative that would serve the same purpose. See?

Storey: So, would the allocation to flood control be part of the subsidy?

Barbour: It would be that part that's written off. So, if the . . .

Storey: So, the subsidy, this concept of subsidy only applies to the repayable part (Barbour: Correct.) of the costs? Is that right?

Barbour: Correct.

Storey: Okay.

Barbour: In other words, a purpose that couldn't carry it's own weight. Now, municipal-industrial water supply is supposed to be repaid, with interest, in fifty years.

Storey: The whole thing?

Barbour: Yeah. Whatever is assigned to them.

Storey: Yeah.

Barbour: Whatever is *allocated* to them. And, in those days recreation was non-reimbursable, but in some earlier cases you weren't allowed to allocate much of the joint cost to recreation. That changed later. Fish and wildlife was considered non-reimbursable, and in some instances, especially if salmon was involved, or something like that, it would be an allocation to it. But that wasn't allowed earlier, in the authorizing documents for this, the Missouri Basin Project. So, that left flood control and navigation as non-reimbursable, and then all the irrigation and power, which was the other two big purposes. There was very little municipal water in the Missouri Basin Projects. (Storey: Yeah.) Very little.

Doing Payout Studies for the Pick-Sloan Missouri Basin Program

So, we had to then use power, and we'd had to adjust the rates, and project the rates out in the future, so there would be enough revenues so that we could show that the Missouri River Basin Project would pay out. Well, it took so long before all the projects came online, that the total payout period would go for hundred—I remember it was 126 years, or something. Because, you'd have to show that each one paid within fifty years of its own individual life. (Storey: Uh-huh.) So, you'd schedule them in. It was a very complicated analysis. I remember, in those days we didn't have computers, and you'd do these payout studies by hand that went for a hundred-plus *years*, and you'd have to figure the operating costs for each year, the interest cost for each year, the revenues, and then what's left over you pay the interest, the balance on the principal. And the thing had to balance, and if you made one little mistake you'd have to do the whole damn thing over again. It was all cranked out by hand. (Storey: Um-hmm.) Because, I remember that was one of the first jobs I had when I moved over to the chief engineer's office, was working the payout studies, for the Missouri River Basin Project. And, that's how I got involved in payout studies, and that's how ultimately we ended up, John Eyre and I were responsible for all the payout studies in the Bureau. (Storey: Um-hmm.) We put an annual report out, showing the payout of all the projects, and the regions would update it every year.

Storey: So, let's see if I understand this. You have project costs that don't have to be repaid? And you have a *group* of project costs that do have to be repaid?

Barbour: Yes some with interest, and some without interest.

Storey: Some with interest, some without, some allocated to power, some allocated to irrigation, maybe some M & I, whatever.

Barbour: Right. Right.

Storey: So, the *non-reimbursable* costs are just paid out of the Department of the Treasury?

Barbour: Right.

Storey: And, the reimbursable costs . . . ?

Barbour: Of course we don't know that, but that's what the assumption is.

Storey: And the reimbur . . .

Storey: And the reimbursable costs have to be repaid, but the subsidy comes in where a part of the income (Barbour: Power mostly.) is applied to one of the *other* reimbursable costs?

Barbour: Right. Correct.

Storey: Okay. Interesting.

Very High Subsidy on the Fruitland Mesa Project

Barbour: Oh yeah. That's a basic concept that anybody that worked for the Bureau of Reclamation during that period of time subsidy was a big argument. How much—then they'd say, "How much can we subsidize irrigation?" And then I told you that one time that I got in trouble with Animas-La Plata. The subsidy was extremely high. I mentioned the project the other day. Anyway I figured what it would take, the subsidy that each farmer would receive at Fruitland Mesa.¹⁷ And, it seemed got so high that *regardless* of where the funds came from it just didn't seem appropriate to me. It was about a *million* dollars per rancher. I think if you had given each one of them one-tenth of that they'd have been very happy. He didn't have to irrigate." (Storey: Um-hmm.) But anyway, I then wrote this blue envelope¹⁸ memo to Washington and, saying that "I don't think this is feasible." The politicians were not happy with me, and I came close to being fired.

Storey: That was part of the Central Arizona authorization?

Barbour: Yeah. The Colorado River Basin Project, and so Aspinall got his projects.

Storey: Yeah. Colorado River Basin Projects there.

17. The Fruitland Mesa Project was named in 1964 and authorized by P.L. 88-568 which provided for construction, operation, and maintenance of the Fruitland Mesa Project and other participating Reclamation projects under the Colorado River Storage Project Act of 1956. The potential major structures are Gould Dam and Reservoir (a.k.a. Fruitland or Onion Valley Dam and Reservoir). It was not built, but there are existing private works.

18. "Blue envelope" is a term used in Reclamation for blue envelopes which are used to transmit something to a person. Only the person to whom the blue envelope is addressed is supposed to open it.

Barbour: So, he got his five projects as part of the Glen Canyon authorization.¹⁹

Storey: Oh. That's the earlier one.

Barbour: The Upper Basin.

Storey: That's the earlier authorization. Yeah.

Barbour: Utah got Flaming Gorge, and of course Glen Canyon got authorized, and a lot of other projects. The Colorado projects were included. Among them were Animas La-Plata, Fruitland Mesa, and . . .

Storey: That would be CRSP (generally spoken as "crisp"), Colorado River Basin Storage Project?

Barbour: Correct.

Storey: And, what? Authorized about '56, as I recall?

Randy Riter Took Him to Salt Lake City to Discuss the Allocation on One of the Projects

Barbour: Yeah. That's when I told you I did one of my first major cost allocation studies. I found that the allocation on one of the projects didn't make sense, and Randy Riter, head of the division agreed. I wrote an internal memo that was sent forward. So then he took me to Salt Lake City to discuss that allocation. I found that the amount they were allocating to a particular purpose just didn't make any sense, so. (Storey: Um-hmm.) Even though it's going to be somewhat arbitrary *still* it ought to make some sense compared to why the project was authorized. If it was authorized primarily for power and you allocated three percent or five percent to power, and the rest to fish and wildlife, or flood, or something else, something's screwy. When everybody perceived the benefits were from *power*, and that's why you're developing it, then, in my estimation, *most* of the cost should be assigned to power. (Storey: Um-hmm.) That was your justification for building the project. And so if we had a municipal-industrial water supply project where a *city* needed the water storage, and we built the project for them, and they're supposed to repay it, and then they did the cost allocation and allocated more than half to recreation, "Wait a minute," you'd have to say. (Storey: Um-hmm.) I won't tell you the name of that project, but I lost that one. I said, "This is ridiculous. The city can afford to pay *three* times that much for water." I says, "It's a gimmicky cost allocation. I'll never agree to that."

Even When He Found the Cost Allocation Inappropriate, Projects Were Sometime Approved

Well, the supporters of the project, *they* liked the cost allocation very much. (Storey: Um-hmm.) And, of course, they told the Commissioner they liked the project very

19. The Colorado River Storage Project was authorized in 1956.

much, and boy we got quick authorization, for that one. Terrific deal for them. They could have paid two or three times more for the water.

Storey: So, your certification was not required, in other words?

Barbour: Oh, I always commented on them, but I was simply a technician out in Denver?

Storey: Well, there's a difference between commenting and saying, "Yeah. This is appropriate." Right?

Barbour: Well, you comment that "this is not appropriate because of these factors," you know, *but* in that particular instance, there *were* great recreation benefits because the project was right near the town. (Storey: Uh-huh.) So who's going to benefit? The people that lived in town, (Storey: Yeah.) in those days. If you got authorization, you could allocate non-reimbursable—fish and wildlife, and recreation.

Storey: And this . . .

Barbour: Great fishing. Great recreation. It's just like Chatfield. Well, no, because that's not—this is like Cheesman. (Storey: Um-hmm.) Well, they don't use a lot of recreation, but you can see the recreation potential there. Right close to Denver. We'll say, "Okay. You let us build it we'll allocate two-thirds of it to recreation, and fish and wildlife."

Storey: So, Reclamation would go in, say, and say . . .

Barbour: They wouldn't.

Storey: "We've got this project."

Barbour: Right.

Storey: "And we're planning to allocate this much to M & I, and this much to" (Barbour: Right.) "fish and wildlife."

Barbour: And then you go for authorization. Right. Get all the supporters.

Storey: And if the Congress approves it, it's done.

Barbour: But, we get the reconnaissance-level report, where they do the first cut. So, we have to review it. And then we can review it at the later stage, you know, when it's, the justification report used for (Storey: Uh-huh.) authorization. And so, when that goes forward, with this large allocation to non-reimbursable in it, you know, that benefits the local folks. Well they're going to like it the best, obviously. And, there's really no one who would want to, and if the rules are so loose and it says, "Well, you *could* do this," but there are so many assumptions that goes into that. (Storey: Um-hmm.) On the measurement of benefits, because you can't allocate more than the benefits. Well, there're so many municipal users, they're going to use the reservoir for recreation too.

The benefits were quite high. And there's a matter of measuring the value—the benefits per recreational user a day. And then, on the other hand it was limited by the alternative costs. Suppose you built the reservoir *strictly* for recreation. What would it cost? So, there are a lot of things you could do with those assumptions, to see whether they were reasonable or not. *But*, once they're in the authorization report and get authorized a certain way it can't be changed.

Storey: Then you're done.

Barbour: That's when the technical reviewer in Denver, as me, can step in and say "Wait a minute. The government could supply the water at a very reasonable rate, and would still get a significantly higher repayment for the project if the cost allocation produced reasonable numbers." But the personnel in the district office are working with the local people and want the project to look as attractive as possible. I could see their viewpoint. "*Look*, this is a great reservoir, with a lot of recreational benefits. You get your municipal water, and you get it at a lower cost than if you built it yourself because we can write off large amounts of costs as non-reimbursable to recreation and fish and wildlife. We make some rough studies." Well, are they going to support it? They've got all their people going to Washington, testifying what a great project it is, and some economist in Denver says, "Wait a minute. You ought to pay, maybe, twice as much." (Storey: Um-hmm.) "Or at least fifty percent more, because it's not quite fair to the taxpayer." How popular do you think you would be?

Storey: But, that never goes to the Congress, then?

The Economic Review Is an Internal Matter Not Presented to Congress with the Legislation

Barbour: Oh no. No. That's an internal matter, you know. Review them, and comment on them, and Washington set the policy. We did the technical studies.

Storey: Wasn't there a law that said you had to have a, a cost-benefit ratio of at least 1:1?

Barbour: Not at all. That was policy.

Storey: It was policy?

"Most of the irrigation projects in the Missouri River Basin Project . . . had a benefit-cost ratio of less than unity when they were built. . . . I know, because I did them. . . . the benefits there really were indirect. . . ."

Barbour: We authorized a lot of projects. Most of the irrigation projects in the Missouri River Basin Project, the irrigation project, had a benefit-cost ratio of less than unity when they were built. (Storey: Um-hmm.) I know, because I did them. And it was okay. Many of the benefits there really were indirect, which were not included. They, you know, these rural communities were losing population. They were, you know, some very substantial, what I call 'regional development benefits' involved. (Storey: Um-hmm.) Social benefits involved, and those were called indirect benefits. But, you

weren't supposed to use those in doing the benefit-cost ratio. And, that's why later we developed this multiple-objective planning approach, and added the regional development and social development] objectives, so that you could measure these things, and add them to it. And so, Congress could say, "Okay. Based on *strictly* economic efficiency, it may be .6:1, but if you look at all these other indirect effects, we can justify that." But, the Congress didn't care. They'd say, they'd like to see it 1:1, at least. And so, there was a lot of pressure on the economists. In those days to reach at least unity of benefits and loses there were about fifty or sixty economists in the Bureau, and about 4,000 engineers and construction people, and they were interested in building projects, obviously.

Storey: Well, you were, after you left McCook you were here in Denver?

Barbour: Yeah. I transferred to Denver.

Storey: So, each of the regions also had economists?

Barbour: Oh, they had a chief economist, in every region, each with a small staff.

Storey: So, did you find yourself in situations where there were disagreements between Denver and the regions?

Barbour: Oh. Absolutely.

Storey: And, what was the focus of those, generally?

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BEGIN OF SIDE 2, TAPE 2. JUNE 24, 2003.

Looked at Economic, Social, Environmental, and Lands Issues and Provided Comments to the Chief Engineer's Office

Barbour: The focus was on whether the analysis made good sense. You know? (Storey: Um-hmm.) Was it reasonable? That it *complied* with manuals and procedures. And that it added up, so to speak. And so, in my office, we had the technical review authority. The Commissioner's Office would wait for our technical review, and we'd make our comments. Chief Engineer would write his comments on the project. *All* aspects. The design, the engineering, and then of course the economics. And that's where I got involved, is the economics. And, there, later, I had the responsibility for all the technical studies on economics. Well, I had them for the other aspects too, there towards the end, but since economics was my thing I probably spent more time on that than the environmental aspects, where I'd rely on George Wallen, and Darrell Adams to look at the social aspects. We also had a land resources group which looked at the land quality to be sure they weren't irrigating some poor lands, too. (Storey: Um-hmm.) So, we had to look at *all* aspects of it. But, the economics, you know—you know what they say, "It's a matter of opinion." That's why the subject could be challenged, because the answer is a matter of opinion. But, still, you know, we had some rules, and I felt they ought to make sense.

“ . . . once we got our comments to the Commissioner’s Office . . . they looked at it from a *policy* standpoint. . . . they might override some of those comments, or . . . from a *policy* standpoint, make some modifications. . . . ”

But, once we got our comments to the Commissioner’s Office, then they looked at it from a *policy* standpoint. See? (Storey: Um-hmm.) And, so they might override some of those comments, or they might not agree with them, and they could, from a *policy* standpoint, make some modifications.

Applied for the Job of Chief Economist, but a Person with Broader Experience Was Chosen

Back in the Central Arizona Project days, we had a chief economist there who had a drinking problem. He had gotten the job as chief economist which I had applied for when I was in the Kansas River District Office in Nebraska. He had more experience in some of the other purposes such as power and municipal water] than I did. I was glad he got it, because I got to end up in the chief engineer’s office.

“So, I ended up with the technical responsibility of the economic studies, and he was over in the policy end. . . . ”

So, I ended up with the technical responsibility of the economic studies, and he was over in the policy end.

Storey: Uh-huh. In Washington D.C.?

Barbour: In Washington D.C.

Storey: When was that, that you applied for that job? Do you remember?

Barbour: When was it?

Storey: Yeah.

Barbour: Oh, this had to be, I was in McCook, Nebraska, it had to be about 1955, or something like that.

Storey: Oh, so you applied from McCook?

Barbour: From McCook.

Storey: Oh. Okay.

Barbour: Can you imagine a neophyte economist, with just experience in the McCook office, and it was down to two of us. He came from the Sacramento regional office, and he had experience with power, and all the other purposes. I only had experience with irrigation and—I did some power work, because I was giving the Corps of Engineers a hard time about the way they allocated power projects. So, I learned a lot about

thermal power–coal generation, gas generation. I learned the costs, and I would argue about how they allocated costs on the Missouri Basin using these costs as a basis.

By Applying for the Chief Economist Job He Received Some Recognition

But, anyway, he got the job, but that gave me a little bit of recognition, so I ultimately, when a job came open in the Chief Engineer’s Office, I applied for it and got it.

“ . . . I was just starting out, but . . . for the Central Arizona Project—they would send him out, but . . . he stayed in the hotel a good share of the time. So, I took on the full responsibility for the economics. That was a real break for me . . . ”

So, then he was top dog over here, and I was just starting out, but by the time they got to the Central Arizona Project—they would send him out, but unfortunately, he had a drinking problem and stayed in the hotel a good share of the time. So, I took on the full responsibility for the economics. That was a real break for me, because then, when any important people such as assistant secretaries, commissioner, assistant commissioners, came to talk about the project, well I was able to respond and run the studies they requested. (Storey: Um-hmm.) And there was *no one* else, I mean *no one*, that knew the details of the economic studies.

“ . . . although . . . [economics] didn’t seem important to a lot of engineering people, . . . economics is *extremely* important at the Washington level. . . . ”

And, although it didn’t seem important to a lot of engineering people, economics is *extremely* important at the Washington level. So, that was a real break for me. And, that’s why I got invited to brief the secretary of interior. (Storey: Um-hmm.) And, I was the man with the lowest grade at the meeting.

Storey: Well now, when you moved to Denver, were you on the staff? Or were you heading a staff?

Barbour: Oh no. I was just the lowest graded staff member there.

Storey: Uh-huh. Tell me about your first promotion.

Boss Thought He Needed More Experience Before He Received a Grade Increase

Barbour: Well, let’s see, I think I was probably a grade eleven [GS-11]. And, I was doing research, reviewed regional reports, and got involved in all these special projects and I thought I deserved a promotion, but I had a boss that felt I ought to spend a lot more time in the job, and I was young, and so forth, and so on.

Washington, D.C., Office Supported Promotion to a GS-12

But, I got a lot of support from Washington because of my special studies. I got a grade increase.

Storey: To a twelve?

Barbour: To a twelve.

Storey: Were you then supervising?

Received a GS-13

Barbour: I wasn't supervising anyone—at that time. And then, when I was assigned to the Westwide Studies the head of the Economics Section was a thirteen at that time, as I recall. Then *I* got a thirteen to move over to the Westwide Studies. And when I got involved—well, no, that's not true. I'm trying to think.

Promotion to a GS-14 Ordered by the Commissioner

My, I'm a little bit confused here— because I remember getting my promotion to a fourteen, because it was *ordered* by the Commissioner, for the work I had done in that meeting with the Secretary of Interior on the Central Arizona Project (CAP). So I'm a little bit fuzzy here. That had to be about 1968. I'd followed CAP all through the pre-authorization process. Oh, what happened was, after that meeting in the secretary's office, Dan Dreyfus, I told you, was there representing the Commissioner's Office, and I representing the chief engineer's office on the economics of the CAP, which I had put together and which included over twenty alternatives. Dan and I had the lowest grades there. He was a 14 and I was a 13. All the rest of them were the commissioner, assistant commissioners, division heads. And, this buddy of mine, Jim Casey, who was the assistant to the Planning Division chief. He was a brilliant guy, but not very diplomatic. He could have been commissioner himself. Earlier during the meeting on the CAP, when the secretary of interior thanked us for the job that we had done, the secretary said, "I want you to do something for the boys." The commissioner had responded "Well, I already gave Dan a fourteen. I'll just upgrade his job." When Casey was discussing the secretary's CAP meeting with the commissioner he said "Do you know who the lowest grade guy in that meeting was?" And he says, "Ed," he said, "What grade is he?" Casey said, "A thirteen." The commissioner replied "Well, tell [Denver] to give him a fourteen." Just like that. Well, it got some resistance in Denver because my supervisor, then, was a fourteen. But anyway, that's how I got my grade.

Carried His GS-14 over to Westwide

And then when we went over to Westwide I carried that grade over. When we came back, then there wasn't room for many fourteens. There was an existent Economics Branch headed by a fourteen. That job was moved to research. Warren Fairchild reorganized the place, to get us back in the Bureau from the Westwide group.

Storey: Warren Fairchild?

Brought Back from Westwide to Head the Resource Analysis Group

Barbour: Warren Fairchild said “I’m going to let you head up economics over there, but I want you to take over more than that. I want you to have the environmental part.” So, by then, I took over what was called the Resource Analysis Branch, which had the economics, environmental, soils, public involvement, and social factors units. The social and public involvement was headed by Darrell Adams. (Storey: Um-hmm.) We had the environmental group, which was headed by George Wallen. And then we had Bill Peters heading up the soils, and then we had a land use planning group, which didn’t last very long. And we had an employee by the name of Dunn come in and do that. And then of course we had the Economics Section.

Storey: This would have been about when?

Barbour: This was about, oh, ‘73, ‘74, when we got reorganized. Consequently there were employees in the previous branch who were moved into other jobs. Some were very unhappy about it. (Storey: Um-hmm.) I could see that.

Promoted Section Heads in the Resource Analysis Group to GS-14s

I felt, all of these sections in my branch were important enough that I helped get them all graded at the fourteen level. So, George Wallen, and Darrell Adams, and my economics group were all raised. So, I was head of the group, of three GS-14 section heads.

Started Pushing for a GS-15 for Himself

So, that’s when I got, started pushing for a fifteen, to head up that branch, because I had the responsibility of supervising these three sections.

Storey: And this was a branch or a division?

Barbour: Branch.

Storey: Okay.

Barbour: A division head, then, was a sixteen. (Storey: Um-hmm.) At that time. But, they were able to get the hydrology branch upgraded upgraded to a level 15, but not my branch.

“Since assistant commissioner Fairchild had indicated that my branch would be upgraded, it seemed to take a long time. . . .”

Since assistant commissioner Fairchild had indicated that my branch would be upgraded, it seemed to take a long time.

Decided to Retire When Offered a Job Outside Reclamation

So, I finally decided—things had changed a lot, organizationally, and the whole water resources establishment was changing. This was in the ‘80s. (Storey: Um-hmm.)

And, Reclamation was not looking at its broad-planning aspects, and it wasn't that much of a challenge to me anymore, and since I got this offer in the private sector where I could earn Social Security, and I could work half-time with a private engineering group, as their chief economist, I decided to retire. They had started to process a Grade Fifteen, when I told them "Well, I wanted to go look around." But, it was going to do it on either a temporary or some other interim basis. Apparently they had heard from Washington, I guess, that they should do something about it.

Gave Nine Days Notice Even Though They Were Processing a Promotion to GS-15

But then, when I got this private offer I decided to give them nine days notice that I was retiring. I did it in a hurry, and probably should have stayed on, and (Laugh) (Storey: Um-hmm.) gotten the year in, or whatever it is, at the higher grade. But, I never had any regrets.

"Things had changed so much that there just wasn't the challenge anymore. . . ."

Things had changed so much that there just wasn't the challenge anymore.

Storey: You retired in?

Retired in 1981, with Thirty-four Years of Service, to Work for Tudor Engineering

Barbour: '81.

Storey: So, you had about thirty-one years of service?

Barbour: Yes, plus Army time. I had three years of military service.

Storey: So that's thirty-four.

Barbour: Military. So I was credited with thirty-four years of service. And, it was a nice retirement, and I was fifty-seven. I was still going to work.

Worked Half-time after Retirement

And so I'd agreed to work half-time, and Tudor Engineering put me on payroll, and gave me health benefits, and other benefits, and Keogh Plan, and it was nice. (Storey: Um-hmm.)

". . . then I only had to work half-time, and I was earning just as much as if I worked full time . . ."

And so, then I only had to work half-time, and I was earning just as much as if I worked full time, also I was getting credit for Social Security as well. So, financially it worked out very well, although, you know, salaries really went up after that. So, I did that for three or four years, and then I went on my own. Tudor Engineering was who I worked with, and then they weren't getting the studies they needed, to keep the

full-time staff going. They asked me to go on strictly a private consulting basis, which I did , which worked out very well.

Then Left Tudor Engineering and Went Strictly on His Own Working a Lot with Stone and Webster

Then I went strictly on my own. Then I could take jobs with others. (Storey: Um-hmm.) So I took a job with Stone & Webster, and then I ended up working more with Stone & Webster than I did with Tudor. So, I did a lot of work with Stone & Webster (Storey: Yeah.) until I hit about seventy, and then I quit.

Wally Chirstiansen

Storey: Could you tell me more about Wally Christiansen?

Wally Christiansen was “the best immediate boss that I ever had. . . .”

Barbour: Wonderful guy, and he *always* was on the fringe of knowledge looking for new things. He always pushed us to get new ideas, and bring in new people, and he was wonderful to work with. In fact, probably one of the best bosses –the best immediate boss, that I ever had. He gave you the leeway and the independence that you needed to do things. He was very receptive of new ideas, and he was stimulating. And, we had a big challenge, then we worked hard at it, put in our own time if we needed to. And he developed a comradeship there among both the men and the women. We worked together as a unit. He was able to work with *all* these other agencies, very diplomatic. Good guy. One of the best guys I’ve ever worked for.

Storey: What did he do when he came back to Reclamation?

After Westwide Christiansen Retired

Barbour: Well, he headed up Westwide, and after that he retired.

Storey: Oh, he retired at the end of Westwide?

Barbour: He had headed up the San Bernardino Office. He was the planning officer—it was a planning office. (Storey: Um-hmm.) And I had done a *little* work for him in earlier days. I used to go out on special assignments, and I met a lot of the people out in the field that way. Because if they had a special problem, they would call me in. So, that’s when I got to know him.

Storey: Now, was George Wallen on Westwide also?

George Wallen

Barbour: Yes. We hired him from the Fish and Wildlife Service. Heard about him. Looked at his biology background and what he could do. He was going to work with me, and so we hired him. And, he was good.

Storey: He was a, what? A wildlife biologist?

Barbour: Fish—yeah.

Storey: Fish biologist?

Darrell Adams

Barbour: Fish biologist. So, he handled all of our environmental studies and environmental impact statements. That was his responsibility. (Storey: Um-hmm.) And then we found Darrell Adams. He was a social psychology professor out at the University of Denver, and we brought him in. Christiansen encouraged me to hire, wanted me to get some people outside the Bureau, get new blood in there, which is a wonderful idea. And so I did. And then he encouraged me to hire a Dr. Schaeffer, who had a Ph.D. in economics, and he turned out to be more of an environmentalist because he was quite negative about development. I had a hard time understanding Dr. Schaeffer. (Storey: Um-hmm.) And he and we were happy when he transferred out, after a little encouragement.

Storey: Where did he transfer out to? Do you know?

Barbour: But he was so environmentally oriented, and he's supposed to do economic studies, you know, and he was very negative for any developmental projects. Smart guy. He taught at Fort Lewis College in Durango. I went over and interviewed him. And, you know, teachers, professors don't get pretty good pay, and we hired him as, I think, a grade thirteen. That was good pay. And he liked the idea of the Westwide Studies. And, Wally encouraged me, although I had others, that applied for the job, within the Bureau, he wanted to bring someone from the outside. But, that didn't work out too well.

Storey: Hmm. Was Christiansen older than you?

Barbour: Oh yeah.

Storey: Do you know if he's alive.

Barbour: Yes. He is.

Storey: Where is he?

Barbour: He's moved. He's, was in southern California. He was at San Bernardino . . .—but he's, I probably have his address. He's a guy who would be wonderful to interview, but I don't think he would travel. You may have to go and talk to him, but he would be great. He's had a, one of these pacemakers for years, and years, and years. In fact, I think he had it when he was working here, and he survived it. (Storey: Um-hmm.) And, I hear from him every year, and I haven't heard from him recently. I heard from him at Christmas time.

Storey: Yeah. Hmm. So, anything else we ought to talk about?

Barbour: No, I, as far as I'm concerned, unless you have some questions about, the evolution of some of what's going on in the Bureau, that I can't think of. I haven't followed the Bureau, once I left, of what they were doing, but I can say that I had some wonderful experiences with the Bureau, and they gave me some wonderful opportunities to do things, and work at levels I had never expected to work. (Storey: Um-hmm.)

Hell's Canyon and the Rampart Project in Alaska

To be able to go to conferences, to represent the secretary, at hearings, and to testify for the secretary on some *extremely* controversial projects, like the Middle Snake I told you about, Sheep High Mountain. (Storey: Yeah.) About Hell's Canyon, then the Rampart Project. When Interior opposed that I got to work on that, and just about every one of the controversial projects.

Storey: Well, tell me more about Rampart, because the way Floyd Dominy tells it, he went to a hearing in Alaska and said, "Oh this is a crummy project. There isn't anybody to take the power. There isn't anybody to take the water. Why are you even thinking about it?"

Barbour: Yeah. We provided him with that data. We had another fellow that was working on it. I'm trying to think what his name was. They wanted me to do the economic studies, and the alternatives to Rampart Project. And, of course, the Fish and Wildlife Service did the studies on the impact on the refuges, and the duck habitat.

Storey: Yeah. This would have been in the '60s, I believe.

Barbour: Yeah. And so I . . .

Storey: And geese habitat, I'll bet?

Barbour: It was really fascinating. I did nuclear, looked at nuclear plants sited in Alaska, but gas and coal were plentiful. And I looked at developing powerplants to serve all the major cities there, and how much it would cost compared to Rampart. We worked with our power people and they did transmission line estimates, to haul the power into Canada and the United States. Also I used load projections to show that this could be a white elephant for a long time.

Storey: Why would Reclamation be looking at Rampart. It wasn't our project.

Secretary of the Interior Opposed the Rampart Project and Dominy Took Point on the Issue

Barbour: We weren't. Well, because Secretary of Interior didn't like it. So, he said, "Hey Dominy, we can't let this happen," and especially his Fish and Wildlife Service people, and all the environmentalists were going *nuts* about it. (Storey: Uh-huh.) But, the Corps was so powerful they were pushing it ahead. So, it wasn't our project. We

had hydropower projects in Alaska, which we studied.

“We had some pretty good projects, several of which have been built by the Alaska Power Authority. In fact, I worked with Alaska Power Authority on some of their local projects. . . .”

We had some pretty good projects, several of which have been built by the Alaska Power Authority. In fact, I worked with Alaska Power Authority on some of their local projects. (Storey: Uh-huh.) And I did that with Tudor Engineering, incidentally. We developed some small projects for some of the natives, and small hydropower projects. That was a lot of fun. (Storey: Uh-huh.)

Small Hydropower Study of Reclamation and the Corps of Engineers

That was not with the Bureau experience, but my Bureau experience in developing small hydropower—you know there was a survey of small hydropower that the Bureau and the Corps of Engineer was involved, and there was Low-Head National Survey, and I was asked to work with the Corps of Engineers, as a consultant from the Bureau, and worked with them to develop the Low-Head Power Study.

Storey: When would that have been?

I “. . . went over as a consultant from the Bureau. And that’s because I had established a reputation with the Corps, and the Federal Power Commission on power evaluations. . . .”

Barbour: Which is an inventory of all the low-head powerplants in this country, and I worked with the Corps of Engineers in doing the economic studies. Oh, that would be in ‘78 or ‘80. So, I worked on the National Power Survey, and went over as a consultant from the Bureau. And that’s because I had established a reputation with the Corps, and the Federal Power Commission on power evaluations. (Storey: Um-hmm.)

“. . . after I retired I prepared manuals for Western Area Power Administration, on how to evaluate power. . . .”

And several years after I retired I prepared manuals for Western Area Power Administration, on how to evaluate power. I prepared manuals, and they paid us well for it at Stone & Webster. So, then they also hired us to update the *Replacement Manual*. And we got paid well for it, and, we did a good job, too. (Storey: Um-hmm.) Although that was not my background, it was a subject I enjoyed—energy economics, and it was so wild in those days. It was nuclear power, and light-water reactors, and fast-breeders, and solar power. We did economic studies on the wind farms.

Did Economic Studies on Wind Farms

Storey: Yeah, this would have been after the energy crisis, in the mid-‘70s? Yeah.

Barbour: During that period. Oh yeah. So, wind was very costly in those days. I did a study on

that saying we had to allocate a lot of the cost as non-reimbursable to make it feasible.

Economic Studies on Alternative Ways of Desalting Water

And, It was worth doing it and would be competitive—if you allocated maybe a third or a half of the costs to research. And then, in desalination studies, we worked on reverse osmosis, and different means of desalining [desalting] water, and I used to do all the economic studies on that. (Storey: Um-hmm.) And Mike Bessler was involved in engineering aspects of that, and he and I used to go around, and he'd lecture on the process, and I'd lecture on the economics of various ways (Storey: Hmm.) of desalination. It was really exciting.

Storey: Did you ever get involved in, what was, what was the weather modification project?

Barbour: Oh yes. With Dr. . . ?

Storey: Project Sky-something?

Economic Studies on Weather Modification

Barbour: Well yeah, we did the economic studies on what it would cost, how much water it might yield, that was part of the Westwide Studies. (Storey: Uh-huh.) Weather modification. I'm trying to think of the gentleman that ran that study. He was a marvelous man. Dr. . . . The most wonderful guy to work with. He was Howard Cohan's boss, I think. I think he headed the labs over there. (Storey: Yeah.) I worked with Howard. Do you know Howard Cohan?

Storey: No.

“That's what was so much fun is doing these special studies. . . .”

Barbour: He headed the labs? He had me do a study on the use of radioactive materials to measure turbine efficiencies. (Storey: Uh-huh.) And, that report. It's someplace. I still have it. Boy, it turned out that we wouldn't touch that with a ten-foot pole because of the danger of radioactivity to the operators. (Laugh) That's what was so much fun is doing these special studies. (Storey: Um-hmm.)

Storey: Any others that you remember?

Studies to Provide Fresh Water to the West

Barbour: Well, you know, let's see what exotic studies we did. Of course, I told you about the icebergs, and the fiberglass pipeline down the coast, and moving water from the Rocky Mountain Trench in Canada, all the way south. We did that one. Oh, we did a big study on, for Holum, on major . . .

Storey: Ken Holum?

Studying Development of a Power Transmission System from the Northwest to the Mississippi River

Barbour: Ken Holum. On major power transmission from the Northwest, all the way to the Mississippi River. We were going to provide a *major*, major transmission system. (Storey: Um-hmm.) And, I did the economic studies on that, but boy that wasn't, you know, the private sector didn't want the federal government involved in that. We would have used the system to take advantage of time and seasonal diversities. And we evaluated the benefits of taking advantage of the diversities in the Northwest, you know, after you hook up the Southwest to it.

Texas Refused to Participate in Studies of the Western Power Grid

But there was *one* state we could not include, and that was the state of Texas. They would have *nothing* to do with the study. So we drew the line west of the Missouri River, Mississippi River, I guess. And we provided a transmission system to serve everything but *Texas*. It was a major system. Integrated all the power. That study is around somewhere. (Storey: Hmm.)

Storey: It would have been a Reclamation grid?

Barbour: Well, we were involved. I don't know whether it would have been a Reclamation grid—Reclamation would have liked to have sponsored it. (Storey: Um-hmm.)

Studies of DC Transmission

And, we did studies on DC transmission, the economics of that. (Storey: Yeah.) Well you just name any major thing that was involved, we got involved, because there *always* had to be an economic study, and there *always* had to be a financial study. (Storey: Um-hmm.) Would it pay?

Made Presentations on Engineering Economics

And I used to have fun lecturing. I lectured all the young engineers that came in, and they'd want me to come in and talk to some of our designers. I'd lecture on economics, engineering economics and the importance of sizing projects. And, so when you build something, you got to have some use for it, and it's got to make some sense. But, it's very important to be able to build it too. (Storey: Yeah.) And design it, there's a lot to *that*. The economics is: you need to justify doing it, and you need it to compare such things as pumping versus gravity, and the efficiencies of turbines—I told you about the Third Powerplant sizing studies.

Incidentally, you talked to Fred Ruud didn't you?

Storey: Yeah.

Believes Fred Ruud Sent His Report on Large Generating Units to Washington, D.C., and That Tipped the Scale on the Units at the Third Powerhouse

Barbour: When I went to the luncheon, and I was telling him that I was doing this interview with you, and I said “Did you tell Brit about the Third Powerplant?”

He said, “Yes. We had a nice discussion about the Third Power.”

I says, “I hope you brought my little blue envelope in there. The thing you did over .” He Laughed. I don’t know whether he did or not, but I still believe *he* was the one that sent a copy of my report to Washington, what would justify the large units. But, the *politics* was in favor of the large unit. (Storey: Um-hmm.) The technical people wanted the safer, more conservative, the smaller units.

Storey: Yeah. It depends on who you talk to.

Barbour: And so the politicians had what they needed, and that was some kind of a justification. “Oh look. We have an economic study that justifies the larger units.” (Storey: Um-hmm.) And based on the assumptions that the designers, and the efficiency curves, and all those things were correctly done. The larger units had to approach the efficiency of the smaller units. (Storey: Um-hmm.)

Designers Worked Three Months on Small Generating Units for the Third Powerhouse Before They Were Switched to Designing the Large Units

So the smaller units were a more conservative approach to design. And I told you they spent about three months designing the smaller units, until they got the orders to go to the larger units. And those were 600-megawatts. Later, the second set went to 700-megawatts.²⁰

Storey: Um-hmm. Yeah.

Fred Ruud and Turbine Design

Barbour: But, Fred was, he was one of the best designers, he’s really a sharpshooter. He was sort of aggressive, like *I* was, except in his own particular field of turbine design. And he’s brilliant on that part of it. (Storey: Um-hmm.) So, we were two mavericks together. (Storey: Yeah.) When you got us together on a problem, why we had a lot of fun. (Laugh) But, you know, that’s kind of the way it was. You’d find in Reclamation you had guys on the fringe all over, in design, in any aspect of it. I always enjoyed working with them, we had some marvelous people in the Bureau. You know, smart guys, easy to work with, and many of them on the fringe of knowledge too, you know. They stayed involved. (Storey: Um-hmm.) Good designers.

Storey: Yeah.

20. “The Third Powerplant contains three generators nameplate rated at 600,000 kW but able to operate up to 690,000 kW, and three generators rated at 805,000 kW. . . .” The 805,000 generators have been uprated. Information found at http://www.usbr.gov/projects/Powerplant.jsp?fac_Name=Grand+Coulee+Powerplant at about 4:30 p.m. on February 10, 2010.

Barbour: Well, that's the good old days.

Storey: (Laugh) Good old days, huh?

Barbour: Now, I go to one of our retirement sessions, I look in among all those retirees I say, "Gee there's enough talent in this room, even though they're kind of old and decrepit, there's enough talent here we could go out and plan a pretty doggone good project again. Except it would have to be in South America."

Oh, we got involved in Thailand—there was a big project in Thailand. (Storey: Yeah.) And water supply studies in South America.

END OF SIDE 2, TAPE 2. JUNE 24, 2003.

BEGIN OF SIDE 1, TAPE 3. JUNE 24, 2003.

Storey: Tape three of an interview by Brit Storey, with Ed Barbour (Barbour: Oh is that . . .) on June 24, (Barbour: Well, this. . .) 2003.

Barbour: Well this is about the end.

Aswan High Dam

Storey: Anyway, you were saying, they were talking about Aswan?

Barbour: Yeah. I think some of our people were, looked into that, Aswan, helping some of the (Storey: Yeah. We . . .) and then the Russians took over.

Storey: And then we went back and rehabilitated it in the late '90s.

Barbour: Did we?

Storey: Yeah.

Barbour: Yeah.

Storey: Had a major project.

Barbour: Then I thought George Wallen was involved in some of the environmental impacts of Aswan? There were some problem—you know they had, what was that below Aswan Dam?

Storey: I don't know.

Barbour: The Nile River. They had this terrible disease that was carried by—what was it carried by? A snail? Or something or another. It was spread along the Nile. Well, the Bureau, you know, was involved. There was no question. It was the top engineering organization in its field. I think we outclassed the Corps of Engineers, as far as that was concerned—in those days.

“ . . . when you don’t have any more dams to build, and no more projects to build, then you have to focus on other things. . . . ”

But, when you don’t have any more dams to build, and no more projects to build, then you have to focus on other things. (Storey: Um-hmm.) That’s what they’re doing now.

Storey: Did you see that coming, when you decided to retire in ‘81?

“ . . . the challenges weren’t there, and the people had changed . . . ”

Barbour: Well, no, that, except the challenges weren’t there, and the people had changed, and I thought it was time to change. (Storey: Um-hmm.) And that’s probably one of the reasons I left, is that it wasn’t as much fun anymore, as far as I was concerned. We weren’t getting involved in new things, whether it was because of the leadership, or the times. I think it was a combination of the two. (Storey: Um-hmm.) I’m trying to think.

Storey: Well, you would . . .

Barbour: This was after Dominy. There was Ellis Armstrong, and I can’t think of the guy. I keep thinking, trying to think of him.

Storey: I keep wanting to say Strauss but that’s not it.

Barbour: I think he was from Idaho. Anyway, . . .

Storey: Stamm?

Barbour: No. Stamm was—before Stamm. I knew Stamm , Gil Stamm, quite well.

Storey: I think Gill Stamm, though, was the Commissioner after Ellis.

Barbour: Yeah, but before Stamm was, before . . .

Storey: And then it was Keith Higginson.

Keith Higginson

Barbour: Higginson. *Keith Higginson*. Keith is one—I really liked Keith. He’s the guy that I told you that we needed someone to do power studies on the Colorado River, and Nelson Jacobs and I had been working together in the Westwide Studies, and we needed to get a, some good analysis on the Colorado River. And, we needed some good analysis on *power* systems, and so forth.

Mike Roluti

And I had worked with Mike Roluti at the Boulder City Office. (Storey: Uh-huh.) So,

Jacobson and I had lunch with Keith, and we told Keith, “We’d like to bring a guy out to help us with our studies, and his name is Mike Roluti, but we need get the position authorized.” *And*, he helped us get it set up. And we were able to bring Mike in. That was a wonderful move for us, and a wonderful move for the Bureau. Look how well he’s done.

Storey: Um-hmm. Oh, he wasn’t in Reclamation then?

Gene Hinds

Barbour: Oh yes. He was in the Boulder City office, (Storey: Uh-huh.) Regional office. And just like Gene Hinds, he was a young economist in the Phoenix office. And, I needed some guys to help me, and I says, “Hey. I would like to have Gene Hinds to help me, and Tom Clark, two young economists.” Tom ended up as the head of the Central Arizona Water Conservancy District. Gene Hinds ended up, as regional director of what? Region Five, or . . .?²¹

Storey: I don’t know.

Barbour: Yeah.

Storey: Hinds is H-I-N-D-S?

Barbour: Yeah. H-I-N-D-S. Yeah.

Storey: Let’s see. I was going to ask you a question about something that you mentioned. What was it? . . . You were talking about the Colorado River.

Barbour: About the desalination, or the . . .?

Storey: No. I it was just now.

Barbour: Oh.

Jimmy Carter’s Hit List

Storey: Oh! What I was going to ask you about, you were here when Carter’s hit-list hit Reclamation. What effect did that have on us? And that reminds me of another question I need to ask you.

Barbour: Well, I was surprised. When Carter came in I thought he was going to be all positive about the program. In fact, I knew that there were some things that could be done in Reclamation with some modification. I thought of maybe trying to contact his office, and see if I could help him with new instructions, or procedures, or that, which I thought would be an improvement in the way we operate, because I had worked on the

21. Eugene Hinds was regional director, from 1982-1988, in Amarillo, Texas, Region 5 (renamed the Southwest Region in 1972).

Principles and Standards, and I thought we had some good ideas going.

“ . . . he turned out to be so *negative* with the hit-list. Of course, it turned us all off. . . . ”

Then he turned out to be so *negative* with the hit-list. Of course, it turned us all off. I couldn't *believe* how negative it was, you know. Of course, that turned me off on Carter's policies, because I thought they were rather extreme. Well, little did I know, way back when, that he didn't particularly like either the Corps *or* the Bureau. (Storey: Um-hmm.) And, he had thoughts of reducing those programs at the very beginning. But, I was surprised at Carter's reaction.²²

Failure of Teton Dam

Storey: Hmm. What about the failure of Teton Dam? What effect did that have on Reclamation, from your point of view?

Barbour: Oh, of course, everybody was flabbergasted by it. We couldn't believe it could happen, you know. And, the devastation that occurred. And, I was trying to think, we got involved in some of the studies on repayment, and so forth, on the reimbursement.

Storey: On reimbursement of . . . ?

Barbour: For losses below the dam, I can't remember too much about the details of that. You know we made significant payments to all those that were damaged downstream. It was a sad time. That was in—what year was that?

Storey: 1976.

Barbour: '76. Yeah. That was, that's when we—let's see. Carter was in . . .

Storey: Carter came in afterwards.

“That didn't help our reputation much. It was kind of downhill after the Teton failure . . . ”

Barbour: Just afterwards? That didn't help our reputation much. It was kind of downhill after the Teton failure—our reputation especially from an engineering standpoint.

“But that point in time, you know there weren't many projects in the late '70s. . . . ”

But that point in time, you know there weren't many projects in the late '70s. Central Arizona Project was under construction. Most major projects were already built. Central Utah was still being completed. (Storey: Um-hmm.) There was some, I don't think there was much left on the American River. And they had shut down, at

22. For a different perspective on President Jimmy Carter's "hit list" see Reclamation's oral history interviews with Daniel (Dan) P. Beard, (revised edition 2009).

that time, Auburn Dam. And they were having drainage problems, salinity problems. We were having a *good* deal of problems with our projects at that point in time. (Storey: Um-hmm.) Well, that's just history. Ran out of projects. I mean, the mission had to change. That's no big surprise.

Storey: Hmm. You remember how people reacted to the failure of Teton?

Barbour: Well, I didn't get out in the field, so I couldn't tell you how the public reacted. But I know the . . .

Storey: Well, I mean Reclamation.

“We couldn't understand how it could have failed . . .”

Barbour: Well, they were all, like I said, everybody was saddened by it, and you know, wondered how it could happen. And, you know, trying to find just how it did happen. I guess you talked to Harold Arthur at great length about it? (Storey: Um-hmm.) And he was affected. We couldn't understand how it could have failed, and how they missed grouting. I guess there was some holes in there that didn't get grouted properly, and so, undermined the dam. I think Harold suffered considerably for it. I guess he signed off on the drawings. I don't remember too much of the details. I get involved in only that (Storey: Yeah.) it affected our reputation. I guess you've interviewed him at (Storey: Yeah.) great length?

Harold Arthur

Storey: Well, tell me about Harold Arthur. What was he like?

Barbour: Oh, he was great to work for. Wonderful to work for. And, he didn't mind talking to the guys he knew something about a particular subject. (Storey: Um-hmm.) You know, directly. He called you in the office and talked to you about an area that he knew that you might be an expert in. And he appreciated the economic study aspects of it. A lot of the engineers didn't necessarily appreciate that side of it. They were really concentrating on the construction, and design, and that sort of thing. So, he felt economics was an important part of it. So, I felt good about that. (Storey: Um-hmm.) He gave us some prominence there. And he relied on us and asked about the economic aspects of it.

Barney Bellport

Storey: Yeah. Before him, was Barney Bellport. What about Barney?

Barbour: Good. I liked Barney, and he was also—he had been a regional director, in Sacramento. So, the economics of those projects were always important. When he testified he had to know *something* about the economics, so he's not strictly an engineering guy. He was a very broad person, having been a regional director, having to know all aspects of it. And, he was quite broad-minded, and I worked very well with Barney (Storey: Yeah.) on special projects.

Storey: Let's see, who was it before Barney?

Emil Lindseth

Barbour: Lindseth was his . . .

Storey: Yeah, Lindseth was never Chief Engineer.

Barbour: He was an assistant, and he could have been commissioner, and he could have been assistant secretary. But, he liked that secondary position and he always had such inside connections with specially industry, GE, many of the large companies, as well as within the Secretary's Office. (Storey: Yeah.) I really enjoyed working with Lindseth.

Rod Vissia

Storey: After Harold Arthur was Rod Vissia?

Barbour: There was Bob—no, let's. Rod, yeah.

Storey: Rod Vissia. What was he like as chief engineer?

Barbour: Well, I didn't know him very well. I was pretty much not involved with Reclamation. I'm trying to think when I left. When did Rod come in? I knew Rod because he was also from Sacramento.

Storey: He would have come in about '77.²³

Barbour: Was he a planner in Sacramento, at first?

Storey: I don't remember.

Barbour: I know Rod was in Sacramento Office. Wasn't he assistant regional director?

Storey: Well, he became regional director in Boise. He was there when . . .

Barbour: Oh. Before Keys? Or after Keys?

Storey: But he was the—no, before Keys. He was there when Teton failed.

John W. Keys III

Barbour: Yeah, Rod—Okay. Then John Keys. See, I worked with John in this office for a while. (Storey: Yeah.) I told you about John, taking him fishing? (Storey: Um-hmm.)

23. While unofficially known as the "Chief Engineer," Harold G. Arthur was the Director, Office of Design and Construction from 1972-1977; Robert B. Jansen assumed that title 1977-1978 and then the title Assistant Commissioner for Engineering and Research (ACER) 1978-1979; then Rodney (Rod) J. Vissia assumed that new title from 1980 to 1982.

Nearly drowned him once, (Laugh) in my little boat. But, I really enjoyed John Keys. I guess he's having a good time up there now?

Storey: Yeah. Well, let's see. There was Grant Bloodgood, we've already talked (Barbour: Yeah) about him?

Barbour: I thought Bellport followed Bloodgood.

Storey: How about S. O. Harper? Was he before your time?

Barbour: Yeah. It was Bloodgood, Bellport, and then Harold, wasn't it?

Storey: Harold Arthur. Then Rod Vissia. Then Bob Jansen.²⁴

Barbour: I think I was gone when Rod—well Rod must have been here when I. . .

Storey: He came in about '77, '78.

After the 1970s There Were Few New Projects

Barbour: Did he? I left in '81. So, he must have been here in this office. But, in those days, after those years, the '70s, where we had all these exciting things going, the sizing of new projects, and so forth, we didn't have many projects. (Storey: Um-hmm.) There weren't many new projects, and most were operating problems, and design problems, and then we tried to get into reclamation of mines.

Lands Group Worked on Reclamation of Coal Mines

I had a group, in this lands group, of Reclamation of coal mine areas. (Storey: Um-hmm.) And my lands group did work in that particular field. That was kind of interesting. But not too exciting. I'm trying to think of any other new exciting thing.

“ . . . by then we weren't doing any more nuclear desalting studies, . . . working with Mexico on desalting plants, . . . doing major transbasin diversions, and . . . moving power from the Northwest to the Southwest. And, the big things were just about over. . . . ”

Of course by then we weren't doing any more nuclear desalting studies, and we weren't working with Mexico on desalting plants, and we weren't doing major transbasin diversions, and we weren't moving power from the Northwest to the Southwest. And, the big things were just (Storey: Yeah.) about over.

Storey: Yeah. Now, of course, in '80 Reagan was elected President, and became President in early '81?

Barbour: Right. And that's . . .

24. Note that the interviewer had Vissia and Jansen out of chronological order in this discussion.

Storey: Did that effect Reclamation, that you saw?

Reagan Administration Modified the *Principles and Guidelines* and Planning Became Mostly Single Purpose

Barbour: I couldn't tell too much, except that I knew it'd affect the way we analyzed the project. He up and modified the *Principles and Guidelines*, and Reagan became more conservative, as I recall. And we were down to not, mostly a single objective, rather than multiple-objective planning. (Storey: Um-hmm.) And, it was more restrictive planning.

“In the ‘80s, at the beginning of the ‘80s, late ‘70s. You know, our large projects were all underway, and there were no major new projects that I know of. . . .”

And, it kind of fit the times as we had run out of new projects at that point in time anyway. In the ‘80s, at the beginning of the ‘80s, late ‘70s. You know, our large projects were all underway, and there were no major new projects that I know of. Can you think of any?

Storey: Well, the last major authorization I'm aware of was 1968.

Colorado River Basin Project Act, 1968

Barbour: You're talking about Central Arizona Project?

Storey: Colorado River Basin Projects Act, yeah.

Barbour: That's the Lower Colorado, which included the Central Arizona Project.

Storey: CAP [Central Arizona Project].

Barbour: That's the biggie.

Storey: Completion of CUP [Central Utah Project].

Barbour: That's the big . . .

Storey: A bunch of the Colorado projects for Aspinall.

Barbour: The last major project (Storey: Yeah.) was the Central Arizona Project. And, I was lucky enough to have worked on it through its authorization—now, we had a lot of controversies. We, at that point in time, we had the 160 acre limitation controversy, when Kennedy attempted to impose the 160 acre limitation on the Imperial Irrigation District. I told you about testifying for the secretary on that, in court.

Economics of the Central Arizona Project

Storey: Yeah. What did you think of the economics of CAP?

Barbour: Well, when you look at that part of the world—desert—and you look where the water is, and take into account Arizona’s entitlement, providing water could do nothing but good (Laugh) down in that part of the country. Now, California could have used it. Lots of people could have used it. (Storey: Um-hmm.) But that was Arizona’s entitlement. They had it coming. And there’s no question that it would have a positive effect down there, as it has proved out to be. The economics—economic impacts—I haven’t followed it. Now, most of that water is going to go to municipal water, and it has a much higher value. And, project water is recharging the aquifers around there, so I think it was positive. Central Arizona, you know, the big aqueduct there. It’s kind of fun to, after it was all built, to go over and cross the bridge across the aqueduct and sit there and look at that aqueduct. Or fly in. (Storey: Um-hmm.) And see that big ditch, and say, “Well, I’ll be darned. There it is. I can’t believe it.” When I think how it was in the early ‘60s.

Bob Young at the University of Arizona Opposed the Central Arizona Project

Storey: You mentioned that Bob Young was the . . .

Barbour: One of the opponents.

Storey: I think the University of Arizona (Barbour: Yeah.) economist who was opposed to the project?

Barbour: Either a University or the state. (Storey: Yeah.) He and another guy got together, and wrote a lot of papers opposing the project. And, I guess that’s one reason he ended up at Fort Collins.

Storey: Yeah. But, you said you had trouble responding to him? Why was that?

For the Central Arizona Project “. . . the costs which were high, and the subsidies were high, and we had a hard time finding the cash register for it because . . . there was the compromise with no hydro dams. And there’s nothing like a hydro dam to provide cash . . .”

Barbour: Oh. I didn’t have much trouble responding to him. He was looking at the costs which were high, and the subsidies were high, and we had a hard time finding the cash register for it because we had to rely, you know—there was the compromise with no hydro dams. And there’s nothing like a hydro dam to provide cash—as a cash register. (Storey: Yeah.) They last forever.

Storey: No Marble Canyon? No Bridge Canyon?

Barbour: No Marble—no Bridge Canyon, and then we had to rely on, finally, on a thermal plant which had a restricted life. We gave it a life of only thirty years. Heck, thirty years, let’s see it was built in. . .

Storey: That’s Navajo [Steam] Generating Station (Barbour: Yeah.) that we’re talking about?

Barbour: And so I had to put in a replacement (Storey: Steam generating.) for the plant, but now they assume extended [lives for] thermal plants. We were using thirty year lives for thermal plants. You compare that to a 100-, 200-, year life, or more, for a hydro plant.

When I was doing the Low-Head Hydro study, I was down on the Illinois River, when I was working for Tudor Engineering, looking at some low-dam sites, and we went over to look at this old plant. It was a *hundred* years old, and the generator was still working, (Storey: Um-hmm.) to give you an idea.

“I always maintained that we never, really, properly evaluated hydropower. . . .”

And, I always maintained that we never, really, properly evaluated hydropower. We used to use, as a surrogate value, a thermal plant, as the value of hydropower. And to me, that was never adequate.

Storey: Because it undervalued the plant?

Barbour: Yeah, because of the longevity of the plant. (Storey: Um-hmm.) And then, the environmental aspects is, you never got a credit for that, you know. It’s clean power. (Storey: Yeah.) Mighty clean. Now, it might screw up some rivers. (Laugh) (Storey: Uh-huh.)

Stone & Webster Was Hired to Provide Information for the Glen Canyon Operations Environmental Statement

So, they hired us, Stone & Webster, to do the analysis on Glen Canyon, all the environmental impact statements, and so forth, and we had this representative from the Environmental Defense Fund, and Mike Roluti headed that study. And, I was supposed to evaluate the economic impacts from reduced releases to serve environmental purposes on hydropower. That was why they hired me as a consultant from Stone and Webster, as an energy expert. And, I guess about that time I was somewhat arrogant, I guess.

The Environmental Defense Fund Argued That Glen Canyon Hydropower Had Very Little Value

And so, the Environmental Defense Fund group thought that hydropower at Glen Canyon had very little value.

Storey: They didn’t want it to be valuable. That’s why. (Laugh)

Barbour: Well, their rationale was, “Look. We’ve got surplus coal-fired powerplants out there.” They were built *after* Glen Canyon hydropower was available. So, the fact that there is surplus coal power not being used—I mean, they argued you don’t get any capacity value for hydro. And I says, “It’s the coal-fired plants that don’t have the value, it’s not the hydro. The hydro’s been there and they’ll be there for a hundred years. And yet it also has an intrinsic value, because of it’s longevity.” They were giving Glen Canyon power extremely low values. Not that they were going to change

the water releases thereby losing power revenues. (Storey: Um-hmm.) But I wanted to see that measurement of the power benefits foregone was a requirement of the study, and I wanted to see those to evaluate it properly, and I didn't think they were. They were *extremely* undervalued. Well, the Bureau kind of felt that they had to agree with Environmental Defense Fund.

“The politics were such that they were going to reoperate Glen Canyon Dam anyway. . . . and I felt my job was to see that it was properly evaluated. Well, I never got it properly evaluated. . . .”

The politics were such that they were going to reoperate Glen Canyon Dam anyway. They were going to change the releases and lose a lot of peaking power there at Glen Canyon, and I felt my job was to see that it was properly evaluated. Well, I never got it properly evaluated. And then, when I wrote a paper on the subject, and I put Mike's name and the project leader's name as co-authors. I wrote the paper, and I put some pretty controversial points in the paper, (Laugh) which probably got Mike and my boss, into trouble about the fact that the hydropower was under-valuated. They were going to do it anyway, so. . . (Storey: Um-hmm.) And then I guess, I don't think they appreciated my comments in some of the meetings we had. (Storey: Yeah.) Of course, I guess I was more outspoken than I should have been. (Storey: Hmm.) But, when you do that all your professional life, and tell them the way it is, I could have been wrong, you know. (Laugh) (Storey: Yeah.) I'm not saying I'm always right. (Laugh)

No, the Bureau was good to me, and I hope I was good to the Bureau and did some things that helped the program, ultimately.

Storey: Good. Well, let me ask you if you're willing for the information on these tapes and the resulting transcripts to be used by researchers?

Barbour: I don't know why not. I mean, unless I said some naughty things about some people.

Storey: I don't think you did.

Barbour: I hope I haven't. If I said some things that makes some folks unhappy I would like it to be a little more diplomatic, and diplomacy is not my long-suit. I think the little story I told about the commissioner in the restroom, and I can't remember how I put that. You remember? When I told you that . . .

Storey: I don't remember it much, so couldn't have been too awful.

Storey: Well, thank you very much.

Barbour: Oh, you're welcome.

END OF SIDE 1, TAPE 3. JUNE 24, 2003.
END OF INTERVIEWS.

Appendix 1: Cover Page of the Executive Summary of the Westwide Study

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EXECUTIVE SUMMARY OF

**Critical Water
Problems
Facing the
Eleven Western
States**

Nov. 196 - 63



UNITED STATES DEPARTMENT OF THE INTERIOR
Rogers C. B. Morton, Secretary



BUREAU OF RECLAMATION
Gilbert G. Stamm, Commissioner

WESTWIDE STUDY
April 1975

Library
Bureau of Reclamation
Denver, Colorado

Appendix 2: Introductory Materials from Westwide Study

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WESTWIDE STUDY REPORT
ON

**Critical Water Problems
Facing the
Eleven Western States**

3628
Vol 70, #3



UNITED STATES DEPARTMENT OF THE INTERIOR
Rogers C. B. Morton, Secretary



BUREAU OF RECLAMATION
Gilbert G. Stamm, Commissioner

FOREWORD

To:
The President
Water Resources Council
The Congress

This is my report on the critical water problems facing the 11 Western States, summarizing the results of the Western U.S. Water Plan Study initiated in 1969. Authorization for that study was provided by the Congress in the Colorado River Basin Project Act (Public Law 90-537) in September 1968. The act directed the Secretary of the Interior to conduct reconnaissance investigations for the purpose of developing a general plan to meet the future water needs of the 11 Western States lying wholly or in part west of the Continental Divide.

Western water resources programs generally have not fully addressed the needs and desires of the people of the Nation's highest growth-related region; instream flow requirements and Indian water needs are still being identified and quantified. Water requirements in the Western States have increased at phenomenal rates in recent years and pressures have mounted to develop the vast natural resources of the West while at the same time providing greater safeguards for the national environment and more water for fish and wildlife, recreation, and a general quality of life.

Since the passage of the act, new national priorities have emerged. Satisfaction of national energy and food and fiber needs, emerging land-use policies, and the need for adequate programs to enhance the environment place new demands on planning for development of the resources of the Western States. Development of the West's energy mineral reserves, timber, and other food and fiber resources for national use may conflict with other national priorities, but the development of these resources is increasingly urgent.

While Public Law 90-537 directed that my report and recommendations be completed no later than June 30, 1977, it was determined that in light of pressing needs and priorities, the assessment of critical water supply problems must be accelerated. The report contains the results of this accelerated interagency State-Federal effort. It has been prepared in such manner as to provide the information necessary to assist the Federal Government in making decisions on policy, funding, and action programs for development of the West's resources. However, the report itself does not serve as the document upon which any specific authorization for study or request for funding is based.

Problems identified as having high priority are those related to the needs for water for mineral and energy resources development, municipal and industrial water services, water supplies necessary to satisfy the objective of Indian self-determination, and water and plans for the maintenance and improvement of the quality of the environment. In determining possible solutions to these and other future water needs, emphasis has been given to total water management, including water reuse and recycling and improvement of water system efficiency.

This report provides valuable information on all aspects of water and related land resources in the 11 Western States. Conclusions have been reached and recommendations drawn. It is an important and valuable document for those people interested in the proper use and care of our valuable natural resources.

ROGERS C. B. MORTON
Secretary, United States
Department of the Interior

ACKNOWLEDGMENT

The Westwide Study represents the joint efforts of representatives of the 11 Western States, commissions representing regional and national interests, nongovernmental organizations, and the Federal Government. All those involved helped to make possible the valuable contribution of the Westwide Study.

Participants were organized into three groups whose functions are discussed in the introduction of this report. The three groups are the Advisory Committee, the Management Group, and the Implementation Group.

Participating in the Advisory Committee were representatives from:

Arizona	Idaho	New Mexico	Washington
California	Montana	Oregon	Wyoming
Colorado	Nevada	Utah	

Pacific Northwest River Basins Commission	Arkansas-White-Red Basin Inter-Agency Committee
Missouri River Basin Commission	Upper Colorado River Commission
Colorado River Commission of Nevada	Pacific Southwest Interagency Committee
Colorado River Board of California	

National Water Resources Association	Water Resources Congress
Western States Water Council	U.S. Chamber of Commerce
League of Women Voters	National Congress of American Indians
Sierra Club	National Association of Conservation Districts
National Association of Counties	Western Systems Coordinating Council
Four Corners Regional Commission	American Water Works Association
International Boundary and Water Commission (U.S. Section)	Wildlife Management Institute
Izaak Walton League of America	Rocky Mountain Center on Environment
American Farm Bureau Federation	National Grange
AFL-CIO	Trout Unlimited
Natural Resources Council of America	
National Tribal Chairman's Association	

Participating in the Management Group were representatives from:

Water Resources Council	Pacific Northwest River Basin Commission
Department of Agriculture	Department of the Interior
Economic Research Service	Bureau of Indian Affairs
Forest Service	Bureau of Mines
Soil Conservation Service	Bureau of Sport Fisheries and Wildlife
Department of the Army	Bureau of Outdoor Recreation
Corps of Engineers	Geological Survey
Department of Commerce	Office of Saline Water
Environmental Protection Agency	Bureau of Land Management
Federal Power Commission	Bureau of Reclamation
Department of Health, Education and Welfare	National Park Service
Department of Housing and Urban Development	Bonneville Power Administration
	Department of Transportation

Participating in the Implementation Group were field counterparts of the participating Federal agencies, representatives of the 11 Western States, the Pacific Northwest River Basins Commission, and consultants.

Primary responsibility for decisions rested with the Department of the Interior in consultation with the Water Resources Council and other Federal agencies. The Bureau of Reclamation of the Department of the Interior was the lead agency for the study and preparation of this report for printing was done through the facilities of the Bureau of Reclamation.

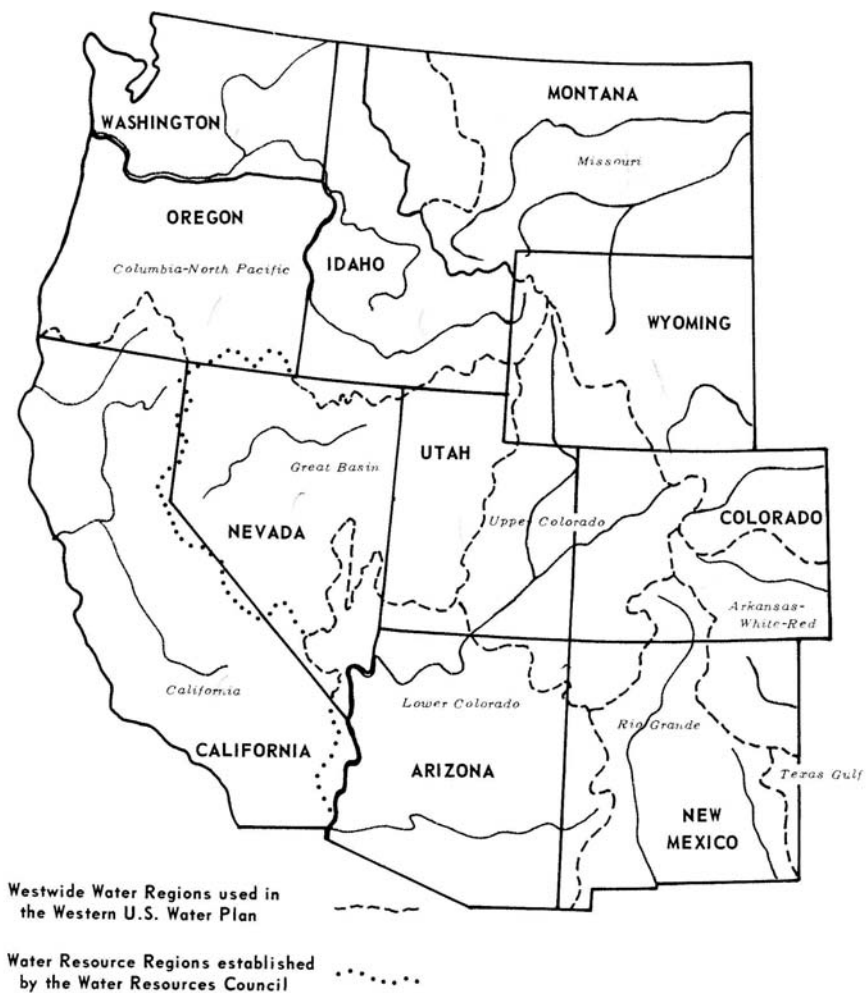


Figure 1-1. Westwide Study Area.

CHAPTER I STUDY PURPOSE, HISTORY AND APPROACH

INTRODUCTION

Investigations for the Western U.S. Water Plan – or Westwide Study as it is commonly called – were undertaken under the authority of the Colorado River Basin Project Act (Public Law 90-537), passed by Congress on September 30, 1968. Titles I and II of this Act related specifically to planning and directly concerned the Westwide Study.

Arizona, southern California, southern Nevada, and portions of Mexico are largely dependent on the Colorado River for fresh water as are major portions of the four Rocky Mountain States of Wyoming, Utah, Colorado, and New Mexico. The Congress recognized this reliance and called in Title I of the legislation for “the provision of additional and adequate water supplies for use in the Upper as well as the Lower Colorado River Basin.” A 1922 Compact specifies amounts of water to be allocated to Upper and Lower Basin States, but seldom during the past 40 years has the annual runoff in the Colorado River been sufficient to meet the Compact allocations.

Title II of the Act directed that the “Secretary of the Interior shall conduct full and complete reconnaissance investigations for the purpose of developing a general plan to meet the future water needs of the Western United States. Such investigations shall include the long-range water supply available and the long-range requirements in each water resource region of the Western United States.” The Congress had defined the West as the 11 States lying wholly or in part west of the Continental Divide. (See Figure I-1.)

Progress reports on Westwide Study activities were called for biennially beginning in June 1971, with a final reconnaissance report to the President, Congress, and Water Resources Council due not later than June 30, 1977. The Secretary of the Interior assigned leadership in this planning effort to the Bureau of Reclamation and established a resident study management team in Denver, Colorado, composed of representatives of several Federal Departments, Bureaus, offices, and agencies. The study effort has been strongly based on participation of many agencies and organizations of Federal and State Governments and private groups. Policy guidance has been received from a Department of the Interior group in Washington.

In order to better coordinate the Westwide Study effort with other water and related resource legislation

and to be responsive to current national goals and objectives, it was determined that the study should be completed by July 1, 1974. This accelerated and redirected study effort identifies and recommends specific future studies to provide needed solutions to the critical water problems facing the 11 Western States. It does not present a general plan.

STUDY PURPOSE

The development of adequate information upon which to base future significant decisions relative to the water and related resources of the 11 Western States has been a goal of this study effort. A determination and an assessment of the critical water related resource problems for the study area have been made through a cooperative interagency endeavor. This report presents the results of that effort. An objective has been to provide a meaningful report on the identified problems and to set forth alternative studies and viewpoints. An effort is made in this report and the Executive Summary to reflect the views of the wide variety of interests participating in the study.

Future Federal water resources planning must be governed by legislation enacted by Congress and by policy contained in the Principles and Standards approved by the President on September 5, 1973,¹ as they may be modified. This report does not formulate plans; rather, it recommends levels and areas of future Federal involvement in water and related land resources planning which, if undertaken, would be governed by current legislation and administrative policy. State and local entities will participate through parallel or accompanying studies as appropriate.

This report takes into consideration the views of the States and of a broad group of other participating interests in the study. However, the report itself will be the report of the Secretary of the Interior in response to Congressional directives and administrative requirements. It consists of three documents: The Report, The Executive Summary, and The Official Comments. The official comments are a compilation of the official reviews on the first two documents.

¹Federal Register, September 10, 1973, Vol. 38, No. 174, Part III, Water Resources Council, Water and Related Land Resources, Establishment of Principles and Standards for Planning.

This report is intended to provide both quantitative and qualitative information on critical aspects of water and related land resources in the 11 Western States. Urgent resource problems have been dimensioned, conclusions have been reached, and recommendations drawn. Followup responsibility rests with the decision-makers – the President, the Congress, the Governors, and the State legislatures – to determine how, where, and when to translate the findings of the Westwide Report into viable action programs.

STUDY HISTORY

The Colorado River Basin Project Act was the consummation of many years of effort and controversy. The States of the Colorado River Basin were concerned with developing means to provide additional water supplies for use within their Southwest region. Importation of water on a large scale was viewed by many interests in the Southwest as necessary to avoid catastrophe, but the Pacific Northwest, the "obvious" source for importation into the Colorado, feared that such a course would prejudice its own future welfare and growth. The result of this impasse was a compromise under which the Central Arizona project and certain other projects desired by Colorado River Basin interests were authorized in the 1968 Act with two provisions:

1. For a 10-year period from the date of the Act, no effort would be made to plan for importation of water from drainages outside the Colorado River Basin States.
2. By June 30, 1977, the Secretary of the Interior must investigate and report on water supply availability and water needs for each of the water resource regions of the 11 Western States and on sources and means of augmentation of the water supplies available for the Colorado River Basin, other than from the Pacific Northwest.

In enacting the Colorado River Basin Project Act, Congress recognized a tumultuous history of water scarcities in parts of the West, and set about building a formula to do something about it.

The specific information requested by Congress included:

1. Estimates of both the long-range water supplies available and the long-range water requirements for each water resource region of the 11 Western States.

2. Results of full and complete reconnaissance investigations for the purpose of developing a general plan to meet the future water needs of the Western United States.

3. Results of the studies of possible means of augmentation of the natural water supplies of the Upper and Lower Colorado River Basins from sources within the Basin, including weather modification, desalting, water conservation, and geothermal.

4. Results of the studies of possible means and sources of augmentation from sources outside the Basin in the States of Arizona, California, Colorado, and New Mexico, particularly northern California.

5. Recommendations for such feasibility studies as are warranted of sources and means of augmentation.

Thus, it was evident that the Westwide Study was to be a multiagency, multidisciplinary effort; involve the 11 Western States; and accommodate the newly evolving planning concepts and values.

The Plan of Study

To accomplish this, an ad hoc committee composed of representatives from interested Federal agencies and States was formed in November 1970 and charged with developing a plan of study. This committee was composed of representatives of the 11 Western States, the Federal agencies involved in water resource development, the Water Resources Council, and other commissions and councils.

Several key decisions faced this ad hoc committee, the most difficult of which was defining the proper scope for the study. Of importance to the determination of scope were two major qualifications: (1) the study would be reconnaissance, or Level B, in character, and (2) it would cover only those resources and activities that affected the availability and requirements for water. Another decision was that the study effort must take full advantage of all previous studies, Federal and non-Federal, and that in essence the Type I Framework studies would constitute the initial base for Westwide planning. Due to the Westwide Study's comprehensive nature, every water planning activity in the West – past or present – Federal, State, or private – should contribute. With this background the original Plan of Study was developed which identified the additional information and investigations required. The Plan of

Study was made a part of the first biennial progress report presented to Congress in June 1971.

However, concern was soon expressed that the scope of the Study as conceived at that time was too broad, more than could be accomplished. In July of 1971, the House Appropriations Committee, in reporting out the "Public Works for Water and Power Development and Atomic Energy Commission Appropriation Bill, 1972," stated:

*** It is requested that a revised plan be developed for Committee approval which limits investigation to the essential elements required to meet study objectives of assessment of water needs and development of plans to meet these requirements ***

An intensive review and reevaluation of the scope of the Plan of Study in light of the request of the Appropriations Committee was undertaken during the first half of FY 1972. The reexamination was conducted by the involved Federal agencies and by the affected 11 Western States. It consisted of reviewing in detail the Type I Framework reports and ongoing programs for the Western river basins and identifying, item by item, the additional work necessary to: (1) determine water availability and water requirements, and (2) develop an array of alternative plans at the reconnaissance level (Level B) to meet future water requirements to the year 2020 with emphasis on year 2000.

As a result of the reexamination, some work items in the original Plan of Study were transferred to ongoing programs, some items were eliminated, some modified, and others added. The Plan of Study as modified in March 1972 was considered the minimum additional work required to meet the directives of the Colorado River Basin Project Act of 1968.

Study Organization and Accomplishments

During the period of time from September 1970 to January 1973, the overall study effort advanced from an organizational phase to implementation. The already established basic organization for the accomplishment of the Study provided much toward this effort. The Department of the Interior group considered key policy and criteria after other interests had opportunity to contribute. Primary responsibility for decisions rested with the Department of the Interior at the Washington level in consultation with the Water Resources Council and other Federal agencies.

The Advisory Committee was composed of representatives from the fields of natural resources having direct ties to the 11 Western States. This committee reviewed and advised on the adequacy of standards, criteria, and assumptions used in the conduct of the Study. The Committee held seven meetings from March 1971 to December 1973 which provided a forum for exchange of ideas and public involvement at the policy level. Participating in the Advisory Committee were representatives from:

States of:

Arizona	New Mexico
California	Oregon
Colorado	Utah
Idaho	Washington
Montana	Wyoming
Nevada	

Pacific Northwest River Basins Commission
 Missouri River Basin Commission
 Colorado River Commission of Nevada
 Colorado River Board of California
 National Water Resources Association
 Western States Water Council
 League of Women Voters
 Sierra Club
 National Association of Counties
 Four Corners Regional Commission
 International Boundary and Water Commission
 (U.S. Section)
 Izaak Walton League of America
 American Farm Bureau Federation
 AFL-CIO
 Natural Resources Council of America
 National Tribal Chairman's Association
 Arkansas-White-Red Basin Inter-Agency
 Committee
 Upper Colorado River Commission
 Pacific Southwest Interagency Committee
 Water Resources Congress
 U.S. Chamber of Commerce
 National Wildlife Federation
 National Congress of American Indians
 National Association of Conservation Districts
 Western Systems Coordinating Council
 American Water Works Association
 Wildlife Management Institute
 Rocky Mountain Center on Environment
 National Grange
 Trout Unlimited

As initially organized, the Management Group had responsibility for overall management and coordination

of the Study. It was to be composed of membership from the 11 Western States, all interested Federal agencies, and certain commissions and councils; however, active participation was primarily by resident Federal agencies. A total of some 20 Federal agencies were involved in the Westwide Study; 10 from within the Department of the Interior. Those participating were as follows:

Water Resources Council
 Department of Agriculture
 *Economic Research Service
 *Forest Service
 *Soil Conservation Service
 Department of the Army
 *Corps of Engineers
 Department of Commerce
 *Environmental Protection Agency
 Federal Power Commission
 Department of Health, Education and Welfare
 Department of Housing and Urban Development
 Pacific Northwest River Basins Commission
 Department of the Interior
 *Bureau of Indian Affairs
 *Bureau of Mines
 *Bureau of Sport Fisheries and Wildlife
 *Bureau of Outdoor Recreation
 *Geological Survey
 *Office of Saline Water
 *Bureau of Land Management
 *Bureau of Reclamation
 National Park Service
 Bonneville Power Administration
 Department of Transportation

*Resident member agency - based in Denver, Colorado.

The Implementation Group included the field counterparts of the participating Federal agencies, representatives of the 11 Western States, the Pacific Northwest River Basins Commission, and consultants. This group was originally responsible for assembling and comparing necessary basic data, identifying water needs and available water resources, and initiating the development of alternative plans to satisfy all water needs for States and water resource regions.

In this early phase, new procedures on multiobjective planning were developed and tested, various programs and studies were initiated to provide data and information on augmentation possibilities, with special emphasis on means to augment the flows of the Colorado River, and interagency, interdisciplinary planning teams were organized on a state-by-state basis and assigned a wide variety of tasks. State-Federal Study

Teams in existence in the northwest States were also formed in the other States. These teams provided information needed by the Westwide Study effort to insure that local views of water needs and requirements and the desired future characteristics of the local areas were provided. Completed and on-going State water plans complemented this effort and provided much useful information. One of the Study's basic guidelines has been to take account of and balance local, State, regional, and national interests; thus it was important that the study effort have specific and authoritative knowledge of State objectives and desires.

The various teams from the Westwide Management Group and the State-Federal Study Teams compiled substantial planning information and additional planning tools and techniques. The Management Group worked on plan formulation, techniques to gather and make best use of the needed water and land statistics, development of an environmental inventory, creation of information on the various schemes to augment the natural flows of the Colorado River, and development of a range of unit consumptive water requirements.

REDIRECTION OF THE WESTWIDE STUDY

New national priorities have emerged since passage of the authorizing legislation for Westwide. Satisfaction of national energy and food and fiber needs and emerging land use policies, together with the protection and enhancement of the environment, place new demands on planning for development of the resources of the Western States. Development of the energy mineral reserves, timber, and food and fiber resources for national use often conflicts with other national priorities. But need for these resources is pressing.

Questions surrounding the decisions for use of these vital resources must necessarily receive first attention. Sound fiscal management dictates that available water and related land resources planning capability be applied to problems of highest priority. In this overall context, the Westwide Study was administratively redirected in January 1973 to the objective of identifying by July 1, 1974, only the most pressing and immediate water and land related study needs.

The Westwide Study effort was basically centralized and scoped to provide:

1. Assessment of data from completed and ongoing studies on water, land and related resources and the possibility of these data being used in studies to determine solutions for priority demands.

2. Identification of the water supplies and requirements for the 11 Western States and the nine water resource regions within those states.
3. Recommendations for further detailed studies (Level C) for areas facing the most critical water-related problems.
4. Identification of the need and recommendations for any future Level B studies.

Level C is defined as program or project detailed studies to support authorization or implement a plan of action. These multiobjective studies which are needed in the subsequent 10- to 15-year period, are to implement findings, conclusions, and recommendations of framework studies and assessments and regional or river basin Level B studies. Level B is a reconnaissance level evaluation of water and land resources, on a regional or river basin basis, prepared to resolve complex multidisciplinary problems with a 15-25 year time frame identified in framework and assessment Level A studies. These multiobjective studies are to involve Federal, State, and local interests and will identify and recommend action plans and programs.

Reassessment and redirection of the overall Westwide effort was necessary to complete the study in the reduced time period imposed. Resource inventories and plan formulation studies were discontinued and problem assessment studies were stepped up.

Factors Affecting Redirection

Of far-reaching influence is the changing attitude toward population and economic growth. Growth affects resource needs and the environment largely through the economy. Awareness is growing that disparity in growth between urban and rural areas is accompanied by changes in the quality of life; an acceleration of the depletion of domestic and international resources; greater pressure on the environment; fewer social options; and greater dependence on continual rapid technological developments to solve these problems. If present patterns continue, these problems will grow, irreversibly forcing changes in the current way of life. Slower growth means time, resources and additional options: Time to gain the knowledge needed; time to redress the mistakes of past growth; resources to implement the proper solutions and more choices in a future way of life.

New approaches to water and related land resource planning have evolved beginning in December 1968 with the increase in discount rate announced by the

Water Resources Council and with the recently approved Principles and Standards. This new multiple-objective approach has brought into question many of the water plans completed or in progress. Reevaluation and reformulation of many of these plans will be required.

Another important factor influencing Federal water planners in recent years has been the increasing activity of States in resources planning. In years past, many of the Western States relied heavily on Federal agencies to plan their water and related resources developments. Now they are building staffs, formulating State water plans, and participating to a much greater degree in the planning process. This is a desirable trend which calls for new working arrangements between the States and Federal water resource agencies.

The recently coined phrase "energy crisis" is rapidly becoming a byword in today's conversation. The facts of today's United States energy picture speak for themselves. More energy has been consumed in the past 30 years than in all history before 1940. One of the most critical trend lines is the continuing increase in per capita energy consumption in the United States. Even if current United States birth rates approaching zero population growth are maintained, the high-energy life style is expected to put new demands on all energy resources. In the United States, overall energy consumption may triple by the year 2000.

The environmental concerns of recent years, which receive major emphasis in the National Environmental Policy Act of 1969, have a major impact on planning. This Act requires that Federal agencies take environmental factors into full account in all their planning and decision-making. Much of the current concern over aspects of the environment has sprung from a negative reaction to the degradation inflicted on the natural surroundings. But there is a positive side to the struggle for environmental quality, and it too has been an important consideration in the Westwide Study effort. The planner and the decisionmaker must thoroughly consider and document the probable consequences of their planning and decisions on environmental values.

A part of the overall environmental picture important to the water planner is the water quality control program set forth in the Federal Water Pollution Control Act, as amended, which has led to the establishment of State water quality standards throughout the Nation. Every project that stores, diverts, or otherwise changes the natural flow of a river or stream is affected by the requirements of water quality considerations, be they for fish, esthetics, or the

maintenance of set standards. In recognition of this close relationship, Congress in that Act authorized the Water Resources Council to prepare water resource plans for river basins throughout the Nation. In the West, this action could be considered as a duplication of the initial Westwide charge.

The potential effects of all of these rapid and unprecedented changes and how to accommodate them in the planning of water and related resources development are the major concerns of Federal, State and private interests involved in resource planning. The Westwide Study has been focused within the framework of these changes to provide information on where additional high priority study effort is needed to bring forth solutions to the water problems facing the West.

Defining Critical Problems

One of the most difficult assignments in the redirected study was establishing a basis for defining the most critical water and related problems. Recognizing that there are interdependencies among the categories, the order of priority in establishing this criticality from the national viewpoint was determined as (1) Municipal and Industrial Water Supplies; (2) Energy Development; (3) Environmental Protection and Enhancement; and (4) Agriculture and other Developmental Programs.

Issue papers were requested from the State-Federal Study Teams on water and related problems believed at the field level to be of a critical nature. Also, the teams were asked to prepare a report by States which summarized the critical issues and made recommendations consistent with the revised study objectives. Concurrently, action was initiated by the Management Group on the following items: (1) Additional issue papers were prepared on problems thought to be critical; (2) A screening and summarizing of problems submitted by others were completed; (3) Original investigative work on specialized problems such as energy was undertaken; and (4) The reports by States, the framework studies, and other available data were screened and evaluated.

The most critical water and water-related problems were defined and an assessment made of what should be done about them. Issues were grouped on a substantive basis and the result was a list of problems by States which were judged to be critical. Many of these problems occurred in more than one State on both a regional and a Westwide basis. Therefore, a consistent approach for considering State problems as a part of a regional or Westwide problem was developed. Through this process, a set of water-related problems, including functional, institutional, and social problems

was established. These were discussed with the States, Advisory Committee and other interests. From these discussions and further review and analysis, a final list of critical problems, requiring further study or new studies in the near time frame, was developed. Recommendations for additional study have been made for most identified problems. Where study is needed in the 1976 to 1980 time frame, recommendations are made for agency participation, range of funding, and level of study effort.

Report Organization

The remainder of this report is divided into six additional chapters. Chapter II, The Westwide Situation, provides an assessment of the present setting on water and land resources, population, economy, environment, minerals and energy. Chapter III, Aspects of the Future, examines various important factors which will influence water planning in the Westwide area with emphasis on year 2000. Chapter IV, Westwide Problems, discusses critical problems that are common to most of the 11 Western States. Chapter V, Regional Problems, presents critical problems that affect large geographic areas involving two or more States. Chapter VI, State Specific Problems, sets forth critical problems, more closely identified with individual State conditions. In the latter three chapters, various approaches to problem resolution are discussed, conclusions drawn, and recommendations made for supplemental or new studies were considered appropriate. Chapter VII, General Observations, synthesizes and consolidates the multitude of conclusions and recommendations.

This report is supported by a number of working documents and unpublished material on file. Working documents with a limited distribution to study participants include:

- Augmentation Potential through Weather Modification
- Consumptive Water Requirements for Public Lands Administered by the Bureau of Land Management
- Definition of terms
- Guidelines for Planning Ground-Water Management Indian Reservations in the Eleven Western States
- Land Resource Base
- Outdoor Recreation Needs
- The Role of Ground Water in Resource Planning in the Western United States
- Socioeconomic Characteristics
- Wild and Scenic Rivers, Streams and Stream Systems
- Wilderness, Potential Wilderness, Research Natural Areas and Natural Landmarks

Oral History Interviews: Version 2—Showing Corrections and Additions
Edmund Barbour

Storey: This is Brit Allan Storey, Senior Historian with the Bureau of Reclamation, interviewing Edmund “Ed” Barbour in the Bureau of Reclamation’s Denver office in Building 67, on June 10, 2003, at about two o’clock in the afternoon. This is tape one.

[Let me]²⁵ begin by my asking you where you were born, and raised, and educated, and how you ended up at Reclamation Mr. Barbour?

Born and Raised in Port Arthur, Texas

Barbour: Okay. Well, I was born in Port Arthur, Texas. I went to school there. I spent a little time at the business college waiting to get drafted in the Army since my dad wouldn’t let me volunteer.

Drafted into the Air Force

So, I got drafted when I was nineteen, ended up in the Air Force, and spent time in the Air Force. Spent a little time in France, and Germany.

Enrolled in the University of Denver

And then when I returned, I decided I was going to go to school, which I tried to get in the University of Texas but they were on the semester system. So I decided to enroll at the University of Denver, because I could get there quickly (Laugh) and start for the following semester. So, I went and started at the University of Denver, never been to Denver before in my life.

Earned a Master’s Degree in Economics

Went on the Texas Zephyr. And, went to University of Denver, and liked it there, and got my master’s degree there, in economics. And, after graduating there, why I had three offers to go to work, and times were tough in those days, in 1950, getting a job.

Accepted Job Offer from the Bureau of Reclamation

One was with the Bureau of Reclamation and one was with the Bank of America, and the other was with Prudential Insurance Company in their investment department. I thought it’d be more *fun* to get into water resources. So, I accepted the job with the Bureau of Reclamation as an economist, and since I had a master’s they started me out as a GS-9, instead of a seven, I guess,

25. 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. 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.

which was really nice.

Learned to Do Benefit-Cost Analyses in Denver

And I went to work in the Denver office for several months, learning how to do benefit-cost analysis, payout studies, and those sort of things under Harold Davis, who was Chief Economist in those days, and Ray Ahlberg²⁶ who was the Chief Reports person, smartest, one of the smartest guys I ever ran into.

Sent to Indianola, Nebraska, to Work in the Kansas River District Office

So, I ended up in Indianola, Nebraska, which was head of the Kansas River, which was the headquarters of the Kansas River District Office, as a neophyte. And they put me in charge of the economic studies for the Definite Plan Reports. If you're kind of interested in those days, these projects, the Definite Plan Reports [were required] in order to proceed [with] construction, but these projects were already under construction. We were writing the report as ~~we~~ [construction] went along. (Storey: Um hmm.) Both the Frenchman-Cambridge Division, and the Bostwick Division.

“We did a lot of projects out of that office . . .”

We did a lot of projects out of that office, Kirwin, Webster. We did ~~all the~~, a lot of the economic studies there, but nothing too exciting happened there, except some of the controversies we had with the subsidy for irrigation and how the Missouri River Basin Project Payout Study evolved, and the fact that the irrigation projects in Nebraska, although they were authorized, were quite costly, and the subsidy was quite high per acre. And one of the reasons were some of the funny economics we had on the main stem projects.

Cost Allocation on the Pick-Sloan Missouri Basin Program

So, one of the first controversies I got involved in was a [the] cost allocation on the Missouri Basin Project, where we felt the Corps of Engineers didn't treat us fairly. They didn't give us enough reimbursable allocations, so we ended up allocating more than we thought to irrigation and power than we needed to.

“ . . . cost allocations were always the *bane* of our lives . . . ”

But, cost allocations were always the *bane* of our lives, because—well multiple-purpose projects, you had to divvy up the costs, and the way you divvied them up impacted what people had to pay, and what the power rates were, and what municipal water rates were.

“ . . . cost allocation, in essence, is . . . *unavoidably arbitrary* . . . ”

And, since cost allocation, in essence, is *arbitrary, unavoidably arbitrary* because you're allocating, you know, multiple-purpose costs, which supposedly are indivisible.

26. In 1950 both Davis and Ahlberg worked in the Region 7 office, later known as the Lower Missouri Region.

So I had a lot of fun with that, analyzing, and *arguing* about what [was] the proper allocation to the various purposes ~~on the~~, on those major projects on the Missouri River Basin.²⁷ The Corps built most of them, obviously, and we had the irrigation and the power part of it.

Power Costs Caused Problems with Benefit-Cost Ratios in the Missouri River Basin

We had some, one of the interesting things that happened, as I recall, is that when we did a pump project, we were assigned a part of the cost of the main stem, part of the power costs. And, the power costs were so high that it really ~~screwed up our—I shouldn't use the term 'screwed up', it really~~ impacted our benefit-cost ratios, and we had a *heck* of a time getting to unity, one-to-one. And one of the problems was the big suballocation that they made, on those major projects, to irrigation.

Sent a Blue Envelope to Jim Casey Suggesting We Build a Steam Generation Electric Plant Rather Than Use High-Cost Hydropower on a Project

So, I wrote in a blue envelope to Washington, as I recall, saying, "Look. Just let us build our own steam powerplant, a coal-fired plant. It's a lot cheaper than the cost allocation ~~you~~ assigned to our project." And I sent that to a guy by the name of Jim Casey. I don't know whether you remember Jim Casey or not?

Storey: No. I've never met him.

Barbour: He was in Washington. And I told him that, ~~in essence, that allocation was so high to irrigation because the irrigation part of power,~~ what they did was suballocated part of the powerplant part to commercial power and part to irrigation pumping. Although, there was no irrigation pumping. (Storey: Um hmm.) Consequently, the part allocated to irrigation ~~, suballocated, the part of the power allocation suballocated to irrigation,~~ was non-interest bearing. So, you can see that, in the payout study, if you had a big chunk of the power assigned to irrigation, and you didn't have to use any of the power for pumping, and all of that was non-reimbursable—was non-interest bearing, it was a very positive impact on the payout studies.

Storey: Was this the Intake Project?

Barbour: No, these were, ~~all the pumping, there were~~ a number of [irrigation] pumping projects (Storey: Okay.) in the Missouri River Basin Project, in the early project. (Storey: Um hmm.) They're pumping out of the river, and anyone that wanted to use power—and you know they had a very cheap rate of 2½ mills for pumping power. And there was an allocation—that you had to accept this large allocation to go along with the cheap power, which made the economics tough, to me.

“So, I made the comment that, ‘Why, heck, irrigation is really subsidizing power, because of the way this allocation was made.’”

27. Several different names are applied to the Pick-Sloan Missouri Basin Program during the interview. This is one of them.

So, I made the comment that, “Why, heck, irrigation is really subsidizing power, because of the way this allocation was made.” And I wrote a blue envelope to Jim Casey in Washington, and he thought that was pretty good. So he ~~thought=he~~ accepted it as his own idea and he presented before a meeting. And, of course, the *political* ramifications of that were tremendous, because what you had to do, in order to ~~overcome, once you~~ changed the allocation you had to increase the power rates, and no one’s going to tolerate increasing power rates. And, not only that, the cost of power increased, so you didn’t have the large subsidy, which was used, *ultimately*, to pay off the ~~power~~ [irrigation] projects. So I remember, he called me. He says, “Ed.” He says, “Get rid of that blue envelope that you wrote me.” (Laugh) He says, “That got me in more trouble.”

“That was the first controversial thing I got into, was in McCook. Otherwise, we were building these irrigation projects, and we barely could keep ahead of the construction. . . .”

That was the first controversial thing I got into, was in McCook. Otherwise, we were building these irrigation projects, and we barely could keep ahead of the construction.

Lived in the Reclamation Camp at Indianola in a Converted German Prisoner of War Camp

We had a good time in those days because we stayed at the prisoner of war camp there. They had a German prisoner of war camp they converted to living facilities, and offices.

“. . . we had . . . up to 500 people working there. And we’re building . . . all those projects in the Kansas River Basin. We had lots of money. . . . one of the largest construction programs. . . .”

And we had something like up to 500 people working there. And we’re building all those projects, you know, Frenchman-Cambridge, Bostwick, all those projects in the Kansas River Basin. We had lots of money. (Storey: Um-hmm) We had one of the largest construction programs.

Storey: This was in ‘50, ‘51?

“. . . we lived . . . like a commune there, because we had a garden plot that was all shared, and we had little plots that we grew vegetables in. And it was an interesting society that we operated under . . .”

Barbour: ‘50 through ‘56 is the time I spent in McCook. (Storey: Um-hmm.) And we lived—it’s like a commune there, because we had a garden plot that was all shared, and we had little plots that we grew vegetables in. And it was an interesting society that we operated under, with the manager having the best, depending on your status, the kind of living quarters that you were entitled to.

“ . . . the higher up you were, in status, the better living quarters you got. . . .”

So, the higher up you were, in status, the better living quarters you got. (Storey: Um-hmm.) But, we had good times in those days. That’s the early years.

Accident While Duck Hunting on Trenton Reservoir

And, one thing I remember there had nothing to do with the work, except my buddy and I nearly met our maker in Trenton Reservoir. We were out duck hunting and got swamped and had to float into shore on decoys.

Storey: Which buddy was that?

Barbour: Hank Wilson, who ended up as Programs Chief in Washington. Yeah, he and I tested out the recreational aspects of Trenton Reservoir, which is now called Swanson Lake. One windy day, we got swamped, and we didn’t have life jackets, so we floated in on decoys. It was kind of interesting. But there’s a long story there. (Laugh) I won’t go into that. It has nothing to do with Bureau of Reclamation history, except we got a good taste of the reservoir. (Storey: Um-hmm.)

Transferred into the Chief Engineer’s Office

But, after that, I transferred into the Chief Engineer’s office.

Storey: That would have been ‘56?

Barbour: ‘56. And, worked for Ira Watson and Earl Fogarty. And that’s where I began to develop a reputation for working on special projects.

Worked on Drainage Issues on the Riverton Project

The first one was drainage at Riverton Project. I don’t know if you’ve ever heard of the problems that we had on the Riverton Project. (Storey: Um-hmm.) So, one of the first studies I did was developing procedures for determining which drains were justifiable, which drains they could build, and which they would not. So, from there, I got a lot of interesting special studies.

Cost Allocation on Glen Canyon Dam

One was the cost allocation, on Glen Canyon, for example. (Storey: Um-hmm.)

Randy Riter Didn’t like to Travel by Air

Which, I worked with Randy [John R.] Riter in those days. Dear Randy. He didn’t like to go by air. So, when we went up to the regional office to discuss cost allocation, how we would revise the Glen Canyon cost allocation, that was big stuff for me in those days. That was one of the largest projects we had. And, he wanted to go by train. “Oh, you’ll enjoy it.” And, it was overnight by train to Salt Lake City. I swore

I'd never do that again. He *slept* all the way through. But every stop, you know, you'd wake up, hear clacking of rails—but I did that for dear old Randy. He was a great guy. He worked on all of those major studies, you know. He was the top hydrologist, in the Bureau of Reclamation.

Emil Lindseth's "Dirty Seven" Studied New Technologies

But some of the interesting things, I guess that's what we want to talk about huh? (Storey: Um-hmm.) I got to do special assignments, like Emil Lindseth organized a group and he had engineers, and estimators, Tom Hollearin, and "Big" Howard Cohan was a member of that group. He called it the "Dirty Seven." And, we looked at all the new technologies.

Studied the Economics of Nuclear Power and Desalting

And so, they sent a team of us over to Oakridge National Laboratories to learn about atomic energy and nuclear powerplants, and desalting of sea water using nuclear power as the *basis* [power source], combined electrical powerplants with desalting plants. So, we spent a week up there, at Oakridge, learning the terminology and looking at some of the economics. Then later we got to apply them.

"It was a lot like science fiction in those days. . . ."

It was a lot like science fiction in those days. I guess I had the science fiction desk, because we began to do alternative studies using nuclear desalting. And, we had people come from General Electric[, and Westinghouse,] and we worked with the Atomic Energy Commission. And, in those days, they had an Office of Saline Water. A guy by the name of Hunter was the head of that.

We would get together with " . . . Atomic Energy Commission, Office of Saline Water, and put together *plans* for *major* nuclear desalting to *solve* the water supply problems in the Colorado River. . . ."

And, Atomic Energy Commission, Office of Saline Water, and put together *plans* for *major* nuclear desalting to *solve* the water supply problems in the Colorado River.

Bolsa Island Project Overseen by Manuel "Manny" Lopez

In fact, at one time, you know, we had a project called Bolsa Island. It came very close to being constructed.

Storey: Bulls Island?

Barbour: Bolsa Island.

Storey: B-U-L-L-S?

Barbour: B-O-L-S-A. Bolsa Island.

Storey: Oh. Bolsa Island.

Barbour: And it was an artificial island, ~~built~~, to be built off the coast of southern California. It was to have two large nuclear reactors. And, of course you have to have one from Westinghouse, and one from G-E. One was a pressurized-water reactor, and the other was a light-water reactor. See, those were competing concepts in those days. So, we put one of each in. And then we used Oakridge National Laboratory's plans for building these *large* distillation plants. So it would take the [residual] heat, before you used *all* the energy in the turbines, we'd pull it off and still maintain some heat value, and use that to boil water and convert ocean water into fresh water, and very very salty wastewater-brine. (Storey: Um-hmm.) And, the plans were put together, and we selected an engineer to oversee it, which was Manuel Lopez.²⁸ Did you ever hear of Manuel Lopez?

Storey: Yeah. I've interviewed Manny.

Barbour: Yeah? He was to be the leader there. We did a report on it, showing how much water we could produce, how much power. And, we thought we had both the utilities on board and the Los Angeles Department of Water [and] Power? Whatever their title is. And we were going to build it[—had the plans].

Storey: M-W-D,²⁹ huh?

Barbour: Yeah. And [in one plan] we were going to build this thing, and ~~it was~~, the island was like a large concrete donut, ~~to be built~~, offshore. And ~~then~~ [I think] it was to be *floated* out, several miles from the shoreline, and then *sunk*, and backfilled. And two nuclear plant[s] and the desalting plant [were to be] put on that island.

“ . . . just before we got construction, the utilities didn't like the idea of the federal government being involved in generating plants . . . And, the politics caught up with us, and, before we could get the thing underway, it was canceled. . . . ”

Well, just before we got construction, the utilities didn't like the idea of the federal government being involved in generating plants—nuclear generating plants. And, the politics caught up with us, and, before we could get the thing underway, it was canceled. But, someplace, somewhere, is a report, which we put together, on the economics of using nuclear desalting. In those days, you know, this was in the '60s, in the early '70s, (Storey: Um-hmm.) nuclear power was the thing.

Westwide Studies

When we were doing the Westwide Studies, which I did all the economic studies for *later*, we were projecting nuclear power by year 2000 would provide fifty percent of the total power. I think it's providing, maybe, eleven or twelve, thirteen percent now, to give you a idea. It fell out of grace, obviously, when they had the problems. But, not only were we going to ~~do the current technology~~, [be] using

28. Interviewed for Reclamation's oral history program.

29. The official title is the Metropolitan Water District of Southern California.

current technology, which was the pressurized and light-water reactors, and we were going to ~~use~~ [consider] fast breeders. And those were projected to be online, by the Atomic Energy Commission, by 1990. And, the ~~deal~~ [the benefit] of fast breeders was that it generated more fuel than it consumed. Actually, when you produce power, you have plutonium, enriched plutonium left over, and you could sell it and recover all your operating and fuel costs.

“At one time, using our low interest rates, I got really in a bind because all my numbers showed that we’d have a *negative* energy cost. We made more money on selling plutonium, than we had to pay for the energy output. . . .”

At one time, using our low interest rates, I got really in a bind because all my numbers showed that we’d have a *negative* energy cost. We made more money on selling plutonium, than we had to pay for the energy output. And I said to myself, “This will never work,” so we just arbitrarily assigned 1 mil as the cost of energy for the fast breeder.

Planning to Augment the Colorado River by 10,000,000 Acre Feet

And, when we—we’re kind of skipping around a little bit, and, but talking about fast breeders, we did a hush-hush study for [the] secretary. And, Lindseth headed it out, Jim Douglas. I don’t know whether your remember Jim Douglas or not? He was assistant director, Region Seven. Jim Douglas and Emil Lindseth headed up the group. I did the economics. Charlie LeMoyne helped with engineering. And, this was part of the politics of the time. We developed a plan to augment the Colorado River by ten million acre-feet. And one way we were going to do it is *divert* water out of the Columbia River, and *move* it all the way into Lake Mead. So, this study was very confidential. And we had the opportunity and [Emil] Lindseth and Jim Douglas, and I, and one of the estimators—~~Charlie LeMoyne didn’t get invited. He didn’t particularly like that~~—to present this to the Secretary of Interior, *on a Saturday, after hours. Because* it was, of course, very sensitive.

“Nobody’s going to fool around with Scoop Jackson’s river . . . He was head of the Interior Insular Affairs Committee. . . .”

Nobody’s going to fool around with Scoop Jackson’s river (Laugh) you know, in those days. He was head of the ~~Interior Insular Affairs~~, Interior Insular Affairs Committee.

Storey: Um-hmm. This would have been Stuart Udall?

Hearings on the Central Arizona Project

Barbour: Oh yes. Secretary was Stuart Udall. He was interested, of course, in the Central Arizona Project. That’s his home state. (Storey: Um-hmm.) And, they had been working to get that project for years, and years, and years.

Central Arizona Project Was a Birthday Present to Carl Hayden

And, it wasn't until Senator [Carl] Hayden, you know, finally on his what, 93rd or 94th birthday, he got the Central Arizona as a project. I was *there* in the hearings when they introduced the old gentleman. And Scoop Jackson had the hearings, ~~you know, in his big meeting—no, they had it~~ in Hayden's Appropriations Committee Room, because it was a lot *larger* than Senator Jackson's [Interior Committee hearing] room. (Storey: Um-hmm.) So, that's another story. But, I remember that when they got the old gentleman, and led him down, and sat him down, Scoop Jackson did. And then we had our team, and Secretary of [the] Interior [Stewart L. Udall], [Kenneth] Holum, assistant [secretary], and [Ed Weinburg, legal counsel] ~~Weinberger~~, and then Commissioner [Floyd] Dominy backing him up, ~~assistant commissioner~~. And then Arleigh West, the regional director. And then we were about five or six deep. And, of course, we always had the witness statements[, which Dan Dreyfus and I handled,] with all of the [supportive] data, in case somebody asked a question.

Storey: Um-hmm. You were talking about this briefing?

Barbour: Going back ~~to this thing~~—let's go back to that briefing. I'm getting [this out of order.]

Storey: That's okay.

Barbour: Wandering here.

Storey: We'll cover all of this.

Presentation to the Secretary on Colorado River Augmentation Was Very Secret and Was to Be Held on Saturday

Barbour: Wandering here. But, anyway, so the—on a Saturday—the night before, of course, we put all the, we got there the night before and (Laugh), this is very interesting. The night before, Jim Douglas and the boys celebrated a little bit. We had all the numbers and we're getting ready to make this big presentation. It was going to be in the secretary's office, on a Saturday. And, it was a very confidential meeting. We were not supposed to say anything about it. There were only *five* copies of the report made. And, they were watched very carefully. I tried to get hold of one and I never did end up with one. Charlie LeMoynes had one, and I don't know who has got the other. They may be in the files someplace. Small report.

Discussed Moving 10,000,000 Acre Feet of Water and Using Nuclear Powerplant/Desalting Plant on the Pacific Coast

And, not only did we discuss moving ten million acre-feet, using nuclear desalting, either at, on the coast, either at Camp Pendleton or one of the *coastal* situation, and hauling the water in and dumping it in Lake Mead.

“... we ... planned this canal, from the ... lowest dam in the Columbia River, and we pumped out a measly—I think to net ten million acre-feet—we had to pump about twelve or thirteen million acre-feet ...”

But then, we ~~built this canal, designed or~~ planned this canal, from the ~~lower dam, below the lower dam,~~ lowest dam in the Columbia River, and we pumped out a measly—I think to net ten million acre-feet—we had to pump about twelve or thirteen million acre-feet, (Storey: Um-hmm.) out of the Columbia River, ~~and then[.]~~ It took ~~such~~ tremendous amount of power, and I can't remember the total head. To me it seemed like it was 2000 feet, (Storey: Um-hmm.) total lift.

“ . . . you get the Columbia River water and *dump* it in Lake Mead. Now that was a big canal. . . . And, the pumping was costly. . . . ”

By the time you get the Columbia River [water] and *dump* it in Lake Mead. Now that was a big canal. (Storey: Yeah.) And it had a lot of pumping plants on it. And, the pumping was costly.

Studied Alternatives for Providing Power to Transport Columbia River Water to the Colorado River

So first, we ~~did, I did~~ [analyzed using] coal-fired plants, and then the conventional light-water—Westinghouse and General Electric nuclear [power plants]. And, we had gotten good data from both GE, we had them come over, and Westinghouse and make presentation to us about what the costs would be and projection of yellow cake ~~and, oh it was, that was,~~ [fuel which] you had to project ~~this thing~~ way out in time, and that was also interesting.

“So we decided that one of the alternatives was put fast breeders along the big ditch. . . . ”

So we decided that one of the alternatives was put fast breeders along the big ditch. And, did the estimates. And then we had all these pump lifts and we had to cost it out, and little report, and we put it on a chart, and we took it into the office and Stew, Stewart, I shouldn't call him—Udall, in those days, very friendly guy.

Stewart Udall “ . . . was in a sports shirt, and loafers, and he's sitting in front of the fireplace there. . . . And he had a rocking chair, sitting in a straight-backed rocking chair. . . . *Exactly* like Kennedy. (Laugh) You know, and Emil said, you know, 'The showoff,' he says, 'he's got one, he's got a chair just exactly like Kennedy's.' ”

And, he was in a sports shirt, and loafers, and he's sitting in front of the fireplace there. There was a fireplace in the Secretary's office. I don't know if you've ever been there or not?

Storey: No. I've never been in.

Barbour: And he had a rocking chair, sitting in a straight-backed rocking chair.

Storey: Just like Kennedy.

Barbour: *Exactly* like Kennedy. (Laugh) You know, and Emil said, you know, “The showoff,” he says, “he’s got one, he’s got a chair just exactly like Kennedy’s.” Because Kennedy had a bad back. (Storey: Yeah.) And so, he walked in there, and of course we were nervous, you know. Here is the presentation for the secretary. He was so friendly and disarming. So, we made the presentation and Emil laid out the plan.

Briefing Assistant Secretary Kenneth Holum on the Study Before Presenting to Stewart Udall

It was kind of interesting, that day—let’s see, it was the morning before, we went to make a little presentation to Ken Holum, who was assistant secretary, and we were explaining some of the things. And Jim Douglas, who had imbibed a little bit too much the night before, and it got kind of boring after a while, and he fell asleep.

Storey: In Holum's office?

Barbour: In this meeting in Holum’s office.

Storey: This was Kenneth Holum, I believe?

Emil Lindseth Offered Jobs in Washington, D.C.

Barbour: Yeah. Ken Holum. And Lindseth was there. And, Lindseth he was so fast on his feet. He’s such a diplomat, you know. Wonderful man. Everybody loved him. They wanted him, you know, as assistant secretary before Holum, but he didn’t want to move to Washington. My understanding, and he mentioned to me that they wanted him there as assistant secretary but he didn’t want to take the job. He didn’t want to leave Denver. He was, remember, assistant to the chief engineer in Denver. He liked the job. (Storey: Um-hmm.)

“... they *always* called on him [Emil Lindseth] for special studies. And that’s why he *organized* this little group . . . I did all the economic studies for—the “Dirty Seven,”

But they *always* called on him for special studies. And that’s why he *organized* this little group, of which I was a member. I did all the economic studies for ~~this little—the~~ “Dirty Seven,” ~~or whatever~~ they used to call us. (Storey: Um-hmm.)

“We took all the hot projects, you know. We had *all* the fun. We had what we called ‘the science fiction desk. . . .’”

We took all the hot projects, you know. We had *all* the fun. We had what we called “the science fiction desk.”

Secretary Udall Kept the Chart That Went with the Presentation to Show to Scoop Jackson and Seek Money for the Westwide Studies

But anyway, so we make the presentation and Stew asked a lot of interesting

questions, and after we were through he thanked us, and he says, “Don’t take that chart Emil.” He says, “Put it behind the sofa there. I don’t want anybody to see it. I’m going to show that to Scoop Jackson.” See, in the back of his mind we were working on augmentation of the Colorado River, and we were trying to get *money* in those days to do the Westwide Study. (Storey: Um-hmm.) Which, when we estimated, it’s going to cost, I don’t know, \$20 million or ~~something~~. And, so we wanted to show him, we wanted to do other study. We were doing using nuclear alternatives to desalt water and haul it in. We were ~~going to get northern California~~, [looking at getting] 2½ million [acre feet] out of northern California, and dump it in the river, and then we were going to do a lot of desalination, ~~you know~~.

We “were going to do all these exotic alternatives to get water in the river, but . . . the strategy was to go to the Columbia and get it. And, then we were going to give everybody fresh water on the way. We were going to restore Pyramid Lake, and do all kinds of things. . . .”

And, were going to do all these exotic alternatives to get water in the river, but we thought the strategy was to go to the Columbia and get it. And, then we were going to give everybody fresh water on the way. We were going to restore Pyramid Lake, and do all kinds of things. ~~By the time we got there, it was a long ways, you know~~. And, the strategy was to get Scoop to help authorize money to study other alternatives. So we include his river, you know, it might make him a little nervous, I think. So he [Secretary Udall] says, “I’ll just show Scoop that. Just leave it there.” Well, we finally got money, you know, to do the Westwide Studies. Initially, I think, we got like \$4 or \$5 million we spent on it. We were supposed to spend \$20 million. We had to cut the study short. They cut us off, (Laugh) you know, before we completed the study. And that was another interesting, interesting study that we did here in this building.

Storey: What was the relationship of all this to the Pacific Northwest, Pacific Southwest plans and so on? Which were ultimately published? Do you know?

Barbour: Well, we did—this was in the ‘70s, and of course Central Arizona Project was the start of it, you know? At the beginning they had the lower Colorado River Basin Project.

Storey: It would have been the ‘60s, right?

Westwide Study Authorized in 1968

Barbour: That was in the ‘60s. It got authorized in 1968. But, all these augmentation studies came later, and then we finally did these Westwide study. We had representatives from the eleven western states, and we ~~had~~, set up offices in this building, ~~on the fourteenth floor, [or] on the thirteenth floor~~. ~~I can’t remember, but where~~ We were an independent group and we had Fish and Wildlife, ~~people~~. We [Bureau of Outdoor Recreation, we] had people from most *all* the agencies, including the Corps of Engineers.

Storey: And Terry Lynott?³⁰

Staffing the Westwide Study

Barbour: In this particular, in this office (Storey: Yeah.) working on the Westwide plan. And then we had state representatives come in and we had them working closely with the Water Resources Council. Don Maughn was head of the Water Resources Council. And, in those days they were developing the Principles and Standards. And, we were, and I was given the job of developing, implementing procedures for the Principles and Standards, try them out to see how they work . . .

END SIDE 1, TAPE 1. JUNE 10, 2003.

BEGIN SIDE 2, TAPE 1. JUNE 10, 2003.

Storey: Principles and Standards, and did test studies?

Work with the Water Resources Council

Barbour: That was during the Westwide Studies, because we had to *use* those, and those were being developed. The Water Resources Council was very active in those days, and I was a consultant to the Water Resources Council, ~~developing procedures~~. And, I used to go to Washington and work with those guys on how to develop the procedures.

Development of the *Principles and Standards* for Multiple-objective Planning

And, finally, in order to do implementing procedures, I organized a *group*, an interagency group, and I think there were thirty or forty of us. And, we began writing guidelines, which were ultimately called the “Yellow Book.” (Storey: Um-hmm.) And, I put it together, as editor, and wrote some various segments of it, and I edited the whole thing. ~~And, there is, what they call the “Yellow Book,” which was supposed to be the bible~~ [It was to be the guidelines] for implementing the Principles and Standards. And, that was the days of “Multiple-Objective Planning.” You plan for more than one objective. This was the thing, the new thing, is multiple-objective planning, because then we had *more* than one objective. In the past we had [simply a] national economic efficiency objective. That was always an objective. ~~One was~~ Regional development, was [also a major] ~~an~~ objective. And both of those were always an objective. Do you remember direct benefits and indirect benefits? I don’t know whether you’re familiar with those terms? But [in project] economics you had the direct benefits, those were impacts on income, and then you had the secondary benefits, were the impacts on businesses and employment and so forth.

Four Basic Objectives of the *Principles and Standards*

“ . . . sometimes you want to build a project *just* for the social impacts . . . ”

[The new Principles and Standards] ~~So, then we~~ developed four basic objective[s],

30. Terry Lynott was interviewed for Reclamation’s oral history program.

which were: National Economic Development, Regional Economic Development, Social Well-Being because sometimes you want to build a project *just* for the social impacts, like unemployment, you know, or [an] Indian project.

Strictly for social aspect. And then we had, of course, the biggie, Environmental Quality was an objective. So, we had a four-account system, and it was our job, and I headed up the group, to develop procedures to evaluate each one of those [four basic objectives]. (Storey: Um-hmm.) And the most fun we had was Environmental Quality.

George Wallen and Darrell Adams Came to the Westwide Study

And George Wallen was working—I got him, stole him from the Fish and Wildlife Service, and brought him into Westwide, and he developed. ~~and he and~~ Dr. Adams, Darrell Adams, who is a social psychologist, and he did these evaluation procedures. So, we developed a numerical system to evaluate environmental impacts, and, we put it all in the [“Yellow] Book.”]

“So, we had a four-account system on how to evaluate different projects, and when you planned a project . . . you planned several alternatives that would maximize one of these objectives. . . .”

So, we had a four-account system on how to evaluate different projects, and when you planned a project, you didn’t plan just *one* alternative, you planned [several] alternatives that would maximize one of these objectives. So, you might have four alternatives. And it could be different. It could be very efficient. That might be the smallest project. And, if you added Regional Development, you know, it’d provide more job[s]. If it ~~had~~ [served] Social Well-Being, you might have [serve] some ~~underprivileged~~ [unemployed or underemployed] people. [For] Environmental Quality, you might have [different features] ~~a lot of extra stuff~~, or reduce it or change it. So ~~you could have—and then you~~ [these plans] would [be] evaluate[d] with this four-account system.

Taking Multipurpose Planning out to the World Community

And, the world liked it. The International Water Resources Group, IWR, whatever it was. I had done the work, and so they asked me [to talk.] The United Nations had a group, and they met in ~~Madrid~~ [New Delhi, India]. They had an international symposium, and I made a presentation on multiple-purpose and multiple-objective planning in the United States. It was interesting. We had, Mrs. Gandhi ~~was~~ there to introduce the [symposium.] [About] 900 people [attended discussing multiple-objective] ~~in there talking about~~ water resources planning. (Storey: Uh-huh.) Worked with the Indian folks. And then they [U.N.] liked it so much they set up another conference in Manila, ~~United Nation Conference~~, and we did the same thing there. We presented multiple-objective planning for the world. *Everybody* thought this was the thing, until the Reagan administration decided, “Well” They whacked, the conservatives whacked it down and whacked it down until all we had left was National Economic Development. [The projects] ~~It~~ had to pay for itself, you know? These

other things, regional development, social well being, oh you could evaluate them, but you couldn't design a *project* to explicitly serve them. Environmental Quality, you could sure measure it, and you might consider Environmental Quality[. So it was],~~but it~~ reduced it down to dual objectives. And we had four objectives, but that was the *politics* of it. (Storey: Um-hmm.) That's how it evolved. And finally, they did away with the Water Resources Council. You remember? (Storey: Um-hmm.)

Big National Meeting to Talk about Multipurpose Planning and Had Trips to Rainbow Bridge and Glen Canyon

But, we had, just staying with that subject a little bit, we had this big national meeting, and we invited *everyone*, Audubon Society, Sierra Club, and we treat them to a big trip to Glen Canyon.

Warren Fairchild Thought Big

We had a big national conference with representatives from the U.S. Chamber of Commerce. [Warren] Fairchild was heading those, he was the Assistant then, and he thought big. I mean we had everybody at this meeting, helping us formulate ~~water resource, an~~ approach[es] to good water resources planning. And we had seminars. And then we treated them all to a trip to Rainbow Bridge. (Storey: Um-hmm.) And so the National Park Service put us in boats (Laugh) ~~and we go. It was wonderful.~~ We ~~all take~~ [get] a look at Rainbow Bridge. And the one fun thing I had there is when we went up to Rainbow Bridge we had all these Sierra Club guys.

Developing Procedures for Evaluating Environmental Quality

They were always giving us a fit, but I knew these guys quite well, you know, because environmental quality was also an objective, so I needed to use them, and they helped ~~me~~ [us] develop procedures for evaluating environmental quality. (Storey: Um-hmm.) [For example in measuring open and] ~~Opening~~ green space, ~~and~~ we use[d] a numerical system, one to ten. One was kind of the worst thing you saw. Ten was the best thing you'd ever knew, ~~and we would evaluate opening green space and things like that.~~ In fact, we wrote it up and George Wallen and I, and I had a friend who was the head of [Scoop] Jackson's technical committee, Dan Dreyfus, who had helped me on the Central Arizona Project, Incidentally. So, He got it published as a Senate Document. So, I and several of my associates, ~~we, it was~~ [had] a senate document that was printed and distributed all over the place on how to evaluate environmental quality, which we developed here in the Bureau of Reclamation. So, we did some real good work in environmental quality in those days.

Weather Modification for the Colorado River

Well, getting back to that other thing, on the augmenting the Colorado River. Of course, you know, there was weather modification, rain-making.

“ . . . the desalination thing was really active. We *nearly* did something there. *Very close. . . .* ”

That was always a part, a big part of it. And, the desalination thing was really active. We *nearly* did something there. *Very close*. And then we did—I don't know whether you've seen the reports, or if you studied history of what went on in those days?

Worked Jointly with Mexico on a Nuclear Powerplant and Desalting Plant Located near Yuma, Arizona

We joined with Mexico and sited one on the border, a large nuclear desalting plant. (Storey: Uh-huh.) And, we shared the power, and that report is somewhere around here. I did some of the economic studies on it, ~~but~~, and we shared the power with Mexico, and we shared the water [also]. And, we sited it there near Yuma[, Arizona]. And because we had to get rid of the brine, we [proposed to] excavate a channel into the Baja, California, and it was big enough ~~they~~ [that it] could be navigate[d].

“We were going to make a port out of Yuma. . . .”

We were going to make a port out of Yuma. (Laugh) We always kidded about that. (Storey: Um-hmm.) ~~So is that, you know,~~ [That was needed] to get rid of, the brine ~~was so large, produce~~ [left after producing] all that water—I've forgotten the ratio between fresh water and brine. But again, those were the science fiction days. So, there is a study on joining with Mexico and building a dual-purpose nuclear desalting plant.

Storey: How were we going . . . ?

Barbour: And running the water back up. We shared it with Mexico. (Storey: Uh-huh.) Because Mexico was short, you know. They never did seem to get their share of the Colorado River. And, when they *did* get it, it was a little on the salty side, as you recall? (Storey: Um-hmm.) You know, ~~all those~~ [built the] reverse-osmosis plant. I don't know if they're still operating. [Reclamation] ~~We~~ did all the *study* [studies]. We got all that data from Oakridge National Laboratory [for] the different ~~processing~~ [processes], and Office of Saline Water. Membrane, reverse osmosis, ~~were two of the major,~~ and the distillation were the ~~three~~ [two] *major* ways to desalt water. And, we used to lecture about the economics of various [alternatives]—and now they're doing more in the field of reverse osmosis, I think. (Storey: Um-hmm.) Although they're still doing distillation plants. Israel has some very large distillation plants. And, ~~in,~~ ~~when we went,~~ when I made this little trip to the Philippines, and made a presentation about multiple objective planning and so forth, I met a guy from China who *headed* the distillation plants in China. And, they were building the distillation plants. (Storey: Um-hmm.) And that was, he was an interesting guy. That's another story.

But anyway, getting back to, to our meeting with Udall. After that [meeting discussing use of Columbia River water] is when we got money to do the Westwide Studies. And then that's when we organized and spent three or four years putting the study together. And, we put out the report. You've seen *The Critical Water Problems*

*of the West, the Westwide Study?*³¹

Storey: I've heard about it.

Westwide Study Was Cut Short and Staff Had to Be Integrated Back into the Regular Reclamation Staff

Barbour: It's a report about so thick. And I think we spent \$5 to \$6 million doing that study. We cut it short. We ran out of funds. And, here we were, a whole special group, and they had to integrate us back into the Bureau of Reclamation.

“... Dominy had *ordered* several of us to leave the jobs we had and to be reassigned to the Westwide Group. . . .”

Well, Dominy had *ordered* several of us to leave the jobs we had and to be reassigned to the Westwide Group. (Storey: Um-hmm.) And, so, when Westwide was over, then we had to be integrated back to the Bureau of Reclamation, and that didn't make a lot of people happy. Because here we had positions over there, and so we were competing with guys that had existing positions over here. And, so there was a little bit of strife. So I ended up ~~with the~~, I worked with [Warren] Fairchild in reorganizing the Bureau, and *integrating* Westwide [people] with the regular Bureau of Reclamation (Storey: Uh-huh.) forces.

“... the Westwide Study was really a new thing for the Bureau, and a lot of the agencies, I think, were a little jealous of the Bureau of Reclamation taking the leadership on that. . . .”

The Westwide Study was really a new thing for the Bureau, and a lot of the agencies, I think, were a little jealous of the Bureau of Reclamation taking the leadership on that. Of course, we were given the leadership. And, Wally Christiansen headed it up, and we staffed up, and we had a nice budget you know. Spending a million dollars a year you could—and we had *all* the [western] states. All the states sent some of their best people. And we had state study teams, each state. And then there was a water plan [developed] for each of the states. Some of the states were very cooperative, some weren't. California was tough to work with. *Idaho* was very cooperative, and, some of the other states. But, ~~we~~, the plan includes the eleven western states and their critical water problems, and they're reported there as best we could, and we got the states to review it and help us write it. And, if you'll go [to the

31. These documents may be of particular interest. All are found in the Bureau of Reclamation's library at the Denver Federal Center. United States Department of the Interior, Bureau of Reclamation, "Western U. S. Water Plan. Proposed Plan of Study" Official Review Draft, April 1, 1971; United States Department of the Interior, Bureau of Reclamation, "Executive Summary: The Critical Water Problems Facing the Eleven Western States: Westwide Study," Review draft, May 1974; United States Department of the Interior, Bureau of Reclamation, *Executive Summary: The Critical Water Problems Facing the Eleven Western States: Westwide Study*, April 1975; United States Department of the Interior, Bureau of Reclamation, "Westwide Study Report on: The Critical Water Problems Facing the Eleven Western States," Review Draft, May 1974; United States Department of the Interior, Bureau of Reclamation, *Westwide Study Report on: The Critical Water Problems Facing the Eleven Western States*, April 1975; and United States Department of the Interior, Bureau of Reclamation, *State Comments: The Critical Water Problems Facing the Eleven Western States: Westwide Study Report*, June 1976.

reports], you'll see that we made projections of what might happen in the future. One of the things, of course, we assumed [was] the [sources of] energy ~~question there~~. Nuclear power was a big part of the solution there.

The other, you know, I was just thinking of some of the highlights, some of the fun things we did in those days, when the Bureau was really perking. (Laugh) (Storey: Um-hmm.) But, we had a lot of things to do, and we are recognized as an agency, and because, I think, mostly because of Emil Lindseth. Of course, we were a great design group, construction group. We were always the greatest there. But, we weren't the big planners. But, with Lindseth coming in and looking at all these [new] technologies and getting us involved [with] the Office of Saline Water and the Atomic Energy Commission. We'd have meetings with these people, at high levels. Some of the top people providing data for the Bureau of Reclamation to do these big studies. (Storey: Yeah.)

Central Arizona Project Was Fun

Now, also involved was Central Arizona Project. Now that was probably, the most fun we had was working on that project until authorization.

Met with the Secretary over the Central Arizona Project

And, that was the other—I only had *two* meetings with Secretary of Interior. [The first was alternatives for augmenting the Colorado River, including the Columbia River.] ~~That was~~ The other meeting I had with him [was on the Central Arizona Project—where] ~~And that is that~~ we put together all the alternative plans.

About Thirty-four Alternatives Studied for the Central Arizona Project

There was something like *thirty-four* alternative plans, were put together for the Lower Colorado Basin Project, which was *primarily* the Central Arizona Project.

Looking for a “Cash Register” for the Central Arizona Project

Because it needed a cash register. So, where was the cash register? The cash register had to be where? Bridge Canyon? Marble Canyon?

Bridge Canyon Dam's Name Changed to Walapai Dam

Bridge Canyon, you know, the name was changed to Walapai Dam. Did you know that? (Storey: Um-hmm.) Because there's a little Indian reservation in the canyon, and ~~we~~ [apparently it was] thought by changing the name we'd get a little more support for it. *Only* reason it was changed. So, it became Walapai Dam, right in the middle of all of our studies. And, it was a mess trying to change *all* those studies to Walapai Dam. Well, a lot of people couldn't spell it, and hardly pronounce it. But, ~~we went~~, we spent [a lot of] time in Phoenix, with some of the people. We had Bruce [Blanchard] there, and the Secretary's office, the regional offices, ~~are~~ *all* involved, trying to evolve a plan that would include enough revenues to pay for the project.

Central Arizona Project Cost More than Any Other Reclamation Project

I mean the Central Arizona Project was the *very largest* project, as far as cost-wise, (Storey: Um-hmm.) that the Bureau has ever built. And we had to have a way to pay for it.

Controversy about Bridge Canyon Dam and the Grand Canyon National Park

Well, you know, we always used big hydropower plants as a cash register, correct? Missouri Basin and Hoover. So, first we tried to borrow funds from Hoover. We thought that might be a good way to go. But we didn't get a lot [of revenues there], so we had to [consider] build[ing] a new project, so we were going to build Bridge Canyon, high Bridge Canyon, in the canyon [to provide power revenues]. [But it had] ~~And~~ a little problem is, it backed up a little water into the park, (Storey: Um-hmm.) the Grand Canyon Park. Well, Sierra Club didn't like that. In fact, they had so much—I don't want to call it propaganda, but *information* out that my daughter came home from school and says, "Daddy, why are you damming up the Grand Canyon? You know we go there every summer!"

"They had all the school kids believing that the Bureau of Reclamation was going to flood the Grand Canyon, with Bridge Canyon Dam. . . . we were just going to encroach a little bit . . . and there was no overlook where you would ever see the upper end of the lake. . . ."

They had all the school kids believing that the Bureau of Reclamation was going to flood the Grand Canyon, with Bridge Canyon Dam. And we were just going to encroach a little bit, on the park, and there was no overlook ~~that would~~, [where] you would ever see the upper end of the lake. But, that was one of the studies that we did. Bridge Canyon was a natural. Another high dam in the canyon. Produce a lot of power. Get lots of money. A lot of revenues. Pay for the project. Great!

David Brower

Except, our friend Dave Bower?

Storey: Brower.

Barbour: With the Sierra Club, he didn't like it, of course, needless [to say]—~~and they were~~, and I'll tell you about Dave once. He was sitting at my elbow once, in the hearings. And I didn't know who he was. He was *looking* at my witness book. And, Dan Dreyfus says, "Close your book, Ed." I said, "Why?" He said, "That's Dave Brower sitting—he's looking at your witness statements." You know. These are statements we prepared for the Commissioner. At a question the Commissioner would turn around and stick his hand out.

Storey: We're talking Dominy, now?

Barbour: Yes. And, [Dan] McCarthy sat right behind. And, if *McCarthy* didn't have the

answer, he reached back and that's where we were. (Storey: Uh-huh.) And, [if] it was ~~economic~~, hydrology [or design], Cliff Pugh was head of the district office, he had all the technical stuff. Dan Dreyfus had all the programming, and a lot of the general stuff. And, I had all economics. So, we had sheets of paper.

“ . . . friendly congressmen, you see, would call the commissioner, or the commissioner's office, the day before, and tell them the questions they might ask in the hearings. . . . ”

And, a lot of the friendly congressmen, you see, would call the commissioner, or the commissioner's office, the day before, and tell them the questions they might ask in the hearings.

John Saylor Was an Unfriendly Member of Congress

Except, the unfriendly ones, like [John] Saylor, who hated the Bureau of Reclamation, you know, from Pennsylvania. I remember the Commissioner ~~says, “I ought to” he says “I ought to cuss that son. . . .”~~ [mentioned he should give Saylor a piece of his mind.] We were in a restroom and Saylor was giving him a hard time. He was talking to [Ed (Eddie)] Weinberg, chief solicitor. He and Weinberg were sitting next to the Secretary.

Storey: Ed Weinberg?

Barbour: Yeah. Weinberg, and they were sitting next to each other, and of course, we were way in the third row. And, he was talking to Weinberg there, at the urinal, and he was giving Saylor hell. And Ed Weinberg just kept saying, “Floyd, forget it. Forget it. It's not going to help you anything to tell him off.

The Congressional Hearings Were Very Exciting to Attend

Forget it.” (Laugh) But, you know we were—the hearings were ~~just one exciting~~, very exciting to attend. ~~But anyway, before they, we had to develop plans before we—this was earlier when we had to—~~So, we had [developed] these thirty-four plans ~~that we developed~~, with all the hot shot staff in Phoenix. And, we just got our new Honeywell computers here, ~~and Darrell (snapping fingers) come on.~~

Doing Payout Studies on Reclamation's New Computers

Darrell Webber headed up the group. So I had Darrell work with one of my young guys that were helping me do all the payout studies on the computer. (Storey: Uh-huh.) ~~And, you know, they'd print out sheets.~~ You know those old computer sheets. Well, with thirty-four different kind of combinations, you know, in a meeting, boy, ~~I~~ [it] felt very impressive. I'd bring in these stacks of stuff[—computer print outs]. They'd ask you a question, you know, they'd look at it and it was *very impressive*. They had a lot of junk in there (Laugh) you know. A lot of *assumption* in there. I shouldn't call it junk. You have to make a lot of assumptions. So, there was a lot of information in there. But, then we'd summarize it. And, so we [reported on] ~~had~~ all

the plans. But, they develop [even] more plans, [because] everybody had a different idea. And we had twelve basic plans, and then modifications of the plans, so we ended up with *thirty-four different* plans [including] the economics and the financial plans. And so, I stopped by to pick them up from Darrell, and go immediately to Washington, because we had a presentation to make to the Secretary of Interior. ~~So, we took all of this material and took it to Washington.~~ And Dan Dreyfus was the coordinator then. Brilliant guy. Shaved his head. You could never miss Dan Dreyfus. He ended up, I mention this, as Senator [Scoop] Jackson's, the chief of his technical staff, ~~Dan Dreyfus did.~~ And, he's still somewhere in Washington[, D.C.]. I'll have to go see him. But, we had some wonderful memories. There's a guy you ought to talk to. (Laugh) (Storey: Uh-huh.) He has some wonderful memories. He participated in all ~~this stuff~~ [these studies]. Anyway, so we spent, we had all of these plans and the thing we had to do is get it down to a fewer ~~amount~~ [plans].

Meeting to Reduce the Number of Alternatives to Be Presented to the Secretary for the Central Arizona Project

So, we had some of the people from the Secretary's office come in, six or seven, and said, "Look, we can't show that many plans to the Secretary, we got to get it down [to] a reasonable few."

Whittled the Alternatives down to Seven—None Including a Coal-fired Powerplant

And so we had a meeting that night and they whittled it down, I think, to seven plans, major plans. ~~And, I thought they had,~~ *Except* they had left out one of the plans that ~~we~~ had a coal-fired plant site, ~~I think, at Topco or something.~~ I can't remember the name of the plan. But, I'll tell you what it is now.

Worked with Dan Dreyfus and a Draftsman to Develop a Very Large Chart Presenting the Seven Alternative Plans for the Central Arizona Project

But anyway, so, we had the plans, and they selected seven, and then Dan Dreyfus and I with a draftsman worked all morning to put out a gorgeous chart. It was huge. It had a hinge in the middle to get it in the elevator. So, we meet with the Secretary in the afternoon to present all these plans, right? And, so, the night before we were going to brief the Commissioner, and we were working late, Dan Dreyfus and I.

Briefing Floyd Dominy on the Alternatives for the Central Arizona Project

And, Floyd Dominy called us into his office ~~and so we went up there.~~ He wanted a little briefing. And, he really wasn't too much interested in all this damn thermal plant. We had [also included a] nuclear powerplant ~~as, on~~ [similar to the one at] Camp Pendleton. We had them [located] along the lower Colorado River. We [also] had mine-mouth coal-fired plants as a source of energy. We had pump storage combined with nuclear power. We had pump storage alone. We had all kinds of different combinations (Storey: Uh-huh) to provide a source of [power and] revenues. And [in] *one* we had *no* powerplants at all, ~~charge~~ [but assumed] an ad valorem tax to recover costs. We had to recover costs, because we had to meet the reimbursable requirements

of Reclamation law. So, we needed money. We needed *lots* of money, because you're not going to get a lot of money out of the irrigators. You never could, never would—they couldn't afford it.

Needed to Find a Big Cash Register for the Central Arizona Project

So, we needed to have a big, big cash register. So, we had all of these plans. And, we had a high Bridge Canyon, a low Bridge Canyon, a low low Bridge Canyon, a Marble Canyon, a low Bridge plus a low Marble Canyon, and then we had pump storage plus steam plant. We had *all* of these plans.

They Were Very Proud of Their Chart of Alternatives for the Central Arizona Project

Anyway ~~they~~ [the Interior team] got it down to roughly seven plans, and we, ~~on the~~ draftsmen were so proud. It's going to the Secretary. You know he's going to put out a pretty chart, right? (Storey: Uh-huh.) And we had jillions of columns on costs and [power and water] rates and allocations and how long it took to pay out, and surpluses available to pay for all these other related projects, the Indian projects and so forth. But, anyway, ~~so, we walk in~~—then we needed to brief the commissioner. He called us in. It was late.

Commissioner Dominy Didn't Think There Was Any Chance of a Thermal Powerplant

So Dan and I went out to see the commissioner was in his office. He had a bed in there. He would sleep in there sometimes. ~~He did a lot of things there too, but . . .~~ (Laugh) So, we were briefing him. He wanted to know—he didn't care about those thermal plants. He didn't think there was *any chance* we'd get any kind of a thermal plant.

Dominy Was Only interested in the Hydro Plants

He was interested in the hydro plants. So he asked me about Marble Canyon, and Bridge Canyon, and low Bridge Canyon. Those are the three things he was interested in. And, I told him Marble Canyon didn't stand up too well, when you compare it to Bridge, either low Bridge or high Bridge.

Commissioner Dominy Agreed to Eliminate Marble Canyon Dam as Not Economically Practical

And, as far as I was concerned he probably wanted to eliminate Marble Canyon. So, he said, "That sounds reasonable." And so then it was down to, ~~he wanted~~ [the selection of] a dam. He and Brower had gone down the river, and he had taken pictures of that river, of all the talus slopes. He said, "Those *ugly* talus slopes down the canyon. You think it's beautiful?" he says. (Laugh) That's kind of interesting, because he had a lot of slides.

Commissioner Dominy and Wayne Aspinall Agree on the High Bridge Canyon Alternative

But anyway, ~~so we were trying to~~, we were looking at low Bridge Canyon and high Bridge Canyon, and all of a sudden the phone rings. And we were discussing it. And he says, "Hello. Oh. Wayne." And, we couldn't hear the other end of the conversation. "Yeah. Yeah. Yeah. I'd agree with that. I would agree with that. Yeah. I'll, see you tomorrow Wayne" or "Talk to you tomorrow" or something, you know. And so, he turned to us and he said it's high Bridge Canyon. He said that was Wayne Aspinall. You know he was head of (Storey: Uh-huh.) the ~~Joint~~ House Committee [that reviewed our projects]? So, we *knew* high Bridge Canyon was one of the alternatives. No question, it was going to be on the list. And it was. So, after ~~we got these, after these guys~~ [the secretary's staff] went through all these plans and selected seven, and we didn't have much input[.], ~~because we were, you know, here were these~~ We only put the studies together—we weren't making all the big decisions.

Staff Objected to Elimination of the Steam Generating Plant from Alternatives to Be Presented to the Secretary

And, we objected to the fact that they left off the steam plant there, using Navajo coal, and taking water out of the plant that you have right now, Navajo Powerplant. That's the one.

Storey: Yeah. Navajo is a steam generating plant.

Barbour: So, ~~they~~ [the secretary's team] left that out. So, when I went, we went to brief the next day, and the next afternoon went to brief the ~~Commissioner~~ [secretary], and we got all of our stuff together and the big chart.

Storey: Brief the secretary?

Barbour: I mean the secretary, excuse me, (storey: yeah.) with the commissioner. And, we were, Dan Dreyfus and I, and Dan McCarthy were in the elevator, and the commissioner joins us, and we have this big chart in there.

Commissioner Dominy Knew He Wanted the High Bridge Canyon Dam

And, the Commissioner walks in—he never looked at our charts, with ~~all these funny~~ [at least 10 different] alternatives in it. He knew the one he wanted was high Bridge Canyon. And so he brings a ~~slide, a~~ box of slides, a projector, and a screen. And that's what he brings to the meeting. He gets in the elevator with us. So, we all get off on the, what is it the seventh, sixth floor? Seventh floor?

Storey: Sixth floor for the secretary.

Assistant Secretary Ken Holum Requests Quick Look at the Chart for Alternatives on the Central Arizona Project

Barbour: Sixth floor. Secretary. Whatever floor it is. We all get off there and we go in the outer office and then Holum comes up to me, he says, "Ed. Have you got the numbers? I'd like to take a look." I said, "we got them on this big chart."

Assistant Secretary Holum Places the Navajo Steam Generating Plant as Alternative Number One on the Chart Using a Ball Point Pen

So Dan and I get this big chart and Kenneth looked at it and says, "Where's the coal-fired plant? Uses Navajo coal?"

I says, "They threw it out last night."

He says, "Oh my god!" He says, "We['ve] got to have that plan. ~~He says,~~ I've got some current information that, you know, I think that one might go." He says [asked], "You['ve] got the numbers?"

I said, "Yes. I have the numbers."

He says, "You give them to me." And he took out his ballpoint pen, and he ~~put on~~ [took] this gorgeous chart that we had, and he marked it up. He put that as plan number one. That's the plan that got built. (Storey: Uh-huh.) Would you believe it? That's the plan that got built. We go in the office and it was really exciting. We went through and the deputy secretary asked some great questions—because he knew thermal power. And I was the only one in the room that knew anything about thermal. I [had] ~~got~~ all the numbers, you know, the heat units, and kind of a plants, and ~~cooling~~, how you'd cool the plants, and the economics of hauling coal, you know, the length of the railroad versus the length of the pipeline to provide water to the plant.

"There's where we made the big mistake. We should have moved the damn thing and put it as close to the coal sources as we could, and haul the water there . . ."

There's where we made the big mistake. We should have moved the damn thing and put it as close to the coal sources as we could, and haul the water there, because you know what's happened there, you know the environmental problems with Navajo Powerplant and how much money they've had to spend there? (Storey: Yeah.) Bad siting. But, we always said, ~~that'd~~ [there would have] been a little tiny bitty dam you couldn't see from space, as opposed to these large smoke stacks that, with smoke coming out that the astronauts can see for miles and miles, ~~a long way~~. (Storey: Yeah) ~~Comparing you to the coal-fire plant that the little tiny, of course the water behind the dam, you would have been able to see that.~~

Storey: At Bridge Canyon?

"You could *tell* that something had happened politically, and they had decided to build a thermal plant. . . ."

Barbour: But anyway, we had a good meeting, ~~and went through~~. You could *tell* that something had happened politically, and they had decided to build a thermal plant, or go for the

thermal plant. ~~They had agreed, the Sierra,~~ [Apparently] they got the Sierra Club to go along with it [the steam plant], to avoid any structure in the Colorado River. That was the compromise. Give up Bridge Canyon and get a thermal plant, but they wouldn't let the government build it, but [have] ~~they'd let, they'd finance it to get~~ the Salt River Project to [build and] operate and [own it.] ~~the ownership would be in the Salt River Project.~~ (Storey: Um-hmm.) ~~See, that's the way, that was the way the,~~ This was going on in the background in the meantime, and they had pretty well decided on this [alternative]. But, anyway, [we] went through the meeting, and the secretary complimented us for all the in-depth work that we'd had done, and so forth and so on. ~~And he says, he asked about I'd done all of them. He said,~~ The deputy secretary, who was familiar with thermal power, when he knew I had put together the thermal studies, asked me "Are you an engineer ~~in thermo~~ [working with thermal plants]?" I said, "No. I'm an economist." (Laugh) It kind of shocked him a little bit. But, I had done the economics work on it.

Commissioner Dominy Made a Slide Presentation in Support of Bridge Canyon Dam

But, afterwards, then the commissioner says, "Okay, Mr. Secretary, it's my turn." After we got all through all the plans and ~~everything~~ [the discussion]. And so, he put up the screen, got out his slides, and we sat there and had a slide show. And the commissioner showed his slides of ~~him going~~ [his trip] down the Colorado River, the talus slopes, and so forth, ~~implying~~ [saying] that "You're not going to lose much here. Look. ~~Isn't that,~~ It isn't that gorgeous in the canyon." And, he was still stuck on Bridge Canyon, and he still thought the politic was such, *regardless* of what the secretary decided, you know, he was always an independent guy anyway, and had his own political support, Dominy. (Storey: Um-hmm.)

Commissioner Dominy Thought He'd Get His Dam at Bridge Canyon

And he thought he'd get his dam. Of course, he didn't get it. When it was authorized, it [was] ~~authorizes~~ Navajo Powerplant [that was selected-]. ~~But, it was, but~~ it was very exciting. We worked on that project. Started in 1961 and it was finally authorized [in 1968.] ~~well,~~ Of course it [planning really] started in 1947, ~~the plans.~~ And, it took that many years [to get the project authorized]. And then when . . .

END SIDE 2, TAPE 1. JUNE 10, 2003.
BEGIN SIDE 1, TAPE 2. JUNE 10, 2003

Storey: Tape two of an interview by Brit Storey with Edmund Barbour, on June the 10th, 2003.

Presentation at the House? And the Senate?

Barbour: Yeah. And I got to ~~submit~~ [attend], that's where the hearings were really interesting. One thing that ~~was,~~ really, ~~it~~ stands out in my mind. Of course, it was very exciting. It was crowded, and we had Saylor there. There was a lot of opposition to the project. The Sierra Club was there, and that's when David Brower was ~~we'd line up~~ [its head].

“They’d call it the ‘football team,’ but it was three, three, three. Nine of us. . . . And, it would be interior solicitor Eddie Weinberg, and the commissioner, and the secretary, in the first row. And then, behind him, would be the regional director, Arleigh West, Dan McCarthy, and I think Randy Riter. . . . And then, it was me, and Dan Dreyfus, and Cliff Pugh, who was project manager of the Phoenix office. And, we were all armed with these big witness books . . .”

They’d call it the “football team,” but it was three, three, three. Nine of us. . . . And, it would be [interior solicitor] Eddie Weinberg, and the commissioner, and the secretary, in the first row. And then, behind him, would be the regional director[, Arleigh West], Dan McCarthy, and I think Randy Riter. . . . And then, it was me, and Dan Dreyfus, and Cliff Pugh, who was project manager of the Phoenix office. And, we were all armed with these big witness books, to handle any question that came up [or, even, might come up]. And, boy, with looseleaf notebook[s], ~~and we were ready to, and~~ [with] sheets of paper that we had worked *all night* getting ready for the Commissioner. ~~And, never did get to, I never did get to, they never asked me a question.~~ The only guy who got to answer ~~, ask, answer~~ a question was Randy Riter, on a some hydrology point, and then what the cost of pump lift was per foot, per foot of lift. And, Cliff Pugh was sitting next to me, and he had that thing memorized. He just jumped up like a cork, like a cork in a pan of water, you know, and he announced what it was. So many dollars per foot of lift, I think. I don’t know who asked the question. Some ~~guy~~ [representative] showing off his engineering ~~thing~~ [ability]. “What was the cost of a pump lift there?” You know, we lifted a heck of a lot of water to get it ~~to the central,~~ (Storey: Yeah.) in[to] the Central Arizona Project.

Storey: Several hundred feet, I think?

Barbour: Yeah, but, that was pretty exciting. And during the meeting, the governor of Arizona was testifying.

Governor of Arizona Addressed Wayne Aspinall as “Aspenwall”

Of course, he favored the project. And we had given him a lot of ~~stuff~~ [information]. And he made the terrible mistake of addressing Aspinall as “Aspenwall.” (Laughter) Well, you know, Aspinall, ~~he’s a big guy. He was, I mean~~ [was] short, and he had a temper. He got ~~as, madder, and you know, he got~~ very upset about, [and] angry at that. You could tell the sparks were flying. When you’re the governor of Arizona and couldn’t pronounce the chairman of the Interior Insular Affairs Committee, who had the life and death hold on this project, [and you] couldn’t pronounce his name correctly. And the poor governor, he’s just sweating blood in that chair. Well, we all swallowed hard. (Laugh) We couldn’t help but snicker a little bit. But anyway, those were the days. That was the Central Arizona Project, when ~~we had,~~ we had a lot of fun. ~~And, we got some—I don’t know how long you want to—I’m still, I’m talking about some highlights of some things that we did in those days.~~

Bob Young of the University of Arizona Opposed the Central Arizona Project

Storey: Before we do that, there was a professor in the agriculture school, I believe, or maybe

in economics at the University of Arizona, I believe?

Barbour: Yes.

Storey: Who said that the economics of the project weren't any good?

Barbour: Absolutely. His name, let me see. (Drumming fingers on table.) I know. We were always battling him. And he and another guy, both wrote papers on the subject. And, some of ~~the papers're pretty~~ [were quite] good. He talked about the subsidy. And, it was a big subsidy. No question about it. We had to project repayment *way out* in the future. (Storey: Um.) And some of those assumptions—you know, they're assumptions, and you could challenge those.

Storey: I've forgotten his name. He claimed that he was denied tenure because of this, because he opposed the project.

Barbour: Right. And, he moved to CSU [Colorado State University]. [Subsequently identifies him as Bob Young. See page 57, 172.]

Storey: Oh, he did?

Barbour: And you might be interested to know that I hired him as a consultant.

Storey: (Laughter) Oh you did? (Laughter)

Later Hired Bob Young as a Consultant

Barbour: I'd call him up. I was doing a study when I was working with ~~Stone & Webster. No. No. No, I wasn't working with Stone & Webster. I was starting to work with another~~ Tudor Engineering Company. Nelson Jacobs and I worked on studies of the Poudre River. You know, ~~we~~, I don't know of any plants and projects [that were actually built] on the Poudre River. And we were doing this study for the state [of Colorado], and I needed some information on the value of water that was available for sale.

Storey: This was after you left Reclamation?

Barbour: Oh yeah. I was working for a consultant. I was working for Tudor Engineering. I ~~was their Chief Economist~~ When I left the Bureau in '81, I went to work, half time, and was their Chief Economist, for some of their studies. And ~~that~~ [the Poudre River] was a study we had. And, I, I'm trying to think of his name. I called him up and he had assistants that worked for him. And, he was good on water. And I asked him to do a little job for me. And I can't remember what I paid him to do ~~some~~ [an] evaluation of the value of water if it were converted from irrigation to municipal industrial water use. (Storey: Um-hmm.) And, ~~so, we'd be, you know,~~ he's a smart guy. He just opposed . . . a lot of people opposed the [Central Arizona] Project. That was an *extremely* controversial project. (Storey: Um-hmm.)

“ . . . there was *no way* they were going to deny Senator Carl Hayden, because he was chairman of the Appropriation’s Committee, and it was his turn to get a project. And, he allowed all the other projects to go through. All the California projects. And they knew it. And he had earned points. Everybody got their project. . . .”

But, there was *no way* they were going to deny Senator [Carl] Hayden, because he was ~~head~~, chairman of the Appropriation’s Committee, and it was his turn to get a project. And, he allowed all the other projects to go through. All the California projects. And they knew it. And he had earned points. Everybody got their project. And, the Upper Basin got their projects, and now it was time for him to get the Central Arizona Project, and he wouldn’t be denied, and *nobody* was going to deny him.

“That was his birthday present, the Central Arizona Project. . . .”

That was his birthday present, the Central Arizona Project. He was going to get *some kind* of project. (Storey: Um-hmm.) And he was, *I think*, ninety-three. It was, I remember they talked about, “This is his birthday present.”

Storey: Who talked about it?

Barbour: Well, the guys. Commissioner, Dan McCarthy, all the Washington guys.

Dan McCarthy

Dan McCarthy was the *top guy* [planner], the head in Washington. He was a great writer, and spoke well. And, ~~he~~ [was] a real diplomat. And, he worked on *all* of those controversial studies. And, he helped us with the Westwide studies. ~~And he was a great writer. He wrote the executive~~ He had retired and we hired him back to write the “executive summary” for the Westwide report. ~~And, I don’t know~~, If you go back and look at the Westwide report, that little slick document, we paid Dan McCarthy to do that.

Storey: Um-hmm. So, it’s more than just an introduction, it was a . . .

Barbour: Sort of a summary.

Storey: Of the whole thing?

Barbour: Right.

Storey: Yeah.

Barbour: Executive summary, (Storey: Yeah.) of the whole thing. And, it was well done. But that report’s about this thick. I don’t know if you’ve ever looked at it or not?

Storey: A couple inches, huh?

Barbour: We spent, oh, three or four years doing that study. (Storey: Yeah.) And we had a *lot* of people working on it.

Terry Lynott on the Westwide Study

Storey: Terry Lynott was on that study if I recall?

Barbour: Terry was our ~~reports~~, head of reports. ~~Terry Lynott was on it.~~ George Wallen and Wally Christiansen headed it up. I had the economics and resource analysis part. And, George Wallen had the environmental part. ~~So~~ And we had several engineers involved. I don't remember all of them.

Wally Christiansen

Wally Christiansen, incidentally, is still alive, who headed up the study.

Storey: Oh. Where is he?

Barbour: He's down in California. And several years ago I went to visit him. He's moved since then. *He* would be a great guy to talk to. He's got a pacemaker, and I don't know how well he is. He's had a pacemaker, I don't know, ten or fifteen years, but he's a *great* guy to talk to. (Storey: Hmm.) He had a wonderful experience and ~~he~~ shepherded the ~~thing~~ [the Westwide studies] through [to the end]. You know.

Storey: You don't know where he's living though?

Barbour: He's in California. And, I could probably get his address. I get a [Christmas] *card* from him every year. I notice that he has moved from where he was before. (Storey: Yeah.) I had a relative down in San Diego, and we'd drop by and visit with him, and we'd talk about the old times. (Storey: Um-hmm.)

Economic Studies of the Third Powerhouse at Grand Coulee

Some other things that we can talk about, that I think are of interest, was—I did the economic studies on the Third Powerplant [at Grand Coulee]. That was a big controversy. Harold Arthur asked me, they couldn't agree on whether they'd go with the big units. You remember the Russians built these huge units?

Storey: Yeah.

Barbour: Six hundred-megawatt units? And so, they proposed, of course, they wanted to keep up with the Russians, so they proposed to do, like, ~~700-~~ [500-] megawatt units for the Third Powerplant. The [initial] *design* was based on 300-megawatt units that operated at a lower speed, consequently they're more efficient.

Some People Wanted 600 Megawatt Units at Third Powerhouse

And, there was a group of people that were pushing the large units, the ~~700-~~ 600

megawatts,³² which had to operate, to equal the output, at higher speeds[.] ~~which was, I think it was sixty-something versus seventy-something.~~ And the question was, “How’d the economics stack up?” (Storey: Um-hmm.)

Old School Reclamation Staff Wanted to Build 300-megawatt Units in the Third Powerhouse

And they had a lot of arguments between the old school, who wanted to build a 300-megawatt units, which were like the existing 300-megawatt units. They were conservative and they ran at a lower specific speed, those are the revolutionary speeds, as opposed to the big units that were being designed for the Russians, which *operated* at *higher* speed, because they were *so big*, you know get a greater output that way. (Storey: Um-hmm.) So the question, “Which one to build?” And so he called me and said, “Ed, could you do an economic study? I can’t get these guys to agree. Could you check the economics out on it?” ~~And I used to do those costs.~~ I said, “Oh that sounds like fun.”

Storey: Harold Arthur called you?

Fred Ruud, Harold Arthur, and Studies on the Units to Go into the Third Powerhouse at Grand Coulee

Barbour: Fred Ruud ~~had told, or sicced~~ [wanted me to work with] Harold Arthur ~~on me~~. Fred Ruud had come around[, and he asked]-~~He said~~, “You have any economic experience?”

I said, “Yes.”

“Do you do economic studies?” he says. And I looked around, it was Fred Ruud.

I said, “Sure.”

He says, “We got an interesting—are you willing to work on it?”

I said, “Sure. What is it?”

And he explained it to me. Pretty soon I get a call from Harold Arthur. “Do the study.” He says, “You can have the run of the place. Just ask any question. Get any numbers you want.”

Bates, I think, was head of turbines in those days. He was very concerned. He *hated* those big units. And then there was Fred Ruud ~~the techno~~, [representing] the technocrats, who wanted the big units, high-speed units, you know—to compete with the Russians.

32. See also Reclamation’s oral history of Theodore “Ted” Mermel who also played a part in this debate.

“I said, ‘If all these technical assumptions, all this information I got from your experts . . . are, you know, as they say, the economics leans toward the larger units . . .’”

So, I did the study and conclusions I reached, I said, “If all these technical assumptions, all this information I got from your experts about specific speeds and the ~~efficiency~~, relative efficiencies . . .” They gave the higher units a lower rated efficiency, overall efficiency, than the low-speed conservative unit, little, smaller units. “If all these factors are, you know, as they say, the economics leans toward the higher speed [larger] units, strictly on economics. ~~Now whether or not you could do it or not . . .~~” So, I sent that in a memo to him.

“ . . . they were beginning to do detail design on 300 megawatt units. . . . then, all of a sudden, the orders came down to switch to 700 megawatt units. . . . Fred Ruud said, ‘Oh, it just happened that your memo ended up on Ken Holum’s desk. . . .’ they wanted to *compete*. . . . So they *junked* about three months worth of design, to go to the higher speed units. . . .”

~~I heard, he~~ [Harold Arthur] thanked me, and I heard that they were beginning to do detail design on 300 megawatt units. And that proceeded for about three months, then, all of a sudden, the orders came down to switch to 700 megawatt units. I wondered what happened, and Fred Ruud said, “Oh, it just happened that your memo ended up on Ken Holum’s desk.” (Storey: Um-hmm.) I suspect, I think, if you’ll ask Fred, I think he sent a copy of my memo to the assistant secretary. And, they wanted to *compete*. They found no reason why we couldn’t have as big a units as the Russians, and so they said, “Start the design all over.” So they *junked* about three months worth of design, to go to the higher speed units. And that’s what’s there. And, it’s kind of interesting. I guess they did have some problems. And I think Fred Ruud had some kind of problems with those high-speed—and Fred Ruud was, I think later hired to straighten out something about them. They had some vibration problems.

Develops Replacement Manual for Hydroelectric Facilities as a Consultant after Leaving Reclamation

But, I ~~was doing~~ [did] a special study for the Bureau of Reclamation, when I was a consultant, on replacement lives. ~~and so~~ I went around to all the Reclamation offices getting lives of facilities, generators, turbines, ~~and, I don’t know~~ [etcetera]. Are you familiar with the replacement manual that they have here?

Storey: No. I’m not, actually.

Barbour: That’s established [service] lives, so that you can put *replacement* costs as a part of the [repayment] analysis. (Storey: Uh-huh.) So you can set up funds [to replace units]. And I had done one of the earlier reports, and it needed to be *upgraded*. So, Stone & Webster got it [the contract], and they hired me to help with the study. So, I got to go around ~~the country~~ [Reclamation] interviewing all these old timers about[, for example], “How long does a turbine last? And how long does this part or this part last?” But, one of the questions ~~was the~~ [involved] turbines, ~~and so forth~~. But, so, I

was there at Grand Coulee, and we had our meeting with all the old timers. And then they said, “Hey Ed. I understand you worked on the Third Powerplant?”

I said, “Yeah.”

He said, “One of the units is open. You want to see it?” I said, “Oh gosh. I do.” So, they were working on one of those large units, and they had a *ladder* going down into the thing. (Storey: Uh-huh.) So, I went down the, half way down the ladder, and looked in that. Can you imagine the size, the interior? Now, there’s a picture of the interior. Have you seen those ~~pictures~~ [paintings] that Commissioner Dominy [had commissioned]?

Storey: The paintings. Yeah.

Barbour: Commissioned all those paintings.

Storey: Inside the turbine?

Barbour: One of them is inside the turbine.

Storey: Yeah, that hangs in the Department of Interior Museum in Washington.

Barbour: I have a copy.

Storey: The original . . .

Barbour: Remember they gave copies to everybody that wanted them.

Storey: Yeah.

Barbour: I wanted a set.

Storey: We just disposed of the last set of those prints, maybe two years ago.

Westwide Meeting and Trip to Rainbow Bridge

Barbour: Well, I have a set. I kept that one. I wanted to tell you, you know, I, we were talking about this big, ~~the~~ national meeting we had, on Westwide, which we invited everyone. (Storey: Um-hmm.) And it was a very high-level meeting with all the *major agencies* attending, including Audubon Society, Sierra Club, and so forth. And, so ~~we had this,~~ we went up to see Bridge Canyon. I wanted to finish that story. The Rainbow Bridge. And, we boated up ~~there~~ [as far as you could]. ~~There~~ You had to walk in there, because the water wasn’t under the bridge. (Storey: Um-hmm.) And Don Maughn, I don’t know whether you knew it or not, he was, he couldn’t walk. He was crippled.

Storey: Um-hmm.

Barbour: And, he operated in a wheel chair. He was head of the Water Resources Council. ~~And~~

~~see they~~ [The Bureau] wanted to get him up there, ~~and~~ [so] they designed a special chair. They took an office chair and put wheels, bicycle wheels, on it, and we wheeled him up to see Rainbow Bridge. And, I've got a picture of that. But, when I got there, I had my old Rollie [Rolleiflex camera] there, and I was going to get a picture of that Rainbow Bridge. So, I got back and I saw some of the guys climbing up on top. And it was one of the Sierra Club guys. And so, I'm down below, and I'd taken a picture of as many guys as I could get, on the ~~side~~ [base], not with the Rainbow Bridge in the background, ~~but on the side~~, and I got ~~all the people~~, *most* of the people that participated in the meeting, which I still have, incidentally, [hanging in my office]. And then, I took a picture of Rainbow Bridge. There was nice clouds in the back[ground]. It was a gorgeous picture. And, up on top, was one of our guys from the regional office, that had shown [a small group] ~~them~~ how to get up there. And they didn't invite me. I was really peeved. They had climbed up and there they were standing on top of Rainbow Bridge. (Storey: Um-hmm.) And one of the Sierra Club guys, so I say, I hollered at him. I says, "Hey, I'm taking your picture." I says, "I want you to smile." I said, "Now take two steps backwards." (Laughter) They gave me a hard time. But, so I have that picture. (Storey: Uh-huh.) ~~And I framed it. And one of the guys framed it here. Blew it up, our photograph,~~ [Our] photography group here blew it up for me. And, I framed it, and I gave it to the Commissioner, and he had it in his office for a while. I still have my copy. ~~And the inset, has got all the people, a lot of the people that worked on the Westwide study. I got that in my little office at home. (Storey: Um-hmm.) I don't know whether you'd see it, or, I gave a copy to somebody here. Maybe they had it in the front office.~~

Storey: Yeah. I haven't seen it around here.

Barbour: ~~Yeah. But, I have it hanging in my office. And the Commissioner had it hanging in his office for a while. I don't know whatever happened to it. They said, "Oh you better get a copy of that for the Commissioner." (Storey: Yeah.) But, those were, really,~~ We had some real neat, exciting times at Bureau of Reclamation. Involved in about all the water resources planning, in those days.

"That's the days before Jimmy Carter came in and gave us a hard time, you know. Jimmy Carter didn't seem to like the Bureau or the Corps of Engineers. . . ."

That's the days before Jimmy Carter came in and gave us a hard time, you know. Jimmy Carter [didn't seem to] ~~never~~ liked the Bureau or the Corps of Engineers.

Storey: Let's see. That was before [Ronald] Reagan.

Barbour: Yeah.

Storey: I'm trying to think. Under Johnson? A lot of this was going in under Johnson.

Commissioner Ellis Armstrong

Barbour: Well, Reagan came in after that. The commissioners there, after Dominy, there was Armstrong. And I knew Ellis quite well, because when he was a construction

engineer, way back when in McCook, Nebraska, he was working on Trenton Dam. He was the construction engineer for Trenton Dam.

And he came over and sat at my desk. He said, “You’re an economist, aren’t you?”

And I said, “Yeah.”

He says, “I’m the construction engineer, and I’m trying to write a justification for getting material to build this damn railroad bypass.” And he says, “And I want you to do an economic study of what it means to delay it, and so forth and so on, you know. But, if I could get the material and construct it as opposed to delaying the thing for such and such a period of time.” And so I did a little economic study for him. But, he had never forgot that. Because, when he was commissioner over there, he had me come in and do some special studies.

Ellis Armstrong requested “a comparative analysis of the estimates made for authorization purposes, as opposed to the final construction costs. . . .”

And, *one* of them was a comparative analysis of the estimates made for authorization purposes, as opposed to the [final] construction costs. (Storey: Uh-huh.) So, I did that study, and had to go back and dig up the costs that was in the authorization documents, of a *number* of projects. I don’t know how many projects ~~I had to [do] and~~ [were] compared, and then I had to try to justify, you know, everything’s going to increase in costs, right? So, I developed factors [such as] for price escalation and for design problems, and so forth and so on. So, I took a whole list of projects, because the Bureau of the Budget was ~~getting after~~ [criticizing] the Bureau of Reclamation, you know, for saying it’s going to cost one thing ~~and~~ [at] authorization, and the final projects’ [costs] were ~~really overrun~~ [significantly greater]. And so I took that study ~~up~~ [to Washington,] and Ellis Armstrong liked it, and he says, “We’re going to have to go and present this report before the Bureau of the Budget.” And, they ~~had~~ set me up to make the presentation. The next thing I know, he [decided to go] ~~went~~ with me. And, he didn’t know a thing about the study, but it was kind of interesting that he would take the time to go over there. And we had a nice meeting with the ~~Bureau Office of BOB,~~ Bureau of the Budget[, but Ellis was bored, and I think took a little nap]. It’s now something else. What is it now?

Storey: Oh, it’s . . . golly.

Barbour: He used to refer to us as “kiddy-car economists.” (Laugh) Sometimes.

Storey: Who’s that?

Barbour: Ellis Armstrong. (Laugh)

Storey: Oh. “Kiddy-car economists?”

Barbour: Especially if we didn’t agree with some of his projects. He’s a good guy.

Storey: Now it's O-M-B, the Office of Management and Budget.

Barbour: And Budget. Right. I used to work with them.

Storey: After Ellis, was the man who came in from Boise?

Barbour: Yes.

Gil Stamm and the Fruitland Mesa Project in Colorado

Storey: Stamm?

Barbour: No. No. No. Before Stamm. Gil Stamm was assistant to Armstrong and he ended up as commissioner.

Storey: As commissioner, right.

Barbour: I thought he was going to fire me once for what I had to say about Fruitland Mesa. I don't know if you know where that . . . ?

Storey: Here in, that's here in Colorado, I believe?

Identified a Subsidy over \$1,000,000 per Farmer on the Fruitland Mesa Project

Barbour: Yeah. I wrote a memo saying, "~~My god.~~" [that] the subsidy was over a million dollars for each farmer. And, that was a hard one to justify, hard one to swallow. Well, the *governor* wanted it, Governor Love, I guess, at that point in time. And, I write this memo saying that, you know, "The economics was not very good, and the subsidy was extremely high per farmer." (Storey: Um-hmm.) Over a million dollars, in those days. (Storey: Yeah.)

Every Promotion Received Was Ordered from the Washington, D.C., Office

Well, he didn't appreciate that, and I learned later that ~~he didn't like it. I might get~~ [I could've gotten] fired over it, but I had a lot of support in the secretary's office, in those days. (Storey: Uh-huh.) ~~It was always good.~~ I had a better reputation in the secretary's office, in ~~the~~ Washington ~~office~~ than I did in my own office. Every promotion I got was ordered from Washington. I didn't get it through here. After the meeting [with the secretary] that we had on the Central Arizona Project, and all the alternatives, Jim Casey told the Commissioner that I was ~~the lowest grade room, lowest guy, I was,~~ the guy in the room with the lowest grade. I was a thirteen. And Dan was a fourteen. He says, "What, call out to Denver and tell them to give him a raise." Of course, they didn't like it here, obviously. My boss was a fourteen, Ira Watson. Of course, I did all the tough ~~jobs~~ [assignments] and Ira sat back and supervised, ~~of course.~~ He didn't supervise me very much because I did work that he, you know, wasn't qualified to do. I did all the thermal [power] stuff and so forth. (Storey: Um-hmm.) And so, that wasn't a very happy situation, but *I didn't mind.* I laughed all the way to the bank. (Laugh) So, that's how I got my promotion[.] ~~is~~

The Commissioner calls and says, “Give that . . .” and they said, “Oh, he’s young. And he hasn’t been in the job that long. And . . .” I was a GS-13 at that time.

So, I says, “Well, that was a nice Christmas present.” (Storey: Um-hmm.) *But*, I didn’t have any of the trappings of the office or anything. I had a little desk in the corner, and so forth, but that’s where I operated and did ~~all, all these~~ [many special economic] studies.

Storey: This would have been Floyd Dominy?

Barbour: Yeah.

Storey: Who called and . . .

Barbour: Oh yeah.

Storey: Said, “Take care of this.”

Barbour: Yeah.

Storey: So, what . . . ?

Charlie Lemoyne Was Left out of the Meeting with the Secretary

Barbour: When I got back, when we got back [from Washington]—Charlie LeMoyne with me. You remember LeMoyne?

Storey: No.

Barbour: He was assistant chief of the planning here. He was kind of a tough—he was a colonel ~~or something~~ in the Army. And he’s that kind of guy that’d look at your travel report, and if you spent too much money he’d let you know. Mileage, maybe he’d check the mileage or something. But, he went with me [to Washington on the CAP review]. He ~~did a lot of~~ [reviewed] the engineering part of it. Well, ~~they did, when we went to=~~ they had to select ~~certain~~ [just a few] people to meet with the secretary. Well, McCarthy’s going to take care of all the engineering, and Randy Riter was going to take care of all of the hydrology, and LeMoyne couldn’t have the economics, so they left him out of the meeting, (Storey: Uh-huh.) and he felt pretty darn bad about it. I felt bad about it too, because I had to work with him. So, I get to go and meet [with] the secretary, and the under-secretary and [his staff] all of these wonderful people, you know, and he has to sit [it] out. So, as soon as I get back he asked me what all went on. And I gave him [an oral report] in great detail. ~~So, when we got back—and~~ [Also] I wrote the memo for [the trip] ~~him,~~ in which Charlie LeMoyne put his name first. I still have the memo. And I still have a ~~chart~~ [table], with all the thirty-four alternatives on it. ~~I still have the memo in my file.~~ And so, he comes in, and so he goes up to, as soon as we get back he goes up to Harold Arthur to report on the meetings that we had with secretary of interior. Well, they chatted a while, then Harold apparently says, “Well, how was it there in the meeting?” And then he had to

admit he wasn't there. He says, "Well, who was there?" He says, "Ed Barbour was there." And, he says, "Well, why isn't he reporting on the meeting?" So I got a hurry-up call. I think Charlie kind of felt bad about it you know.

Harold was such a wonderful guy. "Ed," he said, "I heard that you attended the meeting. How was it? Tell me all about it." (Storey: Uh-huh.) And, I tell him all the story about [the secretary's review committee] leaving one of the plans out [which Holum penciled in and that was the one that got authorized], ~~and how nice Ken Holum was.~~ Ken was such a wonderful guy. So easy to talk to. You know, he ended up heading up some big coal association. ~~Ken Holum did, (Storey: Uh-huh.)~~ after he left Interior. And Bruce [Blanchard?] ended up heading the New York Power Authority, or something or other? (Storey: Hmm) ~~And, of course, you know Stewart Udall.~~

Testified on the 160 Acre Limitation in California Where the Government Was Making the Case There Was a Federal Interest and the Limitation Applied

And I also did another job for Stewart Udall. Couple of more jobs. One was, I testified ~~he couldn't get, darn~~ [for] Jim Flannery [who] was his [chief] economist, and they needed someone to testify [for the secretary] on the 160 acre limitation. Jim said he did not want to do it.]

Stewart Udall, During the Kennedy Administration Decided to Sue the Imperial Irrigation District to Impose the 160 Acre Limitation

[The] ~~Under~~ *Kennedy* [Administration], ~~he~~ decided to sue the Imperial Irrigation District and impose the 160 acre limitation. Those ~~are~~ [were] big corporate *farmers*, in the Imperial Irrigation District, and if he imposed a 160 acre limitation then a husband and wife could only own 320. That was extremely valuable land. So, it was a [very controversial] big trial in District Court [with large owners opposing it and smaller farmers supporting it].

Nobody in Washington, D.C., Wanted to Touch the Imperial Irrigation District Law Suit

And, nobody in Washington wanted to touch it. It was very controversial. So, Jim Flannery says, "Send Ed out there." So, Eddie Weinberg, ~~and he~~ sent one of his lawyers out there, and [together] we developed testimony, and I went to the Imperial Irrigation District and dug out all their old files to see how much of a subsidy they received, since the inception of the Hoover Project.

Government Lawyer Wanted to Show How Much Subsidy the Imperial Irrigation District Had Received

Because, ~~he wanted the,~~ the lawyer wanted us to show how much of a subsidy ~~they~~ [farmers had] received. And, they received all kind of subsidy, powerplants [revenues], and they pay very little for the water.

"And, my testimony was to demonstrate that the federal government had

provided a large subsidy and had an interest, and, consequently the 160 acre limitation should apply. . . .”

And, ~~that~~ [my testimony] was to demonstrate that the ~~feds~~ [federal government had provided a large subsidy and] had an interest, and, [consequently] the 160 acre limitation should apply.

“ . . . we lost the trial because the court ruled that a statute of limitations applied. . . .”

So we developed testimony, and I testified ~~for~~, as an expert witness for the secretary of interior, but we lost the trial because ~~there kind of [was a] sort of a~~ [the court ruled that a] statute of limitations [applied]. It didn't specifically mention [acreage limitations] it in the authorizing act of the Hoover Dam, *but* the law was on the books [at that time. I thought] ~~And~~ Kennedy was right. It applied. But the ruling, ~~they finally came out~~, and the politics were so heavy on it, that the statute of limitations applied. Boy that was, I tell you that was an interesting [assignment].

Storey: Now, one version of this story I heard was that Ray Lyman Wilbur, who of course was a Californian, was Secretary at the time Hoover was being built, and he exempted them. You know anything about that?

Reclamation Had Never Implemented the Restriction on the Imperial Irrigation District

Barbour: No. No. [I recall the opposition couldn't] ~~They didn't~~ prove, it was never exempted. [The authorizing legislation] ~~He~~ did *not* exempt them in the fact[. Acreage limitation] ~~that he just had not [been] implement[ed.] the, did not implement the restriction.~~

Storey: By inaction?

Barbour: By inaction.

Storey: And so then the court ruled that because the . . . ?

“He did not implement it, and time had lapsed—sort of like a statute of limitation. But, there's no question in my mind, that it applied. . . .”

Barbour: He did not implement it, and time had lapsed— sort of like a statute of limitation[.] ~~things~~. But, there's no question in my mind, that it applied. (Storey: Uh-huh.) When you go back and study [what happened, I think the supporters] ~~the rules—now they,~~ *they purposely*, from what I understood, did not discuss it on the floor, when they discussed the bill. (Storey: Uh-huh.) *Purposely* omitted discussion.

Storey: When they authorized the money to build it?

Barbour: Yeah. When they authorized the project, it wasn't mentioned, but the *law* was on the books.

Storey: Yeah, well, it was 1902.³³

Barbour: And Kennedy maintained, and I think he was correct, that it did apply. (Storey: Yeah.) And, I think, legally, it did apply[.], ~~except they kind of twist~~, I don't know that worked, but [the court] ~~they~~ did rule [that] a statute of limitation[s] applied. [The defendants] ~~But, they~~ had some ~~high-falutin~~ [highly paid California] lawyers.

END SIDE 1, TAPE 2. JUNE 10, 2003

BEGIN SIDE 2, TAPE 2. JUNE 10, 2003

Storey: Weren't very popular?

Imperial Irrigation Strategy During the Trial

Barbour: I wasn't very popular, because some of those old timers would [testify] ~~go~~, of course they didn't get all the corporation farmers up there. They got the guys up there that were ~~originally~~, sort of like homesteaders, ~~originally were there~~. And, one of the old gentlemen talked about when he was [young], he ~~got to ride~~ [rode in] in the boxcar, and he got off there at the Imperial Valley and he looked around. He says, "It was so hot and miserable he nearly went home, but decided he might apply for one of those farms." (Laugh) This was an old timer, you know. And so, he had built up, I don't know how many acres. I think he owned six or eight hundred acres, or something like that. (Storey: Uh-huh.) Of course, they *selected* him purposely, *to testify*. You know, to get sympathy from the court, ~~you know~~. And the old timer ~~there, but he had, he~~ told about *all* the investment he had made, and a lot of it, you know, was *given* to him through the government, ~~on the big~~ subsidies. He said he did it all himself. He "didn't get any help from the government." So forth and so on. And so, I punched the [interior] lawyer. I says, "When you cross examine him," I said, "You ought to ask him these questions." And I wrote some questions out for him [about the subsidies the farmer had received]. He punched me back and he says, "Man I wouldn't touch that with a ten-foot pole." When they came around to [our lawyer and the judge asked ~~him~~ ~~and says~~, "Do you have any questions for him?" And, [our lawyer] ~~he~~ says, "No sir, I don't." (Laugh) He didn't ask him a single question, because the poor old gentleman up there, you know, they helped him up to the witness chair, swore him in, and he was telling his history, you know, and how he built up his farm from scratch and, you know, finally got up to, I think it was eight hundred acres or whatever it was. But, he didn't talk about ~~these big~~, these big corporate farmers that had ten thousand acres. (Storey: Uh-huh.) And they'd have combines, you know, four or five in a row, going down the fields. (Storey: Hmm.) Combining cotton. (Storey: Yeah.) But that was, that was another interesting, the Imperial Irrigation District. We did something else. And we did, Manny [Manuel Lopez] and I did some studies on using the geothermal *steam* for developing power there in the [Imperial] ~~Salt~~ Valley.

Worked with Manny Lopez on Studies for Geothermal Steam Plants in the Imperial Valley

33. The Reclamation Act of June 17, 1902, ch. 10 93, 32 Stat. 3880. Section 5 of the act imposed the 160 acre limitation.

Storey: Oh, are there geothermal features there?

Barbour: Oh yeah. And, we did, oh what, what did Manny call it? [Dante's Inferno.] Anyway, we did a study of using geothermal steam as a source of power. But the problem there is *it* [that steam] just corroded the heck out of everything. (Storey: Um-hmm.) And, there *are* some geothermal [plants in the area], but Imperial Valley had a great source of it, but ~~it, it~~, the water was so bad that we finally gave that study up. But, there's a report on that. I think Manny Lopez worked on that, and he would call it, the report had red flames on it, and he called it Dante's Inferno, Inferno report, or something or another.

Middle Snake River Controversy around Hell's Canyon

And then there was the Middle Snake controversy. High Mountain Sheep. Did you ever hear about that?

Storey: That sounds vaguely familiar?

Barbour: Hell's Canyon.

Storey: Yeah.

Reclamation Had a Single Dam Plan at Hell's Canyon–High Mountain Sheep

Barbour: And we had a plan, you know, of course, Snake River, Hell's Canyon was screwed up earlier, by politics. You know, the Bureau had a single dam plan there, at Hell's Canyon. (Storey: Uh-huh.) *One* high dam. And, the politics were such, in my estimation, although there was some controversy about it, ~~it was~~ [I think] the best solution ~~the~~ [was a single high] dam on the river.

Eisenhower Administration Let Idaho Power and Light Build Low Dams in Hell's Canyon

I think it was the Eisenhower Administration, you know, which was oriented toward private development, and ended up giving *it* [the right to build dams] to Idaho Power and Light, ~~and~~, [which] ended up with the three dams, Brownlee, Ox Bow, and Hell's Canyon[–all] *low* dams.

“So, instead of developing one high dam, they have three existing *low* dams, which did *not* maximize use of the site, and were not deep enough to get *temperature* control to keep that water cool, and, consequently, you know what's happened to the salmon runs. . . .”

So, instead of developing one high dam, they have three existing *low* dams, which did *not* maximize use of the site, and [were] not deep enough to get *temperature* control to keep that water cool, and, consequently, you know what's happened to the salmon runs. (Storey: Um-hmm.) The Bureau of Reclamation's plan was *much superior* to that. But, politics, there's where politics, I think, was a real bad decision as far as

water resources development. But later, then, we looked at other sites there. There's a—what's the name of the dam? Anyway, there was, we looked at another dam site there, and it was . . . [High Mountain Sheep]

Storey: In Hell's Canyon, or on the Salmon?

High Mountain Sheep Dam Proposal Was Complicated

Barbour: In Hell's Canyon. *Above* the Salmon River (Storey: Uh-huh.) Junction ~~is~~ [with] the Nemaha. . . ~~above the Nemaha, and the Salmon's on one side, and~~ As I recall Salmon's on one side and the Nemaha is on the other, and they were *both* terrific salmon streams[.] ~~; obviously, the Salmon River.~~ [It was called] High Mountain Sheep. (Storey: Um-hmm.) ~~But they awarded it, they~~ [It was] awarded it to a private group, or a quasi-private group, and it [a challenge] went all the way up to the Supreme Court. And the Supreme Court deferred it to the Federal Power Commission, [so that] they could make the decision. (Storey: Um-hmm.) And, at that time ~~then~~, Udall was convinced that maybe a high dam, Mountain Sheep Dam, one single dam there, would help make up for the fact that we didn't have the storage on that river. And, of course it involved salmon fishery, and Fish and Wildlife Service, and all these people, so ~~the Federal Communications;~~ the Federal Power Commission had hearings on it. (Storey: Um-hmm.) And, [the] secretary's office asked me to be an expert witness on the economics ~~of that.~~ ~~So, they;~~ So that we could qualify ourselves as good witnesses, they took us up the canyon. And so, we made a trip up and [a group of us] visited the site. ~~There's a group of us that went up there.~~ And someone asked "why ~~they, they said,~~ "Why in the hell are you sending Barbour up there? He's just an economist." [The response was] ~~He said,~~ "He's going to testify. We want him to be able to say he saw the site." That was great. (Laugh) Because we took a mail boat up there. There's no other way you can get up the canyon, Hell's Canyon. (Storey: Yeah.) Gosh it was exciting. We looked at those sites. Climbed around there. And, spent the day.

Storey: Uh-huh. Now, when would this have been?

Barbour: This was in '70s. ~~Of course;~~ The Department of Agriculture, and the Forest Service; ~~wanted to declare it,~~ and a lot of people, all the environmentalists, wanted it to be declared a [national] recreation river. So that was the alternative. And, that was really the best solution for it. But, the Secretary, at that time, Udall had supported a High Mountain Sheep. He didn't want ~~the other;~~ *private* development of it. He thought we could do a lot better, because we could spend the money ~~for temperature control;~~ and provide temperature control and enhance the salmon [fishery]. The salmon fishery was always pretty much a loss. You couldn't get them around those ~~dams;~~ Idaho Power and Light dams. They never could, successfully, haul them around. (Storey: Um-hmm.) So, we thought that was one way we could enhance it, so we had all kind of experts [at the hearing].

Storey: Get them up to these two rivers, where they spawned a lot. Huh?

Testifying on High Mountain Sheep Dam Before the Federal Power Commission

Barbour: Yeah. So, I got to testify, and it's kind of interesting, if you ever sat in a Federal Power Commission hearing. You know, ~~he's, this guy's~~ [the commissioner conducting the hearing is] judge, and ~~everything, jury and everything~~. The Commissioner. And he swears you in. (Laugh) "Do you swear to tell the whole truth, nothing but the truth?" Can you imagine having to say, "I do," and still have to testify on the economics of a project? (Laugh) When a lot of it was a matter of opinion? Oh, I tell you, the lawyer for the [power interests], just grilled me, just terribly on the stand. ~~And I had used~~, It was a peaking plant, and I had used combustion turbines, which [we] and the Federal Power Commission ~~we~~ *always* used as a surrogate value for the power values ~~there~~. (Storey: Uh-huh.) And, the opponents were just grilling the hell out of me, and guess who came to my defense? The guy from the Sierra Club. (Laugh) My lawyer was letting me get *murdered* up there, (Storey: Uh-huh) when the guy from the Sierra Club jumped up and he said, "Yes. It's correct. That's what they do use." He says, "You mean you use combustion turbines as a measure of the value?" "How are you going to measure the value of a peaking facility unless you use ~~some~~ [the same] kind of alternative that was a peaking facility?" ~~And, combustion turbines~~, I had worked with the Federal Power Commission years before that [helping] to develop procedures for evaluating hydropower projects. (Storey: Um-hmm.) And, we [did use] ~~used~~ combustion turbines and base-load plants, and combinations of ~~that~~ [those] to evaluate pump storage, ~~and so forth~~.

And that's another story where we developed a manual, for the Federal Power Commission. We worked *very* closely with them, on how to evaluate power. And I used to go around the country holding meetings and working with the Federal Power Commission on[.], ~~and we put out a~~, We helped them put out [the] *Power Values Manual*. And, that's someplace. [I also did a] ~~We did that~~ special study for Western [Area] Power Administration on that subject. (Storey: Hmm.) We just had a lot of fun in those days.

Storey: Tell me what, how did separation of Western Area Power Administration from Reclamation affect us? In your work?

Considered Working for the Western Area Power Administration Which Did Repayment Studies

Barbour: Well, they ended up with the repayment studies over there, and, for the marketing[.] ; ~~and I considered~~ going over there. [The Department of the Interior] ~~We~~ had a real problem on who was going to do the planning studies and the economic studies ~~and so forth, the division. And, I~~, So they set up separate [group for] economic studies over there. And, I think that's one of the problems we had, the payout studies, which we did. In fact, I did [them] in my office. ~~The Power Division; [-]~~ someone from the Power Division and someone from my office[.] , ~~and I personally, would do the payout studies and~~ We did an annual report on *all* the payout studies for the Bureau of Reclamation. ~~Well, that went over there. And~~ We didn't think they had really the [experience] ~~competence in that part of it, [in]~~ doing the cost allocations and we had the experience in that. So ~~that part~~, we *resisted* [moving the project studies] ~~them~~ going over there.

Storey: They were doing our cost allocations?

Barbour: They would take our cost allocation[s], but sometimes we felt they didn't understand how they were used. We would give them [allocated costs] ~~costing~~, but they would do the payout studies. And that had been our responsibility. And, there are a lot of intricacies in how you deal with surplus revenues. And, you see we [also had] ~~have~~ municipal/industrial water supply revenues, and it was all consolidated in[to] single payout studies. Power revenues were just a part of it. (Storey: Uh-huh.) So, we had some discussions about that. ~~I decided~~, I had an opportunity to go[, transfer,] over there, I decided to stay with the Bureau ~~in those days~~. Although I'd have ~~done better~~. ~~I'd had~~ probably done better ~~from a~~, as far as grade structure, over there. Their grade structure was one grade higher than ours.

Storey: Why did you decide not to go? A lot of people did.

Barbour: ~~I liked, I liked~~, I liked what we were doing. It was exciting. We were doing a lot of things. The power part was only one small part of it. (Storey: Um-hmm.) You know we were looking at all kinds of projects. See, I had the technical review responsibility for all the reports, (Storey: Um-hmm.) projects. And we reviewed them here for technical adequacy. And, I had the economics, and the environmental, and the lands part. And, in those days, we were looking at the social impacts, and public involvement, which Darrell Adams was our expert on that subject. (Storey: Uh-huh.) He was with me on Westwide. And ~~so~~, he was in my branch.

“ . . . we set up a Resource Analysis Branch in the Bureau. It was the first time ever we, the Bureau, had a multi-disciplinary group. . . . ”

~~So, we had~~, When we [moved back to Reclamation] ~~were set up here, when we broke away~~ from Westwide Studies, we set up a Resource Analysis Branch in the Bureau. It was the first time *ever* we[, the Bureau,] had a multi-disciplinary group. And, in my Resources Analysis Branch, I had the environmental studies, which ~~was~~ George Wallen, headed those up. And, then we had the Social, or the, what ~~did~~ we call[ed] the Social Impact Studies and Public Participation [Branch], and Darrell Adams headed that up. And then I had an economics group, and it was headed up by Dr. [Alan P.] Kleinman. Kleinman headed that up, and then later he left and someone else took that over. Glen Masters took that over. And *then*, they put the land resources in that branch. So, we had a very interesting ~~branch a~~ multi-disciplinary group, and our staff meetings were always very interesting. Because we had economists, environmentalists, and soil scientists there, and social psychologists there. (Laugh) And, at one time, when they were looking at land-use planning, and the Bureau almost got involved in land use planning, I had a land-use planner. But that didn't last long, until they decided the Bureau of Reclamation wasn't going to get involved in land-use planning. (Storey: Um-hmm.) So, we lost that function. But it was [challenging,] really very exciting. We had a lot of different projects.

Storey: When did you become the head of that branch?

Integrating Staff from the Westwide Study Back into Reclamation

Barbour: Well, I headed it up in Westwide, and the [question] ~~decision~~ was, how are we going to organize the Bureau when the Westwide people were through? And, Ed [Warren] Fairchild[, the new assistant commissioner] had worked with us so closely [on the Westwide studies], and so Fairchild had much of the say, and he asked me to help organize the offices here, (Storey: Um-hmm) and so obviously I set (laugh) it up so, which I thought was a reasonable way to do it, the way we had it at Westwide. So, at that time, I think, who was head of economics? Maybe Bob Struthers. Ira Watson was [took over] ~~put into~~ research. And I took over that branch.

Storey: When would that have been?

Barbour: It was fun. Oh, this was early '70s. After Westwide, after we completed the Westwide report. (Storey: Uh-huh.) We reorganized and brought in all the Westwide people. George Wallen moved over and, with me, as part of my branch. And Darrell Adams, worked over there, was part of the branch. And then, they integrated the land resources in[to] our group. That was a separate group. Bill Peters was the head of that. And, we did, mine reclamation studies in those days too. Land use studies, and reclamation of mine sites. That sort of thing. It was quite interesting. ~~We had just a lot of—and then we were involved in,~~ The department would involve us in all these [special studies.]=~~I called them the,~~ We [jokingly called it] ~~had~~ the “science fiction” desk over there. Anything that came along, the big transport job of water from the Canadian Rockies in the United States, worked on that, and worked on a huge transmission inter-tie, [from] the Northwest to the Southwest. (Storey: Um-hmm.) That never flew. That was one of [Assistant Secretary Kenneth] Holum’s³⁴ things.

Pacific Northwest-Pacific Southwest Intertie Proposal

The big inter-tie between the Columbia in the Northwest, and the Missouri Basin Project, to integrate all that power to take advantage of diversity [of electricity demand] (Storey: Um-hmm.) you know? That was a major study.

And, of course we did ~~all those~~ desalination studies.

Then we got involved, of course, with all the controversial projects. The Grand Coulee thing [Third Powerhouse sizing question.], you know. And special assignments. (Storey: Um-hmm.) The 160 acre limitation special assignment. And, the Middle Snake special [studies on building High Mountain Sheep Dam.] ~~assignment, you know.~~

Worked on the Proposed Peripheral Canal Around the Sacramento-San Joaquin Delta in California

And then, they sent me out on the Peripheral Canal [study]. We were going to move water from northern California into southern California. And we had this big canal that we were going to build. And they sent me up there to help work out the

34. Assistant Secretary of the Interior for Water and Power Development Kenneth Holum served in the period 1961 to 1969.

economics.

Trying to Increase Water Rates to Westland Irrigation District

And then, when we had the big hassle with the Westlands Irrigation District, probably one of the most politically *powerful* [water] group[s] in the country, in California, and we tried to increase their rates when [Guy] Martin³⁵ came in as Assistant Secretary, and he was dealing with a very powerful group.

“ . . . they didn’t have anybody in Washington that would go on that assignment, so they sent me out there to testify on what a *big* subsidy it was the Westland irrigators were receiving and how little they paid. . . . ”

Nobody, they didn’t have anybody in Washington that would go on that assignment, so they sent me out there to testify on what a *big* subsidy it was the Westland irrigators were [receiving] ~~using~~ and how little they paid. (Storey: Uh-huh.) Oh, I was [not] very popular there. But, they needed somebody from the outside to do it. The local regional director [did not want to] ~~couldn’t~~ do it. They had to work with those guys. And, because [of] the economics, you know, you had to do a financial study. *It* was more important than benefit-cost analysis, because it decided who paid what, and involved ~~in there was~~ cost allocation, and that happened to be my thing.

“ . . . I admitted immediately that it was somewhat arbitrary. I could tell them how we did it in as fair a way as the procedure would allow. . . . ”

Although, I admitted immediately that it was [somewhat] arbitrary. ~~But if anybody’s going to be arbitrary, I could tell them how [we did it] to do it arbitrarily, and in as fair a way as [the procedures would allow.] we could.~~ Because, we had [several] procedures, [including the] ~~called the Separable Costs~~, Separable Cost Remaining Benefits Method. And, we had Alternative Justifiable Expenditure Method. We had different kinds of methodologies for allocating costs. And everybody argued about them. And wrote papers about them. We argued with the Corps, on how do you allocate a multiple-purpose project. Because part of it was non-reimbursable, and part had to be repaid with interest, and part had to be repaid without interest, and the power part could support the irrigation part, (Storey: Um-hmm.) and the irrigation part was non-interest bearing, and the power part was interest bearing, and the municipal industrial water supply part was interest bearing. And [al]so there [were] ~~was~~ interest rates involved, and there were repayment contracts that had to be negotiated.

“So, when you allocated costs and divvied up the costs, of course the constituency would run to the regional director and say, ‘Hey! They’re allocating too much cost to us.’ So, it was *always* controversial. . . . ”

So, when you allocated costs and divvied up the costs, of course the constituency would run to the regional director and say, “Hey! They’re allocating too much cost to us.” So, it was *always* controversial. (Storey: Um-hmm.) And, I used to lecture on

35. Assistant Secretary of the Interior for Land and Water Resources Guy Martin served in the period 1977 to 1981.

the subjects to get all these foreign trainees in here.

How Project Water Users Might Be Charged Without Allocating Costs to the Various users

And what they[, foreign visitors,] want to know is how to allocate-multiple purpose costs. I says, “You know, the solution to that would be just don’t allocate them.” It’d shake them up. I [would say,] says, “You really don’t have to allocate them.” [They would ask,] ~~And he says,~~ “Well what would you do?” He says, “Well, what you do is, you decide what’s a reasonable rate to charge,” (Storey: And charge it.) “Charge all the users, ~~and charge them, and back it off~~ and see how much of the project you [can] pay. If you[’ve] got a good [paying] project, you might have some [funds] left over to build another project, *or* you recover all the costs, *or* that part you don’t recover, and you think it’s in the national interest, just call it non-reimbursable. And if you’re doing flood control . . .” [You may determine that] ~~Before, you know, you says,~~ “~~Okay,~~ the flood control costs are non-reimbursable. *Navigation* costs are reimbursable. And then [there were arguments] ~~we got arguing~~ about fish and wildlife. At one point in time, it was non-reimbursable. And at another point in time it was partially reimbursable. Separable costs were reimbursable. “What’s a separable cost? What’s a specific cost? What’s a joint cost?”

“ . . . we’d get a project, . . . primarily authorized for, say, municipal/industrial water supply, and it’s to serve a city . . . [that] was going to enjoy *all* of the recreation benefits . . . and half the costs were allocated to recreation as non-reimbursable, I said, ‘Wait a minute. Somehow that doesn’t make sense. . . .’ ”

So they would *argue* [that], and it was, it was rather arbitrary, but nevertheless, it had to be done [following procedures]. And we’d get a project, and when it come through me, and I see the project, when it was primarily authorized for, say, municipal/industrial water supply, and it’s to serve a city, and that city was going to enjoy *all* of the recreation benefits. When it came to me and half the costs were allocated to recreation as non-reimbursable, I said, “Wait a minute. Somehow that doesn’t make sense since the purpose of that project is municipal industrial water supply. I know you want to treat your constituencies nice, and don’t charge them much for water.” Because that allocation influenced what they had to pay [since] ~~Because~~ they had to return full costs, with interest, in fifty years. (Storey: Um-hmm.)

“So, the allocation became very very controversial, and political–politicized. . . .”

So, the allocation became very very controversial, and political–politicized. And so, you said, “Well, there’s a lot of ways to do that.” But, we used to argue about that, and it’s [admittedly] very arbitrary. [Since the Bureau is not building many new] ~~They, I guess they still—we don’t build any~~ projects, so we don’t have too many [allocation questions]. I guess you could go back and reallocate costs. And most of the payout studies, now, that are still [being cranked] ~~cranking~~ out, are based on some kind of cost allocation, whether it’s good, bad, or indifferent. (Storey: Um-hmm.)

Cost Allocation for Glen Canyon Dam

Glen Canyon. Cost allocation was *very important* to determine the payout and how much money's available for all the participating projects. That's how I first got involved in cost allocation, when I looked at it it seemed a little peculiar to me, and I mentioned [it] to Randy Riter. Randy Riter agreed, and so he sent me out there to [help] revise the cost allocation [to something I thought was more reasonable]. That didn't make me very popular. But, we, we had some fun [interesting] times.

Decision to Retire

Storey: Tell me why you decided to retire. We're getting toward the end of our two hours.

Barbour: Oh, well. I guess, things had changed considerably. We had different people in Washington, and I didn't like the [politics.] ~~policies.~~ And, ~~I didn't particularly appreciate, I thought we had some,~~ some of the guys who ~~had, who~~ I thought were top-flight had left, and we had people who took their place who I thought did not have a lot of imagination, and expertise[–were inexperienced and naive]. And, with everybody changing there, ~~I also, there were changes here.~~ And, I felt that all the work that I had done wasn't quite appreciated. And I had been promised a grade raise and, because I had the responsibilities of–I had gotten all of my people grade increases, fourteens. And I was also a fourteen, and I thought I was entitled. And, one of the other guys had gotten a fifteen, and I thought didn't have the responsibility in the multi-disciplinary that I had, and I was having a little difficulty getting that next grade. And, although I had support in the assistant secretary, in the secretary's office, I didn't have support in the Bureau anymore, because there were a lot of change[s] of people. And there were people there, and they didn't like some of the economic decisions I had made, or studies I had made. ~~Which, for,~~ Some of these projects [I thought] were [not economically sound] ~~truly dogs,~~ and the fact that we kind of laid it on the line, I always thought an administrator ought to really know [more about the economics.], ~~when a dog was a dog.~~ But all of those things sort of got together, and then I had an opportunity to go and be, be chief economist in this engineering firm. And, I thought, I had my years in, and I didn't particularly like the politics in the Bureau in those days. And, I could make as much money. I could work and earn My Social Security, and get my retirement, so I [resigned.] ~~gave them,~~ [Apparently] when they found out I was going to retire, somehow they worked out that they started processing papers for a fifteen. And I went down to personnel and says, "Well, I think I'm going to do something else." So, I gave them less than two weeks notice, and said I was going to retire, because I had this other job.

Left Reclamation and Worked at Tudor Engineering

So, I went to work with Tudor Engineering [Company] at that time. And, I spent about nine or ten years in the private sector, (Storey: Um-hmm.) which, I really enjoyed. And, I did special studies there. We did pump storage studies, and hydropower, and steam power studies.

Went out on His Own and Worked a Lot for Stone and Webster

And, I worked for Tudor, and then I went on my own and did a lot of work for Stone and Webster. I was fifty-seven, and I wasn't quite ready to retire, so I kept tapering off. I worked half time. And then I tapered off to a quarter time. And then I'd take jobs occasionally. And then, when I hit seventy, ~~I decided~~, I didn't accept any more jobs.

“The last major job I worked on was helping with that Glen Canyon study on the environmental releases . . .”

The last major job I worked on was helping with that Glen Canyon study ~~and the~~ [on the] environmental effects [releases] ~~=I'm doing some of the power studies there~~ [and hydropower production]. (Storey: Uh-huh.) ~~And I~~, It got to be very controversial and by then I was kind of losing my patience with some of the people there, [I guess] ~~so I didn't~~, I didn't get along as *well* with the group as I probably [should] ~~could~~ have, and the Environmental Defense Fund didn't particularly like what I had to say, because they were trying to *downplay* the power effects, and tried to tell me, of course, how to measure *power* benefits, which I had been doing for most of my career. And, they were claiming that the power benefits loss from ~~=I didn't care that they~~ [the] *modified* the flow out of Glen Canyon [were only equal to the cost of burning coal at a steam plant.] I just wanted them to do a good job and show them what the power benefits foregone [actually] would be. And they claimed that since there was surplus power in that area, and there was some surplus power in some coal fired steam plants, [because] they had [over-sized] ~~over-built~~ some of the steam plants, that the, ~~that our capacity had no value~~, hydropower capacity given up. ~~It had no value because there was replacement power out there.~~ I couldn't believe they only wanted to [recognize only] ~~give us~~ what they called the energy component, which was very small. [Glen Canyon] ~~And, it was a peaking facility[, and] .~~ ~~And it's~~, that capacity's worth a lot of money [~~—significantly more than simply the cost of burning coal.~~] (Storey: Um-hmm.) ~~And I tried to maintain, and tried to say, “Look. This is what that is worth.”~~ I didn't agree with them, and I guess I was, at that point in time, I was losing my patience[.] ~~a little bit.~~ ~~So, I guess~~ I didn't get along *too well* in that group. And, I thought they were somewhat arrogant and I thought ~~we kind of~~, the Bureau [was too lenient.] ~~kind of somewhat caved in.~~ Mike [Roluti] was there. ~~Poor Mike. I gave him a hard time. He was running the study~~ [for the Bureau].

Storey: Mike Roluti?

Barbour: ~~Yeah. And, I just couldn't agree, but then he had to work with those people. And, I was giving him a hard time—as I'm prone to do. I'm somewhat impatient, and somewhat bossy, I guess. (Storey: Um-hmm.)~~ But, so the studies, when they [were] finally [completed], I couldn't endorse them. I did write the executive summary for that, and [included questions about the power benefits lost], ~~stuck in a few things~~ which they left in. I think I got Mike in a little bit of trouble (laugh) on it. And, I did a paper [on the subject], and then presented it to [the] . . . annual ~~or biannual power meetings~~ (Storey: Um-hmm.)— [International Conference on Hydropower] with the Corps of Engineers. So, I did a paper ~~on that one~~, and put Mike's name on it too, and I guess I had a few comments in there [regarding the possible under-valuation of Glen Canyon peaking Power that I don't think were too well appreciated. But, that's when

Stone & Webster was the contractor for [the study,] ~~that one~~, and I was working for Stone & Webster [and consequently could put in my own views]. But, you know, I enjoyed working with people. It was a multi-disciplinary group [that studied Glen Canyon], you know, but I thought the study really under evaluated power [benefits] foregone. But, it didn't matter—the environmental water releases were going to be made anyway]. They were going to do it anyway. And that was okay. I just wanted to be sure the numbers were (Storey: Yeah) at least half way reasonable.

Storey: Well, why don't we save further discussion for later and let me ask . . .

Barbour: Well, okay.

Storey: Whether or not you're willing for information on these tapes, and the resulting transcripts to be used by researchers?

Barbour: Oh, I don't mind?

Storey: That's a 'yes' I take it?

Barbour: Have I said anything out-of-school?

Storey: I hope not.

Barbour: I don't know.

Storey: That's a yes, I think?

Barbour: Huh?

Storey: You're saying yes?

Barbour: Yeah, I, I don't, you know . . .

Storey: Good. Well, thank you very much.

~~Barbour: I think that's what happened and . . . I had made a list of some of the—this is off the record. (Tape turned off.)~~

END OF SIDE 2, TAPE 2. JUNE 10, 2003.

BEGIN SIDE 1, TAPE 1. JUNE 24, 2003.

Storey: This is Brit Storey, Senior Historian of the Bureau of Reclamation, interviewing Edmund Barbour on June the 24th, 2003, at about two o'clock in the afternoon in Building 67 on the Denver Federal Center. This is tape one.

Harold Davis, Ray Ahlberg, and Economic Studies

Let's talk about Harold Davis and Ray Ahlberg.

Barbour: Oh.

Storey: First of all. They were the first people you worked with, right?

Barbour: Um-hmm. Yeah. Great guys. Harold was the chief economist for Region Seven, and he gave me my initial training—I didn't know from anything, I had just earned my *master's* degree at the *University* of Denver. (Storey: Um-hmm.) And so he said I'm going to do economic studies, benefit-cost ratios, cost allocation, payout studies, that sort of thing, in McCook, Nebraska. They were going to train me for about three or four months. And Ray Ahlberg was the head of reports, probably one of the finest reports [writers] ~~men~~ that the Bureau ever had. I mean he could *cut* to the chase immediately. And he had great analytical powers, and he could understand all aspects of it. (Storey: Um-hmm.) And, he used to come around and review our reports. I was then assigned to the Kansas River District Office, and that was at ~~the~~ Indianola, Nebraska. That's the old prisoner of war camp there.

So Ray used to come out and review the reports, and he always called it straight. Always. We used to have fun with him. Occasionally I'd plant something in the Appendix that didn't make any sense, and see if he could find it. And he would. (Storey: Um-hmm.) He was a [talented] ~~good~~ guy.

Taking Ray Ahlberg Fishing on Harry Strunk Reservoir

He enjoys going fishing too, so sometime he'd [spend] ~~spent~~ the weekend and we'd take him out in a tiny boat, ~~and take him~~ out to Harry Strunk Reservoir. You ever hear of Harry Strunk? He's the editor of the *McCook Gazette*. He was one of the *big boosters* of the Bureau of Reclamation. In fact, you could probably give him a lot of credit for ~~our~~ the amount of money we got in the Kansas River District. We were one of the fattest districts there. We had a *huge* construction program there. (Storey: Uh-huh.) ~~And, he was editor of the McCook Gazette, and he was a strong supporter.~~ I remember once I called him up, and I didn't get my *Gazette*, my *McCook Gazette*, and I called to complain about it. And it wasn't twenty minutes later and Harry delivered it in person. (Laugh) Oh, he was great guy. He really supported us. He did a lot for the Bureau.

Well, getting back to—Ray was a great reports man.

Storey: But this was a Reclamation reservoir?

Medicine Creek Dam

Barbour: Oh yes. Yes. Medicine Creek Dam.

Storey: Yeah, how was the fishing?

Barbour: The fishing was good early, you know—in the new reservoir it's always good. (Storey: Um-hmm.) We were head-on to construction in those days.

There Was a Lot of Construction in the McCook Office

Just finished Bonny Reservoir. ~~They're building,~~ Trenton Dam was under construction. Medicine Creek had been completed. Red Willow Dam was, they were [studying] ~~looking~~ at Red Willow Dam. They hadn't started construction yet. The Corps was building Harlan County Reservoir. Just a lot of activity going on after the war. You know, this was to keep us employed, ~~so you know,~~ we had something like 500 people, and a *large* budget, very large budget. We spent several hundred million dollars on dams and [water supply] projects [as] part of the Missouri River Basin Project. (Storey: Um-hmm.) All those dams were authorized after they had the Republican River Flood. I think it was in 1913,³⁶ and I think they lost a hundred and something lives. ~~I think,~~ My recollection, when I wrote about it, it was 113 lives. I'm not sure. But, I had an old timer tell me that the Republican River was so high that he went out in his little boat rescuing some of the farmers out of the tops of trees. (Storey: Um-hmm.) But that was the '35 flood, ~~and that's what=~~ and then there was another one in [the '40s] ~~later than that, on the south, this was on the south ; originally the south~~ fork of the Republican River [which resulted in] ~~. So that's why~~ all those dams [being] ~~were~~ authorized, and that's why we got all that money. ~~and~~ We built all those projects, primarily flood control, with quite a bit of irrigation involved. (Storey: Um-hmm.)

~~But, both of those guys I'd, Harold, I worked with Harold [Davis, chief regional economist,] H the years that he was Chief Economist there. And then worked with [and] Ray [Ahlberg] all the years [I was in the field office].~~

Storey: They were in the region?

Barbour: They were in the regional office.

Storey: In Denver? But you were in McCook?

Barbour: And I was in the McCook. The Kansas River District Office. (Storey: Uh-huh.) I worked there for six years, and then ~~I got~~ transferred to the Chief Engineer's Office.

Storey: Tell me about living in the Reclamation town there.

Set up Housekeeping in Indianola, Nebraska

Barbour: Oh it was wonderful. It was a new experience. I had just gotten married. We'd had *nothing*. We had a car, that we were in hock for, and we bought a card table, and just our clothes over there. And we had no furniture, whatsoever. I had just gotten out of [college.] And, they gave us one of these tar-paper-sided barracks, that they had set up for the ~~German war camp,~~ German prisoner of war [camp]. And, [Reclamation] divided [the barracks] up in one and two-bedroom units. And so that's where most of

36. Note that Ed Barbour later says the flood was in 1935. Apparently the 1935 date is correct. The Nebraska Department of Natural Resources identifies that other significant flood events on the Republican occurred in 1885, 1903, 1905, 1915, and 1947. In 1826 there is evidence of another major flood. Information found at <http://www.dnr.state.ne.us/floodplain/mitigation/1935flood.html> on January 9, 2009, about 3:00 in the afternoon.

us lived, because there was no housing in McCook. And with 500 people out there, we had a lot of families living there.

Storey: How many units in a . . . ?

Barbour: Well, there might be the, I'd say maybe three or four units, ~~or five units~~. And there were a number of these buildings. And then there was the hospital area, which was *much* nicer. And, that's where they treated the German ~~prisoner of war~~, the prisoners. And also, that's where all the administrative personnel stayed, that administered the camp, the war camp. (Storey: Um-hmm.)

The "Hospital Area" Was Where the VIPS Lived

And of course, when they *all* moved out, the best quarters were called the 'hospital area', and all the VIPs got to live there. And then us peons[, lower graded people,] lived in the barracks, the tar-paper barracks.

"But it was great. It was cheap. My recollection is they charged us either \$20 or \$23 a month. . . ."

But it was great. It was cheap. My recollection is they charged us either \$20 or \$23 a month. And we got electric stove, and electric refrigerator, included. ~~And, usually, I think~~ We had a one-bedroom apartment. (Storey: Um-hmm.) So, I set up with a card table and two apple boxes. That's how we got started. And then we went over and bought a convertible sofa. You could sit on it during the day, and sleep on it at night, because we were just starting out, in debt, you know.

Started at a GS-7 Rather than the Normal GS-5

Fortunately, and since I had gotten my Masters [degree], I got started at a Grade Seven. *Normally* they started everybody at Grade Five. So I was feeling pretty good about that. So, we bought a few things. I remember then, when, there's a furniture company in McCook called Pade's Furniture, and I went over there and bought some furniture, and they hauled it out in a truck. And, incidentally, I still have the bedroom *set*. It was an oak, one of these white-oak bedroom sets[.] ~~which I still have. I bought it then.~~

Ken Kauffman Helped Unload Some New Furniture

And when they were unloading it a guy by the name of Ken Kauffman came over to help me. He had just moved in not too long ago, before I had. We both started in 1950, in McCook, Nebraska. (Storey: Um-hmm.) And he helped me unload. Now that was in 1950[.] ~~and to this day~~ He invited me to go hunting that fall, as I recall, because his wife was pregnant, and she was overdue, and [she, being a nurse, suggested] ~~he figured~~ if he ran her across those bumpy roads, hunting pheasant, that she might give birth to their first son, who happened to be Mark. So, I can remember that first fall, and that we were out there, on the countryside, bouncy roads, seeing if we [could] ~~can get~~ help Laurel (Laugh) go into labor, (Storey: Hmm.) as we hunted.

That was the first hunting trip. And to this day, we're still hunting and fishing together. (Storey: Hmm.) So that's fifty-three years. He's a guy you might want to talk to, and you might do an oral history.

Storey: Did you ever meet the Budd family there?

Barbour: The Budd?

Storey: Um-hmm.

Barbour: Oh yeah.

Storey: B-U-D-D.

Barbour: Oh yeah.

Storey: Tell me about them.

Barbour: Oh yeah. I didn't know them too well. Let me think of his first name. For some reason, short name. Ah, he was an engineer. Was he in Survey? Can't remember. (Storey: Um-hmm.) I didn't know him too well. I knew a guy by the name of Frank Best, in engineering. And there was a Lipmann, I think, who was head of engineering estimates. Um. . . Um. . . I'm trying to think. Robinson was the district manager at that time. Al Redman was the planning engineer, and I worked for him. Boy it's hard to remember all those names.

The Gym Was a Social and Activities Center

Anyway, we had a good office. It was kind of family-oriented. You were kind of accepted in the Reclamation family, those who all lived close together. We used the old gym that they had for the prisoners of war. And, we'd play volleyball once or twice a week there, and we'd have our parties there[.] ~~and you know~~; It was sort of a communal life. We all helped each other. (Storey: Um-hmm.) It was, it was a good time. ~~Good times~~. Everybody was fairly young, getting started together.

Storey: You mentioned a garden, I think?

The Garden at Indianola

Barbour: Oh yeah. Well, we had to have a garden so Hubb Robinson[, the district manager,] had this plot. He would get it cultivated every year, and then divide up in little *plots*, just like a communal farm. And you could sign up, ~~and you could sign up~~ for one plot or two plots. If you had a larger family you could sign up for more than that. And then every spring, ~~why~~ you'd go out there and plant it[.] ~~and we~~; It was gravity irrigated, ~~usually~~. Except for Hubb, he had a little sprinkler system, because he was the closest (Laugh) one to the water supply. (Storey: Um-hmm.) But, we'd go out there and it'd be like a bunch of coolies out there, ~~you know, out there~~; We'd all be visiting, and planting potatoes, and lord knows what. But that didn't last very long,

you know, everybody in the spring wanted to plant. Pretty soon, by the middle of July, weeds were all over the place, and by August you could hardly find your plot for the weeds. (Storey: Um-hmm.) They'd be doing other things. But, we had a good time [in those days] ~~doing those things~~. We don't do that anymore, I don't think, in any of the Reclamation offices. (Storey: Yeah.) But, in those days, you know, [those] ~~them~~ big budgets, and [the] Reclamation program was very active. We had a large construction program all over the United States. And, Reclamation was the place to work. (Storey: Um-hmm.) Very desirable.

Storey: Now, what were you doing exactly? Were you doing studies for future projects? Or were you looking at existing projects?

Working on a Plan for the Kansas River Basin

Barbour: Well, actually, most of the work there, ~~we did~~, we were doing a Kansas River Basin Plan, ~~as part of our efforts~~.

Most of Our Effort Was Definite Plan Reports

We spent some time on future projects, but most of the time was spent on doing the Definite Plan Reports for projects that were already under construction, but the plans weren't completed. So that was kind of interesting—trying to keep ~~up=keep~~ ahead so they could go into the design phase.

Negotiating Repayment Contracts with Irrigators

So much of it was ~~also~~ dealing with the irrigators, negotiating repayment contracts, as I was on the *economics* end of it. (Storey: Um-hmm.) I would *assist* in doing the studies.

Use of Ability to Pay Studies to Determine Repayment Charges

We had agricultural economists do what they called the Ability to Pay Studies, determine how much a farmer could afford to pay. And then, I used their results to project repayment, and how much the districts would have to pay, how much they could return, how much subsidy they ~~were~~ required. And those projects required a lot of subsidies because they [could afford to pay only a relatively small portion of the costs.] ~~paid very little~~. Actually we were pretty easy on the irrigators, I thought, and probably necessarily so. We didn't charge very much for water. (Storey: Um-hmm.)

“ . . . the subsidy was substantial per acre . . . we had the big cash registers . . . Those revenues were used to show repayment for irrigation . . . ”

And, the subsidy was substantial per acre, but that was the history of Reclamation in those days. We theoretically had a big basin account, we had the big cash registers, Missouri River Project, *all* the mainstem reservoirs produced power, and that went into a fund, the Power Fund. ~~And so, we used~~ Those revenues [were used] to show repayment for irrigation, and we'd do these long [complicated] payout studies. I

remember one went over about 130 ~~or 140~~ years, to pay out the whole [basin] project. The rules were that you had to pay [each project] ~~them~~ out [separately] within fifty years, some with interest, some without interest— depending on the purpose. (Storey: Um-hmm.)

Had to Move to McCook, Nebraska

But, I spent six years in McCook. We moved ~~into~~, out of Indianola, [after] ~~and~~ they completed a new office in McCook, and then we were *all* required to move into McCook, [after] ~~and~~ they closed down the prisoner of war camp. So, we had to find places to live, and it was kind of difficult to do, but, we managed, and we had good times in McCook.

Storey: Hmm. What kind of subsidies are we talking about here?

Subsidies for Projects

Barbour: Oh, you know, we used to have limits. It's, it's hard for me to remember but there would be, sometimes subsidies would be, oh, \$500-\$1,000 an acre, and we tried to establish a limit in those days, and I can't recall what the limit was[.] ~~, but I know~~ ~~Dominy=~~ *But* the politics were such that if you got support, and you got money to build it, [there were not significant limits.] Then we just leaned more on power surpluses to pay for the project. So long as they thought we were making a reasonable charge to the irrigators, and they [at best] were covering their own operating costs. That was the important thing. And my recollection is we were charging irrigators \$1.60 an acre [for construction costs], in those days. That was just kind of a standard thing. And I, ~~maybe~~ to this day, ~~the contract is~~, they were forty-year contracts. So that had to be in the fifties. ~~No, maybe~~ They [probably have] renegotiated the contracts.

Storey: That's repayment or that's maintenance?

Barbour: That's repayment [of construction costs— operation and maintenance costs were recovered].

Storey: That's repayment. Yeah.

Barbour: They have to pay their own maintenance costs. (Storey: Uh-huh.) And, the maintenance would run, I'm trying to think, maybe about the same amount, or something of that nature.

Storey: When you say subsidy, what do you mean? Do you mean that. . . ?

Barbour: Well, ~~what you did is you~~, when you did analysis of a project you allocated the cost to irrigation, and to what other purposes [might be identified.] ~~if~~, Most of these [project purposes] were irrigation and flood control. *And*, in those days, we were permitted to allocate to recreation, and fish and wildlife. And, at that time, those were ~~even~~ considered non-reimbursable. And so, of course, there's a lot of pressure on allocating

~~as many~~, as much cost as you can to those [noon-reimbursable purposes] projects that didn't have to be repaid. And ~~the procedures we had~~, we had certain procedures that we used in allocating joint costs, and, they were called the Separable Costs Remaining Benefits Method, and the Alternative Justifiable Expenditure Method, and the Use Facilities Method[. These] were the three major methods. ~~And~~, I used to lecture on cost allocation theory, because I kind of made it a speciality of mine. And, we were *required* to allocate costs, and we were *required* to follow these procedures. (Storey: Um-hmm.) And I always thought that, well we could do it, and we did it because we had to. But it didn't make a lot of sense, pretty arbitrary. The pressures were to allocate as much as you could, to those projects [costs] that didn't have to be repaid, obviously.

Storey: To a non-reimbursable cost?

Barbour: Yeah. And I, I don't know, probably the same pressures are here today, and you probably use the same [methods]—if you had a [new] project[s.], ~~which you don't have~~. I don't know if you have any new projects.

Storey: And it was . . .

Worked on Animas-La Plata Project

Barbour: ~~Probably using the same projects~~. I worked on Animas-La Plata. We did that thing way back in the '60s and '70s. I never thought it would be built, looks like [it will be]. But they have to allocate costs. Now, [I believe,] the repayment requirements have changed somewhat.

Consultant to Water Resources Council to Develop New Reimbursement Policies

When they brought me on ~~sort of~~ as a consultant to Water Resources Council, to develop new reimbursement policies.

Looked at Increasing Repayment on Projects

And so, I did a little study for Don Maughn[, director of the Water Resources Council,] on how a project could earn more—well, if they could be repaid at a higher level.

Constituents Applied a Lot of Pressure to Keep Repayment Allocations Low

And so we looked at various ways, but the pressures are so great. The constituents [could be an] ~~are the~~ irrigation district *or* a municipality. And [there] it was a lot of pressure, you know, to treat them well, to keep those allocations low. ~~And, so the procedures, because we used~~ Benefits or single-purpose alternative [were eliminated] as a *limit* to how much you could allocate to a particular purpose. But [they're] both theoretical, and the benefits are fairly theoretical, you know, what's water worth? We had our procedures, and a single-purpose alternative had all kinds of problems. Do you use the same site? Does it have to be a *reasonable* alternative? Is it one that you

think could be built at all? Is it a *likely* alternative or a theoretical alternative? (Storey: Um-hmm.) You could *argue* for months, years, about it. In fact, I'm sure they're still arguing about it, about cost allocation procedure. And still you have to do it. The Missouri River Basin Project, to this day, I presume they're using some of the same allocations that we put together way back [then] ~~when~~ because we established precedent. And the Upper Colorado River Basin Project [had] ~~it's got a cost allocation [controversies].~~ It Probably [some of the earlier allocations haven't] ~~hasn't~~ changed. ~~Maybe~~ They [may simplify] ~~might~~ index[ing] some of the [cost] elements of it.

Annually Updated Repayment Studies

I and John Eyre—I think John is gone now. I'm not sure. We used to have the responsibility to [update] ~~put, for all~~ the payout studies. Every year we'd update the payout studies. We would have to look at the cost allocation again, [and] ~~so~~ we had devised rules. [It was difficult] ~~You didn't want to shake, you know, you're not going~~ to make any *major changes* in a cost allocation after it's been authorized by Congress. But, you know there have been modifications, and changes, and so you did the best you could, and still *hopefully* tried to be reasonable about it. I *always* maintain, the test of a good allocation was how reasonable it was. *If* you knew that the legislation that created the project intended this project to be primarily [for] a particular purpose, if it might be for municipal-industrial water supply, and that was the *whole* emphasis, it'd be kind of crazy if you come up with an allocation with three-fourths of it allocated to recreation, and fish and wildlife, and one-fourth to municipal water supply. (Storey: Um-hmm.) But it's happened. (Laugh.) ~~But it's happened.~~ And I got in trouble on one of them. I said "I couldn't buy it." There's ~~no, you know there's~~ no [sense] ~~excuse~~ for allocating [a] ~~these~~ huge amount [to recreational uses] of . . . even though the benefits were great. And even now today we know that recreation turned out to be a wonderful purpose, and it has provided a lot of benefits, whether it's paid for or not, there's a *good social* benefit there. *Still*, we found in some instances those who enjoyed recreation benefits were also those who got the water. It was the municipal folks who got the water supply, so they got *double* benefits. And by virtue of the fact that recreation, in those days, was non-reimbursable, [the cities] ~~they got double then, they~~ didn't have to *pay* very much for the water and they got all the benefits from recreation, as well[.] ~~as from municipal water.~~ (Storey: Um-hmm.) So, when I [would] see one ~~of them~~ come up, and [they didn't seem fair,] ~~they're a little distorted like that,~~ since I had the final, technical authority on cost allocations in those days, I tried to [check on their reasonableness.] ~~take a look at it.~~

“. . . there's, no one really to represent the general public interests, the tax-payer, in a water resources project. . . .”

But see, *unfortunately*, there's, no one really [to represent] ~~protect~~ the general public interests, the tax-payer, in [a] water resources project [except the reviewers]. To say, "Well wait a minute. This is not fair. The water's too cheap. They can afford to pay more."

“. . . you'll find that for many water projects, Corps projects, Bureau projects,

whatever, that the water users get by pretty well, because of these *non-reimbursable* allocations. . . .”

But you’ll find that [for many water] ~~throughout all the~~ project[s], Corps projects, Bureau projects, whatever, that the water users get by pretty well, because of these *non-reimbursable* allocations. And, they benefit by it, so [do] the local communities benefit [from the non-reimbursable allocations.] ~~by it.~~

“If they don’t pay as much, they can spend more money locally. And so the economy grows. *Those* are the big benefits from the old Reclamation projects, what it did to the local economies. Not the direct users, but the indirect users. . . .”

[If] they don’t pay as much, ~~so~~ they can spend more money locally. And so the economy grows. *Those* are the big benefits from the old Reclamation projects, what it did to the local economies. Not the direct users, but the indirect users. (Storey: Um-hmm.) And there lies a can of worms too, is trying to measure the indirect effects. And, there are all kind of ways to do that, with multiplier effects, and so forth. The first paper I ever wrote was on the multiplier effect, *The Impact of Projects on A Community*. And there’s no question about what a project will do. The *secondary* benefits are very very significant.

“*Very often* that’s a major reason for building a project, is to get the secondary benefits . . .”

Very often ~~that’s,~~ that’s [a major] ~~most of the sole~~ reason [for] ~~you can~~ build[ing] a project, is to [get] ~~do~~ the secondary benefits, but you didn’t *provide* for any repayment that way. You couldn’t assess them. And the only way you could assess them is an ad valorem tax, and that means you had to get the local folks to form an irrigation district, conservancy district, and then tax themselves. And, that wasn’t an easy thing to do.

“I often wondered, ‘Well, why do we go through this nonsense?’ . . . we should just say ‘This is what they can afford to pay. Here’s a *reasonable* amount. And the rest is non-reimbursable.’”

So, anyway, the financial aspect was simply saying how much the project costs, and how much would be repaid over what period of time. The fact that you got assistance from another project really didn’t matter too much, it just made it look good. And I often wondered, “Well, why do we go through this nonsense?” We say, “Here’s a project, and it serves primarily irrigation, and recreation, and maybe some flood control. This is what they can afford to pay. Here’s a *reasonable* amount. And the rest is non-reimbursable.” Forget about going through this funny business of taking revenues from one, you know, one project 500 miles away, and assume that those revenues will pay for this project [forty] ~~twenty~~ years in the future. But those are the kind of things we, as a society, we decide makes us feel better, except we know that what’s going on today and tomorrow are much more important, and not what you project the next forty or fifty years. (Storey: Um-hmm.) But you kind of have to be philosophic about the economic and the financial aspect. I learned that the hard way.

“I took it too seriously to begin with. But Congress just wanted to be sure they had a benefit-cost ratio better than unity. And they all, had all kinds of rules to *help* you do that . . .”

I took it too seriously to begin with. But Congress just wanted to be sure they had a benefit-cost ratio better than unity. And they all, had all kinds of rules to *help* you do that, like a low interest rate, and they liked to see a project repaid, except they had all these subsidies, and *basin* accounts [to help accomplish payout.]

Storey: What does “better than unity” mean?

Barbour: Better than 1 to 1—\$1 worth of cost supported by \$1 worth of benefits.

Assumed Constant Dollar (No Inflation) in Calculations

And, this requires a financial analysis projected in the future, and [which requires the ~~cross-~~ consideration [of] interest rates and inflation rates[.] ~~which we all assume that~~; We assume[d a] ~~the~~ constant dollar in the analysis for years and years and years, rather than inflation—assuming that all costs are affected essentially the same by inflation, consequently you [were] apply[ing] it on both sides of the equation. It’s a washout. But, when I got out of government work and went with the private sector, we didn’t do it that way. We projected inflation, because inflation can be different for different kinds of things, especially if you’re doing projections such as we used to do for nuclear power, and [for example] ~~you know~~, project the cost of yellow cake in the future (uranium). How do you handle inflation then? And inflation on oil was a lot different than trying to project [inflation for] yellow cake, you know, uranium fuel. (Storey: Um-hmm.) Or gas, or coal, or—so, when I left the Bureau, and went to work in the private sector, then I developed inflation *curves* for various types of fuels, construction, and so forth. So, we always used projections in[to] the futures, and cash flow analysis, and sensitivity studies. Say, “Okay, let’s look at a *range of inflation*,” on whatever were the major thing, or all the factors. And that way you could do some sensitivity tests and say, “Okay. If the interest rate [and inflation rate] were this or that, this is the impact on this project. This is how many years it would take to pay. This is how much you would have to charge for it.” ~~And those kind of things~~. So, I thought, when I got in the private sector, ~~on the analysis, and I, we put together. I think~~ we were more justifiable using more *current* data than we did when, in the Bureau, where we used what Congress pretty well [set as the rules.] ~~kind of set aside~~. We had criteria that they’d argue about, for years, on interest rates and what they should be, and whether inflation should be included. And then, we were always subject, you know, to controversy because anybody that attacked us—and incidentally, you asked me about ~~the guy that’s given us~~, one of the guys giving us a hard time on the Central Arizona Project? Bob Young. (Storey: Um-hmm.) Do you remember that name?

Storey: I don’t remember it, no.

Barbour: That was the guy.

Storey: I just remember the story.

Barbour: It was Young and another guy that teamed together and wrote *all these negative* reports on the Central Arizona Project, which we tried to answer. And it was difficult to answer. You know, that, but nevertheless I think the Central Arizona Project turned out to be okay. (Storey: Um-hmm.) As far as Arizona's concerned, they wouldn't have a water supply. They'd be in real bad shape (Storey: Yeah.) without the Central Arizona Project.

But, going back to ~~the~~, McCook, those days, those projects, they had a lot of money and ~~the projects~~, there was a lot of [support and] momentum to build those projects. And when you look at the fact that it did employ a lot of ~~guys~~, people, you know.

“ . . . although some of the specifics of the analysis may be somewhat in question . . . the overall impacts on the economy of the area, I think the Reclamation Program has proved to be a good investment, in most areas. Oh, we made a few mistakes . . . ”

And those were benefits from that aspect. I think the Reclamation Program, although some of the specifics of the analysis may be somewhat in question, but [considering] the overall impacts, ~~you know~~, on the economy of the area, ~~and so forth~~, I think the Reclamation Program has proved to be a good investment, in most areas. Oh, we made a few mistakes here and there, and probably spent too much money on some projects, and . . .

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Storey: [?] range?

Barbour: We had some reservoirs where we, like Bonny Reservoir where ~~we, the irrigation~~, it was built for flood control and irrigation, [though] ~~and~~ we could *never* justify irrigating out of Bonny. It was too costly. We looked at gravity projects, and *pump* projects. But, it turns out that it was a great recreation resource. And, I think Bonny cost, what, \$13 or \$14 million? And, over the years the recreation benefits [and flood control benefits] ~~just about~~ justified it—a lot of people having fun down there. It's a good place to go. And, it is providing protection for flood control. I don't think we've had a major flood since Bonny was built. ~~We don't know~~. We planned for a 100-year flood, now they're talking about 1000-year floods. (Storey: Um-hmm.) ~~You know~~. So fortunately we developed some pretty good projects, I thought, especially in that part of the world where water was scarce, and *lakes* were scare. And now, it's provided good recreation potentials, and its helped the irrigators. Well, you got any more questions? (Laugh)

Storey: Yeah. You said a couple of times there was a lot of pressure.

Barbour: Oh, from . . . ?

Storey: To have low reimbursable costs.

Barbour: Oh sure.

Storey: Talk about the kinds of pressures you're thinking of here.

Water User Pressure to Build Projects and Keep Repayment Low

Barbour: Well, of course, these, you know, ~~the~~ projects were supported by whom? The water users. And so, you know, ~~you try to maintain,~~ the lower the cost[s are] to the water users the ~~better it was,~~ the more support you got. So ~~there, if you,~~ if an initial study was made and the study showed a very low repayment required, ~~you know,~~ and then you did an analysis and find that they can afford to pay more, for example, and you proposed that, and it goes up the ladder, and they have to discuss it with the district people [who're] ~~they're~~ not going to be very happy about it. Usually when a new administration would [take] ~~come~~ over they'd look at some of these water rates and say, "Hey. We[']ve got to do something about it." This is what happened when—I'm trying to think of the name. I mentioned it to you before.

Studies Determined Westland Could Pay More for Water

When I testified on the Westland [project that] ~~thing, they came in and says,~~ "Well, Westland [has] ~~'s been getting away with~~ very low water rates. They can afford to pay more." In fact, (Laugh) I didn't know anything about Westland *early* in my career, but I remember one thing about Westland. I remember we had [an economist,] ~~a guy by the name of~~ Don Street, ~~an economist,~~ who was in Boise, Idaho, and he was transferred to our office. And this was probably in 1957 or '58, ~~or something or another.~~ And so we did some studies to show that really the Californians just were *not* carrying their share, that we were having trouble showing repayment, and one of the reasons—the water charges were so low. (Storey: Um-hmm.) And so, he was an Ag economist, and he did studies, and he showed, by golly, they could afford to pay at least twice as much for water. And there would be more revenues coming in, they could do more things, it wouldn't be such a burden on power [revenues.] ~~and so forth, and so on.~~ So, (Laugh) a planning engineer from Sacramento came in. He was really peeved. In fact, he was giving Don Street a hard, hard time. And then he called Don something or another, like a "dumb accountant" or something like that. I don't know what he called him. And Don, I had to pull him back. I thought there was going to be a fist fight, *over* water charges for *Westland* Irrigation District. Kind of interesting that years later the assistant secretary—what was his name? Anyway, asked me to testify before a committee, and it had a lot of people from the state, on what those farmers could afford to pay. So, these local guys did the study, and they wanted somebody to present it. Nobody in Washington [wanted to face] ~~dare with~~ Westland. The Westland Irrigation District is probably [one of] the most powerful, politically powerful, irrigation district[s] in the *whole* country, huge district. Are you familiar with Westlands? (Storey: Um-hmm.) So [a visitor from] ~~they asked me, and we're talking about the fella that was here in this office. He was there too. He was in the assistant [secretary's office]—Beard [asked me].~~

Storey: Dan Beard?

Barbour: Dan Beard.

Storey: He was the commissioner, and he was on that?

Barbour: No, he wasn't a commissioner, though, he was working over in the assistant secretary's office in those days.

Storey: Yeah. He was deputy assistant secretary under Carter, I believe.

Barbour: No. This was before that. He was just—I don't know what his title was over there. But I remember Dan was there, and we were, and several others, and we were deciding how we're going to make this presentation, and just what numbers we were going to present to show what the farmers could pay. And [he] ~~they~~ wanted to also show the subsidies they received. And ~~they~~, nobody likes to hear that, how much subsidy they received, so. Anyway, I recall—did I tell you the story about telling about the, Truman?

Storey: Hmm-Um. I don't think so.

Barbour: Well, I figured, it was a *lot* of tension, in that meeting, and the Westland's people were there, the top state people were there, and the assistant secretary was there. I can't think of his name. [Guy] Martin? Mart . . .—would that be right?

Storey: That may be right. I'm not sure though.

Barbour: He was chairing the meeting, I think. And so, they had all this thing going. The time come for them, for someone to have some numbers, you know, "Just how much of a subsidy are they receiving? Just how much are they paying?" And they had done the studies out of the regional office, and so they had asked me to make the presentation. And there's all these cameras, and all these people in the room, and I was obviously nervous, and I thought that Dan or somebody else should be doing it, someone from ~~the~~, Martin's staff should be doing it. But Jim Flannery was their economist, and he was a real politician. (Laugh) He's not going to do it. (Storey: Um-hmm.) So that's how he asked me to do it. Well, I didn't know any better, I guess. "Sure. I'll do it. I'll go and do it, check the study to see if makes sense, and I'll make the presentation." So I started out, and he called me, and he didn't even know who I was. Beard didn't. But "Now we were going to have this presentation of repayment ability, and repayment, and that sort of thing, and we have a," (Laugh) ~~he looks on there,~~ "Oh ~~yeah, we have,~~ Ed Barbour is going to do that." And he didn't know I was sitting there fairly close to him. ~~He didn't even know where I was.~~ So, I stood up, and I had a board there, and so I was putting the stuff on the board. So I says, "Well if you notice I'm doing this with one hand—with my right hand." I says, "It reminds me of Truman, when he called economists together to get some advice. And he says, 'Okay, what's going on?' ~~He says,~~ 'Well, Mr. President,' [the economist] ~~he~~ says, 'on the one hand' he says, 'we ~~do,~~ are nearing full employment. On the other hand investment's low, and I think if we could just increase investments, and it'll improve

employment, and things will be a lot better.’ And so he sat down.

And [the] next ~~an~~ economist got up and he says, ‘Well, Mr. President, he’s correct, but on the other hand,’ he says, ‘I think it’s good that we have a little deflation, and maintain prices at a lower level. This will ~~increase, this will~~ encourage investors ~~to go out~~, and ~~this~~ could increase employment.’ And he sat down.

And he had a third economist. He got up and he says, ‘Well, Mr. President, on the other hand,’ and by then he [Truman] had lost his patience. He says ‘By god what I need is a one-handed economist!’”

And I says, “If you’ll notice,” and the guys kind of laughed, you know, they thought it was a pretty good story. That’s an old old story. So I says, “If you’ll notice, ~~I’m~~ I’ll be doing this with my right hand.” (Laugh.) You know it was kind of a little bit of aside, and I was sorry I said that.

But anyway, I did get through it okay, but whether they got much more repayment out of Westlands Irrigation District, to this day I don’t know. (Storey: Hmm.) But this was always a battle, every time we’d get a new administration, especially a conservative group. “By god we’re going to have those reclamation people pay more. All those people [that] benefit from Reclamation projects should be paying more.” And *truly*, they could afford to pay more, but it’s tough to do.

[In] ~~But~~, economic analysis ~~, benefit-cost ratio~~, they’re always hung up on benefit-cost ratio[s]—it was always “Just get it better than 1:1.” I was doing ~~a study on~~, ~~this was~~ one of the first economic studies I ever did in McCook, Nebraska—I didn’t know from much. I thought, “Well, I’ll do it like I’m supposed to do it.” So, we had a little reservoir by the name of ~~Lowell, I think, Reservoir-Lovewell~~. Lovewell. ~~That’s built now, but~~ It’s a regulating reservoir on the Bostwick Irrigation Project[,] ~~, and they needed to have regulation~~. The canal was so long [it] ~~, and they needed to have~~ a little regulation towards the end of it. Well, it’s going to make a mighty darn good recreation, fish and wildlife reservoir. So ~~they needed to, so well~~ Redman[, our planning engineer] said, “Ed, I want you to do an economic study on this thing, and, we’d like to justify wanting to build a project there.” And so I checked. I was new. I went to the engineering [section] ~~outfit~~ and checked all the cost estimates to see that they looked reasonable, and made sense, and then I checked with the Corps of Engineers, to see if we could get any [more] flood benefits out of them. Well, it was an off-stream reservoir, you know, canal regulation so they didn’t (Storey: Uh-huh.) come through with anything. [Talked to] ~~Stuck~~ the fish and wildlife folks, and they had [provided] ~~got~~ some benefits, and then I called Omaha to the National Park Service. That’s before the Bureau of Outdoor Recreation. ~~You know we had a Bureau of Outdoor Recreation after. Then we don’t have a Bureau.~~ (Storey: Um-hmm.) So I talked to them and got benefits, recreation benefits, and I put it all together, and [prepared a] ~~did a cost~~, benefit-cost analysis—the benefits that accrue from regulation, ~~get~~ more irrigation, stabilized flow, and all that. The best I could do. And I talked to the agricultural economist [about] ~~of~~ what that might do [to crop] ~~the~~ yields by [having a] better water supply, and how many additional acres might be irrigated, ~~and all that stuff~~. Put[ting] it all together ~~and~~ I came up with a benefit-cost ratio, following

the rules, [of] .67 to 1. That means the benefits were only ~~.67~~; 67 cents for every dollar's worth of cost. So I says, "Well, Al, I made a quick and dirty study like you asked me to and it comes out .67 to 1."

He says, "That's, ~~that's~~ not a good study."

And I says, "Well, it's as objective a study as I could make with all the data[, and] ." ~~And I says,~~ "here's all the data, and I can back up all the data. I got it from all your experts."

~~He says, "Don't . . ." I said, "But it's an objective . . ."~~ He says, "Objective?" He says, "Don't you know the objective is to come out with a benefit-cost ratio of greater than 1 to 1?" (Laugh)

He really meant it. But to this day I'll never forget that. I don't know whether they ever got it back to 1 to 1, but I didn't change my study. I don't know ~~what but they built it.~~ later [whether] they were able to justify it, or they maybe didn't have to justify it—if the politics were such somebody [could] put it [up for] ~~in~~ authorization, then they, you know, they swapped projects like they do, and "You vote for my project and I'll vote for yours." Well, they got ~~Lowell Reservoir—Lovewell~~; Lovewell. And it's a *fine* reservoir for regulating, and it's a wonderful reservoir to fish in. (Storey: Um-hmm.) And, looking back, it didn't hurt, you know, (Laugh) it created employment locally, but it was pretty hard to justify [using our procedures.] ~~from the economic standpoint.~~ Assuming our economics meant anything. (Storey: Hmm.) But, . . . go ahead.

Storey: Was it the same way throughout your career?

“. . . it's *always* controversial. And that's what I fed on anyway—I like controversy. . . .”

Barbour: No, we had some good projects, but it's *always* controversial. And that's what I fed on anyway—I like controversy. (Storey: Um-hmm.) I enjoyed it. And that's why I got a lot of the special assignments, because if there was a controversial project, or a project didn't make sense to me, well I'd say something about it, and sometimes it wouldn't help, and sometimes it would.

“. . . taking on some of the tough projects, is why I developed a reputation for being a kind of a special projects guy, and that's why I got all these fun assignments . . .”

And by doing that, by taking on some of the tough projects, [is] why I developed a reputation for being a kind of a special projects guy, and that's why I got all these fun assignments ~~from~~, from going to Oakridge National Laboratory and learning about nuclear desalting, which the Bureau had *never* done. [The assistant chief engineer, Emil Lindseth, set up a small study group and called it the "Dirty Seven."] ~~They got a five, seven-person group.~~ I told you a little bit about that. And, we talked to the top people in AEC, Atomic Energy Commission, and Office of Saline Water at that time,

headed by Dr. Hunter. And we had [information on] the latest technology, and we had nuclear engineers coming out to this office—well, in the old building. And, we had people from GE [General Electric] and Westinghouse, giving us their best *estimates* on reactors. And, fortunately, I got to work with them.

Cost Allocation on a Nuclear Reactor Generating Plant

And we'd have, talk about cost allocation. You got a nuclear reactor—you know, we're used to building reservoirs, (Storey: Um-hmm.) dams and reservoirs. Now ~~you~~ you can [you] do a cost allocation on that[?] ~~, and~~ Find a single-purpose alternative, and ~~you~~ measure the benefits. ~~Okay?~~ You take the lesser of the two, subtract the separable costs, develop a ratio, and you got the basis for an allocation. Did I leave you there someplace?

Storey: Um-hmm. But don't worry about it.

Single-use Basis in the Benefit-Cost Analysis

Barbour: It's very simple to find. You say, "Okay. If you built this on a single-use basis, how much would it cost?" "Ten million bucks." "Now what are the benefits worth?" And you capitalize the benefits. You know how to do that? (Storey: Um-mmm.) It's a stream of benefits, you find the present worth of it. So you find a present worth of benefit, "Oh, that's \$6 million." So we use the lesser of the two which is \$6 million. Right? One's ten, one's six. You do that for every purpose, so you take the lesser of the two, which is called the justifiable expenditure, and develop a ratio. First, you can separate all those costs that you can identify with the purpose, like, [its] transmission line, the power[plant], the [canals] ~~ditch~~, you know, for irrigation, a picnic table for recreation, etc. You could take those out and allocate [them] ~~it~~ directly [to those purposes]. So now the remaining is what we call the remaining joint costs, and you take the residuals of this, the lesser of the two, [which is] ~~what's~~ called the justifiable expenditure, and then you develop a ratio. And it'll be twenty-, thirty-, forty [percent], whatever, and you [divide] ~~divvy~~ up the joint costs that way. (Storey: Um-hmm.)

"We thought we were going to solve all the water problems of the world . . . with nuclear reactors, using the heat for desalination . . ."

Now, if you're starting in this new field that we were looking at. We [thought we] were going to solve all the [water] problems of the world, the Colorado River, and the West, and the water shortage in Arizona, and California ~~, and so forth~~, with nuclear reactors, using the heat for desalination, large-scale desalination. The ~~salination part of it~~, desalination part of it used heat. And of course you'd generate electricity with heat. Now, you've got to have heat, so you [can] boil the water. So you have to take it out at a temperature where it'll boil water. ~~But, when you build a=~~ You're [dealing with] ~~looking at~~ high temperatures, and high pressures.

"So, what you do is you . . . pull the heat off a *little* bit before you *normally* would. Consequently you disadvantage the power generation . . ."

So, what you do is you pull the [heat away from the production of] power, you pull the heat off a *little* bit before you *normally* [would] do. Consequently you disadvantage the power generation [somewhat], so you can give heat to the water (Storey: Um-hmm.) [production.] ~~generation.~~ Now the question is, [how do] you ~~got to~~ allocate costs of this nuclear reactor between electricity and water. So they [asked,] ~~say,~~ “Hey, how are you going to do that?” You know, I said, “Well.” (Laugh) “We’ve never done this before, but I think we can figure out a way.” So, I [consulted] ~~got~~ a heat engineer and I [asked,] ~~says,~~ “Well, heat is valuable because it does work. Is that right?” And what is it called, entropy? Or something like that? And I [said,] ~~says,~~ “~~Because it does work, right?~~ Now, if you had a generator, and you used *all* the heat right down to where it does no more work, ~~and it’s,~~ then you ~~, you know, get rid of it.~~” ~~You~~ exhaust it, I think, at ninety-[seven] ~~something~~ degrees. I can’t remember the number anyway. But now we’re going to [withdraw heat] . . . ~~pull it at—I don’t know.~~ What’s boiling water? What’s it take to boil water? A hundred and eighty?

Storey: Oh, I don’t—212 is it?

Barbour: Two-twelve? Anyway, if you pull it off at 240, or 250, then what are you going to [lose is some potential for generating electric power—] ~~use?~~ ~~So, they figured out~~ the ability of heat to do work. And, of course, [that ability] it goes down to practically zero when they exhaust it. (Storey: Um-hmm.) So, they call it entropy, or something or another. So, this is what I developed as a way to allocate the costs between the two [using the potential of heat to do work]. And I [ask,] ~~says,~~ “Okay. How much of this heat did we use in desalting, and how much work could it have done ? ~~How much work has it done over here~~ for the electrical part of it?” [That could be the basis for using] ~~And we’d use~~ what we called ~~then a~~ “Use of Facilities Method,” [which was one of] ~~because there were~~ three methods you could use: the Alternative Justifiable Expenditure Method, the Alternative, ~~and it’s all the~~ Separable Cost Methods, and then the ~~Alternative Justifiable Expenditure Method, and the Use of Facility~~ [Method]. So, [I] ~~we~~ developed a cost-allocation procedure to deal with these dual-purpose nuclear reactors [using the ability of heat to do work as a basis for allocating costs], which was an innovation. Nobody had done it. And the Bureau [got involved] ~~here,~~ ~~you know, this is what, because we’re getting~~ into these new fields, because of ~~one,~~ mostly one [man,] ~~guy,~~ Emil Lindseth, who got us *moving* into these new fields. “Let’s look at these possibilities.” And that’s why, when we did all those alternative studies we [looked at] ~~had~~ nuclear powerplants, and we had desalination plants.

This was in the, these were in those *marvelous* innovative years of the [early] ‘70s. See, in the ‘60s you had the environmental movement begin to bloom. (Storey: Um-hmm.) So, you had the Environmental Protection Act. You had the Water Quality Act, towards the end of the ‘60s. Then you had the Water Resources Council [formulating] ~~begin to form.~~ *All* new procedures.

In the 1970s “Here’s the situation, we’re just about out of water and now we’re developing the most complicated set of rules on how to plan it, after most of it’s already planned and gone. . . .”

~~People were taking a lot of=~~ Here’s the situation, we’re just about out of water and

now we're developing the most (Laugh) ~~the most~~ complicated set of rules on how to plan it, after most of it's already planned and gone. (Storey: Uh-huh.) [New sources of water had to be found.] We spent a *lot* of time and effort in committees, and *national* groups, and this is one of them. You know, we took them on this little trip here. (taps table)

Storey: Out to Rainbow Bridge? You mentioned that last time.

Barbour: Out to Rainbow. Yeah. We had ~~=and then, not only that, we~~ developed [new] these procedures, you know, very sophisticated procedures that recognized environmental quality, *water* quality [as well as the conventional purposes.] ~~and all of those things.~~

“ . . . we were getting very very sophisticated at a point in time when we're running out of water. . . . ”

Social impacts, and we were getting very very sophisticated at a point in time when we're running out of water. Well, maybe that's the time to be sophisticated. And so we even [set up] ~~got~~ international groups, the International Water Resources Association got involved, and they thought we were doing a great job.

Development of the Guidelines on How to Implement Multiple Objective Planning³⁷

And so, I told you that I got about forty or fifty [water resource people got] ~~guys~~ together from all the agencies and we put together what we called the “Yellow Book,” [which provided] guidelines on how to implement multiple-objective planning.

International Attention for the *Guidelines*

And, the United Nations liked it, and we got *invited* to India, and the Philippines, United Nation's Water Resource Council's meetings, and [I was asked to make] ~~made~~ presentation[s] on how you [performed] ~~did this~~ multiple-objective planning. ~~And now~~ [How] you plan for more than just economic efficiency. You [could also] plan for regional development [to] ~~—You know—~~ create more jobs; and plan for social well being to help people. [Those] ~~That~~ would be the primary objective[s]. [You could also plan] ~~Or you,~~ environmental [quality.] ~~protection;~~ You might build a reservoir just [to preserve a rare] ~~for~~ fishery or something like that. But, that didn't last long. (Storey: Um-hmm.) We got a [group of water resource people] ~~bunch of guys~~ together and we did several test projects on how that might work, and we evaluated [the various plans and effects] ~~them and so forth;~~ and sent those forward to the Water Resources Council.

“The Bureau was . . . on the forefront in those days, in water resources planning. . . . ”

~~But~~ The Bureau was ~~, you know, it was~~ on the forefront in those days, in water resources planning. And, the Corps, I believe, was jealous of ~~hated~~ us [because of] ~~for~~

37. In 1973 the U.S. Water Resources Council published the *Guidelines for Implementing Principles and Standards for Multiobjective Planning of Water Resources*.

it.

Reclamation Was Given the Westwide Study

And then, when [Reclamation was given the] ~~they got this~~ Westwide Study, which was to develop water plans for the eleven western states, on a *multi-agency* basis, and we were the lead agency, that really [irked] ~~killed~~ them.

Storey: When was that?

Barbour: This was in the late '60s, early '70s. And, we ~~knew they~~ got this big authorization for money to do it, starting with, I think, several million dollars[.] ~~;~~ and It was supposed to ultimately [cost closer to] ~~be~~ \$20 million [.] ~~;~~ or something. ~~And so then, we had got~~ Wally Christiansen [was selected] to head it up; and [given a staff.] ~~were going to give him a staff.~~ And where are they going to get the staff from? Of course, from the ~~old,~~ the Bureau of Reclamation [and other agencies]. And, so, then several of us were ordered by the commissioner to go serve. We were concerned about this, you know, we knew it couldn't have a long life. You know, a special study, working with all these agencies—what's going to happen at the end of it, you know? (Storey: Um-hmm.) Nevertheless, we got orders from the commissioner—"Barbour ~~will be assigned to that.~~ and Ken Kauffman will [be] assigned to that; Wally Christiansen would head it up. And we got several [other] people assigned to this group. So, then we set out as a multi-agency group [with representatives from most of the water agencies]. We had our offices up on the thirteenth floor.

Storey: Of Building 67?

Barbour: *This* building. And, we had the corner office. The *nice* one, you know, the [one] that's at the *northwest* corner. (Storey: Um-hmm.) We had those offices. ~~And then,~~ We had offices for Geological Survey, Fish and Wildlife, National Park Service.

Staffers from Many Agencies and Bureaus Participated in the Westwide Study

We [also asked] ~~even let the poor old~~ Corps [representatives to] ~~guys~~ come in and [join us.] ~~sit at a desk for a while,~~ Corps of Engineer ~~guys,~~ but ~~they,~~ we had a couple of guys here that were kind of sabotaging our efforts. Well, maybe, I don't know that they really . . . well, We were trying to do these broad [comprehensive] ~~;~~ grandiose plans for the eleven western states. We ~~selected,~~ we talked to *all* the state engineers, [and] ~~the~~ head[s] of the water resources department[s], and we had representatives from every state, and we had selected teams for each state. (Storey: Um-hmm.) And, [had] ~~have~~ them write [up] of their critical [water] problems[.] ~~;~~ and that sort of thing. ~~And,~~ It was really an innovation for the Bureau, and [showed] ~~showing~~ some leadership in water resources planning.

Scoop Jackson Prevented the Westwide Study Looking at the Columbia River

And we did that from about '69, '70, through about '72, or '73, when finally [funding was terminated.] ~~they cut us off.~~ ~~They says,~~ [It was said,] Well, the politics wasn't

good, and then finally ~~when~~ we were looking, (Laugh) we looked at plans of even bringing water from the (Laugh) Columbia River into [the Colorado.] ~~of course~~. When that idea came up [Senator Henry M. (Scoop)] Jackson got this moratorium [passed saying] ~~and said~~ “You cannot touch the Columbia. You ~~guys~~ can study the Colorado River, and you can study all these other [alternatives] ~~funny things~~ if you want to: rainmaking, and desalination of water, and all [those other exotic plans.] ~~that kind of stuff~~. You could even look at bringing water [in from the north.]” You remember we talked about bringing water from Canada, and then moving water along the coast, and a pipeline from northern California to southern California. (Storey: Uh-huh.) We looked at floating icebergs down [from Alaska]. [Some of us called it ~~And, we really had the~~ “science fiction.” The Bureau was doing some fun things in those days.

Storey: And were they using economists in those studies?

Headed Economics, Environmental, and Social Groups

Barbour: Oh, well, ~~see, you know, well~~, that was my job. I had the responsibility for ~~all~~ the economic studies. And, [I] also had the responsibility for ~~the environmental~~. ~~I had~~ an environmental group, and the economics group. George Wallen, I had *helped* bring over from the Fish and Wildlife Service. ~~And~~ George headed up the environmental group. And then, we brought in, [for the first time for the Bureau,] ~~a, the only time~~, a social psychologist, Dr. Adams. You know Darrell Adams? (Storey: Um-hmm.) We brought him to look at ~~the~~ public involvement, and the social aspects, because we had, we were trying to implement the *Principles and Standards*.³⁸ That was a requirement—~~that we~~, when we ran the study we had to implement the *Principles and Standards*, and develop procedures to implement them. That was a part of our effort.

Storey: So, what were the *Principles and Standards*?

Barbour: Well, they are principles and standards of water planning.

Storey: And where did those come from?

Barbour: Well, the Water Resources Council.

Storey: Okay.

Barbour: ~~And~~ They were *published*, in the Federal Register, and all agencies, *supposedly*, had to follow them. ~~And~~, We were given the job of *interpreting* those in the Westwide Study, and that’s when I put together implementing instructions for the *Principles and Standards*. ~~And that’s, you know~~, I should have brought you a [copy of the] “Yellow Book,” it’s about [three-quarters of an inch] ~~this~~ thick. ~~And we finally~~, and I edited ~~the thing~~, and put it together at the very end. In fact, [for] doing that work, I got the [Interior Department] Silver Medal[.] ~~for that, ultimately~~. ~~Is that silver?~~ It should have been a gold of course. (Laugh) But, that’s the top medal, isn’t it?

38. U.S. Water Resources Council. *Principles and Standards for Planning Water and Related Land Resources*. 38 *Federal Register* 24778–24862, September 10, 1973.

Storey: This is one of the awards?

Barbour: Yeah. Are you familiar with the silver?

Storey: Something like a Distinguished Service Award?

Barbour: It is, except the highest one is gold, and the [silver is] second highest[.] ~~the highest in the Bureau, then it goes to the departmental level. Second is silver.~~ (Storey: Um-hmm.) [Also the Bureau can give] ~~And then you get this~~ outstanding performance [citations, which I received.] ~~thing, that you get. And, so . . .~~

Storey: And you say this, these *Standards* were about an inch thick, huh?

Barbour: [Yes—it took a lot of ~~Oh yeah, well, I don't know. We worked hard~~ [work].

Storey: Maybe a little larger?

Barbour: I had about forty or fifty people who [working] ~~tried, everybody trying~~ to put it together[.] ~~so~~ I [did the economics, edited, and finally put it together [at] in the very end. And we had procedures for evaluating social well being. And Darrell Adams helped a lot in developing this, in analyzing [the] this use of a scale of one to ten. (Storey: Um-hmm.) ~~Not only looking at Social aspects—but~~ those things that you couldn't measure in terms of dollar and cents ~~we~~ would [be] measure[d] on a scale [of 0 to 10]. And, we would use a system where you'd [involve] ~~get~~ a multi-disciplinary group. [For example,] ~~And~~ if you were going to measure environmental impacts, we'd have categories like "opening green space, would be one. And, if you wanted to [determine whether] ~~see, well~~ this is good, bad, or indifferent, [regarding] ~~what were~~ the impacts on opening [and] green space [,] ? ~~And~~ then you would get a multi-disciplinary group together, (Storey: Um-hmm.) and sit in a room, and say, "Okay. Let's put a [value] ~~mark~~ on this. Everybody do it separately. Zero or one being the low, and ten being the highest. [Ten] if it's the best thing you ~~ever~~ knew of, [and 0 if it s the worst.]" ~~or the best thing you ever . . ."~~

END OF SIDE 2, TAPE 1. JUNE 24, 2003.

BEGIN SIDE 1, TAPE 2. JUNE 24, 2003

Storey: This is Brit Storey, Senior Historian at the Bureau of Reclamation, interviewing Ed Barbour on June the 24th, 2003. This is tape two.

[Don't] think it's worth much, you go to a lower rating?

Barbour: Right. ~~And then,~~ we would do that [with a] ~~and then~~ multi-disciplinary group, we really emphasized the multi-disciplinary planning, tried to bring all aspects involved, environmental people, biologists, engineers, economists, and so forth. This was the *essence* of multiple-objective planning. You're looking at multiple objectives—and you're looking at all aspects of planning. ~~So then,~~ You could develop a system, which we did, in evaluating environmental quality—[a] ~~The~~ rating system. And then if you got a multi-disciplinary group to [do] ~~get~~ it, it's surprising. You get some central

tendencies[.] ~~there, you know.~~ All of them [If all the ratings] are up on the scale, then it must be pretty good. ~~If everybody's up here on the higher scale.~~ (Storey: Um-hmm.) You have unanimity [of] opinion[.] ~~there, you know.~~ If it's on the lower scale it wasn't so hot. And you could do that for a lot of things you couldn't [measure in] ~~put~~ dollars and cents. Some things you could measure numerically, that you couldn't measure with dollars and cents, like water quality, things like that. You can go out and, you know, check the quality, and sedimentation, and [other factors.] ~~all those kind of things.~~

Measured Four Different “Accounts:” National and Regional Economic Development, Environmental Quality, and Social Well-being

~~But,~~ We had a four-account system, and *one* [which was] ~~measured economic, what we called national economic development, which was kind of dollar and cents measure of impacts on income, directly; and regional development, which were the secondary effects, jobs and [other growth factors.] that kind of stuff.~~ And then we had environmental quality, how did [you evaluate] ~~it affect that?~~ And then we had social well being, Darrell's favorite subject, how do you [evaluate] ~~affect that?~~ And you could do that through public involvement meetings, and [other non-monetary approaches.] ~~lots of things.~~ And that's, you know, Darrell did very well in public involvement. [Do] you know he did the manual on it (Storey: Um-hmm.) when we were working together? In fact, he spent ~~about~~ several million dollars of our research program on that, developing procedures. ~~And the guy~~ He hired, Dave Creighton³⁹ [who] has now got his own [consulting] business[.] ~~and I still~~ get his letters. And he's doing work all over the country, [inn fact,] all over the world, in *public* involvement. And, Darrell ~~had~~ got him started with us[.] ~~but we had the one, Bureau,~~ Can you imagine that[, the Bureau of Reclamation published] ~~put out one of the best public-involvement manuals for any, and that any agency has ever used.~~ (Storey: Um-hmm.)

We did some real good things there in the '70s—innovative things. Then, with the change in administration, less emphasis on social effects, and [other intangibles,] ~~those sort of things,~~ the Principles and Standards were modified so that ~~you could only plan, you can plan for objective,~~ you could plan mostly for economic development, and some consideration [given] to environmental quality. But, before, we said, “Look[, for example,] ~~—~~ If there's an area . . .” and you tried to do two or three plans, one that would emphasize economics, it would be a tight plan, and get high repayment, high benefit-cost ratio. Or you might modify it to include more social [effects], more jobs or there might be an Indian reservation, or there might be lots of unemployment. So, its make-work [projects you could add.] ~~stuff you could put in there.~~ That would be the social well being objective that you were serving [and also ~~—~~ ~~Or, you had~~ regional development, which was also to provide income, and jobs, and business development [as] on a secondary [effect.] ~~not directly, but indirectly.~~ And We [developed an] ~~all had~~ account system to measure all these effects. But, that [was abandoned.] ~~went down the drain.~~ [It was] They decided that these [indirect effects]

39. Referring to James L. Creighton who authored *Public Involvement Manual : Involving the Public in Water and Power Resources Decisions* (1980); *Procedures for Alternative Futures Planning*, (1976); and, with others, *Public Involvement Techniques : A Reader of Ten Years Experience at the Institute for Water Resources*, (1983).

~~other things, yes you could~~ [be] evaluate[d,] ~~them~~ but you did primarily one plan, which [emphasized] ~~was~~ economic efficiency. By that time we [had] run out of projects anyway. (Storey: Um-hmm.)

You know, by that time there were only two to three major dam sites left, in the country. There's one on the Columbia River. What's the name of that site? I thought I'd never forget it. Of course there are ones on the Colorado, that I told you about, that there's *no way* you're going to ever develop those, Bridge Canyon, Marble Canyon (or Walapai, they called it). ~~So, those were out.~~ And, on the American River we had Auburn, which [was] ~~they~~ stopped. Remember Auburn site? (Storey: Um-hmm.) Remember we got ~~at~~ the foundation ready to go, and everything? I did the *power* studies there to show [that] ~~what,~~ and it was going to be a *good* peaking-power facility[.] ~~there, at Auburn site.~~ Well, ~~but=~~ they had [Auburn] ~~the thing~~ under construction[, but it was abandoned]. ~~So, there were no sites left.~~

“ . . . the environmental movement was strong enough, you know, there were not going to be many more dams . . . ”

And then, the environmental movement was strong enough, you know, there [were] ~~'re~~ are not going to be [many] ~~any~~ more dams, and I don't think we've built ~~many,~~ any since. So, ~~the whole=~~ what do I want to call it? the whole *outlook* of the Bureau changed, and we were always talking about ~~always having these meetings,~~ “ what ~~should be our~~ goals and objectives [should be] ~~, you know,~~ in the Bureau?” And we finally narrowed them down to water management, you know, and water conservation, [with consideration given to] ~~and~~ environmental quality enhancements, and that sort of thing.

“ . . . where we are today . . . objectives of the Bureau, now it's to get more out of what you've got . . . ”

And where we are today, what, when you look at your objectives of the Bureau, now it's to get more out of what you've got today. (Storey: Um-hmm.) Better water management, better hydroelectric power management, and so forth. And that's, that's because ~~one, because the~~ [dam] sites [have been used or are not acceptable.] ~~are gone.~~

“ . . . there are still some projects left to be done, but I don't' think the *Bureau* will build them. . . . ”

And there are still some projects left to be done, but I don't' think the *Bureau* will build them. Now, you might, just like we know that the city of, county of Denver had to build Dillon.

“ . . . Reclamation did all the plans for . . . Denver's Dillon Reservoir. . . . ”

~~We did,~~ The Bureau of Reclamation did all the plans ~~and everything~~ for [Denver's] ~~the~~ Dillon Reservoir. ~~And, that was the=~~ In fact, I worked on one of the first projects, the Blue [River]-South Platte Project. But, there was no way [the Bureau could overcome the objections of the local interests].

Two Forks Was One of Reclamation's Projects

And then when Two Forks came along, that was one of our projects. And, ~~boy,~~ I tell you, when you went to one of those public meetings and you were the Bureau (Laugh) you had to look out. Larry Nelson was telling me, he conducted one of those public meetings, and he “nearly got run out of there,” he said.

Storey: Larry who?

Barbour: Nelson. He was working at the region, and he was doing ~~some~~ planning on the Platte River. Well, now they wished they had the project, you know—Two Forks. (Storey: Um-hmm.) They could use it. But ~~then~~ the Environmental Protection Agency, you know, finally was the straw that broke the back of the developers. ~~See, finally,~~ The city and the counties, and everybody got together and they were going to build it, and they [prepared an] ~~did this~~ extremely costly environmental impact statement.

Finally EPA Ruled Against Two Forks

And finally the EPA ruled against it. (Storey: Yeah.) And they couldn't overcome that. That ~~td~~ [would have] been a nice reservoir. And, Denver would be better off. ~~And,~~ That stretch of the river, which I always fish[ed], which I love[d] to fish, ~~it~~ wasn't as much fun as it was anymore, with all those floaters coming down, and [crowds] ~~all kinds~~ of people along the shores, and wild parties[.] ~~, and things.~~ So, it didn't turn [out] to be as pristine a stretch [of] ~~as~~ river as you might think. (Storey: Hmm.)

“But, those are kind of the heyday, when we were still building projects. Those were the fun days of the Bureau. . . .”

But, those are kind of the heyday, when we were still building projects[.] ~~, and~~ Those were the fun days of the Bureau. And, now you [know how it is,] ~~got a=well,~~ ~~you are,~~ you are at the Commissioner's level now.

Storey: Well, about three steps removed, yeah.

Grant Bloodgood

Barbour: Yeah. So when did they [reorganize the Bureau?] ~~, I wonder when they did, when did they do that?~~ You know, we were always separate, apart. And it was headed by the chief engineer. (Storey: Um-hmm.) And he was very very powerful. We had a [man] ~~guy~~ by the name of [Grant] Bloodgood. I guess you've probably heard of Bloodgood.

Storey: Grant Bloodgood.

Barbour: Grant Bloodgood. I had one of my first trips to Washington, ~~and I was,~~ I think it was early in the '60s or so. ~~And~~ I was working on the Central Arizona Project, which opened a lot of doors for me, because it was a very important project. They sent me [to Washington] ~~out there~~ to redo the cost allocation [and] ~~;~~ take a look [at] ~~;~~ ~~do~~ the

financial analysis[.] ~~and so forth.~~ And it was a very sensitive project. So, I would go to Washington and work on it. ~~And so~~ I had gone to the assistant secretary's office to work with some of their economists on the project, because Stewart Udall[, being from Arizona, was very interested in the project.] ~~that was his baby, you know.~~

Bloodgood Told Him to Never Transfer to the Washington, D.C., Office

So, I had been down to the ~~Secretary's, the~~ Secretary's Office, and I was in the elevator and Grant Bloodgood, I remember Grant Bloodgood was in there. He said, "Hey. You work in my office?" I [said,] ~~says,~~ "Sure I do." I think he knew my name, I'm not sure. He [said] ~~says,~~ "Son. I want to give you a little advice. Whatever you do, *never* transfer to this damn place." ~~He says,~~ "They'll *drive* you crazy." ~~(Laugh)~~ ~~He says,~~ "I can't, Hell, every time I come over here I can hardly wait to leave." (Laugh) I'll never forget it. I'm just a young guy, you know. I thought this was really great stuff. He [added,] ~~says,~~ "Just stay out of Washington as much as you can." (Laugh) And I had a lot of opportunities to transfer out there—I never did.

Subsidies in Reclamation Projects

Storey: Hmm. Let's talk a little more about subsidy.

Barbour: Subsidies?

Storey: I don't quite understand what subsidy is. You were saying maybe there was \$500, maybe there was a \$1000 subsidy. Does that mean a \$1000 an acre (Barbour: An acre.) that wouldn't be repaid?

Barbour: Someone else would be paying for it, theoretically. If it was a part of a project, a basin project. Then you'd use power revenues, in your payout study, and you had to show that each project would pay out in a certain period of time, (Storey: Um-hmm.) usually fifty years. So, you would normally contract for irrigation repayment for forty years, and then assume [that it would] ~~and~~ extend it another ten years. And then, what *wasn't* paid for, you would borrow funds, so to speak, ~~or~~ from revenues generated by electric power, and [thus] show a payout of that project. So, *that* was a subsidy. So the irrigators might pay [\$1 an acre,] ~~like \$168, even if it was \$2 an acre,~~ times forty years, [or a total of] ~~it's~~ \$80 an acre. Okay? (Storey: Um-hmm.) And the [project] ~~things~~ costs \$600 an acre to build, or \$1000 an acre, some of them did. So, you see it needed [about \$500] ~~\$800~~ or \$900 worth of subsidy.

Storey: Okay.

Barbour: So then, ~~you~~ simply, if it was part of the Missouri Basin Project, and we did these long payout studies, we ~~just~~ scheduled *all* the projects [year by year.] ~~and~~ When [irrigation projects] ~~they~~ needed help we'd schedule the [necessary] revenues. In the meantime, we had to pay the power off too, within a *specific* period of time, *with interest*. So, you had to be sure that the revenues were great enough to pay off the power investment, and also pay the irrigation investment. So, one of the first things I

did in the Chief's Office was work on the Missouri Basin Project⁴⁰ Payout Study, which [included] ~~was like~~ several hundred projects. ~~And then,~~ Many of the projects, the powerplants were developed by the Corps of Engineers, but they were part of the Missouri River Basin Project. (Storey: Um-hmm.)

Debate with the Corps of Engineers about How Much of Pick-Sloan Missouri Basin Program Costs to Allocate to Flood Control and Navigation

And so, this is why I [told] ~~tell~~ you we had the battle about cost allocation with the Corps of Engineers, on the mainstem. They [did not] ~~wouldn't allocate~~ as much to flood control as we thought they should—which was non-reimbursable[,] [for] ~~—And~~ the more they allocated to flood control, of course, the less [the reimbursable functions] ~~we~~ had to pay. Less was available to allocate to power, less available to allocate to irrigation. Now, they had navigation and flood control, both of which [are] non-reimbursable. (Storey: Um-hmm.) ~~And,~~ What they ~~did is they assumed,~~ they built [was] ~~what?~~ three or four, ~~three or four~~ mainstem reservoirs?

Storey: Yeah, like Garrison and Oahe, and Fork Peck.

Barbour: And I used to be able to name them all. So we put all of those in the project. ~~And~~ Then, I'd look at the cost allocation and say, "Hey. You know, I don't think this allocation is very fair. How did you minimize these, [these] ~~this~~ allocation[s] to navigation and flood control when the reason you ~~guys~~ built it, and ~~the reason that you~~ got authorization [was for those] ~~, is they were the predominant purposes.~~ ~~That's why you did it.~~" (Storey: Um-hmm.) "That's why they had the Corps [build these.] ~~do it.~~ Now, why is your allocation so minimal to those purposes?" "Well, we assume[d] that if we had one big dam, we could control most of the floods. And so all of ~~that, and so~~ ~~we could produce all~~ the benefits [could be produced] by maybe one or two dams, instead of [the] three or four dams that were actually built." So, when they did the cost allocation, since I told you it was limited by the single-purpose alternative, or the benefits. Well, they [assumed only] ~~had us~~ one or two [dams] ~~reservoirs,~~ and that [were low cost] ~~was cheap~~ to build [for] a single [purpose flood control] dam[s] when [they actually] ~~you~~ built three or four. So that [assumption would establish what] ~~would be the restriction.~~ ~~That would be the maximum that you could allocate [to flood control].~~

“ . . . we never did win. Because the Corps was much more powerful than we were. . . . ”

So, we had an argument, a discussion, a very heated discussion, and we had a guy, who was head of Power Division, by the name of Bennett? Assistant—what's his last name? [Newcomb B.] "Buzz" Bennett? Buzz? Anyway, he was head of the Power Division, and he was assistant commissioner, head of Power[.] ~~, and so then~~ [When] I told him that, ~~so~~ he carried on a correspondence with the Corps arguing about cost allocation, but we never did win. Because the Corps was much more powerful than we were.

40. Officially known as the Pick-Sloan Missouri Basin Program (PSMBP).

Storey: We had to use their allocations?

Barbour: We had to use their flood control benefits, and their allocations.

Storey: Now, . . .

“ . . . their flood control benefits were large, but if you capitalized those benefits you can make a large allocation to flood control, but it was *limited* by the single-purpose alternative that would serve the same purpose. . . .”

Barbour: But their flood control benefits were [large,] *great*, but if you capitalized those [benefits] you can make a [large] *huge* allocation [to flood control], but it was *limited* by the single-purpose alternative that would serve the same purpose. See?

Storey: So, would the allocation to flood control be part of the subsidy?

Barbour: ~~Sure. No. No.~~ It would be that part that's written off. So, if the . . .

Storey: So, the subsidy, this concept of subsidy only applies to the repayable part (Barbour: Correct.) of the costs? Is that right?

Barbour: Correct.

Storey: Okay.

Barbour: In other words, a purpose that couldn't carry it's own weight. Now, municipal-industrial water supply is supposed to be repaid, with interest, in fifty years.

Storey: The whole thing?

Barbour: Yeah. Whatever is assigned to them.

Storey: Yeah.

Barbour: Whatever is *allocated* to them. And, in those days recreation was non-reimbursable, but in some earlier cases you weren't allowed to allocate much of the joint cost to recreation. That changed later. Fish and wildlife was considered non-reimbursable, and in some instances, especially if salmon was involved, or something like that, it would be an allocation to it. But that wasn't allowed earlier, in the authorizing documents for this, the Missouri Basin Project. So, that left flood control and navigation as non-reimbursable, and then all the irrigation and power, which was the other two big [purposes.] ~~things~~. There [was] ~~were~~ very little municipal water in the Missouri Basin Projects. (Storey: Yeah.) Very little.

Doing Payout Studies for the Pick-Sloan Missouri Basin Program

So, we had to then use power, and we'd had to adjust the rates, and project the rates out in the future, so there would be enough revenues so that we could show that the

Missouri River Basin Project would pay out. Well, it took so long [before all] ~~;~~and the projects came online, that the total payout period would go for hundred—I remember it was 126 years, or something. Because, you’d have to show that each one paid within fifty years of its own individual life[.] ~~;~~you know? (Storey: Uh-huh.) So, you’d schedule them in. ~~And then you’d just;~~ It was a very complicated analysis. I remember, in those days we didn’t have computers, and you’d do these payout studies [by hand] that went for a hundred-[plus] ~~and-something~~ years, and you’d have to figure the operating costs for each year, the interest cost for each year, the revenues, and then what’s left over you pay the interest, ~~and then you put~~ the balance on the principal. ~~And, if you made one;~~ And the thing had to balance, and [if] you made one little mistake ~~;~~you know, you’d have to do the whole damn thing over again. ~~And;~~ It was all cranked out ~~;~~you know, by hand. (Storey: Um-hmm.) Because, I remember that was one of the first jobs I had when I moved over to ~~the chief engineer’s, I mean,~~ ~~yeah;~~ the chief engineer’s office, was working the payout studies, [for] ~~on~~ the Missouri River Basin Project. And, that’s how I got involved in payout studies, and that’s how ultimately we ended up, [John] Eyer and I [were] ~~;~~ responsible for all the payout studies in the Bureau. (Storey: Um-hmm.) We put an annual report out, showing the payout of all the projects, and ~~we’d have~~ the regions [would] update it [every year].

Storey: So, let’s see if I understand this. You have project costs that don’t have to be repaid? And you have a *group* of project costs that do have to be repaid?

Barbour: [Yes] ~~Well and~~ some with interest, and some without interest.

Storey: Some with interest, some without, some allocated to power, some allocated to irrigation, maybe some M & I, whatever.

Barbour: Right. Right.

Storey: So, the *non-reimbursable* costs are just paid out of the [Department of the] Treasury?

Barbour: Right.

Storey: And, the reimbursable costs . . . ?

Barbour: Of course we don’t know that, but that’s what the assumption is.

Storey: And the reimbur . . .

~~Barbour: They’re not repaid.~~

Storey: And the reimbursable costs have to be repaid, but the subsidy comes in where a part of the *reimbursable* income (Barbour: [Power] ~~Irrigation~~ mostly.) is applied to one of the *other* reimbursable costs?

Barbour: Right. Correct.

Storey: Okay. Interesting.

Very High Subsidy on the Fruitland Mesa Project

Barbour: Oh yeah. That's a basic concept that anybody that worked for the Bureau of Reclamation [during that] ~~on that, in the last, well, in those~~ period of time subsidy was a big argument. How much—then they'd say, "How much can we subsidize irrigation?" And then I told you that one time that I got in trouble with ~~the, not the Animas, well Animas-La Plata[.] was a killer too. It was=~~ The subsidy was extremely high. I mentioned the project the other day[.] ~~now I can't remember it.~~ Anyway I figured what it would take, the subsidy that each farmer would receive [at] Fruitland Mesa. And, it [seemed] got so high that ~~I, you know, regardless~~ of where the funds came from it just didn't seem appropriate [to me]. It was a[bout a] *million* dollars [per] a rancher. ~~To provide irrigation for them, we would subsidize a million dollars. I says, "Well, you know all you have to do is give him [I think if you had given each one of them] one-tenth of that [they'd have been] and he'd be very happy. And, if He didn't have to irrigate."~~ (Storey: Um-hmm.) But anyway, I then wrote this blue [envelope]⁴¹ memo to Washington and, saying that "I don't [think] ~~know~~ this is [feasible.]" . . ." ~~it was authorized. Good old Aspinall, you know, when he, when he found . . .~~ [The politicians were not happy with me, and I came close to being fired.]

Storey: That was part of the Central Arizona authorization?

Barbour: Yeah. The Colorado River Basin Project, and so [Aspinall] ~~he~~ got his projects.

Storey: Yeah. Colorado River Basin Projects there.

Barbour: So, he got his five projects [as] ~~No, that's part of the Glen Canyon [authorization].~~⁴²

Storey: Oh. That's the earlier one.

Barbour: The Upper Basin.

Storey: That's the earlier authorization. Yeah.

Barbour: ~~The Upper Basin was out, so they got, so Utah got Flaming Gorge. They had a big meeting.~~ Utah got Flaming Gorge, and of course Glen Canyon got authorized, and a lot of other projects. The ~~five~~ Colorado project[s were included. Among them were] ~~includes~~ Animas La-Plata, Fruitland Mesa, and . . .

Storey: That would be CRSP (generally spoken as "crisp"), Colorado River Basin Storage Project?

Barbour: Correct.

Storey: And, what? Authorized about '56, as I recall?

41. "Blue envelope" is a term used in Reclamation for blue envelopes which are used to transmit something to a person. Only the person to whom the blue envelope is addressed is supposed to open it.

42. The Colorado River Storage Project was authorized in 1956.

Randy Riter Took Him to Salt Lake City to Discuss the Allocation on One of the Projects

Barbour: Yeah. That's when I told you I did one of my first [major] cost allocation [studies.] ~~things.~~ I found that the allocation on one of the projects didn't make sense, and Randy Riter, head of the division [agreed.] ~~thought,~~ I wrote a[n internal] ~~little~~ memo [that was] ~~, and my boss, well we sent it up~~ forward. So then he took me to Salt Lake City to, ~~you know,~~ to discuss that allocation. ~~So that's how I first (Laugh) became known as the~~ ~~I didn't like the looks of the allocation.~~ I said, "It didn't make sense." I found that the amount they were allocating to a particular purpose just didn't make any sense, so. (Storey: Um-hmm.) ~~Not that allocation itself=~~ [Even though] it's going to be [somewhat] arbitrary *still* it ought to make some sense compared to why the project was authorized. If it was authorized primarily for power and you allocated three percent or five percent to power, and the rest to fish and wildlife, or flood, or something else, something's screwy. When everybody perceived the benefits were from *power*, and that's why you're developing it, then, in my estimation, *most* of the cost should be assigned to power. (Storey: Um-hmm.) That [was] ~~'s what~~ your justification for building the project. And [so if] we had a municipal-industrial water supply project where ~~if a city needed the water,~~ ~~they needed~~ storage, and we built the project for them, and they're supposed to repay it, ~~of course,~~ and then they did the cost allocation and allocated more than half to recreation, "Wait a minute," [you'd have to say.] ~~You know?~~ (Storey: Um-hmm.) I won't tell you the name of that project, but I lost that one. I said, "This is ridiculous. [The city] ~~These guys~~ can afford to pay *three* times that much for water." I says, "It's a gimmicky cost allocation. I'll never agree to that."

Even When He Found the Cost Allocation Inappropriate, Projects Were Sometime Approved

Well, the supporters of the project, *they* liked [the cost allocation] ~~it~~ very much. (Storey: Um-hmm.) And, of course, they told the Commissioner they liked the project very much, and boy we got quick authorization, for that one. Terrific deal for them. They could have paid two or three times more for the water.

Storey: So, your certification was not required, in other words?

Barbour: Oh, I always commented on them[, but I was simply a] ~~. But, why, heck no, this~~ technician out in Denver?

Storey: Well, there's a difference between commenting and saying, "Yeah. This is appropriate." Right?

Barbour: Well, you comment that ~~"This doesn't make any,~~ that this is not appropriate because of these factors," you know[,] ~~and then they rule on it,~~ *but you can,* in that particular instance, there *were* great recreation benefits because *they're* [the project was] right near the town. (Storey: Uh-huh.) So who's going to benefit? The people that lived in town, (Storey: Yeah.) in those days. ~~Oh, you could allocate,~~ If you got authorization, you could allocate ~~it's~~ non-reimbursable—fish and wildlife, and recreation.

Storey: And this . . .

Barbour: Great fishing. Great recreation. It's just like Chatfield. Well, no, because that's not—this is like Cheesman. (Storey: Um-hmm.) Well, they don't use a lot of recreation, but you can see the recreation potential there. Right close to Denver. We'll say, "Okay. You let us build it we'll allocate two-thirds of it to recreation, and fish and wildlife."

Storey: So, Reclamation would go in, say, and say . . .

Barbour: They wouldn't.

Storey: "We've got this project."

Barbour: Right.

Storey: "And we're planning to allocate this much to M & I, and this much to" (Barbour: Right.) "fish and wildlife."

Barbour: And then you go for authorization. Right. Get all the supporters.

Storey: And if the Congress approves it, it's done.

Barbour: ~~And with those numbers in it. So it has to go for authorization. See?~~ But, we get the reconnaissance-level report, where they do the first cut. So, we have [to review it.] ~~a crack at it there.~~ And then we [can review] ~~have a crack at it~~ at the later stage, you know, when it's, the justification report [used for] ~~—~~(Storey: Uh-huh.) ~~The~~ authorization[.] report. And so, when that goes forward, ~~see, then, if it goes forward~~ with this [large] ~~wonderful~~ allocation [to non-reimbursable] in it, you know, that benefits the local folks[.] ; Well they're going to like it the best, obviously. And, there's really no one who would want to, and if the rules are so loose and it says, "Well, you *could* do this," but there are so many assumptions that goes into that. (Storey: Um-hmm.) On the measurement of benefits, because you can't allocate more than the benefits. Well, there're so many municipal users, they're going to use the reservoir for recreation too. The benefits were quite high. And there's a matter of measuring the value—the benefits per [recreational] user a day. And then, on the other hand it was limited by the alternative costs. Suppose you built [the reservoir] ~~something strictly~~ for recreation. What would it cost? So, [there are] ~~you had those things that could, and there's~~ a lot of things you could do with those assumptions, to see whether they were reasonable or not. *But*, once they're in the authorization report, and get authorized [a certain] ~~that way [it can't be changed.] ; and that's . . .~~

Storey: Then you're done.

Barbour: That's [when the technical reviewer in Denver, as me, can step in and say] ~~a step that I stepped in. I said,~~ "Wait a minute. The government could [supply] ~~get=~~ the water [at a] ~~could be very very~~ reasonable [rate], and ~~the government~~ would still get a ~~much significant,~~ a significantly higher repayment for the project [if the cost allocation

produced reasonable numbers].” But the [personnel in] ~~folk, the people in the regional, in the district office [are] ;they’re~~ working with the local people and they want [the project] ~~it~~ to look as attractive as possible. I could see their viewpoint. “~~Look[,]~~ ~~Well,~~ this is a great reservoir, [with] ~~and~~ a lot of recreational benefits. You get your municipal water, and you get it [at a lower cost than if you built it yourself because we can write off large amounts of costs as non-reimbursable to recreation and fish and wildlife.] ~~;look at it.~~ We make some rough [studies.”] ~~numbers here, and it’s only gonna cost. . . .”~~ Well, are they going to support it? They’ve got all their people going to Washington, testifying what a great project it is, and some economist in Denver says, “Wait a minute. ~~We think~~ You ought to pay, maybe, twice as much.” (Storey: Um-hmm.) “Or at least fifty percent more, because it’s not quite fair to the taxpayer.” How popular do you think you would be?

Storey: But, that never goes to the Congress, then?

The Economic Review Is an Internal Matter Not Presented to Congress with the Legislation

Barbour: Oh no. No. ~~That was,~~ That’s an internal matter, you know. Review them, and comment on them, and Washington set the policy. We did the technical studies.

Storey: Wasn’t there a law that said you had to have a, a cost-benefit ratio of at least 1:1?

Barbour: Not at all. That was policy.

Storey: It was policy?

“Most of the [irrigation] projects in the Missouri River Basin Project . . . had a benefit-cost ratio of less than unity when they were built. . . . I know, because I did them. . . . the benefits there really were indirect. . . .”

Barbour: We authorized a lot of projects. Most of the projects in the Missouri River Basin Project, the irrigation project, had a benefit-cost ratio of less than unity when they were built. (Storey: Um-hmm.) I know, because I did them. And it was okay. [Many of the] ~~The~~ benefits there really were indirect[, which were not included]. They, you know, ~~they were,~~ these rural communities were losing population. They were, you know, some very substantial, what I call ‘regional development benefits’ involved. (Storey: Um-hmm.) Social benefits involved, and those were called indirect benefits. But, you weren’t supposed to use those in doing the benefit-cost ratio. And, that’s why ~~we developed the water,~~ later we developed this multiple-objective planning [approach] ~~thing,~~ and added [the regional development and social development] objectives, so that you could measure these things, and add them to it. And so, Congress could say, “Okay. Based on *strictly* economic efficiency, it may be .6:1, but [if] you look at all these other [indirect] effects, we can justify that.” But, the Congress didn’t care. They’d say, they’d like to see it 1:1, at least. And so, there was a lot of pressure [on]. ~~So,~~ the economists[.] ~~and, there are only,~~ In those days [to reach at least unity of benefits and losses there were about] ~~like~~ fifty or sixty economists in the Bureau, and [about] ~~like~~ 4,000 engineers and construction people,

and they were interested in building projects, obviously.

Storey: Well, you were, after you left McCook you were here in Denver?

Barbour: Yeah. I transferred to Denver.

Storey: So, each of the regions also had economists?

Barbour: Oh, they had a chief economist, in every region[, each with a small staff].

Storey: So, did you find yourself in situations where there were disagreements between Denver and the regions?

Barbour: Oh. Absolutely.

Storey: And, what was the focus of those, generally?

END OF SIDE 1, TAPE 2. JUNE 24, 2003.

BEGIN OF SIDE 2, TAPE 2. JUNE 24, 2003.

Looked at Economic, Social, Environmental, and Lands Issues and Provided Comments to the Chief Engineer's Office

Barbour: The [focus was on whether the] analysis made good sense. You know? (Storey: Um-hmm.) [Was it] ~~it was~~ reasonable[?]- That it *complied* with ~~whatever~~ manuals and ~~so forth~~, procedures. And that it added up, so to speak. And so, in my office, we had the technical review authority. The Commissioner's Office would wait for our technical review, and we'd make our comments. Chief Engineer would write his comments on the project. *All* aspects. The design, the engineering, and then of course the economics. And that's where I got involved, is the economics. And, there, later, I had the responsibility for all the technical studies on ~~the~~ economics. Well, I had them for the other aspects too, there towards the end, but since ~~I was~~ economics was my thing I probably spent more time on that than the environmental aspects, [where] ~~and~~ I'd rely on George Wallen, [and] ~~or~~ [Darrell] Adams to look at the social aspects[. We also had] ~~and then we had a lands group~~, a land resources group [which looked] ~~and they look~~ at the land quality to be sure they weren't irrigating some [poor] ~~to use~~ lands, too. (Storey: Um-hmm.) So, we had to look at *all* aspects of it. But, the economics, you know—you know what they say, "It's a matter of opinion." That's why ~~you like~~ the subject [could be challenged], because the answer is a matter of opinion. But, still, you know, we had some rules, and I felt they ought to make sense.

“... once we got our comments to the Commissioner's Office . . . they looked at it from a *policy* standpoint. . . . they might override some of those comments, or . . . from a *policy* standpoint, make some modifications. . . .”

But, once we got our comments to the Commissioner's Office, then they looked at it from a *policy* standpoint. See? (Storey: Um-hmm.) And, so they might override some of those comments, or they ~~don't~~, might not agree with them, and they could,

from a *policy* standpoint, ~~they might~~ make some modifications.

Applied for the Job of Chief Economist, but a Person with Broader Experience Was Chosen

~~But, we had, in those day, way~~ Back when in the Central Arizona Project days, we had a[chief economist] ~~guy~~ there who had a drinking problem. He [had gotten the job as chief economist which I had applied for when I was in the Kansas River District Office in Nebraska.,] ~~'s the guy that got the job—I applied for the chief economist when I—nobody else wanted it, except this other fellow, who got it. I told you~~ He had more experience in some of the other purposes such as power and municipal water] than I did. I was glad he got it, because I got to end up in the chief engineer's [office].

“So, I ended up with the technical responsibility of the economic studies, and he was over in the policy end. . . .”

So, I ended up with the technical responsibility of [the] economic [studies,] ~~study~~; and he was over [in] ~~on~~ the policy end.

Storey: Uh-huh. In Washington D.C.?

Barbour: In Washington D.C.

Storey: When was that, that you applied for that job? Do you remember?

Barbour: When was it?

Storey: Yeah.

Barbour: Oh, this had to be, I was in McCook, Nebraska, it had to be about 1955, or something like that.

Storey: Oh, so you applied from McCook?

Barbour: From McCook.

Storey: Oh. Okay.

Barbour: Can you imagine a neophyte economist, with just experience in the McCook office, and [it] ~~the only, we~~ was down to two of us. He came from the Sacramento regional office, and he had experience with power, and all the [other purposes.] ~~others~~. I only had experience with irrigation and—I did some power work, because I was giving [the Corps of Engineers] ~~them~~ a hard time about the way [they] ~~we~~ allocated power projects. So, I learned a lot about [thermal] power—coal generation, gas generation. I [learned] ~~knew all~~ the costs[, and] ~~on that sort of thing, because~~ I would argue about how they allocated costs on the Missouri Basin [using these costs as a basis].

By Applying for the Chief Economist Job He Received Some Recognition

But, anyway, he got the job, but that gave me a little bit of recognition, so I ultimately, when a job came open in the Chief Engineer's Office, I applied for it and got it.

“ . . . I was just starting out, but . . . [for] the Central Arizona Project—they would send him out, but . . . [he] stayed in the hotel a good share of the time. So, I took on the full responsibility for the economics. That was a real break for me . . . ”

So, then he was top dog over here, and I was just starting out, but ~~when~~, by the time they got to the Central Arizona Project—they would send him out, but unfortunately, he had a drinking problem [and stayed] ~~so he holed up pretty much~~ in the hotel a good share of the time. So, I took on the full responsibility [for the economics]. That was a real break for me, because then, when ~~there were~~ any important people [such as] ~~came out there~~, assistant secretaries, commissioner, assistant commissioners, [came] ~~and so forth~~, to talk about the project, well I was [able to respond and] ~~running~~ the studies [they requested]. (Storey: Um-hmm.) And there was *no one* [else], I mean *no one*, that knew the details of the economic studies[.] ~~; but me.~~

“ . . . although . . . [economics] didn't seem important to a lot of engineering people, . . . economics is *extremely* important at the Washington level. . . . ”

And, although it [didn't] ~~doesn't~~ seem important to a lot of engineering people, ~~that~~ economics is ~~important~~, it's *extremely* important at the Washington level. So, that was a real break for me. And, that's why I got invited to brief the secretary of interior. (Storey: Um-hmm.) And, I was the ~~lowest~~ man [with the lowest grade at] ~~on the totem pole~~, in the meeting.

Storey: Well now, when you moved to Denver, were you on the staff? Or were you heading a staff?

Barbour: Oh no. I was just the lowest [graded] staff member [there].

Storey: Uh-huh. Tell me about your first promotion.

Boss Thought He Needed More Experience Before He Received a Grade Increase

Barbour: Well, let's see[,] ~~That was, I think I got a Grade Eleven, and~~ I think I was probably ~~was~~ a Grade Eleven. And, I was doing research, [reviewed regional reports,] and ~~then~~ I got involved in all these special projects and I thought I deserved a promotion, but I had a boss that felt I ought to spend a lot more time in the job, and I was young, and so forth, and so on.

Washington, D.C., Office Supported Promotion to a GS-12

[But,] ~~So~~, I got a lot of support from Washington [because of my special studies.] ~~and sure enough~~ I got a grade increase.

Storey: To a twelve?

Barbour: To a twelve.

Storey: Were you then supervising?

Received a GS-13

Barbour: ~~And then, and then when we went over=~~ I wasn't supervising anyone—at that time. And then, when [I was assigned to] ~~we had~~ the Westwide Studies ~~my~~, the head of the [Economics Section] ~~office~~ was a thirteen at that time, as I recall. Then *I* got a thirteen to move over to the Westwide Studies[.] ~~, because of going over there.~~ And when I got involved—well, no, that's not true. I'm trying to think.

Promotion to a GS-14 Ordered by the Commissioner

My, I'm a little bit [confused here]— because I remember getting my promotion to a fourteen, because it was *ordered* by the Commissioner, [for] ~~because of~~ the work I had done in that meeting with the Secretary of Interior [on the Central Arizona Project (CAP)]. So I'm a little bit fuzzy here. ~~So,~~ That had to be [about] 1968[.] ~~, or something like that. So,~~ I'd followed [CAP] it all through the [pre-]authorization process. Oh, what happened was, after that meeting [in the secretary's office], Dan Dreyfus, I told you, was there representing the Commissioner's Office, and I [representing te chief engineer's office on the economics of the CAP, which I had put together and which included over twenty alternatives.] ~~, were~~ [Dan and I had the lowest grades ~~the only lower down guys in~~ there. [He was a 14 and I was a 13.] ~~I mean low-grade guys.~~ All the rest of them were the commissioner, assistant commissioners, division heads. And, this buddy of mine, ~~who was~~ Jim Casey, [who was the assistant to the Planning Division chief.] ~~always kind of looked after me. I always helped him too.~~ He was a brilliant guy[, but not very diplomatic]. ~~A most undiplomatic guy in the world.~~ He could have been commissioner himself. ~~He was a brilliant guy.~~ [Earlier during the meeting on the CAP,] ~~But,~~ when the secretary of interior thanked us for the job that we had done, ~~and he said,~~ the secretary said, "I want you to do something for the boys." [The] ~~And later,~~ commissioner had [responded] ~~commented to Casey, or something or another, and he says,~~ "Well, I already gave Dan a fourteen. ~~He's already a fourteen.~~ I'll just upgrade his job." ~~He says, and then this friend of mine who was my support, and he said,~~ [When Casey was discussing the secretary's CAP meeting with the commissioner he said "Do you know who the lowest grade guy in that meeting was?" And he says, "Ed," he said, "What grade is he?" [Casey] He said, "A thirteen." [The commissioner replied] ~~He says,~~ "Well, tell [Denver] ~~them~~ to give him a fourteen." Just like that. Well, it got some resistance [in Denver] ~~over it~~ because my supervisor, then, was a fourteen. But anyway, that's how I got my grade.

Carried His GS-14 over to Westwide

And then when we went over to Westwide I carried that grade over. [When] ~~Westwide,~~ we came back, then there [wasn't] ~~were~~n't many room for many fourteens. [There was an existent] ~~They were head of a=~~ Economics Branch ~~was~~ headed by a fourteen[.] [That job was moved to research.] ~~, but they,~~ [Warren] Fairchild

reorganized the place, [to] put us, get us back in the Bureau from [the] Westwide [group].

Storey: Warren Fairchild?

Brought Back from Westwide to Head the Resource Analysis Group

Barbour: Warren Fairchild —~~And so, he~~ said “I’m going to let you head up economics over there, but I want you to take over more than that. I want you to have the environmental part.” So, by then, I took over what [was] ~~they call[ed the]~~ a Resource Analysis [Branch,] ~~group,~~ which had the economics, environmental[,] ~~=I thought there was, “Gee. All these disciplines are going to be rough.”~~ soils[,] ~~people,~~ public [involvement, and] ~~social, whatever the thing was that, we had the social factors [units.] [the social and public involvement was headed by]~~ ~~I guess is what we called it, group, which is~~ Darrell Adams. (Storey: Um-hmm.) We had the environmental group, which was [headed by] George Wallen. And then we had Bill Peters heading up the [soils,] ~~lands,~~ and then we had a land use [planning] group, which didn’t last very long[.] ~~=land use planning group.~~ And we had [an employee] ~~a guy~~ by the name of Dunn come in and do that. And then of course we had the Economics Section.

Storey: This would have been about when?

Barbour: This was about, oh, ‘73, ‘74, when we got reorganized. Consequently there were [employees in the previous branch who] ~~people around that had economics, and so forth, and they were moved aside~~ into other jobs. [Some] ~~They~~ were very unhappy about it. (Storey: Um-hmm.) ~~I can see that.~~ I could see that.

Promoted Section Heads in the Resource Analysis Group to GS-14s

~~But, I was able,~~ I felt, all of these sections ~~that I had~~ in my branch were important enough [that I helped get them all graded at the fourteen level.] ~~so I got them all promoted up to fourteens.~~ So, George Wallen, and Darrell Adams, and my economics group were all raised. So, I was head of the group, of three [GS-]14 section heads.

Started Pushing for a GS-15 for Himself

So, that’s when I got, started pushing for a fifteen, to head up that branch, because I had the [responsibility of supervising these three sections.]

Storey: And this was a branch or a division?

Barbour: Branch.

Storey: Okay.

Barbour: A division head, then, was [a] sixteen. (Storey: Um-hmm.) At that time. But, they were able to get the hydrology [branch] upgraded [upgraded to a level 15, but not my branch.] ~~but they never could get mine.~~

“Since assistant commissioner Fairchild had indicated that my branch would be upgraded, it seemed to take a long time. . . .”

[Since assistant commissioner Fairchild had indicated that my branch would be upgraded,] ~~They promised to get mine upgraded. I thought they had promised to get it, but~~ it seemed to take a long time.

Decided to Retire When Offered a Job Outside Reclamation

So, ~~when~~ I finally decided—things had changed a lot, [organizationally, and] *politically* ~~things have changed.~~ the whole water resources [establishment] ~~thing~~ was changing. This was [in the] ‘80s[.] , 1980, and so forth. (Storey: Um-hmm.) And, [Reclamation was not] ~~they weren’t~~ looking at [its] ~~this~~ broad-planning aspects[, and] ~~of things.~~ it wasn’t that much of a challenge to me anymore, [and since] ~~so~~ I got this offer [in the private sector where I] ~~to—I figured retirement,~~ could earn Social Security, and I could work half-time ~~—I got this offer to go~~ with a private engineering group, as their chief economist[, I decided to retire]. ~~And~~ They had started to process a Grade Fifteen, when ~~they,~~ when I told them “Well, I wanted to go look around.” But, [it was] ~~they were~~ going to do it on a either a temporary [or some other interim] ~~, or some kind of a basis[.] , they were going to try to do that for me, because~~ [Apparently] they had heard from Washington, I guess, that they should do something about it.

Gave Nine Days Notice Even Though They Were Processing a Promotion to GS-15

But then, when I got this [private] offer I [decided to give] ~~says, I gave~~ them nine days notice [that I was retiring.] ~~and decided=~~ I did it ~~, probably,~~ in a hurry[, and] ~~—I~~ probably should have stayed on, and ~~then . . .~~ (Laugh) (Storey: Um-hmm.) got[ten] the year in, or whatever it is, at the higher [grade.] ~~rate.~~ But, I never had any regrets.

“Things had changed so much that there just wasn’t the challenge anymore. . . .”

Things had changed so much [that] there just wasn’t the challenge anymore.

Storey: You retired in?

Retired in 1981, with Thirty-four Years of Service, to Work for Tudor Engineering

Barbour: ‘81.

Storey: So, you had about thirty-one years of service?

Barbour: Yes, [plus] ~~I had~~ Army time. I had three years of [military service.] ~~Army.~~

Storey: So that’s thirty-four.

Barbour: Military. So I [was credited with] ~~had~~ thirty-four years of service. And, it was a nice retirement, and I was fifty-seven. I was still going to work.

Worked Half-time after Retirement

And so I'd agreed to work half-time, and [Tudor Engineering] they put me on payroll, and gave me health benefits, [and other benefits,] ~~all kinds of stuff~~, and Keogh Plan, and it was nice. (Storey: Um-hmm.)

“ . . . then I only had to work half-time, and I was earning just as much as if I worked full time . . . ”

And so, then I only had to work half-time, and I was earning just as much as if I worked full time, [also I was getting credit for] ~~and I was working on my~~ Social Security as well. So, financially it worked out [very well], although, you know, salaries really went up after that. So, I did that for ~~for, a couple~~ three or four years, and then I went on my own. Tudor Engineering was who I worked with, and then they weren't getting the studies they [needed], to keep the full[-time] staff going. They asked me to go on ~~as~~ strictly a private consulting basis, which I did ~~instead of a~~, which worked out [very] ~~reat~~ well.

Then Left Tudor Engineering and Went Strictly on His Own Working a Lot with Stone and Webster

Then I went strictly on my own. Then I could take jobs with others. (Storey: Um-hmm.) So I took a job with Stone & Webster, and then I ended up working more with Stone & Webster than I did with Tudor. So, I did a lot of work with Stone & Webster (Storey: Yeah.) until I hit about seventy, and then I quit.

Wally Chirstiansen

Storey: Could you tell me more about Wally Christiansen?

Wally Christiansen was “the best immediate boss that I ever had. . . .”

Barbour: Wonderful guy, and he *always* was on the fringe [of knowledge] looking for [new] ~~to~~ things. He always pushed us to get new ideas, and bring in new people, and he was wonderful to work with. In fact, probably one of the best bosses –the best [immediate] ~~boss, direct~~ boss, that I ever had. He gave you the leeway and the independence that you needed to do things. He was very receptive of [new] ideas, and he was stimulating. And, we had a big challenge, then we worked hard at it, put in our own time if we needed to. And he developed a comradeship there among both the men and the women. We worked together as a unit. He was able to work with *all* these other agencies, very diplomatic. Good guy. One of the best guys I've ever worked for.

Storey: What did he do when he came back to Reclamation?

After Westwide Christiansen Retired

Barbour: Well, he headed up Westwide, and after that he retired.

Storey: Oh, he retired at the end of Westwide?

Barbour: He [had] headed up the San Bernardino Office. He was the planning officer[-] ~~He was, I guess~~ it was a planning office[.] (Storey: Um-hmm.) ~~but he headed up San Bernardino Office.~~ And I had done a *little* work for him [in earlier days]. I used to go out on special assignments, and I met a lot of the people out in the field that way. Because if they had a special problem, they would call me in. So, that's when I got to know him.

Storey: Now, was George Wallen on Westwide also?

George Wallen

Barbour: Yes. We hired him from the Fish and Wildlife Service. Heard about him. Looked at his [biology background and] what he could do. ~~And so,~~ He was going to work with me, and so we hired him. And, he was good.

Storey: He was a, what? A wildlife biologist?

Barbour: Fish-yeah.

Storey: Fish biologist?

Darrell Adams

Barbour: Fish biologist. So, he handled all of our environmental studies [and] environmental impact statements[.] ~~and all that.~~ That was his responsibility. (Storey: Um-hmm.) And then we found Darrell [Adams]. He was a [social psychology] professor out at the University of Denver, and we brought him in. [Christiansen] encouraged me to hire, ~~Christiansen~~ wanted me to get some people outside the Bureau, get new blood in there, which is a wonderful idea. And so I did. And then he encouraged me to hire a Dr. Schaeffer, who had a Ph.D. in economics, and he [turned out to be] ~~was~~ more of an environmentalist because he was quite negative about development. I ~~kind of~~ had a hard time [understanding] ~~with~~ Dr. Schaeffer. (Storey: Um-hmm.) And [he and we were] ~~finally was very~~ happy when he transferred out, after a little [encouragement.] ~~pressure.~~

Storey: Where did he transfer out to? Do you know?

Barbour: But he was so environmentally oriented, and he's supposed to do economic studies, you know, and he was very negative for any developmental projects. Smart guy. He ~~used,~~ he taught at [Fort Lewis College in] Durango. I went over and interviewed him. And, you know, teachers, professors don't get pretty good pay, and we hired him as, I think, a grade thirteen. That was good pay. And he liked the idea of the Westwide Studies. And, Wally encouraged me, although I had others, that applied for the job, within the Bureau, he wanted to bring someone from the outside. But, that didn't work out too well.

Storey: Hmm. Was Christiansen older than you?

Barbour: Oh yeah.

Storey: Do you know if he's alive.

Barbour: Yes. He is.

Storey: Where is he?

Barbour: He's moved. He's, was in southern California. He was at San Berna[rdino] . . .-but he's, I probably have his address. He's a guy who would be wonderful [to interview], but I don't think he would travel. You may have to go and talk to him, but he would be great. He's had a, one of these *pacers* [pacemakers] for years, and years, and years. In fact, I think he had it when he was working here, and he survived it. (Storey: Um-hmm.) And, I hear from him, ~~we hear from him~~ every year, and I haven't heard from him recently. I heard from him at Christmas time.

Storey: Yeah. Hmm. So, anything else we ought to talk about?

Barbour: No, I, as far as I'm concerned, unless you have some questions about, [the] ~~you know~~, evolution of some of what's going on [in the Bureau.], that I can't think of. I haven't followed the Bureau, once I left, of what they were doing, ~~and so forth~~, but I can say that I had some wonderful experiences with the Bureau, and they gave me some wonderful opportunities to do things, and work at levels I had never expected to work. (Storey: Um-hmm.)

Hell's Canyon and the Rampart Project in Alaska

To be able to go to conferences, to represent the secretary, [at] ~~and~~ hearings, and to testify for the secretary on some *extremely* controversial projects, like the Middle Snake I told you about, [Sheep] High Mountain. (Storey: Yeah.) About Hell's Canyon, then the Rampart Project. When [Interior] ~~we~~ opposed that I got to work on that, and just about *every* one of the controversial projects.

Storey: Well, tell me more about Rampart, because the way Floyd Dominy tells it, he went to a hearing in Alaska and said, "Oh this is a crummy project. There isn't anybody to take the power. There isn't anybody to take the water. Why are you even thinking about it?"

Barbour: Yeah. We provided him with that data. We had another fellow that was working on it. I'm trying to think what his name was. They wanted me to do the economic studies, and the alternatives to Rampart Project. And, of course, the Fish and Wildlife Service did the studies on the impact on the refuges, and the duck habitat.

Storey: Yeah. This would have been in the '60s, I believe.

Barbour: Yeah. And so I . . .

Storey: And geese habitat, I'll bet?

Barbour: It was really fascinating. I did nuclear, looked at nuclear plants sited in Alaska, but gas and coal [were] ~~was~~ plentiful. And I looked at developing powerplants to serve all the major cities there, and how much it would cost compared to Rampart. We ~~;~~ worked with our power people and they did transmission line estimates, to haul the power into Canada and the United States. [Also] ~~And so, I used that. And then~~ I used load projections ~~;~~ ~~and so forth~~, to show that ~~;~~ ~~you know~~, this could be a white elephant for a long time.

Storey: Why would [Reclamation] be looking at Rampart. It wasn't our project.

Secretary of the Interior Opposed the Rampart Project and Dominy Took Point on the Issue

Barbour: We weren't. Well, because Secretary of Interior didn't like it. So, he said, "Hey Dominy, we can't [let this happen,]" ~~;~~ ~~you know, . . .~~" and especially his Fish and Wildlife [Service] people, and all the environmentalists were going *nuts* about it. (Storey: Uh-huh.) But, the Corps was so powerful they were pushing it ahead. So, it wasn't our project. We had [hydropower] projects in Alaska, which ~~;~~ we studied.

"We had some pretty good projects, several of which have been built by the Alaska Power Authority. In fact, I worked with Alaska Power Authority on some of their local projects. . . ."

We had some pretty good projects, several of which have been built by the Alaska Power Authority. In fact, I worked with Alaska Power Authority on some of their local projects. (Storey: Uh-huh.) And I did that with Tudor Engineering, incidentally. We developed some small projects for some of the natives, and small hydropower projects. That was a lot of fun. (Storey: Uh-huh.)

Small Hydropower Study of Reclamation and the Corps of Engineers

That was not with the Bureau experience, but my Bureau experience in developing small hydropower—you know there was a survey of small hydropower that the Bureau and the Corps of Engineer was involved, and there was Low-Head National Survey, and I was [asked to work with] ~~kind of [loaned] lent out to~~ the Corps of Engineers, as a consultant from the Bureau, and worked with them to develop the Low-Head Power Study.

Storey: When would that have been?

I ". . . went over as a consultant *from the Bureau*. And that's because I had established a reputation with the Corps, and the Federal Power Commission on power evaluations. . . ."

Barbour: Which is an inventory of all the low-head powerplants in this country, and I worked with ~~the Bureau~~, the Corps of Engineers in doing the economic studies. Oh, that

would be in '78 or '80[.] , or so forth. So, I worked on the National Power, there was a National Power Survey, and [went] I, they kind of let, they kind of got me over there, or let me go over as a consultant *from the Bureau*. And that's because I had established a reputation with the Corps, and the Federal Power Commission , and so forth, on power evaluations. (Storey: Um-hmm.)

“ . . . after I retired I prepared manuals for Western Area Power Administration, on how to evaluate power. . . . ”

And [several years after] ~~then when~~ I retired I [prepared] ~~did power value~~ manuals for Western [Area] Power Administration, on how to evaluate power. I [prepared] ~~did big~~ manuals, and they paid us well for it , over at Stone & Webster. So, and then they [also] hired us to [update] ~~do~~ the *Replacement Manual*. And we got paid well for it, and, we did a good job, too. (Storey: Um-hmm.) Although that was not my background, [it] ~~that~~ was a subject I enjoyed— energy economics, and it was so wild in those days. It was nuclear power, and light-water reactors, and fast-breeders, and solar power. We did economic ~~study—wind farms, did all the economic~~ studies on the wind farms.

Did Economic Studies on Wind Farms

Storey: Yeah, this would have been after the energy crisis, in the mid-'70s? Yeah.

Barbour: During that period. Oh yeah. So, wind was very costly in those days[.] , ~~but the wind farm thing, and they,~~ I did a study on that saying ~~that,~~ “No— we had to allocate a lot of [the cost as non-reimbursable to make it feasible.] ~~that to research.”~~

Economic Studies on Alternative Ways of Desalting Water

And, It was worth doing [it and] ~~if you only—and they~~ would be competitive—if you allocated maybe a third or a half of the costs [to research.] , ~~whatever it was.~~ And then, in desalination studies, we worked on reverse osmosis, and different means of desalining [desalting] water, and I used to do all the economic studies on that. (Storey: Um-hmm.) And Mike Bessler was involved in [engineering aspects of] that, and he and I used to go around[,] ~~and lecture,~~ and he'd lecture on the process, and I'd lecture on the economics of various ways (Storey: Hmm.) of desalination. It was really exciting.

Storey: Did you ever get involved in, what was, what was the weather modification project?

Barbour: Oh yes. With Dr. . . . ?

Storey: Project Sky-something?

Economic Studies on Weather Modification

Barbour: Well yeah, we did the economic studies on what it would cost, how much water [it] might [yield], ~~well you know, just how much—well~~ that was part of the Westwide

Studies. (Storey: Uh-huh.) Weather modification. I'm trying to think of the gentleman that ran that study. He was a marvelous man. Dr. . . . The most wonderful guy to work with. He was Howard Cohan's boss, I think. I think he headed the labs over there. (Storey: Yeah.) I worked with Howard. Do you know Howard Cohan?

Storey: No.

“That's what was so much fun is doing these special studies. . . .”

Barbour: He headed the labs? He had me do a study on the use of ~~radioactivity~~, radioactive materials to measure turbine efficiencies. (Storey: Uh-huh.) And, that report. It's someplace. I still have it. Boy, [it turned out that] we wouldn't touch that with a ten-foot pole [because of the danger of radioactivity to the operators.] ~~now~~. (Laugh) That's what was so much fun is doing these special studies. (Storey: Um-hmm.)

Storey: Any others that you remember?

Studies to Provide Fresh Water to the West

Barbour: Well, you know, let's see—~~What's~~, what exotic studies we did. Of course, I told you about the icebergs, and the fiberglass pipeline down the coast, and moving water from the Rocky Mountain Trench in Canada, all the way south. We did that one. Oh, we did a big study on, for Holum, on major . . .

Storey: Ken Holum?

Studying Development of a Power Transmission System from the Northwest to the Mississippi River

Barbour: Ken Holum. On major power transmission from the Northwest, all the way to the Mississippi River. We were going to provide a *major*, major transmission system. (Storey: Um-hmm.) And, I did the economic studies on that, but boy that wasn't, you know, [the private sector] ~~they~~ didn't want the federal government involved in that. We would have [used the system to take advantage of time and seasonal] ~~been, and if we'd only had that, to take care of the~~ diversities. And we evaluated the benefits of taking advantage of the diversities in the Northwest, you know, after you hook up the Southwest to it.

Texas Refused to Participate in Studies of the Western Power Grid

But there was *one* state we could not include, and that was the state of Texas. They would have *nothing* to do with the study. So ~~what we, so~~ we drew the line ~~on the~~, west of the Missouri River, ~~Missouri River~~, Mississippi River, I guess. And we provided a transmission system to serve everything but *Texas*[.] ~~It was a~~ major system. Integrated all the power. ~~And, those~~, That study [is around] ~~was~~ somewhere. (Storey: Hmm.)

Storey: It would have been a Reclamation grid?

Barbour: Well, we were involved. I don't know whether it would have been a Reclamation [grid]–Reclamation would have liked to have [sponsored] ~~done~~ it. (Storey: Um-hmm.)

Studies of DC Transmission

And, we did studies on ~~this~~ DC transmission, the economics of that. (Storey: Yeah.) Well you just name any major thing that was involved, we got involved, because there *always* had to be an economic study, and there *always* had to be a financial study. (Storey: Um-hmm.) Would it pay?

Made Presentations on Engineering Economics

And I used to have fun lecturing. I lectured all the young engineers that came in, and they'd want me to come in and talk to some of our designers[.] ~~and so forth, and why I'd give them a little~~ lecture on economics, engineering economics and the importance of ~~economic, engineering economics, and~~ sizing [projects]. And, so when you build something, you got to have some use for it, and it's got to make some sense. But, it's very important to be able to build it too. (Storey: Yeah.) And design it, there's a lot to *that*. The economics is: you need ~~that~~ to justify it, doing it, and you need it to compare [such things as] pumping versus gravity, and ~~efficient~~, the efficiencies of turbines[-] ; ~~and that sort of—and~~ I told you about the Third Powerplant [sizing studies.] ~~thing~~.

Incidentally, you talked to Fred Ruud didn't you?

Storey: Yeah.

Believes Fred Ruud Sent His Report on Large Generating Units to Harold Arthur and That Tipped the Scale on the Units at the Third Powerhouse

Barbour: When I went to the luncheon, and I was telling him that I was doing this [interview] ~~thing~~ with you, and I said "Did you tell Brit about the Third Powerplant?"

He said, "Yes. We had a nice discussion about the Third Power."

I says, "I hope you brought my little blue envelope in there. The thing you did over it." He Laughed. I don't know whether he did or not, but I still believe *he* was the one that sent a copy of my report to [Washington,] ~~Harold Arthur~~, what would justify the large units. But, the *politics* was in favor of the large unit. (Storey: Um-hmm.) The technical people wanted the safer, more conservative, the smaller units.

Storey: Yeah. It depends on who you talk to.

Barbour: And so the politicians had what they needed, and that was some kind of a justification. "Oh look. We have an economic study that [justifies the larger units.]" ~~shows that—~~ ²² (Storey: Um-hmm.) And ~~there was all presumed~~, based on the [assumptions that the designers,] ~~presumption that the technical guys~~, and the efficiency curves, and all those things were correctly done[.] ; ~~because~~ The larger units had to [approach the efficiency of] ~~spin faster than~~ the smaller units. (Storey: Um-hmm.)

Designers Worked Three Months on Small Generating Units for the Third Powerhouse Before They Were Switched to Designing the Large Units

So [the smaller units were] ~~that is~~ a more conservative approach to [design.] ~~it~~. And I told you they ~~did three months, they~~ spent [about] three months designing the ~~little, the~~ smaller units, until they got the orders to go to the larger units. And those were 600-megawatts. Later, the second set went to 700-megawatts.⁴³

Storey: Um-hmm. Yeah.

Fred Ruud and Turbine Design

Barbour: But, Fred was, he was one of the best [designers], he's really a sharpshooter. He was sort of [aggressive,] like *I* was, except in his own particular field of turbine design. And he's brilliant on that part of it. (Storey: Um-hmm.) So, we were two mavericks together. (Storey: Yeah.) When you [got] ~~get~~ us together on a problem, why we had a lot of fun. (Laugh) But, you know, that's kind of the way [it was]. You'd find in Reclamation you had guys on the fringe all over, in design, in any aspect of it. I always enjoyed working with [them, we] ~~oh I~~ had some marvelous people in the Bureau. You know, smart guys, easy to work with, and many of them on the fringe of knowledge too, you know. They stayed involved. (Storey: Um-hmm.) Good designers.

Storey: Yeah.

Barbour: Well, that's the good old days.

Storey: (Laugh) Good old days, huh?

Barbour: Now, I go to one of our retirement sessions, I look in among all those retirees I say, "Gee there's enough talent in this room, even though they're kind of old and decrepit, there's enough talent here we could go out and plan a pretty doggone good project again. Except it would have to be in South America."

Oh, we got involved in Thailand[—there was a] ~~—Did the~~ big project in Thailand. (Storey: Yeah.) And water [supply studies] in South America.

END OF SIDE 2, TAPE 2. JUNE 24, 2003.

BEGIN OF SIDE 1, TAPE 3. JUNE 24, 2003.

Storey: Tape three of an interview by Brit Storey, with Ed Barbour (Barbour: Oh is that . . .) on June 24, (Barbour: Well, this. . .) 2003.

Barbour: Well this is about the end.

43. "The Third Powerplant contains three generators nameplate rated at 600,000 kW but able to operate up to 690,000 kW, and three generators rated at 805,000 kW. . . ." The 805,000 generators have been uprated. Information found at http://www.usbr.gov/projects/Powerplant.jsp?fac_Name=Grand+Coulee+Powerplant at about 4:30 p.m. on February 10, 2010.

Aswan High Dam

Storey: Anyway, you were saying, they were talking about Aswan?

Barbour: Yeah. I think some of our people were, looked into that, Aswan, helping some of the (Storey: Yeah. We . . .) and then the Russians took over.

Storey: And then we went back and rehabilitated it in the late '90s.

Barbour: Did we?

Storey: Yeah.

Barbour: Yeah.

Storey: Had a major project.

Barbour: Then I thought, ~~I thought, was~~ George [Wallen was] involved in some of the environmental impacts of Aswan? There were some problem—you know they had, what was that below Aswan Dam?

Storey: I don't know.

Barbour: The Nile River. They had this terrible disease that was carried by—what was it carried by? A snail? Or something or another. It was spread along the Nile. Well, the Bureau, you know, was involved. There was no question. It was the top engineering [organization] in [its] ~~the~~ field. I think we outclassed the Corps of Engineers, as far as that was concerned—in those days.

“ . . . when you don't have any more dams to build, and no more projects to build, then you have to focus on other things. . . . ”

But, when ~~we~~, you don't have any more dams to build, and no more projects to build, then you have to focus on other things. (Storey: Um-hmm.) That's what they're doing now.

Storey: Did you see that coming, when you decided to retire in '81?

“ . . . the challenges weren't there, and the people had changed . . . ”

Barbour: Well, no, that, except the challenges weren't there, and the people had changed, and I [thought it was] ~~found that~~ “I think it's time to change.” (Storey: Um-hmm.) And that's probably one of the reasons I left, is that ~~we weren't~~, it wasn't [as much] ~~hardly any~~ fun anymore, as far as I was concerned. We weren't getting involved in new things, whether it was because of the leadership, or the times. I think it was a combination of the two. (Storey: Um-hmm.) I'm trying to think.

Storey: Well, you would . . .

Barbour: This was after Dominy. There was [Ellis] Armstrong, and I can't think of the guy. I keep thinking, trying to think of him.

Storey: I keep wanting to say Strauss but that's not it.

Barbour: I think he was from Idaho. Anyway, . . .

Storey: Stamm?

Barbour: No. Stamm was—before Stamm. I knew Stamm, Gil Stamm, quite well.

Storey: I think Gill Stamm, though, was the Commissioner after Ellis.

Barbour: Yeah, but before Stamm was, before . . .

Storey: And then it was Keith Higginson.

Keith Higginson

Barbour: Higginson. *Keith Higginson*. Keith is one—I really liked Keith. He's the guy that I told you that ~~we were~~; we needed someone to do power studies on the Colorado River, and Nelson Jacobs and I had been working together in the Westwide Studies, and we needed to get a, some good analysis on the Colorado River. And, we needed some good analysis on *power* systems, and so forth.

Mike Roluti

And I had worked with Mike Roluti at the Boulder City Office. (Storey: Uh-huh.) So, [Jacobson and I] ~~we~~ had lunch with Keith, and we told Keith, “We'd like to bring a guy out to help us with our studies, and his name is Mike Roluti, but we need get the position authorized[.]” ~~and so forth.~~²² *And*, he helped us get it set up. And we were able to bring Mike in. That was a wonderful move for us, and a wonderful move for the Bureau. Look how well he's done.

Storey: Um-hmm. Oh, he wasn't in Reclamation then?

Gene Hinds

Barbour: Oh yes. He was in the Boulder City office, (Storey: Uh-huh.) Regional office. And just like Gene Hinds, he was a young economist in the ~~Sacramento office. Not Sacramento, excuse me, the~~ Phoenix office. And, I needed some guys to help me, and I says, “Hey. I would like to have Gene Hinds to help me, and Tom Clark, two young economists.” Tom ended up as the head of the [Central Arizona Water] Conservancy District. Gene Hinds ended up, [as] ~~was it~~ regional director of what? [Region] Five, or . . .?⁴⁴ ~~Yeah, he was . . .~~

44. Eugene Hinds was regional director, from 1982-1988, in Amarillo, Texas, Region 5 (renamed the Southwest Region in 1972).

Storey: I don't know.

Barbour: Yeah.

Storey: Hinds is H-I-N-D-S?

Barbour: Yeah. H-I-N-D-S. Yeah.

Storey: Let's see. I was going to ask you a question about something that you mentioned. What was it? . . . You were talking about the Colorado River.

Barbour: About the desalination, or the . . . ?

Storey: No. I it was just now.

Barbour: Oh.

Jimmy Carter's Hit List

Storey: Oh! What I was going to ask you about, you were here when Carter's hit-list hit Reclamation. What effect did that have on us? And that reminds me of another question I need to ask you.

Barbour: Well, I was surprised. When Carter came in I thought he was going to be all positive about the program. In fact, ~~I was~~, I knew that there were some things that could be done in Reclamation [with] ~~and~~ some modification. I thought of maybe trying to contact his office, and see if I could help him with new instructions, or procedures, or that, which I thought would be an improvement in the way we operate, because I had worked on the *Principles and Standards*, ~~and so forth~~, and I thought ~~that there were~~, we had some good ideas going.

“ . . . he turned out to be so *negative* with the hit-list. Of course, it turned us all off. . . . ”

Then he turned out to be so *negative* [with] ~~in~~ the hit-list. Of course, it turned us all off. I couldn't *believe* how negative it was, you know. Of course, that turned me off on Carter's policies, because I thought they were rather extreme. Well, little did I know, way back when, that he didn't particularly like either the Corps *or* the Bureau. (Storey: Um-hmm.) And, ~~he was going to~~, he had thoughts of reducing those programs at the very beginning. But, I was surprised at Carter's reaction.⁴⁵

Failure of Teton Dam

Storey: Hmm. What about the failure of Teton Dam? What effect did that have on Reclamation, from your point of view?

45. For a different perspective on President Jimmy Carter's "hit list" see Reclamation's oral history interviews with Daniel (Dan) P. Beard, (revised edition 2009).

Barbour: Oh, of course, everybody was flabbergasted by it. We couldn't believe it could happen, you know. And, the devastation that occurred. And, I was trying to think, we got involved in some of the studies on repayment, and so forth, on the reimbursement.

Storey: On reimbursement of . . . ?

Barbour: For losses [below the dam,] ~~in the, you know.~~ I can't remember too much about the details of that. You know we made significant payments to all those that were damaged downstream. ~~No,~~ It was ~~sad.~~ a sad time. That was in—what year was that?

Storey: 1976.

Barbour: '76. Yeah. That was, that's when we—let's see. Carter was in . . .

Storey: Carter came in afterwards.

“That didn't help our reputation much. It was kind of downhill after the Teton failure . . .”

Barbour: Just afterwards? That didn't help our reputation much. It was kind of downhill after the Teton [failure—]—our reputation ~~from an,~~ especially from an engineering standpoint.

“But that point in time, you know there weren't many projects in the late '70s. . . .”

But that point in time, you know there weren't many projects in the late '70s. Central Arizona Project was under construction. Most major projects were [already] ~~going to be~~ built. Central Utah was still being completed. (Storey: Um-hmm.) There was some, I don't think there was much left on the American River. And they had shut down, at that time, Auburn [Dam]. And they were having drainage problems, salinity problems. We were having a *good* deal of problems with our projects at that point in time. (Storey: Um-hmm.) Well, that's just history. Ran out of projects. I mean, the mission had to change. That's no big surprise.

Storey: Hmm. You remember how people reacted to the failure of Teton?

Barbour: Well, I didn't get out in the field, so I couldn't tell you how the public reacted. But I know the . . .

Storey: Well, I mean Reclamation.

“We couldn't understand how it could have failed . . .”

Barbour: Well, they were all, like I said, everybody was saddened by it, and you know, wondered how it could happen. And, you know, trying to find just how it did happen. I guess you talked to Harold Arthur at great length about it? (Storey: Um-hmm.) And he was affected. We couldn't understand how it [could] ~~would~~ have failed, and how they missed grouting. I guess there was some holes in there that didn't get grouted

properly[,]— and so, undermined the dam. ~~Poor~~, I think Harold suffered considerably for it. ~~Who was that~~, I guess he signed off on the drawings. I don't remember too much of the details. I get involved in only that (Storey: Yeah.) [it affected our] reputation. I guess you've interviewed him at (Storey: Yeah.) great length?

Harold Arthur

Storey: Well, tell me about Harold Arthur. What was he like?

Barbour: Oh, he was great to work for. Wonderful to work for. And, he didn't mind talking to the guys he knew something about a particular subject. (Storey: Um-hmm.) You know, directly. He called you in the office and talked to you about an area that he knew that you might be an expert in[,] ~~, or something or another~~. And he appreciated ~~the fact~~, the economic study aspects of it. A lot of the engineers didn't necessarily [appreciate that side of it]. They were really concentrating on the construction, and design, and that sort of thing. So, he felt economics was an important part of it. So, I felt good about that. (Storey: Um-hmm.) ~~But he~~, He gave us some prominence there. And he relied on us [and] ~~I mean~~ asked us about the economic aspects of it.

Barney Bellport

Storey: Yeah. Before him, was Barney Bellport. What about Barney?

Barbour: Good. I liked Barney, and he was also—he had been a regional director, in Sacramento. So, ~~on~~ the economics [of] those projects were always important. When he testified he had to know *something* about the economics, so he's not strictly an engineering guy. He was a very broad person, having been a regional director, having to know all aspects of it. And, he was quite broad-minded, and I worked very well with Barney (Storey: Yeah.) on special projects.

Storey: Let's see, who was it before Barney?

Emil Lindseth

Barbour: Lindseth was his . . .

Storey: Yeah, Lindseth was never Chief Engineer.

Barbour: He was an assistant, and he could have been commissioner, and he could have been assistant secretary. But, he liked that secondary position and he always had such inside connections with [specially] industry, ~~and~~ GE, many of ~~them~~ the large companies, as well as within the Secretary's Office. (Storey: Yeah.) I really enjoyed working with Lindseth. ~~Well, this . . .~~

Rod Vissia

Storey: After Harold Arthur was Rod Vissia?

Barbour: There was Bob—no, let’s. Rod, yeah.

Storey: Rod Vissia. What was he like as chief engineer?

Barbour: Well, I didn’t know him very well. I was pretty much [not involved with Reclamation.] ~~=I think,~~ I’m trying to think when I left. When did Rod come in? I knew Rod because he was also from Sacramento.

Storey: He would have come in about ‘77.⁴⁶

Barbour: Was he a planner in Sacramento, at first?

Storey: I don’t remember.

Barbour: I know Rod was in Sacramento Office. Wasn’t he assistant regional director?

Storey: Well, he became regional director in Boise. He was there when . . .

Barbour: Oh. Before Keys? Or after Keys?

Storey: But he was the—no, before Keys. He was there when Teton failed.

John W. Keys III

Barbour: Yeah, Rod—Okay. Then John Keys. See, I worked with John in this office for a while. (Storey: Yeah.) I told you about John, taking him fishing? (Storey: Um-hmm.) Nearly drowned him once, (Laugh) in my little boat. But, I really enjoyed John Keys. I guess he’s having a good time up there now?

Storey: Yeah. Well, let’s see. There was Grant Bloodgood, we’ve already talked (Barbour: Yeah) about him?

Barbour: I thought Bellport followed Bloodgood.

Storey: How about S. O. Harper? Was he before your time?

Barbour: Yeah. It was Bloodgood, Bellport, and then Harold, wasn’t it?

Storey: Harold Arthur. Then Rod Vissia. Then Bob Jansen.⁴⁷

Barbour: I think I was gone when Rod—well Rod must have been here when I. . .

Storey: He came in about ‘77, ‘78.

46. While unofficially known as the “Chief Engineer,” Harold G. Arthur was the Director, Office of Design and Construction from 1972-1977; Robert B. Jansen assumed that title 1977-1978 and then the title Assistant Commissioner for Engineering and Research (ACER) 1978-1979; then Rodney (Rod) J. Vissia assumed that new title from 1980 to 1982.

47. Note that the interviewer had Vissia and Jansen out of chronological order in this discussion.

After the 1970s There Were Few New Projects

Barbour: Did he? I left in '81. So, he must have been here in this office. But, in those day[s], ~~after that~~, after those years, the '70s, where we had all these exciting things going, the sizing of new projects, and so forth, we didn't have many projects. (Storey: Um-hmm.) There weren't many new projects, and most were operating problems, and design problems, and then we tried to get into ~~=I did get involved in restoration~~ [reclamation] of mines.

Lands Group Worked on Reclamation of Coal Mines

I had a group, in this lands group, of Reclamation of coal mine areas. (Storey: Um-hmm.) And my lands group did work in that particular field. That was kind of interesting. But not too exciting. I'm trying to think of any other new exciting thing.

“ . . . by then we weren't doing any more nuclear desalting studies, . . . working with Mexico on desalting plants, . . . doing major transbasin diversions, and . . . moving power from the Northwest to the Southwest. And, the big things were just about over. . . . ”

Of course ~~we weren't~~, by then we weren't doing any more nuclear desalting [studies], and we weren't working with Mexico on desalting plants, and we weren't doing major transbasin diversions, and we weren't moving power from the Northwest to the Southwest. And, the big things were just (Storey: Yeah.) about over.

Storey: Yeah. Now, of course, in '80 Reagan was elected President, and became President in early '81?

Barbour: Right. And that's . . .

Storey: Did that effect Reclamation, that you saw?

Reagan Administration Modified the *Principles and Guidelines* and Planning Became Mostly Single Purpose

Barbour: I couldn't tell too much, except that I knew it'd affect the way we analyzed the project. He up and modified the *Principles and Guidelines*, and Reagan became more conservative, as I recall. And we were down to not, mostly a single objective, rather than multiple-objective planning. (Storey: Um-hmm.) And, it was more restrictive planning.

“In the '80s, at the beginning of the '80s, late '70s. You know, our large projects were all underway, and there were no major new projects that I know of. . . . ”

And, it kind of fit the times as ~~that~~, we [had] run out of [new] projects at that point in time anyway. In the '80s, at the beginning of the '80s, late '70s. You know, ~~we have the~~, our large projects were all underway, and there were no major new projects that I know of. ~~Do you~~, Can you think of any? ~~In knowing . . .~~

Storey: Well, the last major authorization I'm aware of was 1968.

Colorado River Basin Project Act, 1968

Barbour: You're talking about Central Arizona Project?

Storey: Colorado River Basin Projects Act, yeah.

Barbour: That's the Lower Colorado, which included the Central Arizona Project.

Storey: CAP [Central Arizona Project].

Barbour: That's the biggie.

Storey: Completion of CUP [Central Utah Project].

Barbour: That's the big . . .

Storey: A bunch of the Colorado projects for Aspinall.

Barbour: ~~That was~~ The last major project (Storey: Yeah.) was the Central Arizona Project. And, I was lucky enough to [have worked on it through its authorization]—now, we had a lot of controversies. We, at that point in time, we had the 160 acre limitation [controversy], when Kennedy [attempted] ~~went after the~~ to impose the 160 acre limitation [on the Imperial Irrigation District]. I told you about testifying for the secretary on that, in court.

Economics of the Central Arizona Project

Storey: Yeah. What did you think of the economics of CAP?

Barbour: Well, when you look at that part of the world—desert—and you look where the water is, and [take into account Arizona's] ~~their~~ entitlement, [providing] water could do nothing but good (Laugh) down in that part of the country. Now, California could have used it. Lots of people could have used it. (Storey: Um-hmm.) But that was [Arizona's] ~~their~~ entitlement. They had it coming. And there's no question that it would have a positive effect down there, as it has proved out to be. The economics[—economic impacts—]I haven't followed it. Now, most of that water is going to go to municipal water, and it has a much higher value. And, [project water] ~~it's~~, is recharging the aquifers around there, so I think ~~it's~~, it was positive. Central Arizona, you know, the big aqueduct there. It's kind of fun to, after it was all built, to go over and cross the bridge across the aqueduct and sit there and look at that aqueduct. Or fly in. (Storey: Um-hmm.) And see that big ditch, and say, "Well, I'll be darned. There it is. I can't believe it." When [I think how] it was [in the] early '60s.

Bob Young at the University of Arizona Opposed the Central Arizona Project

Storey: You mentioned that Bob Young was the . . .

Barbour: One of the [opponents.] ~~guys.~~

Storey: I think the University of Arizona (Barbour: Yeah.) economist who was opposed to the project?

Barbour: Either a University or the state. (Storey: Yeah.) He and another guy got together, and wrote a lot of papers opposing the project. And, I guess that's one reason he ended up at Fort Collins.

Storey: Yeah. But, you said you had trouble responding to him? Why was that?

For the Central Arizona Project “. . . the costs which were high, and the subsidies were high, and we had a hard time finding the cash register for it because . . . there was the compromise with no hydro dams. And there's nothing like a hydro dam to provide cash . . .”

Barbour: Oh. I didn't have much trouble responding to him. He was ~~that, you know, he was~~ looking at ~~very=and~~ the costs [which] were high, and the subsidies ~~they~~ were high, and we had a hard time finding the cash register for it because we had to rely, you know—there was the compromise with no hydro dams. And there's nothing like a hydro dam to provide cash—as a cash register. (Storey: Yeah.) They last forever.

Storey: No Marble Canyon? No Bridge Canyon?

Barbour: No Marble—no Bridge Canyon, and then we had to rely on, finally, on a thermal plant which had a restricted life. We gave it a life of only thirty years. Heck, thirty years, let's see it was built in. . .

Storey: That's Navajo [Steam] Generating Station (Barbour: Yeah.) that we're talking about?

Barbour: And so I had to put in a replacement (Storey: Steam generating.) for the plant, but now they [assume] extended [lives for] ~~the life. No, in all~~ thermal plants[.] , We were using thirty year lives [for] ~~on a~~ thermal plant[s]. You compare that to a 100-, 200-, year life, [or more,] ~~whatever you want,~~ for a hydro plant.

When I was doing the Low-Head Hydro [study], I was down on the Illinois River, when I was working for Tudor Engineering, looking at some low-dam sites, and we went over to look at this old plant. It was a *hundred* years old, and the generator was still working, (Storey: Um-hmm.) to give you an idea.

“I always maintained that we never, really, properly evaluated hydropower. . . .”

And, I always maintained that [we] ~~they~~ never, really, properly evaluated hydropower. We used to use, as a surrogate value, a thermal plant, as the value of hydropower. And to me, that was never adequate.

Storey: Because it undervalued the plant?

Barbour: Yeah, because of the longevity of the plant. (Storey: Um-hmm.) And then, the environmental aspects is, you never got a credit for that, you know. It's ~~kind of~~ clean power. (Storey: Yeah.) Mighty clean. Now, it might screw up some rivers. (Laugh) (Storey: Uh-huh.)

Stone & Webster Was Hired to Provide Information for the Glen Canyon Operations Environmental Statement

So, ~~when we had~~, they hired us, Stone & Webster, to do the analysis ~~over the, analysis~~ on Glen Canyon, ~~when they did~~ all the environmental impact statements, and so forth, and we had this [representative from] ~~hotshot, me, with~~ the [Environmental] Defense Fund, and Mike Roluti headed that [study.] ~~up~~. And, I was supposed to evaluate the [economic] impacts [from reduced releases to serve environmental purposes] on hydropower. That was why they hired me [as a consultant from Stone and Webster], as an energy expert[.] ~~on that~~. And, I guess ~~I was~~, about that time I was [somewhat] ~~pretty~~ arrogant, I guess.

The Environmental Defense Fund Argued That Glen Canyon Hydropower Had Very Little Value

And so, the Environmental Defense Fund group ~~, they~~ thought that hydropower [at Glen Canyon] had very little value[.] ~~, because the don't want to—oh, because why? Because there was a lot of...~~

Storey: They didn't want it [to be valuable.] ~~see it valued~~. That's why. (Laugh)

Barbour: Well, ~~either that, but they had a~~, their rationale was, "Look. We've got surplus coal-fired powerplants out there." They were built ~~after the~~ [Glen Canyon] hydropower [was available]. So, the fact that there is surplus [coal] power not being used—I mean, [they argued] you don't get any capacity value for hydro[.] ~~, because there's surplus power there~~. And I says, "It's the coal-fired plants that don't have [the] ~~any~~ value, it's not the hydro. The hydro's been there and they'll be there for a hundred years. And yet it ~~, not only has it a, it has~~ also [has] an intrinsic value, because of it's longevity." ~~And I says—and~~ They were giving [Glen Canyon power] ~~us~~ extremely low values. Not that ~~, you know~~ they were going to [change the water releases thereby losing power revenues.] ~~do what they're going to do anyway, I presume~~. (Storey: Um-hmm.) ~~Breaking up the revenue~~. But I wanted to see [that measurement of] ~~what=~~ the power benefits foregone was a requirement of the study, and I wanted to see those to evaluate it properly, and [I didn't think] they [were.] ~~weren't~~. They were *extremely* undervalued. Well, the Bureau kind of [felt that they] had to [agree] ~~go along~~ with Environmental Defense Fund.

"The politics were such that they were going to reoperate Glen Canyon Dam anyway. . . . and I felt my job was to see that it was properly evaluated. Well, I never got it properly evaluated. . . ."

The politics were such that they were going to [reoperate Glen Canyon Dam] ~~do it~~ anyway. They were going to change the releases ~~, and so forth~~, and lose a lot of

peaking power there at Glen Canyon, and [I felt] my job was to see that it was properly evaluated. Well, I never got it properly evaluated. And then, when I wrote a paper [on the subject,] and I put Mike's name first [and the project leader's name as co-authors.] ~~or my boss's name.~~ I wrote the paper, and I put some pretty [controversial points in the paper,] ~~mean things in there,~~ (Laugh) which probably got Mike [and] my boss, into trouble about the fact that ~~how~~ the [hydro]power was undervalued. They were going to do it anyway, so. . . (Storey: Um-hmm.) And then I guess, I don't think they appreciated my comments in some of the meetings we had. (Storey: Yeah.) Of course, I guess I was more outspoken than I should have been. (Storey: Hmm.) But, when you do that all your professional life, and tell them the way it is[,] ~~=you know,~~ I could [have been] ~~be~~ wrong, you know. (Laugh) (Storey: Yeah.) I'm not saying I'm always right. (Laugh)

No, the Bureau was good to me, and I hope I was good to the Bureau and did some things [that] ~~and~~ helped the program, ultimately.

Storey: Good. Well, let me ask you if you're willing for the information on these tapes and the resulting transcripts to be used by researchers?

Barbour: I don't know why not. I mean, unless I said some naughty things about some people.

Storey: I don't think you did.

Barbour: I hope I haven't. If I said some things that makes some folks unhappy I would ~~not, I'd~~ like [it] to be a little more diplomatic, and diplomacy is not my long-suit. I think the little story I told about the commissioner in the restroom, and I can't remember how I put that. You remember? When I told you that . . .

Storey: I don't remember it much, so couldn't have been too awful.

~~Barbour: Eddie Weinberg. Eddie Weinberg, and they were sitting, and I was on the other side and they couldn't see that I was there, and they were giving Saylor a hard time. (Storey: Yeah.) Who was our arch enemy, incidentally, on the project. (Storey: Oh.) On the C-A-P.~~

Storey: Well, thank you very much.

Barbour: Oh, you're welcome.

END OF SIDE 1, TAPE 3. JUNE 24, 2003.
END OF INTERVIEWS.