

ROB BAUER

March 11, 1996

Tape 1, Side 1

M.O'R.: This is Michael O'Rourke on March 11, 1996, and about to begin an oral history with Rob Bauer. Today's interview is taking place at the Oregon Historical Society library.

Well, before we get into talking specifically about the Riverkeepers, why don't you just tell me an overview of your background, starting with where you were born and who your parents were.

R.B.: I was basically raised in Milwaukie, Oregon, across the Willamette from the Tualatin Basin, and lived there until I was about fifteen and we moved down to California for two years, and back in 1960 we had bought a farm north of Vancouver, Washington. And as a ten- and eleven-year-old I helped, you know, plant trees and dig holes and survey, and so every weekend we'd go out to the farm from Milwaukie. You know, some people have a mountain cabin or a beach cabin. Well, we had a farm. My dad was in agricultural chemicals research, development, things like that. And so this was a hobby farm with four and a half thousand trees. So you know, it's a little more than just a hobby; 30 acres of pear trees...

M.O'R.: That sounds like a big hobby.

R.B.: A big hobby, yeah. So every weekend we'd blast north up 99 to the farm through Friday night traffic and across the Willamette twice and zigzag around, and you know, then they built I-5 and it was just such a luxury - no stoplights, hardly any traffic, you know.

M.O'R.: Cut the travel time significantly.

R.B.: Oh yeah. And then, of course, the traffic and everything grows to fill any road that's ever built.

So we came back to this area, and then I lived out at the farm. Finished high school there, and then I went to Clark

College. We used to call it UCLA, University of Clark and Local Area; it was a community college.

I went up to Western Washington and Bellingham and had an interest in chemistry and took all these classes I was interested in taking, and ran out of classes to take up there, and went to the University of Washington for almost a quarter. It was a shock going from a class of 25 students in organic chemistry to a physics lecture with 800.

Worked about a year, and went back to school and looked to see what degree fit what classes I had taken, basically on my own interest in what classes I wanted to take, but needed a little more motivation to take. And environmental health at Huxley College, which was an environmental cluster college to Western, fit the bill. So I graduated in '76 with a degree in environmental health.

M.O'R.: Where's Huxley?

R.B.: It's up in Bellingham, Washington.

We studied the health effects of pollution, so we had to have anatomy and physiology and a lot of chemistry, biochemistry, microbiology - pretty hard science area. And we had to do a seminar - individual study program. So I did like a correspondence course for wastewater treatment operators. I was interested in water pollution and - the laboratory end of it - and I figured every town had a sewage treatment plant, had a lab, and my image was I'd go up and live in Maine for a year or two and work and get to know the area, then I'd go to Colorado, lit work a couple of years, go to Florida, you know, Alaska, just go all over the place. Instead of having vacations, you know, just a job and work there a couple of years and get to know the area and be pretty much a vagabond, travel all over the place.

Then I got a job offer from Unified Sewage Agency in a large new treatment plant in the lab. And I started in October 1976 and - I'll be there 20 years with the Agency this October.

M.O'R.: So this vagabond plan didn't quite work.

R.B.: Didn't work. You know, came back to my general area and started working in the laboratory at the wastewater treatment plant and doing tests for - the state requires, you know, that it meets a certain level of treatment. So we did those tests, and we did tests internally for process control and stuff.

And the treatment plant discharged into the Tualatin. And as a kid, you know, we heard - we used to call Lake Oswego Lake Polio, because back in the 50's, you know, before we were eating the sugar cubes and stuff, there was lots of cases of polio in Lake Oswego. And up at college I learned that polio is the first disease due to sanitation. If you're an infant and real young, and you're exposed to the polio virus, you develop a natural immunity to it. But if you're kept off in a lily-white clean middle-class environment through your young years, you don't get exposed to it, so you don't develop an immune reaction to it. And then if you're exposed to it later, like as a young adult swimming in Lake Oswego, then you come down with the disease. Polio is not prevalent in Third World countries where they have horrible sanitation. It's just in places where the sanitation is good enough to keep you away from it in your early years.

M.O'R.: So apparently the immune system of a young person is capable of dealing with it without too much ...

R.B.: Right.

M.O'R.: ... fuss and later on, it's a much more serious disease then.

R.B.: Yeah. And doing some research on Lake Oswego about - I'd heard stories that the dam on the river had been blown up in

'45. So I went through '43, '44, '45 and '46, *Lake Oswego Reviews*, scanning them on microfilm, and there would be headlines and articles, you know, another case of infantile paralysis in Colton, you know. The Lake Grove swim park was closed because there'd been a case of infantile paralysis. And the Lake Oswego High School swim team, you know, was no longer able to meet because they couldn't swim in the lake. Just popping up in every couple of issues, and you know, it was a really life-threatening disease. It seemed to hit anybody. At that time, you know, they were talking about mosquitoes, and you know, they really didn't understand the mode of transmission.

M.O'R.: But they recognized that the lake was the source?

R.B.: Right. And what was happening out on the Clackamas, and other places. But of course, Lake Oswego people was focussed on the lake.

M.O'R.: Let me back you up before we go on here. I mean, this is very interesting, but I'm just curious in terms of - You say you wound up up there at Huxley because classes that you'd taken on your own, on your own personal interest, apparently without a strategy or a degree necessarily ...

R.B.: Right. Well, I went up there, you know, as a sophomore, and they give you an advisor, and they help you fill out the schedule, and gee, I had, you know, classes that I wasn't much interested in, and it didn't make a whole lot of sense. So I never went to an advisor again, and I just took the chemistry classes and other classes of things that I was interested in. That probably goes back to - as a kid, my dad was a soil scientist, and on our farm we would do things like put ten different kinds of grain, you know, a row of one kind of grain here, another row along that way, like east to west, and then north to south, we'd put different amounts and different kinds of fertilizers. And so you had like a

checkerboard square, and go out later and harvest a square yard, and weigh how much wheat was produced. And that was just kind of a matter of fact thing we - I thought everybody did this stuff.

M.O'R.: But not really, huh?

R.B.: Yeah.

One of the things I can remember is, he'd discovered that malidinum was a micronutrient for alfalfa in his research. And we would go out and take like a quarter teaspoon of malidinum and put it in a three-gallon sprayer. And I'd go out in an alfalfa field, like a neighbor's or somebody's, and spray my initials, or some design out there on the alfalfa. And you'd come back three or four weeks later, and it would be two or three inches taller, and so dark green it was almost black. Because it was a missing micronutrient. So that was the kind of environment that I grew up in.

M.O'R.: Now your dad's work - was it involved in researching agrichemicals, then?

R.B.: Yeah. He'd spent 15 years at the state experimental station in Washington doing research, and then for the company he worked for, he was the director of research and development.

M.O'R.: Okay. So this was just sort of a carryover onto his hobby farm of his ...

R.B.: Right. Yeah.

M.O'R.: ... professional life.

R.B.: As a kid I'd go out with him when he'd do presentations, and I'd run the old manual slide projector when he'd talk to granges and different farm groups.

M.O'R.: Well, I guess I was curious, since you said that you found that after you had taken courses here and there, that your accumulating academic record sort of pointed you in the direction of an environmental degree. I was just wondering if that grew out of any childhood consciousness of environmental issues.

R.B.: Well, yeah, on the coffee table we'd have *Acrichemical News*, and *Weeds Today*, and you know, *American Farmer*. And then my mom would have *Environmental Action*, *Common Cause*.

M.O'R.: So this became - this is partly from your mother's side, then.

R.B.: Well, yeah. And always kind of a lively discussion of the issues. My mom was very politically active.

A couple of years ago, Clackamas Community College had their 25th anniversary, and she was a featured speaker because she was the one who got the bill through the legislature to start it and did the fundraising and got that community college started. At the time, I thought it was because she didn't think I'd be accepted to any four-year college, and that they needed a two-year college to put me in.

R.B.: And at that time, in the mid-60's, Portland Community College was pretty small, you know, probably in an old high school, and there wasn't really anything in Clackamas County.

M.O'R.: Well, that's interesting. So what were your parents' political affiliation, then? Did they have one?

R.B.: Well, my mom worked a lot in the League of Women Voters, was real active in that, and I remember going down and being a page at the legislature. And you know, she knew all the legislators. And so they always talked about, "Well, I won't go to vote if you don't to vote, because, you know, my vote will cancel out your vote."

M.O'R.: Okay, I was just wondering - so they ...

R.B.: She was strongly Democratic and he was, you know, fairly strongly Republican, I would guess.

M.O'R.: So there was a bit of a conflict there.

R.B.: Yeah. And so she'd be in three PTA's at once, and starting a community college, and you know, was in the League, and just real active.

M.O'R.: Well, that's interesting background. Did your father - I mean, despite his being on the Republican side versus your mom's allegiance to the Democratic party, was he at all interested in any of these environmental issues?

R.B.: Well, back then, there weren't any, you know.

M.O'R.: That's true.

R.B.: When they banned DDT, he bought a case just before they banned it, you know.

M.O'R.: To make sure he didn't run out.

R.B.: To make sure he didn't run out. And you know, I spread lead arsenate, which is a combination of lead and arsenic on our pear trees, you know, with no safety equipment, as a kid - and other long-banned chemicals. He never met a chemical he didn't like.

Then when he retired and the company changed ownership, he could no longer get chemicals, agrichemicals, at like the employee cost, and so they were \$150 a gallon and stuff. So at that point he began going out and sampling and counting the bugs to see whether he really needed to spray rather than just spraying according to the calendar. So it made it more of an environmental management, where you spray when you need it and don't when you don't.

M.O'R.: He was forced to that because of economics?

R.B.: Right. And so, yeah, he pooh-poohed the environmental movement pretty much.

M.O'R.: Well, that must have been kind of difficult for both of them, to have your mother working on - working for the cause.

R.B.: Yeah.

M.O'R.: Thatt's a very a interesting background. I guess it does explain a little bit how you wound up where you were at later on.

R.B.: Yeah, the political action and then the scientific method, you know, of analyzing and looking a stuff. And you know, I originally wanted to have a chemistry degree, and the old - *The Graduate* had come out, you know, telling the young man to go into plastics, and gee, I didn't want to go to New Jersey and be a chemist in some plastics factory. The thing that separates the men from the boys in chemistry is a course called p-chem, or physical chemistry. It's a year-long course that takes a year of physics, which takes a year of calculus.

M.O'R.: Yeah, I attempted physical chemistry at one point.

R.B.: Okay, so you know, I took calculus - I had always been in like the highest math class in high school and gotten C's and D's in it. I was always in the most advanced class, but doing poorly.

M.O'R.: So this is why your mother was a little nervous about your college prospects.

R.B.: Yeah. And so I took calculus at Clark the first quarter, and whoa, this is really strange. So I dropped back the next quarter, and I took the course before calculus, which obviously has nothing to do with - it's trigonometry, which has nothing to do with this calculus. Then I went back, I took the first quarter again, and I squeaked through and I passed it.

So I went up to Bellingham, in Washington, took the second quarter and whoa, they're talking a whole different language. So I go, well, I better go repeat the first quarter again. So I repeat the first quarter, and we have a big test, and I felt pretty good about it, you know, partied pretty hard that night. And the next day, I'm in class, and the professor throws a paper down, you

know, 55 percent. And I go, "Oh no." My whole future flashes in front of me, you know, I can't finish calculus, so I can't get physics, so I can't do p-chem. And finally I look at it and I realize that the childlike scrawl isn't mine. It's somebody else's, you know. It actually had a different name on top. And I go, you know, "Professor, this isn't me."

"Well, who are you?"

I go, "Bauer."

And he said, "Oh yeah, here you go." He throws it on my desk. 23 percent.

M.O'R.: Oh no!

R.B.: And it had my name on top of it. And it was just, you know, the rest of the period was just blacked out as I thought, "What am I going to do," you know. So I got out of calculus and never ventured again.

A friend of mine took p-chem after passing the calculus and physics as the only class. Just a five-credit class. So that was the only course he took that quarter, and he still flunked it. And that's when they were debating whether you could use calculators versus slide rules, because it wasn't fair to the people who couldn't afford a calculator to have somebody there whipping it out a four-function calculator that cost a hundred dollars versus somebody with a slide rule.

M.O'R.: Right. I can remember when the Hewlett-Packard 35 first came out, it was I think maybe even \$200.

R.B.: Oh yeah, yeah. In fact, Huxley had four HP-35's and one HP-45 that the students could borrow. Now I'm sure it comes with CD-ROMs in the back. I know a few years ago, the p-chem books had floppy disks attached to them. But now ...

M.O'R.: Probably CD-ROM. You're right.

R.B.: You couldn't even attempt to take the course without a Pentium.

So I was much more interested in organic chemistry, biochemistry, what makes - you know, why bodies behave the way they do, how they react to chemicals, and that tied into environmental toxins and fit real well into that.

M.O'R.: Well, back to your early employment with USA. This was when you did the research that you mentioned on Lake Oswego; is that right?

R.B.: No, that was recently. When I first started working for USA, it was just in the plant laboratory, so we just got samples within the treatment plant, and it just, you know, the river was over there in the woods, and it discharged into the river.

M.O'R.: And which plant was it?

R.B.: The Durham plant there by Tigard.

M.O'R.: Right, okay. Which had probably just barely been built?

R.B.: Right. It was started in July.

When I went to Huxley, the water pollution classes, this college had just been built, and so the first day in this water pollution class, the professor handed us out three-by-five cards that said, you know, 4-250 ml beakers, you know, nine pounds of sulfuric acid, ten one-ml pipettes - because this college had nothing. And it was like a snipe hunt; we had to go steal it from the main college. Literally. And I'm going, "This lazy bum of a professor. Here he is, you know, he doesn't have anything set up. Because they had, you know, \$20,000 worth of glassware which was on order, but hadn't been delivered. So we would sneak into the other college and steal glassware, basically.

And I thought, this lazy bum. But the first job I got was at a cannery doing their water quality analysis. And there was a note - my supervisor worked swing shift, and I worked days - you know, "Prepare . . .," and there's a list ten tests per Standard Methods, which is the water treatment testing bible, "See you in two weeks."

So I had to set up this lab basically from scratch. I didn't know what we had or what was there, because just kind of some stuff had been jumbled together, and the previous training of, you know, going out and begging, borrowing and stealing equipment was pretty appropriate, and I belatedly appreciated the lazy professor.

So the first thing I did was wash everything, because then I knew what I had and what was clean. I'm partially color-blind, and in those days a lot of things were color changes. And the lab was painted this dark blue, and one of the color changes was lavender to blue. A pretty subtle change, and lost to me. So I had to paint the corner white, put it on a white cafeteria tray, and I'd be adding the chemical and, you know, looking for this color change, and it was driving me nuts. I'd get the gals that were working off the line to come in and, you know, tell me when the color changed. Because what was happening was my blank that had nothing in it was showing up as having a lot more - that since this was ammonia test - ammonia than my 100-part per million standard. And the blank that's supposed to have nothing had more than my standard. I'm tearing my hair out, and finally I notice out of the corner of my eye these condensers, where you're boiling the stuff and reflexing it, the water was condensing on the outside, and I saw a drop fall into one of the beakers. It turned out that just through the cinder-brick wall was the ammonia compressors for the refrigeration. They didn't freon, they used ammonia. So there was a high concentration of ammonia in the air, and the condensation of water on the outside of the condensers was absorbing ammonia, and

the water came out of the faucet, went through the blank, and went through the one, the ten, the twenty-five, the fifty and the hundred, and so the blank - the zero - was the coldest one and got the most condensation that dripped down and had the most ammonia. So I wasn't really losing my mind. The blank actually did have more.

So, you know, just having seen that out of the corner of my eyes saved me from, you know, premature baldness from pulling my hair out. Nowadays, it's all done electronically - you put a probe in and you read a digital display, so color-blindness isn't a problem.

M.O'R.: Yeah. Well, it sounds like you and I have had some similar experiences. I worked in a lab up at the medical school for a couple of years around that same period, so these methods sound like something that I'm familiar with, too.

R.B.: Then there was an opening up at the water quality lab that does the industrial testing for the agency, and also the river monitoring, and that's when I got involved with getting out on the Tualatin, actually. We'd go out and dry-run the county and take samples off of bridges, and then go run the tests, and I would do the biological kinds of test, the bacteriological, the biochemical oxygen demand, and some of the other tests.

It was just amazing. You'd get this sample from Cherry Grove that was crystal-clear, and immediately the next sample below that was brown and murky, like the Tualatin is most places. I kept going, "Gee, is there one spot where this changes, or -?" You know, it got me kind of interested in why did it change from crystal-clear down to the normal kind of turbidity?

M.O'R.: Now, above Cherry Grove, are you talking about a site that is actually up into the Coast Range, then?

R.B.: Yeah, Cherry Grove, the river's pretty much on basalt. And we'd sample at a bridge just downstream of the town of Cherry Grove.

M.O'R.: And that was the furthest upriver point ...

R.B.: That we'd go, yeah.

M.O'R.: And then the next bridge down was about how far?

R.B.: Well, we didn't sample at every bridge, so it was a few miles, maybe ten or 15 miles downstream, and it would be radically different, you know. This would have hardly any bacteria, this one had a whole gob; this had very low suspended material, this one had a whole bunch.

M.O'R.: So when you wanted to figure out why that was, what did you find out?

R.B.: Well, it's been an ongoing process on my own time. I'd go to the bridges in between, you know, and look over, and well, gee, this looks a little better, and oh, this looks a little better, and you know, whoa, this looks a lot better. And, you know, started following up on reading about it and talking to other people. And eventually I walked the stretches or canoed the stretches through there to see where it's going. There's one six-mile stretch where in an average year about 35,000 tons of soil erodes, or about two acres of farmland drop into the river.

It gets all tied back with the type of soil that's there, from the Bretz floods, 13- to 15,000 years ago. Just the geology is pretty interesting on the Tualatin and why it looks the way it does, and it's probably always going to look that way because of the nature of the geology that it's passing through.

M.O'R.: When you first came to work for USA, who were you reporting to?

R.B.: Donna Hapell, the lab supervisor. And I think there were maybe 140 employees, and now there's - I lost track at 330, and there's probably more now.

M.O'R.: And Gary Krahmer would have been there at this point too, right?

R.B.: Yeah, right. Well, yeah, but he wasn't the the manager yet. In fact, I can remember when he got appointed. I was on the employees' association, representing the laboratories. And for some reason, I was up at the County Commissioner meeting, because they were basically our bosses, when Gary got his job, and I kind of ran into him in the elevator going down with the previous boss and Gary patting each other on the back.

M.O'R.: Donna Hapell, did you by any chance know her - well, I'm wondering if she's related to someone named Jerry Hapell.

R.B.: Yeah. It's her husband.

M.O'R.: Yeah, okay. That's interesting.

R.B.: Worked for Tektronics?

M.O'R.: Yeah. Yeah. I used to work at Tek.

R.B.: Oh, okay. Yeah.

M.O'R.: In fact, I've seen Jerry just recently.

R.B.: Yeah, there's not a whole lot of Hapells running around.

R.B.: Yeah. Well, it's six degrees of seperation, or something, you know?

M.O'R.: Yeah, that's right.

R.B.: One of my brothers worked - still works for Tektronics. He's down at Wilsonville on printers now. He's worked in Tek labs and all over the place. He started, you know, in college, putting the insulation on the wire, and he could keep his machine running and nobody else could. So he would be fixing other peoples' machines, and pretty soon somebody would say, "Could you come over

here and take a look at this thing?" So he was an engineer without even a college degree when they first made him an engineer because he knew his stuff.

M.O'R.: That's actually what happened to me too. I went to work there as a technician and would up becoming an engineer within a year or so just because of what I was doing. But I was in DDO, or ...

R.B.: Oh, that was an ugly place.

M.O'R.: For a variety of reasons.

R.B.: Oh yeah. Yeah, I remember him telling me about something that he'd worked on, they figured they could sell X amount of units. And so then, Management said, well, they can only sell half of X. And then it went over to CRT, and they said, "What are these guys talking about, half-X? They can only sell a quarter X. So we'll make a quarter X." And then they were only able to fill a half of what they thought could, so it ended up being like they were able produce an eighth as much as the engineers wanted, and it turned out demand was twice as high as they had expected.

M.O'R.: So they were in big trouble.

R.B.: Yeah. They had one-sixteenth the number of CRT's they needed for this piece of equipment, and then I think they went to Sony as the source. And then the yen shot up.

M.O'R.: I'm not sure exactly what product that would have been. I left there about the time probably that you went to work for USA.

R.B.: Well, yeah. I taught myself programming on a 4551.

M.O'R.: Oh, right.

R.B.: You know, it could have been - IBM could be making Tek-compatible PC's.

[End of Tape 1, Side 1]

ROB BAUER

March 11, 1996

Tape 1, Side 2

R.B.: DEQ wanted to put a limit on how much chlorine we could discharge. You know, you can't dump a fish in chlorinated tapwater because the chlorine will affect the gills and kill them, so you don't want to chlorinate the whole river.

So the DEQ did some live box testing with fish in cages, you know, right above where the effluent, the treated water goes into the river and downstream and upstream. They were in like metal-screened cages with rocks rolling around, in just kind of poorly-done tests. So I did it again the next year with nice big plastic cages with, you know, the only thing metal was the hinges. It was all plastic mesh and plastic pipe. And, you know, we went with Fish & Wildlife and caught bluegill sunfish and put them in these cages and suspended them over for a week or two at a time. And we only lost one fish out of a couple hundred, and that was in the control group. So they all survived everywhere.

And so that saved the agency a lot of money. They could show that, you know, it wasn't toxic in the river, and that lasted probably for 15 years, and then the DEQ statewide said no chlorine in the rivers at all. "We don't care whether you don't kill fish or not, philosophically we don't want any chlorine in the river."

M.O'R.: You mentioned the plastic cages, was that because you did get, what, ionic contamination from these things?

R.B.: Well, you know, we didn't want galvanized zinc-coated, you know, with wires sticking out where they'd scratch up against themselves, and you know, just introduce a whole lot of other things into the situation. So it was either stainless steel or plastic.

M.O'R.: Plastic's cheaper.

R.B.: And you know, we'd sit out there for eight hours in a boat out on the Tualatin, you know, doing chlorine residual tests, and like the part per billion level, and it was -. The equipment was so sensitive that if you moved your head and the sunshine shone on the water, the number would change because the oxidative of power of the sunshine would change the machine's reading. So you had to kind of keep in the shade and you know, we had to battle our way to get boats into the upper river, because there's no access.

We had a little boat with an electric outboard that we'd putt around Tigard in, and then we'd put it in at Farmington. So a couple of people were in the boat, and I was up at the treatment plant with a radio waiting for them to show up, and they never showed up. So one guy went walking along the river -- it's like a six-mile stretch of river -- and he never showed up.

Finally, at six o'clock he calls from the tavern, said that he'd, you know, walked the whole way down. We weren't expecting any current in the river, and that stretch of the river actually has moving water, as opposed to down in Tigard, where it's just a pool of water standing there. And they had the electric outboard wide open and they were grabbing branches and pulling themselves upstream, and just taking hours more than we'd expected them to take. And so that was: Whoa, there is a different kind of river. It's not always real flat.

M.O'R.: Now, when you first came to USA, that would have been a short time after some political upheavals in Washington County that were caused by the building moratorium?

R.B.: Yeah. I was up in Bellingham at that time, so when I came back, 205 was brand new, you know, there was a new bridge over the Willamette, and you know, just like now, you don't see anything about Washington County in the news, it's all Multnomah County, so

didn't know anything about what was going on in Washington County. But I imagine - I mean, if somebody would mention a building moratorium now, they'd just be absolutely shot. It must have been a significant emotional event to the county.

M.O'R.: Yeah, I think so. Well, it served as an organizing principle for USA.

R.B.: Right. To pony up, you know, \$72 million back then, and you know, the roads were just trash. They were just beat up. The County was controlled by farmers; that's why there's no parks department, you know. They have one park now that was kind of forced on them. But it was the good old boy farmers that ran Washington County and, you know, why do you need a park? I got three hundred acres here. I'm going to go someplace and go to the woods? I don't think so. We got cows to milk.

M.O'R.: Right.

R.B.: So, yeah, Washington County politics is something that I thankfully avoided.

M.O'R.: But it sounds like you haven't completely avoided it. I'm just wondering, when you first went to work it sounds like obviously the technical challenges were something of very great interest to you, but when did you start having sort of a political awareness of some of the issues? Or did they interact with your work from the very beginning?

R.B.: Not really. Let's see. You know, it was kind of a personal quest for knowledge, you know. When I'd hear these stories about the river running backwards and people walking across the dry spot in the river, and stuff like that, I was just interested on my own, and researched that and walked across the river without getting my knees wet, or hardly my ankles wet, you know, found the spot at the right time. Tried to track down the myths and stuff, you know.

People talk about, "Oh, back in the old days, I went swimming at Roamer's Rest, and you know, then the Tualatin got all polluted."

Well, I heard from another guy that the owners used to put blue vitriol, which is copper sulfate, in a burlap bag behind a rowboat and row around in the area and dilute it, dissolving this copper sulfate, which is toxic to all life, into the water to kill the algae and what-have-you. But the other guy thinks he was swimming in pristine water, you know. He was swimming in a chemical cocktail. Lake Oswego still adds copper sulfate to the lake. But if you or I went and dumped some copper or industry dumped some copper in the river, we'd be arrested for pollution.

M.O'R.: Well, does Lake Oswego do this legally?

R.B.: Yes. Beneficial use to suppress algae, but it just suppresses algae that's susceptible to copper, and algae that is resistant to copper then has an environmental advantage, and then its population explodes. So, you've got a big bathtub full of warm nutrient-rich water with lots of sunshine on it, you know, the algae's going to grow.

M.O'R.: Despite the copper sulfate.

R.B.: Despite the copper sulfate.

I had heard that people irrigating their lawns with water out of the lake, they'd be irrigating and the boat would come by throwing out the copper sulfate, and then two weeks later their lawn would be dead. Well, it took a few times for them to figure it out. You know, "Gee, why is our lawn dead?" You know, you can't remember when you watered it two weeks ago, because you probably watered it several times since then. But somehow, some people finally made the connection that: Oh. Boat going by with copper sulfate, two weeks later, you know, lawn is dead. Better not irrigate when the boat goes by.

M.O'R.: That's one possible conclusion, right? You might question whether the boat should be going by.

R.B.: And I talked to the Lake Oswego Country Club to see how much water they actually used, to see maybe if we put the treated effluent from the wastewater out, you know, irrigated farmland, golf courses, and stuff like that, would be better than putting it in the river, because everybody's seems to be pumping water out of the river, and we're putting effluent in the river. If you left the water in the river and irrigated with the effluent, that would be, you know, a win-win situation.

And he was mentioning that, you know, every once in a while the water in the lake gets so hot that it kills the grass. They'll be irrigating the eighteenth hole, and the grass dies. And I'm going, let's see, assume the lake is 100 degrees" - which it's never going to get above 80. And it's 100 degrees outside, and you spray this water, it's going to evaporate as it goes through the air. Even if it was 100 degrees falling on the grass, it's not going to kill the grass because it was too hot.

They're three miles away from the lake, they're irrigating the eighteenth green, the boat with the copper sulfate goes by, it gets sucked up into the pipe - there's no way that they're going to put two and two together, because they have never seen they other two. So they were going to put the pipe deeper into the lake to get cooler water, was their solution. But I didn't want to speculate with them and tell them what was the problem, because, you know, they're potential customers.

M.O'R.: Potential customers - of the USA?

R.B.: Of the recycled wastewater, yeah. And I feel strongly that, you know, it's water you've used once that is wasted, and water you use twice is, you know, a much better deal, where you take the water out of the river for drinking water, and instead of

dumping it back into the river as effluent, you run it through the treatment plant, irrigate with it, and then that stops the farmer from pumping out of the river to irrigate. So it just seems like a win-win situation.

M.O'R.: USA wound up in court in the mid-80s over ...

R.B.: Yeah, that was real interesting. I watched them go through the four stages of denial, anger, depression and acceptance. And, you know, corporate culture, it was boom-boom-boom-boom. You could watch the steps. It was very interesting.

You know, it was basically like somebody coming up and saying, "Okay, you've been reporting all this stuff to the DEQ all these years, we've looked at it all and found X-gazillion violations." It would be like if a policeman walked up, opened your trunk, and pulled a thing that had been recording your vehicle speed for the last five years and said, "Aha! You went 50.15 miles per hour in a 50 mile an hour zone; here you went 57 in a 55; you know, here you didn't really come to a complete stop at a stop sign, you just kind of rolled through it. And I'm writing a ticket retroactively for the last five years."

M.O'R.: It was, what, something like 13,000 violations?

R.B.: 13,000, it was just mind-boggling.

At that time I was no longer in the water quality lab. I had gotten promoted to technical service analyst, and I appreciate the way USA has dealt with me in that I was able to grow and use my skills, and there would jobs that would be kind of made around those skills. So I had computer skills and was able to do special projects, things that didn't have, you know, "Okay, I want you to do this, this and this," you know. "Go look at this, see what we can do about that."

So I looked at this mountain of stuff and set up a deal on the computer so that the secretary could enter the data so that we

could get a handle on organizing it and going through. Eventually we had to have a report on each one of those 13,000 violations. Some of them were like failure to sign page 11 of a 14-page permit where the guy had signed pages 1, 2, 3, 4, 5, 6 - so that's \$25,000 because you forgot to sign page 11. Another one would be because the DEQ didn't time-stamp it when it came in - you know, unable to verify when it came in. Some of it was like what's your definition of a week? We have a monthly permit which varies from 28 to 31 days, and we have to have a weekly average; we can't exceed something on a weekly average. Well, how do you do that? Is it the 1st through 7th? Is it Monday through Sunday? If it's Monday through Sunday, what do you do with the days from the previous month and the following month?

And there's all these simply arbitrary decisions that need to be made about what is the definition of a week. There were thousands of those where they interpreted it wrong. And Donna was the lab supervisor, and she very involved with this, and she is so precise and methodical, she had every time the DEQ and USA changed - you know, "Okay, well, this presents a problem, this doesn't make sense, what's really the reason why if it's a weekly average" -. So we'd change it, then somebody else would come and change it. Simple things like averaging numbers, rounding, you know. One computer program rounds it one way, another one rounds it the other way, or just drops it off. The DEQ, the way they'd written the permits, if a permit level was 7, that's different than 7.0. Scientifically 6.5 is 7, and 7.4 is 7.

M.O'R.: But it isn't 7.0.

R.B.: If it's 7.0, then 7.05 is 7, and so how many significant figures they have, and the permit is significant.

M.O'R.: Right. So there really was something at the bottom of these reactions.

R.B.: Right. The bottom line was about one percent.

M.O'R.: Of the violations.

R.B.: Yeah. They sued for \$175 million, and they settled for one percent. So there were violations. They would be like, say, our pounds limit was 11,250, and we'd have 11,400. We reported that to the DEQ. DEQ goes, "Yeah? Okay. No big deal, you know. The fish aren't dead in the river, it's not like it's 50,000 or -"

M.O'R.: Well, I mean is that what really happens, do you think?

R.B.: Yeah. Yeah. It's just like when you're going down the road at 57 miles an hour, the state trooper isn't going to yank you over and write you a ticket.

M.O'R.: I've heard one opinion that the DEQ didn't even look at the figures, didn't look at the reports, and that that was part of the ...

R.B.: Well no. They were aware that these are mechanical, biological systems, and they are not perfect. And the justification that says you should have 11,240 pounds in the river was at best a scientific wild-ass guess. I mean, that's the swag, but - That's the technical term, you know. Somebody said, "Well, gee, let's make it 10 milligrams per litre," you know. Instead of 8.7, or 2.3, or whatever, they took rounded numbers and then ran them through the calculations and came up with pounds figures and stuff like that, basically picked arbitrary numbers that ended with zeros, like tens and twenties and thirties, two hundreds, and came up with these regulations.

And so the DEQ didn't fine everybody every time they didn't do something. If you did something stupid or had a major problem, you

know, you'd get a letter. If you repeated that, you'd get a fine. It's the same way the cops work today.

So they had a bunch of college students sit down at the DEQ office and go through here with a limited knowledge of the permits, and the permits change and are revised, you know. Okay, write down this violation, that violation, and we could tell when different students did it, because they had different interpretations. I mean, it's, you know, like these spies can tell who the spy is by his morse code pattern, you know. You could almost identify, "Oh, here's that guy that thinks that such and such is ..."

M.O'R.: Now when you say "they" had students go in and do it, who's "they"?

R.B.: They - NEDC. National and Jack Churchill and Lewis and Clark Law School.

M.O'R.: Right.

R.B.: It was basically a class project. I've talked to some of the students later that were on that class project, and every year they pick a different thing.

M.O'R.: It was Jack Smith and ...

R.B.: Yeah, they just call it Jack Squared. Jack with the two up there, Jack Smith, Jack Churchill - and Jack Churchill was inflammatory, calling the Tualatin an open sewer. And the press, of course, just loved that, and you know, Channel 8 photographing a crawdad, saying, one of the last surviving crawdads on the Tualatin River, and you know, in '91 there was 23,000 pounds commercially harvested out of the river. And that's a lot of crawdads, you know, they don't weigh a pound apiece. And, you know, just this total media assault, and basically about a percent of them were actually what you'd call violations.

I mean, some of them were significant, having equipment breakdown, but I think it was real beneficial from my standpoint because

if we said, "Oh, well, we need a pump over here, a backup pump," you know, we'd say or we might have a violation, the pump was gotten. Before, it was very hard to get attention of the management, you know. They were busy with the new computer system and the personnel rules and purchasing policies, and all that. And they were off in Hillsboro.

You know, the story is there's nobody up there that can say shit without blushing. This is the way that the operators say it that the treatment plants were kind of forgotten. And then this turned around and made them much more important, a much higher priority. Which working in the plants, which was real beneficial to us. It made them pay a lot more attention. And if we cried wolf, they brought us a wolf gun.

M.O'R.: Tell me about the four stages and how it was manifested within the organization. I mean, what kind of physical evidence was there of these four stages?

R.B.: Let's see, what's first? Denial. Yeah, you know. What are these guys talking about? You know. And just being overwhelmed when you're presented with this huge amount of stuff.

M.O'R.: We've got the best plants in the country, come on.

R.B.: Yeah. How do we even, you know - what do these guys know? This is the way it's been, every plant, every place, you know? This is just so radical. They're digging up all this stuff on us, just like this vendetta, and you know, calling the river an open sewer. You know, that was before people realized that the Willamette was an open sewer. I mean, every time you'd get a heavy dew - But people's view of the Willamette until a few years ago was, you know, this pristine river that we saved.

And you know, the Toiletin - People call the Tualatin the Toiletin - has a very bad image. So yeah, they were, you know - Gee, Lake Oswego wants us to do all this stuff, and they have a dam

on the river that backs it up 30 miles and degrades water quality upstream. Jack Churchill's standing there saying, "You know, these guys are not paying the costs of the treatment, and putting those costs back on Lake Oswego." Well, here's Lake Oswego putting the costs on the river by damming it up and creating a 30-mile-long lake. The last thing you want to do to a small, slow-moving river. And you know, there's a lot of - Lake Oswego is viewed by everybody as fairly arrogant, stuck-up - You know, when I told my mom that I'd moved to Lake Oswego, she just went, Eeeyew. You know. I'm going to have my nose in the air.

And even with the flood, you know, people would say, "Oh, you're going to go and help those guys in their \$800,000 houses and clean up along the canal? I don't think so." But there wasn't a lot of sympathy for somebody living on Lake Oswego, when the public can't go on Lake Oswego.

M.O'R.: You were explaining to me, I think, over the phone about sort of the political clout of Lake Oswego.

R.B.: Oh, yeah. Yeah. The percentage of lawyers and the movers and shakers, yeah.

M.O'R.: If it hadn't been for the Lake Oswego connection, do you think the lawsuit would have gotten off the ground? I mean - Jack Churchill was, I think, on the Lake Oswego City Council.

R.B.: Yeah. Right. But it was a class project. See, Churchill had been with the ETA during the Clean Water Act, helped write the Clean Water Act, so he knew all the ...

M.O'R.: As did Jack Smith.

R.B.: ... ins and outs about, you know, that there was money at the end of the rainbow. The citizens' lawsuit, and stuff like that. He'd worked at the DEQ, had been fairly controversial there. I heard stories about him, you know, almost getting in fistfights with other DEQ employees. So they were kind of the enemy.

So, let's see, the denial you know. And then the anger was I guess taken out at "These guys doing it to us when we've got the best plants in the country."

M.O'R.: Was the anger focussed - I suspect a lot of it might have been focussed on Churchill?

R.B.: Oh, yeah. He was the lightning rod. And you know, I was down at the treatment plant dealing with operators and people like that, so I don't know what the upper management - you know, what was going on up there. But I'd gotten the stuff entered in the computer, and then they kind of came to a realization that. "Oh my god, you know, we're going have to deal with all this."

So I told them that I had gotten it on there, it was available, so they got it, put it under security wraps so that the guy that had gotten it in there could be able to get it out. They didn't want press leaks and all this stuff.

M.O'R.: Sp you really hunkered down inside the organization.

R.B.: Oh yeah, bunker mentality.

Then we started having to grind through all these things, you know, and look back in the logs and see why did this happen, you know, what was the permit parameter at this time, come up with the reason why it happened. That was just an enormous amount of work. I mean, just thousands and thousands of hours. And then, you know, with the lawyers and all that.

My part of it was, "Well what happened here?" and I'd help find out what the reason was. Donna spent lots of time - way more than she'd ever wanted to - with lawyers explaining to them, you know, about rounding errors, and what a definition of a week is, and how it's changed, and if you multiply 3 times 26.8593144, the answer is 75, you know, it's not 75.89613 and all that stuff that the lawyers had just no idea. It was a total cultural difference from the science to the lawyers.

And then I guess the acceptance was when if we needed something, the money was there to get what we needed, and they sat down and say, "Okay, this part, what do you guys need? This part of the plant, what do you need here?" You know, "Okay, if this happens, what do we do?" So we get a tank of chemicals sitting by that a forklift can grab and we can take over there and we can dribble in there to cause it to precipitate out.

So ever since the goal has been zero violations. And you know, imagine driving a car and the goal being zero violations. You don't drive at 55 miles an hour, you have to drive at 52 because if you're driving at 55 and you go to 55.5, you've violated. So you've got to be very conservative, you've got to add, you know, more chemicals than you'd normally would so that if you have a couple of bad days at the end of the month that the average comes out okay.

So it's made operation of the plant a lot more expensive, but made it more important to the operation. And they take a lot of pride - the Durham plant just went a year without a single violation, and I can't remember how many thousands and thousands of parameters that all had to be met. You know, every day a whole bunch of things have to be met. During the flood they got over a hundred million gallons coming into the plant that's - normal flow in the summer's about twenty. So we're impacted by the weather, power outages and all that stuff, and mechanical failures.

M.O'R.: One of the things in fact that Gary Kramer told me that part of the problem with the 13,000 violations was that the DEQ regulations didn't count for the huge variation in storm water flows seasonally.

R.B.: Well, but from their point of view, the reason or cause is that sewer lines are leaking. So you get water seeping into the lines. If you've got, you know, 500 miles of sewer lines and

they're four feet long, each piece, you've got a joint every four feet for five hundred miles, and each one of those is dripping, drip drip drip, that's where that water comes from, and washing down manholes. You could say, "Well, go fix your sewer pipes, so you don't get that water running in." That's horribly expensive, you know, digging up streets, putting in new sewer lines, and it's marginally effective. I mean, there's brand new subdivisions that don't even have any homes hooked up that - two o'clock in the morning here's clear water running them because of just the leakage at the joint, or the contractor, you know, he fills it with gravel and he packs it down and he happens to break the pipe, you know. So they've spent a lot of money putting TV cameras up sewer lines, you know, to check for leaks and seal leaks, but you just get overwhelmed when the groundwater gets saturated in these downpours.

M.O'R.: Well, Gary had also said that actually the standards have been changed to compensate to some extent for the increased storm ...

R.B.: Well, yeah, we have a wet weather event and dry weather permits, but still, our plants, like in the winter, maybe you have to meet a - well, one plant has to meet a 10-milligram per litre suspended solids in the winter, and a 5 in the summer, and the City of Portland's is a 30. So all year long they just have to do a 30, when we're down at a 10 or a 5. And typically in the summer, we're at a 1 or a 2. We're down where you can't really measure the stuff anymore, you know, it's below the detectible limit of some of the tests.

[End of Tape 1, Side 2]