



CAROLYN PRESTON

Date and place of birth (if available): September 17th, 1962, Cambridge, UK

Date and place of interview: March 26th, 2013

Name of interviewer: Peter McKenzie-Brown

Name of videographer: Peter Tombrowski

Full names (spelled out) of all others present: N/A

Consent form signed: Yes

Transcript reviewed by subject:

Interview Duration: 1 hour, 47 minutes

Initials of Interviewer: PMB

Last name of subject: PRESTON

PMB: Okay, and I'm talking to Carolyn Preston. It is Tuesday, the 26th of March 2013. Carolyn is the Executive Director and CEO of the Canadian Oil Sands Network for Research and Development which is going to become just defunct in a couple of days' time, and so it's played an important role in the history of the oil sands. So we want to talk about that as the organization fades into the distant past.

So Carolyn, thank you very much for agreeing to join us today. To give a little bit of the story behind this, Joy Romero, who is one of our recent interviews, and is a Senior Vice-President of Canadian Natural Resources Limited asked me specifically to capture the story of the Canadian Oil Sands Network for Research and Development, which is also known as CONRAD, and that lead to the very fortunate accident, or fact that today we're sitting around together.

So I'd like you to begin by telling me about your own life; tell me your biography, including education and so on. Please mention your husband and children, and say as much or as little as you want because we will be pursuing this line of discussion.



PRESTON: Okay. Well, I guess I'm a resident of Canada despite my very English name, 'cause I actually was born in the UK; and I came over as a very young child when my father came here to work for the National Research Council in Ottawa.

PMB: What year was that, matter of interest?

PRESTON: The year we immigrated here, 1963. And so I went to school in Ottawa, and I guess lived through some interesting times with Trudeau as Prime Minister, through some bombing in Quebec, and all kinds of interesting things. I did my undergraduate degree in engineering chemistry at Queens University, and went on to do my Masters and PhD at the University of Toronto in physical chemistry. One of very few women in both. Came out of Queens with a gold medal in engineering, and I guess in both disciplines less than ten percent are women. Graduated in January 1990, and like every other degree I got, still couldn't get a job except that I was a woman in an underrepresented profession in the federal government. I actually managed to find a job in the federal government, and moved out to Alberta to work in what was then called the Coal Research Laboratories of CANMET, Canadian --

PMB: I want to ask you two questions. I hope you don't mind this; date and place of birth?

PRESTON: Date and place of birth. Oh boy, okay. So you're catching me as I just turned 50.

PMB: Congratulations. So you were born in?

PRESTON: I was recently told it won't hit me till I hit 51. I was born September 17th, 1962 in Cambridge, UK, where my father was a graduate student.

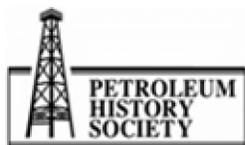
PMB: CANMET, and that stands for?

PRESTON: The Canada Centre for Mineral and Energy Technology which at the time was an organization under Energy, Mines and Resources Canada. It's now a brand name owned by Natural Resources Canada. The department name changed in I believe it was 1993 when I was working there. So in 1990, March 1990 I moved to the Edmonton area to work in a lab in Devon, Alberta called the Coal Research Laboratories whose name changed, I think about three years later, to the Western Research Centre.

At the time there was not so much coal activity going on 'cause the coal industry really didn't feel it needed any research, and the labs surface science techniques, of course, could be applied to the oil sands, and they had actually been working with the oil sands, and the Alberta Research Council, in particular, housed with them since their inception. I think the lab started in maybe the 1960s.

PMB: What year was it that you joined CANMET?

PRESTON: 1990. March 1990. So I joined as a research scientist, and I did a lot of my work in the pilot plant, and onsite with -- working onsite in pilot plants for -- actually I think the summer of the



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first year I was there we were working on developing a fibre optic spectroscopic technique for looking at the percentage of bitumen in slurries. And I worked at the OSLO Pilot Plant here in Calgary, the other six leases organization, and the pilot plant was operated by Imperial Oil. So I spent five years working as a research scientist, and in 1995 when the government was busy downsizing, the Director in Devon changed from David Brown to Bruce Stewart, and he put me in charge of a brand new business development office which was intended to --

PMB: This is the Director of CANMET?

PRESTON: The Director of the lab in Devon, the CANMET lab in Devon, yes, Bruce Stewart. He put me in charge of the business development office because we had to prove our worth to industry by getting money from industry, working collaboratively with industry. So I was in charge of intellectual property and strategic planning, which is something unusual for somebody who has a PhD in chemistry and an undergrad in engineering. But actually I have to admit, from almost the time I walked in that door, Bruce, who worked in the lab then as an advisor to the Director at the time, was giving me strategic materials and asking me my opinion on it.

So the course of my career changed. In that same year I married the Manager for the National Centre for Upgrading Technology, called NCUT, which was a brand new partnership between Alberta and Canada to work on upgrading technology.

PMB: Okay now, you're going to have to help me with that. You called it NCUT. And where was that headquartered?

PRESTON: It's in the same building, in the CANMET -- it was called the Oil Sands Research Centre at that point, the Devon Research Centre.

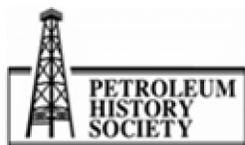
PMB: In Devon, Alberta?

PRESTON: In Devon, Alberta, yeah. So we got married, and I guess in the summer of 1997 we had our first child Matthew, and almost three years later we had our second child Andrew, and about 15 months later we had our daughter Jessamyn. So it's a variation of Jessamy, but it ends the same way as my name. Actually, I'm married to Bill Dawson who was the first Manager of the National Centre for Upgrading Technology.

PMB: Oh, so you kept your own name?

PRESTON: Yeah. And I kept my own name because I worked in the same building with my husband, and you'd be amazed how few people in the building, when they started working there, actually knew we were married. We were on the same management team and they did not know we were married.

So we left CANMET and Alberta in 2007, and at that time I became the Executive Director and CEO of the Petroleum Technology Research Centre in Regina, Saskatchewan, which is a research



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centre that works on heavy oil, enhanced oil recovery, and CO2 capture and sequestration, the monitoring thereof, I guess, at the Weyburn CO2 EOR field. And I left there in 2010 and came back to Alberta, coming to Calgary to become the Executive Director of CONRAD.

PMB: And so it really sounds to me as though your whole -- at least the last ten years or so have been pretty much involved with oil sands, with heavy oil, and with carbon capture and sequestration, which is CCS?

PRESTON: Yes.

PMB: Would that be a fair summary, of that little bit?

PRESTON: Actually I would say 23 years.

PMB: For almost 23 years?

PRESTON: My whole career. My whole career has been spent on oil sands and CCS.

PMB: Okay. And I'm going to ask you to talk in detail about a lot of that stuff. When did you first hear about the oil sands? I'm guessing you didn't hear about it in Ontario, or did you?

PRESTON: Yes I did. I first heard about the oil sands when I was an undergrad in engineering chemistry because -- that was in the early 1980s and Suncor and Syncrude were both operating at that time. And Syncrude and Suncor were both hiring on campus for summer jobs, so I heard about the oil sands then. I had an incredible interest in this enormous project on a world scale, so pretty -- it was a pretty big project; big equipment --

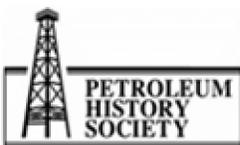
PMB: You're talking about Syncrude now?

PRESTON: I'm talking about Syncrude and Suncor. Big equipment, interesting technology, very heavy oil. Pretty foreign to somebody who is putting gasoline in a car, her father's car. So I believe at some point I probably interviewed for Syncrude, but when I graduated in 1984 with my engineering degree nobody was really hiring, although one of my classmates does actually work at Syncrude Research.

PMB: In 1984 there was a really awful recession in '83, '84 and it affected Canada worse than most countries in the world didn't it?

PRESTON: Yes it did. And, in fact, I recall the summer before, in 1983, a number of students graduating and undergraduates had been -- supposed to be hired by Dome, and they ended up being domed, in other words they didn't have jobs. They didn't have jobs, and much to my dismay there is still a building with that name on it in downtown Calgary.

PMB: Well, toward the end of its period in history it was known as Doom Petroleum.



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PRESTON: Yeah, and I'm sure it was.

PMB: When I worked for Amoco, of course Amoco was the company that bought out Doom or Dome Petroleum, which was a huge -- one of the great high fliers in Canadian history; tremendous background.

And so you've known about it all your life. Now in your bio you've talked about how you got involved in it, but would you focus on what led to your initial personal involvement in the oil sands? How did that happen?

PRESTON: Well, I guess it's sort of a peripheral involvement. In 1988, towards the end of my PhD I came out to Calgary, actually stayed at the University of Calgary in the new residences constructed for the Olympics a few months before, and there was an International Catalysis Congress here in Calgary was held downtown in what's now called the Telus Convention Centre. And one of the side trips we could make was to fly up to the oil sands and have a tour at Syncrude and Suncor onsite, walk around onsite on the weekend. And at the time I believe it was \$300 or something for that excursion; a lot of money for a grad student because it was 1988, and I asked my PhD supervisor if he'd be willing to pay for it, and he said if you're really interested I'll pay for half. And so my hard-earned money, at least half of it went for me to go up there. And we flew into the Mildred Lake Airstrip, and I was just absolutely amazed. I was --

PMB: And the Mildred Lake is the Syncrude Airstrip?

PRESTON: That's correct. And I faced this huge equipment, this incredible mining operation, and I was just blown away. And I thought I want to work for the oil sands. And even though it was difficult to find a job when I graduated in 1990, I ended up working in a research centre, working on oil sands technology development.

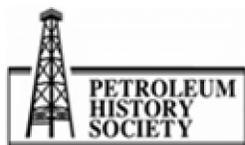
PMB: This is at CANMET at Devon?

PRESTON: At CANMET in Devon, yeah. And so I began my work working on oil sands.

PMB: Okay. So now we're in 1990; you're at CANMET; you're working on oil sands technologies. What did that look like in those days? What were the technologies you were working on and so on?

PRESTON: We were working on a fibre optic technique not only for looking at bitumen content in slurries, but -- and ultimately -- we were developing a near infrared spectroscopic technique for looking at bitumen content versus water and clays and sand in mixtures of slurries, and ultimately that technique was further developed by Syncrude, and we worked with Syncrude on it -- further developed by Syncrude actually to just look at ore quality as it went into the plant. And they still use it today.

PMB: And how do they use it today? Explain a spectroscopic technique, how did it work?



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PRESTON: Well, you shine some light at -- well, it depends on -- in the case they're using it they're not actually shining light through the sample, we were shining light through the sample, but they were actually looking at reflectance, infrared reflectance. You actually end up with a number of peaks in your spectrogram or spectrograph, is old words for it, but anyway. And using mathematical modelling, you know chemically what peaks are attributed to which chemical, and using mathematical modelling you can determine, based on some quantitative analysis, you can determine how much of each component you have in there.

PMB: So this gives you a better understanding of what the chemical construction of that bit of oil sand is, is that -- that bitumen --

PRESTON: No because near infrared doesn't give you -- it's infrared technology that would give you chemical structure. So near infrared, it can't be tuned quite that way. You're looking at compositions, so percentage bitumen, percent water, percentage sand, percentage clay. So it ended up being a useful tool for looking at bitumen content of ores as they go into the extraction facility, and it might allow them to change the way they operate the extraction facility.

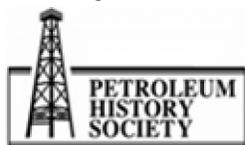
PMB: Okay, fair enough. When I look at your resume, one of the things that I personally find really fascinating is the work that you've done in the technologies, and before we get to the federal/provincial group, the taskforce on the oils sands in 1992, I'd like you to talk a little bit about the technologies of that period, too, because you've got more expertise than most of the people I know.

PRESTON: Technologies of the early 1990s. Well, they were still using bucket wheels; traditional surface mining techniques that you still see west of Edmonton, used for coal mining. So bucket wheels, and belts, and that kind of thing; going to truck and shovel didn't change until the late 1990s. So they were having trouble with corrosion and rubber challenges, that sort of thing because it's extremely harsh ore to deal with, but also very cold climate in the winter.

PMB: And the teeth on the buckets breaking off.

PRESTON: Oh yes. Oh yeah, exactly. I have a friend who used to work at Syncrude Research who is a rubber chemist, and he worked on belts. So they had to worry about all that kind of thing. Then there were tailings. There was something called the Fine Tails Consortium which, between you and me, was originally called the Sludge Consortium, which was looking at how to help settle the unconsolidated tailings in the tailings ponds, so the Clark Hot Water Process uses sodium hydroxide, and that changes the electrochemical structure of the outside of clays and it forces them to repel each other, and they won't settle. So they sit there as a jell-like material in the middle of the tailings pond and won't settle. So that's a legacy of the oil sands, if it can't be resolved, and it will be resolved. I mean there are technologies to deal with it.

It's probably a short form for Fine Tailings Consortium, but anyway. But it was originally the Sludge Consortium. We called it Sludge; a totally undesirable material. So we were dealing with that challenge.



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They were dealing with the challenge of having bitumen in the tailings pond, and how to recover that because that was considered at the time lost product, and actually coincidentally now we would look at it and go -- we actually have bugs in the Athabasca River that convert bitumen. If you look up the Athabasca River you could see natural seepage of bitumen into the river. There are natural bacteria that convert that bitumen into methane and eat some of the hydrocarbon, and clean the river. So if you go downstream the river is clean. So those bugs actually exist in the tailings ponds, too, 'cause where did you get the water from that's in the tailings pond? It came from the river. And these days methane is not a good thing to have coming off your tailings pond for climate change reasons. A methane molecule, in terms of climate change forcing is worth 21 CO₂ molecules.

PMB: Do I understand that you were basically developing these bugs and throwing them into the tailings ponds?

PRESTON: We weren't developing them, but we --

PMB: You were capturing them.

PRESTON: -- at CANMET -- no, we took -- CANMET funded some work at the University of Alberta, conducted by Julia Foght. She was a fairly new professor at the University of Alberta, and actually it was a CONRAD, piece of CONRAD work in the second half of the 1990s, taking those bugs - she's a biochemist - taking those bugs and altering them to see if they could be used for upgrading or converting the bitumen.

PMB: Oh, isn't that incredible.

PRESTON: And she's still working on that work.

PMB: Is there any successes there?

PRESTON: I believe so, yes.

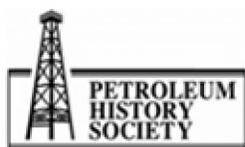
PMB: Well, 20 years later --

PRESTON: Otherwise she wouldn't still be funded if it wasn't successful. But it's really cool. So bioengineering, bioengineering the oil sands. It's called bio-upgrading.

PMB: Bio-upgrading. But now your argument a couple of minutes ago was that because it produces methane, which is an undesirable thing to have in (indiscernible).

PRESTON: Now we would worry about it because bitumen shouldn't be there 'cause it would ultimately be converted to methane, which would be --

PMB: Yeah, it's a greenhouse gas.



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PRESTON: -- emitted by the tailings ponds, and result in climate change.

PMB: It would contribute more to it than carbon, yeah.

PRESTON: Yeah. Yeah. So what else did we work on in the early 1990s? At the time we had Syncrude and Suncor operating mines, and using naphthenic-based froth treatment. And both Syncrude and Suncor have upgraders that produce -- and bitumen, when you upgrade it to produce synthetic crude oil, produces naphtha, and they use naphtha to run their vehicles onsite. But naphtha is also used in froth treatment to thin the bitumen so you can remove a little bit of water and clay and sand, et cetera, from it, and produce a clean bitumen product that can go to the upgrader. They used the solvent they had available onsite which is naphtha.

In 1994 Syncrude Research decided that it needed to relocate in Edmonton from 17th Street North East to the Research Park near the Alberta Research Council, and they weren't going to own the building, and they had pilot plants in the building at 17th Street, and they had to do something with those pilot plants. They gave the froth treatment pilot plant to CANMET in Devon because they weren't allowed to have any pilot plants. They didn't own the building in the Research Park, they weren't allowed to have any pilot plants in the Research Park, certainly nothing that big. So it got moved into a building that we had out in CANMET in 1994, and a Froth Treatment Consortium was developed around that because Shell was starting to develop an interest in building its own operation, but its upgrader was in the Edmonton area, at Scotford in Fort Saskatchewan, and it wanted to be able to transport its bitumen down to its upgrader, but didn't have any naphtha to do that.

So they worked together with Syncrude and Suncor 'because, of course, anything new that's learned could actually, in the future, be used by Syncrude and Suncor. And, of course, anything old could be brought in. And they developed paraffinic froth treatment in conjunction with the scientific staff in - - at the CANMET facility in Devon. And that was actually in addition to the bitumen extraction pilot plant that was run in CANMET, was fundamental to Shell building and beginning to operate the first new operation in the oil sands for 20 years.

PMB: So paraffinic froth treatment is the technology that's being used in the new Kearl project?

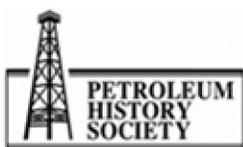
PRESTON: Yes.

PMB: And it was also used in Shell's project, and I think that project came on-stream about five years ago or so, didn't it?

PRESTON: No. Shell? No.

PMB: Ten, maybe ten years ago?

PRESTON: Ten.



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PMB: Ten years ago. Okay, so around 2002 or 3, okay.

PRESTON: Two to three, yeah. That's correct. So paraffins -- naphtha is aromatic, so it has benzene rings in it. So a paraffinic is a straight-chain hydrocarbon, and basically paraffins are more readily available up in Fort McMurray, and more easily transported. So actually Shell operates a pipeline where they strip off the solvent and send it back up to Fort McMurray to dilute the bitumen to send it to the upgrader. So they have a geo pipeline. Yeah, and at Kearl, they're going -- natural gas condensates the paraffins.

PMB: Okay, but now I guess what I'm trying to understand is how the paraffinic froth treatment, and how the paraffinic technologies -- and I wrote an article about this a few months ago, and my memory is slipping here. Can you explain to me how that works 'cause my understanding is that one of the great things about paraffinic froth treatment is it leaves the real gunk behind when you're actually mining the facility, mining the plant, or mining the ore body.

PRESTON: Well, I believe that the tailings from that froth treatment is much easier to deal with than the paraffinic froth treatment, and I'm not really technically proficient in the area of froth treatment, to be quite honest. I would see it more as a game changer for the industry because it allowed an operator to run a mine without having an upgrader. So that's exactly what Imperial is doing. Originally there was a plan for an upgrader at Kearl Lake, and when Imperial took over that project, Exxon Mobile has an appropriate refinery in the United States, and the diluted bitumen would be shipped down there to be converted..

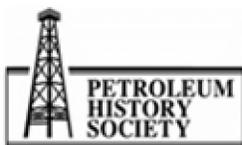
PMB: Okay. Now, this is one of the rare chances I've had to talk to anybody who was really technically proficient, so excuse me if I take full advantage of you.

The famous national taskforce on oil sands strategies, I believe this was struck in 1994. I believe that Jean Chretien had just become the Prime Minister of Canada; he had been the Energy Minister, and Ralph Klein had just become the Premier of Alberta and, of course, he was a real gung-ho free market type of guy. And so it seems to me, my recollection is it was one of those miraculous times when all the stars were nicely aligned, and everything worked out very beautifully. But I wonder whether you would tell us a little bit about that? That's one observer's perspective. From being in the middle of the industry, what's your perspective?

PRESTON: Well, I think the Alberta Chamber of Resources recognized an opportunity at the time to strike this national taskforce. Eric Newell and Erdal Yildirim co-chairing it.

PMB: And the Alberta Chamber of Resources is based in Edmonton?

PRESTON: That's correct, yes. So they recognized that the industry was starting to produce product and it was becoming profitable, so I guess Greenfields production was probably hovering just above \$10 a barrel, and the price of oil was about \$18 a barrel, so there was some money to be made, even including the heavy oil differential. And there was an opportunity to -- given the leadership federally and provincially, to convince the two governments to change the royalty and tax structure for the



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industry to encourage new investment in the industry, and that would allow -- I mean Syncrude and Suncor recognized they were going to run out of oil in the mines they were operating, and they needed to expand, so it was good for them to be incentivized to expand, but it was also an opportunity for some of the other leases to be exploited by other companies such as Shell and CNRL, et cetera.

And I wasn't involved in the taskforce; I only had the pleasure of reading the reports afterwards. But they wrote a series of reports, and one of them that's most relevant to CONRAD is that there's a report on science and technology, and they recognized that without new technology the industry couldn't move forward to improve economic first performance, but also environmental performance, 'cause I think even then they recognized that a huge tailings legacy was not going to sit very well with people if the industry expanded as much as we see it is today, and as far as we see it progressing going forward.

At that time there was no SAGD operation; that didn't start until -- piloting beyond the underground test facility didn't start, by Petro Canada, I believe it was, until the late 1990s --

PMB: I think it might have been Cenovus and JACOS.

PRESTON: And Petro Canada was doing it --

PMB: Was it in there, too?

PRESTON: -- was not very far behind, yes. Well, Cenovus would have been -- it would have been AEC, I should imagine, that was doing it at the time. 'Cause Cenovus is a brand new company.

PMB: EnCana actually.

PRESTON: EnCana? Was it --

PMB: I think it was EnCana, yeah.

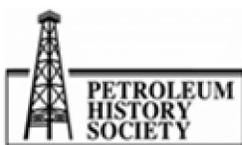
PRESTON: No, no EnCana wasn't formed until 2003.

PMB: Okay.

PRESTON: They're the owner of the Weyburn field --

PMB: Well, then it must have been Alberta Energy Company. .

PRESTON: -- with whom I was -- so it was -- Pan Canadian and AEC merged in 2003 to become EnCana. And now they've been split apart into EnCana and Cenovus.



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PMB: Anyhow, continue with that train of thought, please, 'cause that was quite interesting. You were talking about the development of SAGD.

PRESTON: The development, yes. So I guess the only sort of in situ technique, which is getting oil out of the ground too deep to be mined, so you have to do it in a sort of conventional sense where you pump oil out of the ground, but given that bitumen flows slower than molasses, it's a little hard to pump it out of the ground so you have to actually mobilize it by reducing its viscosity, and one way of doing that is thermally, by heating it up, 'cause it flows better when it's hotter.

So the steam-assisted gravity drainage technology, developed through the AOSTRA Program in the 1980s and early 1990s had been tested at the underground test facility, and there were no operators, unless you consider the Imperial Oil operation at Cold Lake; they claimed that that was heavy oil, but it's actually bitumen. It's probably more mobile bitumen than it is in the oil sands but it's deeper, and they were using a technique called cyclic steam stimulation, which is somewhat similar to SAGD in that you're using steam to mobilize the oil, but you inject steam, wait a bit for the oil to warm up, and then you pump the oil out as opposed to having horizontal wells, and draining the bitumen to a well below the steam well.

PMB: And that technique works in Cold Lake at Imperial's facility there, but --

PRESTON: Well cyclic steam stimulation would work anywhere but it's -- but SAGD -- it depends on the reservoir. I mean CSS, I believe, is used in Peace River, today.

PMB: At Shell?

PRESTON: Yeah. I'm not exactly sure if it's Shell, but likely.

PMB: Yeah. Okay, 'cause Howie Dingle suggested that it just was the better technology to use it at Cold Lake, better than in the Athabasca, for example.

PRESTON: Well, I believe that the resource that Imperial Oil had, the viscosity was not as high as you see in the Athabasca region, yes. And the same is true in Peace River.

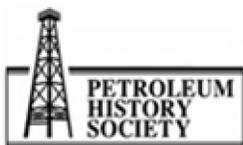
PMB: Okay. I've been trying like crazy to find somebody who's involved with Peace River who will talk to us, and I can't, and I think it's because Shell really controls their people, and won't let them talk. It's the damndest thing.

PRESTON: John Broadhurst wouldn't talk?

PMB: John?

PRESTON: John Broadhurst?

PMB: I'm going to put that name down.



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PRESTON: He's the VP of heavy oil technology at Shell. He's going to be retiring in September, but he's the Vice-Chair of CONRAD.

PMB: I wonder whether I can find somebody who can introduce me. So let's continue from there.

PRESTON: Joy could do that.

PMB: Or maybe even you could.

PRESTON: Or me.

PMB: Actually, Joy would be -- oh, you would be great, if you wouldn't mind.

PRESTON: That's good.

PMB: And then, of course, one of the things that the National Taskforce did, the main thing that it did was an economic thing.

PRESTON: Yes.

PMB: It said here's how we're going to let oil sands expenditures be dealt with on a tax basis.

PRESTON: So on a royalty basis in Alberta, on an income tax basis federally. So basically it improves the net present value of investment for -- so they can offset the big royalties until they've stopped building, so.

PMB: And they've started to recover their investment.

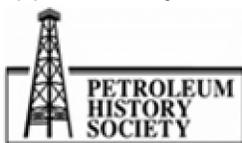
PRESTON: Yes, exactly.

PMB: And one of the outcomes of this was that the oil sands business went nuts --

PRESTON: Yeah, no kidding.

PMB: -- as you know.

PRESTON: Oh yeah, the 1990s and early 2000s were a very exciting time for all of us. All the forecasts were crazy, and the big boom happened when I was living in Edmonton, before it ever reached Calgary. My husband and I sold a house in 2002 that he bought in 1993, and the market for houses in the Edmonton area, and this was an acreage, the market for houses in the Edmonton area, for starter homes, had gone just crazy. My husband bought the acreage, and it was a 15-minute drive from West Edmonton Mall, so like a city person like me loved living out in the country, 'cause it was a wonderful country life, but I could go shopping, or do whatever I wanted -- any city thing I wanted I could have with a short drive. So that house he bought for I believe \$130,000 approximately. In 2002 we had it appraised. We sold it ourselves 'because the market was so hot we



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felt we could sell it ourselves. We had it appraised, then a month later we listed it and I decided, okay we're going to ask for 15 percent more than the appraisal, so we listed it for \$195,000, and we sold it to the first people who looked at it for exactly our asking price. They wouldn't offer us a penny less 'cause they knew they would lose it. It was gorgeous acreage.

They had it appraised by the bank two weeks later and they appraised it at \$210,000. It sold for, two years later, for \$250,000.

PMB: Yeah, that was the time, yeah.

PRESTON: Unbelievable. And that was 2002 to 2004 before it went nuts here in Calgary. Yeah.

PMB: Now, one of the ironies, by the way speaking of that boom time, was that when Ralph Klein retired as Premier, I found an article about his final news conference, and somebody said, were you prepared for what happened with the oil sands after you signed that deal in 1994? And he basically said we had no idea what it was going to do.

PRESTON: No idea.

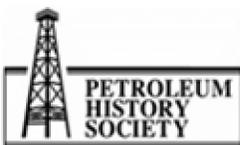
PMB: We had no idea.

PRESTON: The legacy exists today; lack of infrastructure up in Fort McMurray, lack of infrastructure to get equipment up to Fort McMurray. You wouldn't believe the equipment I saw driving by the window of my office in the Research Centre in Devon because it went from Nisku, down Highway 19, and our Research Centre was at the intersection of 19 and 60, and up 60 to go up to Fort McMurray. I saw pieces of upgraders, and cokers, and unbelievable stuff going up there, and the world having to come to a halt because equipment was driving up the road.

PMB: And you'll probably remember that I think it was in 2006 or 7, Peter Lougheed, the former Premier, gave a speech in which he said that was his biggest regret, that we just moved too quickly, and that the oil sands have got -- are a little bit out of -- well, he didn't say a little bit -- are out of control, and it's causing major environmental problems. Now, those are not his exact words, those are his sentiments. I interviewed him about two years ago.

PRESTON: Well, I would say that it could have been planned out better, but I wouldn't say that -- I think the world is looking too closely at the oil sands when it comes to environment. It's become -- everybody's putting a microscope on it, because there's a lot bigger environmental legacy in Venezuela, China, et cetera, but we're all focusing in on the oil sands. And it's a very small area, in a -- and I'm not putting down the residence of Northern Alberta, but it's a small part of the North, and it's small compared to say Venezuela, the Orinoco Belt in Venezuela.

I think we tend to dismiss the environmental legacy in the developing world compared to the developed world which Canada is supposed to be, although we very often don't behave like a developed world 'cause we just sell natural resources. But I think it's unfair because these companies



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have always done their best to clean up after themselves. People look at the tailings ponds and say we have to get rid of the tailings ponds, but if you think of it this way, that tailings pond is required to operate extraction for a surface mine. You need water to do the extraction, and if you're not going to withdraw water from the Athabasca River, apart from initially filling up your tailings pond - you need the water from the tailings pond to run your extraction process. So you cannot get rid of the tailings pond or you have to stop operating, or withdraw water from the Athabasca River, which nobody will tolerate.

PMB: Yeah. Well, you won't find me on the other side of that argument, I'll tell you.

PRESTON: No. No.

PMB: And I came across a really neat thing in the New York Times a couple of days ago. It showed the major countries of the world and, you know, what percentage of their electricity is produced by hydropower, and Canada produces -- are you ready for this or do you know? Seventy-seven percent of our electricity is produced by hydropower, which is not CO₂ or GHG intensive. It's hydroelectric, 77 percent. They're our environmental properties.

PRESTON: Actually, micro-hydro is considered a clean technology, but giant-scale hydro like James Bay is not because you actually do produce -- not only do you displace people and animals and stuff, you're actually --

PMB: Destroying habitat...

PRESTON: -- putting water on top of a lot of growth that rots and produces CO₂, but you also have algae growing, that produces CO₂.

PMB: Well, that's interesting.

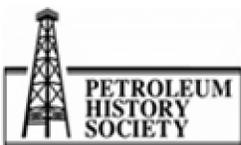
PRESTON: Yes. So it's only micro-hydro that is actually considered to be clean. So the little mills, say at -- what am I thinking of, is it Merrickville in Ontario, near where my parents live, there's an old mill there that used to be used to turn wheat into flour, right? So there was a bakery there and stuff. But a small power company in Ontario is actually running it to produce power, so that's micro-hydro. I believe it's Merrickville.

PMB: In Ontario?

PRESTON: In Ontario. It's near Ottawa.

PMB: Thank you very much. That was -- that was quite good.

PRESTON: It's on the Rideau River, to clarify it.



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PMB: You mention in this article that you've given me that the NTFOSS, which is the National Taskforce and Oil Sands Strategies, also called NTFOSS concluded that the 21 to 25 billion of capital investment required to double or triple oil sands production would generate a 0.6 percent increase in GDP, and one million person years of employment, 97 billion in revenue to all levels of government, and \$106 billion increase in Canada's international balance of trade position from 1996 to 2010. Okay, that was a 1992 study.

PRESTON: Yeah.

PMB: And I know that you can't attest to any of these numbers today, but what you're suggesting, as I understand it, is that a fairly small -- well the investment in the oil sands has huge leverage throughout the economy. In your opinion is that still true?

PRESTON: It's definitely true because the industrial heartland of the country is in Ontario, so a lot of the manufacturing takes place in Ontario, so there are a lot of jobs created in Ontario, although I don't know if they're willing to admit it when they see people losing jobs, but the oil sands has made it less bad than it could have been in Ontario, and the employment, the employment is across the country. We see WestJet flying all the way to Newfoundland to bring people up to Fort McMurray.

Of course the same is true going up to the diamond mines up in the Northwest Territories and Nunavut, I think they have some, and probably the Yukon. You see direct flights by Canadian North up there. So that may seem like nothing, but they actually leave their families behind from whence they came, and they commute every two or three weeks, and so there's economic benefits to the communities from which they come, because they are not unemployed, they're employed, and they're bringing their salaries back to their communities. So they're actually creating indirect jobs in their own communities.

PMB: So somebody from New Brunswick or Newfoundland would be shipping money back and benefitting the local community?

PRESTON: Exactly.

PMB: Okay. Good. You have said, again in this article, and you keep referring back to this so I'm going to use your words here, "technology is the key to clearing the hurdles facing the oil sands".

PRESTON: That's true.

PMB: Very, very general statement.

PRESTON: It's a very general statement, but if we -- you know, I refer to the froth treatment technology; that was a game changer. It's true for the whole oil industry. We've seen the change from traditional strip mining techniques, from bucket wheels and belts and -- to truck and shovel. That may not seem like a technology change, but it actually is. You're changing your equipment so



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it's a technology change. There are changes in upgrading technology to improve energy efficiency and change the product blend. What else would there be?

PMB: Is this the case more in the oil sands industry than in other industries? You know, we're just overwhelmed with these technologies; new technologies face us every day.

PRESTON: Well, I think it's -- it is true because it's -- I like to think of the oil sands as a big experiment actually because it's a different kind of oil. We have oil companies mining. That seems a little counterintuitive, but we have mining engineers, and metallurgical engineers, and petroleum engineers working together, and that multidisciplinary team can bring new technologies to the challenge at hand, but technology is key to the entire oil industry doing well.

I mean you wouldn't be able to drill in the Gulf of Mexico, down several kilometres, without new technology, and find oil. I would say that the -- yeah, the oil sands -- it's a different kind of oil, a biodegraded oil that a Saudi Arabian oil company wouldn't know what to do with 'cause they don't have anything even remotely resembling a heavy end, and this is worse than heavy ends, and we convert it into the same stuff that goes in the tank. So I hope I've made my point.

PMB: I (indiscernible) this and I heard somebody describe pure bitumen as basically having the consistency of peanut butter.

PRESTON: It is. And if my husband, who you'll recall was the Manager for the National Centre for Upgrading Technology, used to refer to bitumen as liquid coal.

PMB: Not a phrase we'd want to use today.

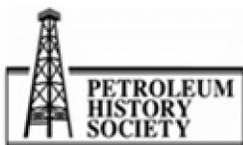
PRESTON: No. But I mean really, it has almost the same energy value before you've converted it.

PMB: Does it really?

PRESTON: Yeah.

PMB: Oh, I didn't know that. Well, I want to go back to one of those technologies. It strikes me as an absurd thing that somebody didn't come up with it earlier, the trucks and shovels. Now, I don't know whether you -- I remember when I was a kid that we had these books, you know, when I was 4 and 5 years old, and there would be Tommy and, you know, he would be the operator of a steam shovel and, you know, I mean basically it was a steam-driven -- you know, it's the same kind of equipment, the same kind of shovel; this was from the 19 teens, you know, when this became quite known, that they're using in the oil sands today, the main difference being that today they're diesel operated, or they're fueled by some other fuel.

PRESTON: Yeah.



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PMB: So the technology is very ancient. And what I understand is that because, you know, bitumen, in the summer its liquid, but in the winter, in most of the seasons of the year it's a really, really --

PRESTON: It's hard, yeah.

PMB: -- tough, difficult material. How absurd was it to bring in those bucket wheels. Would it have made sense to bring in something like a steam shovel, a mechanical shovel in the '60s and '70s when GCOS and Syncrude were being built?

PRESTON: Well, hindsight's 20/20, right? But they were looking at the scale of the project they were embarking on, and they were drawing parallels to the coal industry, which was not too far down the road, and operating it in the same way, instead of thinking of smaller equipment. They were thinking of moving lots of volume of material because it takes a lot of material to convert into a barrel of bitumen, right, or synthetic crude oil. So they were thinking big scale, and I guess they didn't realize that there's some efficiency in thinking of moving smaller quantities. And they also weren't aware how much their equipment would wear, and how much that would cost them on an operating basis.

So in the end -- and I think other surface mining operations came to that conclusion too, around the world, that it was better to think of moving in smaller pieces to extraction or whatever the mining operation is.

PMB: It's my understanding that the first bucket wheel upgraders, when they came here, were assembled from equipment that was essentially bought from Germany.

PRESTON: Yes.

PMB: And the original instruction manuals, before they could do anything else with them, they had to translate the --

PRESTON: Into English?

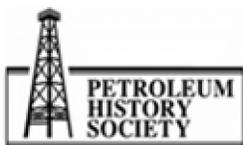
PMB: -- manuals from German into English.

PRESTON: It doesn't surprise me. The Germans have always been very good at mining. They produce a lot of good mining engineers.

PMB: But, of course, the coal in Germany has quite a different, you know, physical structure than the oil sands in Fort McMurray.

PRESTON: Yeah. Yeah.

PMB: Especially in the winter.



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PRESTON: Yeah. Yeah.

PMB: Anything else you'd like to say about technology? I know that you could talk about it all day, but -- and I'd be happy to listen to as much as you'd like to say.

PRESTON: Technology; I think probably what I could say, and it's not about technology per se, but it's the way we develop technology and the successes that CONRAD has had is that technology can be developed at greater pace if we collaborate, and that's because we each bring our different learning sets and knowledge basis, and our experience with us together, and learn from each other, and that leads to developing better things, and faster.

PMB: And now this takes us right to the heart of CONRAD.

PRESTON: It does, exactly.

PMB: Now, can you elaborate on that theme, please, because that's an excellent point.

PRESTON: Well, I guess that AOSTRA was established by the Government of Alberta in the hope that they would tease industry into working on developing other technologies for converting bitumen into synthetic crude oil. And they ultimately ended up developing steam-assisted gravity drainage technology.

They worked on a number of other technologies, but that was the big winner. And although that has proven to be very successful, because we actually see the in situ production almost equalling, now, mining-base production, the industry really didn't like the intellectual property ownership model that AOSTRA presented, and that was that the government owned everything.

PMB: Now let's talk about that a little bit more because one of the people that I interviewed earlier on for this product was Eddy Isaacs, who is the head of the Alberta Research Council, which has taken on many forms, most recent of which is Alberta Innovates.

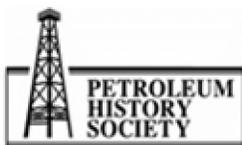
PRESTON: Yeah, he managed the Heavy Oil and Oil Sands Program at Alberta Research Council, that's correct.

PMB: Right. And one of the problems that he addressed - we talked about this just before the camera turned on - is that all of the technology that was developed out of AOSTRA was -- essentially the way the deal worked is that the province would own the patents.

PRESTON: Correct, and license it.

PMB: And what he said is that they never really found a way to license it.

PRESTON: Apart from SAGD, yes. SAGD they did. So the industry didn't like the ownership model, and Imperial Oil, in particular, didn't like the ownership model, and decided that there are a



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lot of benefits to collaborating, which they had done in the development of SAGD at the underground test facility, but it would be better if the investors jointly owned the technology. And so they came up with the CONRAD model, and I believe that model was worked on from the 1980s until 1994 when CONRAD was incorporated; and it was incorporated, actually, around the froth treatment facility being built at CANMET, using Syncrude equipment, which I referred to earlier.

PMB: Now, what I thought I heard you say when we had our earlier discussion is that the first meetings in respect to CONRAD took place in 1986.

PRESTON: Yes. Yes.

PMB: Can you give us a little bit of that story, please?

PRESTON: Well, I don't know very much of it 'cause I wasn't involved 'cause I was still a student at that time. But Bob Mitchell, who is now with ConocoPhillips, was working for the Alberta Department of Energy at the time; he said he recalls -- he told me a couple summers ago, when we started working on what was beyond CONRAD, that he recalls the first CONRAD-like meeting that he attended was in about 1986, and lots of discussions about it. It overlapped with the National Taskforce and Oil Sands Strategy meetings, when they recognized the technology was critically important to growing the industry, and I believe it gelled at an event that was held in Red Deer in 1992 or 1993, and they held the meeting in Red Deer 'cause it was halfway between Edmonton and Calgary. For no other reason.

And they decided they were going to create this thing called CONRAD, and they incorporated it as a non-profit company because it was originally intended to handle the licensing and joint ownership of the intellectual property to the member companies.

PMB: And so that was in 1990?

PRESTON: Two or three, I can't recall. Erdal Yildirim will know the exact date.

PMB: Okay, we have interviewed him.

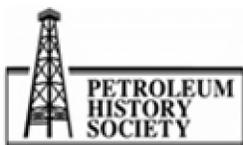
PRESTON: Yes.

PMB: My colleague up in Edmonton did.

PRESTON: Yeah, yeah.

PMB: And we have interviewed him. Okay, so what you created, or what the industry and the province created, in effect, was a model which was able to overcome the real difficulties with AOSTRA?

PRESTON: Yeah. So it's a joint intellectual property ownership model.



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PMB: Can you talk to me a little bit about that, please?

PRESTON: CONRAD conducts two types of work; there's the more public work that involves all the membership 'cause CONRAD has grown over time, but originally there were consortia of member companies. And if you participated in a consortium you paid an initiation fee if you weren't one of the original companies. In other words, you bought into the technology, and that initiation fee was based on what it cost each of those companies to develop the technology up to the current date in which new companies joined. And when you became a member of the consortium you would jointly own the technologies developed, and they're pre-competitive technologies, not competitive technologies, so not proven in commercial operation.

PMB: They are pre-competitive?

PRESTON: Not proven in commercial operation. So the froth treatment facility at CANMET is a pre-commercial demonstration facility, so it's small scale. It's scalable to commercial level, but it's small scale.

So if you bought into the Froth Treatment Consortium after the original members joined, and that would have been CANMET, Syncrude and Suncor. When Shell joined they would have had to pay a fee to join which would have consisted of the cost to operate the facility, and run projects before Shell joined, and then intellect consortium is actually quite big right now, and the membership has come and gone as the industry has changed and everybody has bought everyone in, that kind of thing, to the point where sometimes it's fuzzy. You go who does that, and who owns that company?

So everybody owns a world-free license to use that technology in their commercial operations.

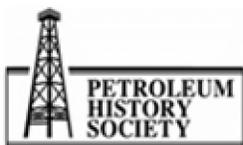
PMB: So they can use it anywhere in the world?

PRESTON: Anywhere. Anywhere for no fee whatsoever, just by being part of the consortium and working together with the others to develop it.

And they also have the rights to further develop that technology. So in the case of Shell, they took away the paraffinic froth treatment and further developed it for their commercial operation, and so they adapt it to their operations. It probably continuously changes. And Imperial did the same thing, to adapt it to what they were building. And so they hold patents in addition to the patents jointly owned by the Froth Treatment Consortium. So they have patents for innovations on the original technology developed.

PMB: So they own the original technology for use anywhere in the world, but as they modify it they develop the (indiscernible) --

PRESTON: Yeah, and those patents that they've used at their commercial operations are proprietary. So they'll be operating that pre-competitive technology slightly differently.



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And the same is true of SAGD operations. They all have to be adapted to different reservoirs. So they're all operating it slightly differently.

I mean every reservoir, just like every mine site, has different qualities of bitumen, different amounts of shale and clays in there, so they have to operate differently, even down to, as Joy says, too many spiders at the Horizon site. More spiders than anybody else has. Lots more.

PMB: Now, my memory tells me that you have actually four industrial research consortia?

PRESTON: Yes.

PMB: One of them is Environmental and Reclamation Research, one is a Tailings Consortium, one is a Bitumen Production Fundamentals Research Group Consortium, and the fourth one is the Froth Treatment Consortium. And if anybody thinks that I could really remember any of that; I'm reading it from a piece of paper. Can you tell me a little bit about that? The first one is called CONRAD ERRG, are the --

PRESTON: CONRAD Environmental and Reclamation Research Group Consortium.

PMB: And one is called OSTC.

PRESTON: Oil Sands Tailings Consortium.

PMB: One is called CONRAD, second word capital B-P-F-R-G.

PRESTON: Bitumen Production Fundamentals Research Group.

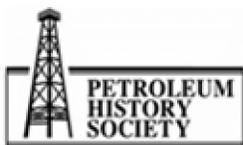
PMB: And finally the Froth Treatment Consortium.

PRESTON: Yeah.

PMB: Can you tell me a little bit about those four, please?

PRESTON: Okay. Well, the CONRAD Froth Treatment Consortium we've already discussed. That was established in 1994.

The next one that was formed was the first tailings -- CONRAD Tailings Consortium. That's not what we call the OSTC now. The OSTC, the Oil Sands Tailings Consortium, is the third iteration of that same consortium. The first consortium was formed in the late 1990s, and I was involved in that when I was in Devon 'cause I actually found money from Technology Early Action Measures, a program under Natural Resources Canada and Western Economic Diversification, to fund a pace technology demonstration at Syncrude, which is a tailings technology. It's a technology brought from other surface mining industry, to try to dewater tailings to see if we could convert it into reclaimable land.



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So there have been three iterations to that consortium; the most recent one, the Oil Sands Tailings Consortium, was struck in early 2011, and the Chair of CONRAD, Alan Fair, who hired me into my job in December 2010, became the Executive Director of that consortium in June 2011, when he retired from Syncrude Research. So then there is the CONRAD Environmental Reclamation Research Group Consortium that was started in the early 2000s, and that is a consortium that looks at land reclamation. So there's a lot of hydrogeology to look at, the hydrogeology of the Shield kind of land, which is boreal forest. So it's an incredibly complex soil system and water system, and they look at replanting vegetation and trees. They collaborate with the coal mining operators west of Edmonton because they have the same challenge as boreal forest. Strip mining has to reclaim that, too. So they need to be able to -- when you reclaim the land you don't just dump all the mud and sludge, and whatever, and then cap it with grass, you actually have to return it to its natural state. So you have to recreate this whole complex boreal forest underlay, as well as the boreal forest itself. And so they look at different indigenous plants that the First Nations might use, like rat root, and see if they can replant that.

PMB: Rat root.

PRESTON: Rat root.

PMB: Before you leave, a couple of minutes ago you said shield type --

PRESTON: Canadian Shield.

PMB: Yeah, so you're talking about the Canadian Shield.

PRESTON: Yes, correct.

PMB: So that's really where the boreal forest originated on that land --

PRESTON: Yes. Yes.

PMB: -- that huge piece of property?

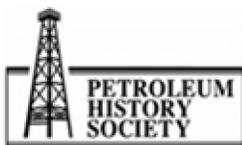
PRESTON: Yeah. Yeah. So it's not the sedimentary basin which we're currently on in Calgary and would be in Edmonton, where we produce conventional types of oil, it's the Canadian Shield.

PMB: So the boreal forest sort of spills over from the Canadian Shield?

PRESTON: Yes, it does. Yeah, you see the boreal forest around Edmonton. Yeah, correct. But even though it's -- one normally sees that type of landscape on the Canadian Shield.

And they also look at fish that might be able -- fish that can live in the tailings ponds and pit lakes.

PMB: Now you've caught my attention. They could live in the tailings ponds?



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PRESTON: Oh yeah, definitely.

PMB: Really?

PRESTON: Yeah, definitely there are. Because I've told you that you can't consolidate or settle the tailings very quickly because the clay particles repel each other; eventually they will settle, but it could take 200 or 300 years. You can actually water cap a tailings pond and you can have ducks living on it, I kid you not, you can have fish swimming in it. Yeah, fish can adapt to all kinds of climates.

PMB: Well you can water cap it. What does that mean?

PRESTON: You put clean water on top of the tailings.

PMB: And because the other water is denser --

PRESTON: Yeah, correct.

PMB: -- then the clean water stays on the top?

PRESTON: That's correct. So there are all kinds of those experiments to properly reclaim the land. So that's the kind of work that the CONRAD ERRG --

PMB: So if those damn ducks had fallen into a water-capped tailings pond --

PRESTON: Well, the ones that you saw on the cover of the oil sands -- of Oil Sands Review a year and a half ago were swimming on top of a water-capped tailings pond.

PMB: I'll be damned. Well, that's very interesting.

PRESTON: That was a rebuttal of the bitumen (indiscernible) ducks. And it was a Syncrude tailings pond.

PMB: And I don't want to laugh about that because when something like that happens --

PRESTON: No, no we don't want to -- I called it oil-capped. That's what I was laughing at was my -
- I hate people saying "my bad", but I suppose that's what it was.

So that consortium has been going for over a decade. It is most --

PMB: This is the tailings --

PRESTON: No, this is the CONRAD ERRG Consortium is what I'm --

PMB: Okay, Environmental and Reclamation Research.



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PRESTON: It's been running for more than a decade, and it uses principally academic researchers actually from around the world; from Canada, the United States, and Australia are looking at the challenges of reclaiming the oil sands. You actually see clay researchers from Australia and South Africa working on the oil sands.

PMB: I'll be damned.

PRESTON: Yeah. That's because it's an interesting academic challenge, right? So we've seen lots of graduate students from the University of Alberta. We see forestry disciplines working on reclamation of the oil sands, and agricultural disciplines working on reclamation of the oil sands. So we actually see those professionals now working in the oil industry. It's really quite interesting.

Lots of graduates from that program are now working in the industry. So it actually brings up an interesting point because CONRAD means lots of different things to different people. The original members of CONRAD were the Alberta and federal governments and the oil sands companies, but over time we saw as CONRAD didn't work too effectively on in situ technologies, we saw CONRAD just focus on mining operations.

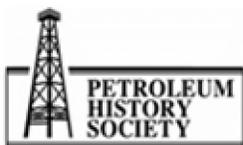
A number of the vendors or chemical companies, analytical companies, consulting companies joined CONRAD to the point where last year in 2012, we had 35 members; seven of them were the oil sands operating companies and soon-to-be-operating companies, and the rest of them, I think five of them were government agencies of provincial or federal level, the rest of them were what we call the vendors. And so they were the majority. And so we had a whole public dimension to CONRAD where we had networking groups where they -- they brought their solutions to the operators. So we had a whole public dimension to CONRAD.

So CONRAD meant to those members, the bigger CONRAD -- people who participated in the CONRAD ERG Consortium, CONRAD meant that consortium, and to some other people, 'cause we held conferences on tailings until the Oil Sands Tailings Research Facility was created, we held conferences on water and on clays; CONRAD, to them, meant just the conferences we held. So it meant lots of different things to different people.

And there's one consortium left that I haven't mentioned is that's the BPFGR. That's our newest consortium, was established in 2006.

PMB: BPFGR is Bitumen Production Fundamentals Research Group Consortium, okay.

PRESTON: BPFGR is Bitumen Production Fundamentals Research Group Consortium. And that was a consortium of seven companies and Eddy Isaacs' group, currently called Alberta Innovates Energy and Environment Solutions, I guess the child of AOSTRA and other things, working together on academic research -- funding academic research together, understanding water chemistry and processes, understanding tailings, understanding bitumen production and extraction, that kind of thing; so more fundamental academic type of research that they wanted to work on together. So no technology developed, per se, but knowledge.



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PMB: Wow, that's very interesting. Now, I'm going to ask you to tell me a little bit about OSLI. And then you started to explain to me earlier on that the reason CONRAD is closing is that other consortiums formed to essentially take over parts of its work. But let's start with OSLI.

PRESTON: OSLI; the Oil Sands Leadership Initiative, began probably in discussions in the mid-2000s, I think crystallized around 2006, wasn't actually formally launched, I don't think, until 2009 when a charter was signed; basically consists of I think five initially, but now seven in situ oil sands operators, but also CNRL is involved now, and Shell is involved and, of course, they have both types of operations.

PMB: Okay, can you name those seven in situ operators?

PRESTON: Oh boy.

PMB: It would be Suncor obviously.

PRESTON: No, Suncor was the lead for this. There was Suncor, there was Shell --

PMB: ConocoPhillips?

PRESTON: ConocoPhillips, Stat Oil, Nexen. Who am I forgetting? There's CNRL now, but I'm missing one. Oh Total.

PMB: And you've said that Shell has also joined, and also Imperial?

PRESTON: No.

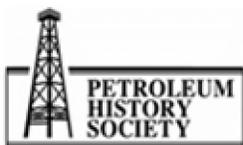
PMB: Not Imperial?

PRESTON: No, no, not Imperial, no. Imperial's child was CONRAD. So I guess a lot of energy and enthusiasm in CONRAD around the time it was formed, a lot of activity, but it was a volunteer-run organization, and so there were never any staff, although eventually over time Erdal Yildirim found himself a part-time General Manager of CONRAD to give it some sense of leadership. It had some secretary services through Alberta Innovates Energy Environment Solutions, formerly AERI, formerly AOSTRA, provided some secretarial and accounting support. So you can imagine when CONRAD was created, it was the CEOs who created CONRAD, and we've actually recently seen the same history repeating itself in some way when COSIA was formed.

PMB: So CONRAD operated really without staff?

PRESTON: Correct.

PMB: It was just volunteers belonging to different committees?



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PRESTON: Correct. Correct. So CEOs formed CONRAD, CEOs sat on the board, which at the time was called the Network Coordinating Council, and they delegated the actual activities and consortia to people who reported to them. And as you can imagine, as the CEOs moved on and their direct reports moved on - they either retired or their career moved in a different direction - the responsibility goes to somebody else, and it goes from being centre of desk, really important, to sliding over sideways and eventually ending up on the floor, and less and less important to people getting their jobs done. They would attend meetings less frequently.

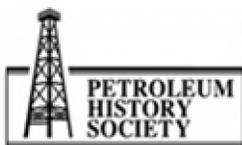
So eventually you could see that there were opportunities that would be lost, would be taken up by say some professor at the University of Alberta, or the University of Calgary, or a consulting group, or whatever, and SAGD really wasn't a big part of the industry for a very long time, so although we had a group supposedly working in that area, barely met and talked about the Alberta Research Council's AACI Program. It was the Alberta ARC -- used to be CANMET Industry Consortium, and then it used to be -- then when CANMET left because its funding changed in the mid-'90s, it became the Alberta ARC Consortium for Industry.

It was a consortium of some bench scale modeling of in situ bitumen extraction techniques. So trying to go beyond SAGD or trying to better understand SAGD. So VAPEX, which is a solvent-based recovery technology. And that was a technology developed by a professor here at the University of Calgary.

So since that AACI Consortium was closed to the rest of the CONRAD members 'cause it was pay to play, consortium run outside of CONRAD, the CONRAD members really didn't have much say in what went on, and it was the companies who invested, who weren't all CONRAD members. So there was an association, but I guess the in situ operators felt that they needed to work collaboratively to improve technology, improve the land reclamation, basically improve the economic and environmental performance of the industry. And great motivation by all of those companies, a lot of energy, but again volunteer lead, not somebody centre of desk -- well, it was centre of desk. It is centre of desk, but as you know communication from a CEO several layers down doesn't necessarily work all that well. Lots of enthusiasm, which was true at the beginning of CONRAD, but people tend to forget that that was true at the beginning of CONRAD.

So it was created in much the same way, and they have done some absolutely fantastic things with -- particularly with First Nations and stakeholder relations up in Fort McMurray, and ensuring communities have children who stay in school, stay away from drugs, that kind of thing. So some absolutely fantastic things that they've managed to accomplish from 2006 until this year which is what, seven years?

So Vincent Sauvestre, who was the first and only Executive Director of OSLI, started his work in December of 2010 like I did. So he was seconded from Total. He's originally from France; and he had great energy and enthusiasm for OSLI. He actually used to sit on the Network Coordinating Council of CONRAD for Total. So he was an R&D Manager for Total, ENP Canada. So he was that Executive Director for the length of time I have, and his job ends this week, just like mine does.



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PMB: Now, did I hear you tell me earlier on that you began on the same day?

PRESTON: We began on December 1st, 2010, both of us.

PMB: And you're both ending on March 31st?

PRESTON: Yes, 2013. And the story around that is somewhat interesting. Oh, it is very interesting actually. I guess Vincent got hired for his job ultimately by the CEOs of those OSLI members. The Chair and Vice-Chair of CONRAD who hired me were Alan Fair from Syncrude, and Ron Myers from Imperial Oil, and they, of course, were at the managerial level.

Unbeknownst to them, the CEOs of the oil sands operating companies in the fall of 2010 decided that there were too many groups doing too many different things that they couldn't keep tabs on, was involving way too much of their staff time to try to keep tabs on, that somehow we needed to, as Joy Romero likes to say, simplify the superstructure; in other words try to gain a little more control over this chaos, and this frenetic activity focused on the oil sands, to try to channel everybody forwards in a positive direction, and also to regain a social license to operate in the oil sands.

So Vincent, and I, and Soheil Asgarpour, from PTAC the Petroleum Technology Alliance Canada, we were all asked to come to an oil sands CEO meeting being held at CAPP, the Canadian Association for Petroleum Producers; Greg Stringham, the VP of Oils Sands at CAPP asked us to come, and in 15 minutes or less talk about our organizations, and why they were critically important to the future of the oils sands and its social license to operate.

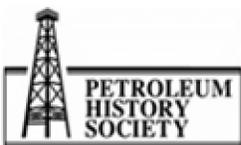
So I actually think that if CONRAD hadn't had full-time leadership at that point, and that was in February 2011, and Alan Fair, Ron Myers, and I hadn't had a chance to do some strategic thinking about how we would like to recreate CONRAD, I think CONRAD would have been dead because it wasn't held in very high regard by those CEOs anymore. They had lost tabs on what CONRAD had become, except that it was distracting their staff as far as they were concerned.

So I actually went in there and I explained how we were going to bring CONRAD back to life, and how it was going -- its value proposition to the industry, got asked some pretty hardnosed questions by those CEOs, and walked out, and CONRAD was still alive and actually held in quite high regard by them, to the point where I can't remember which of the CEOs yelled it out to David Collier, Hey, this lady needs to be in one of your CAPP commercials on TV. Because Jean Michel Gires had asked me if I really thought we could solve the tailings challenge.

PMB: What was his name?

PRESTON: Jean Michel Gires.

PMB: Jean Michel -- how do you spell the last name?



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PRESTON: He was, for several years until I think it was early January, the President of Total E&P Canada. He asked me if I really felt that we could reclaim the tailings ponds, and I was very enthusiastic that we could and how we would do it..

Anyway, so we didn't hear much except that there was going to be a new future for CONRAD, and OSLI, and all the rest of these hangers-on all over the place at some point over the next couple of years, hopefully by the end -- we heard hopefully by the end of 2011, which seemed incredibly challenging to rein all of this in.

In July something called an implementation team was struck by four individuals working for some of these oil sands companies, to come up with a new organization that was basically going to be better than just a merger of CONRAD and OSLI. And so Vincent, Alan, who is the new Executive Director of the Oil Sands Tailings Consortium, and I found ourselves in the thick of planning this organization with some consultants, and these four members of the implementation team. And what we ended up creating was something called Canada's Oil Sands Innovation Alliance, called COSIA, Ore COSIA, which was publically announced on March 1st, 2012 with a new Chief Executive, Dan Wicklum, who had come from Environment Canada in Ottawa, from the Water Directorate, I think, so an environmental leader in the federal government.

PMB: And who would have funded that organization?

PRESTON: That organization has 14 member companies, and I wouldn't be able to list them all off, but they represent 90 percent of the oil sands production, and they are all the large companies.

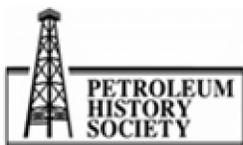
PMB: And there was no government funding of that?

PRESTON: None. It's a for-profit company. It doesn't make money, but just so it can hold funds legally, a problem CONRAD ran into while I was running it, and I fixed, but the best thing to do is become for-profit, to manage funds.

And so those are the shareholders of those 14 companies, and there is no government membership whatsoever. There is no membership of these vendors except they could become associate members of the organization and become involved in its activities, but not have any strategic say in the direction of the organization. So that organization focuses on four environmental priority areas, plus monitoring of oil sands environmental impacts, and those four areas are water, land, tailings, and greenhouse gases, so...

PMB: And the fifth one is monitoring.

PRESTON: Monitoring. And as part of, I guess, a four-tiered strategy for better managing the activities in the oil sands industry wide, the first focus is on technology, which is COSIA; there's the regional activities which I believe is going to come under the Oil Sands Developers Group, there is communication (indiscernible) there will be a whole separate monitoring body which will be



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associated with government I believe. So the monitoring is the technology side of monitoring that COSIA is involved.

So, of course getting it all done by the end of 2011 wasn't realistic, so the date moved to the end of 2012, and was supposed to be when CONRAD and OSLI's sun set and, of course, it slipped a bit until the end of March; CONRAD because it was actually a company that had to be dissolved. OSLI would never form -- was never incorporated because COSIA started. So by the end of this year we saw the CONRAD, ERRC Consortium, and the Oil Sands Tailings Consortium move off to COSIA, and from OSLI their Land Stewardship Group merged with the CONRAD ERRC, and they had a water management working group that merged -- we had a water focus group on our public side of our company, and we have a clay focus group that will become part of the tailings part of COSIA. That was a recent decision.

But there were some orphaned things. Halfway through 2012 the multinationals decided that they couldn't collaborate on everything because competition law was becoming way too restrictive. The Competition Bureau was looking way too closely at the industry, and when you start collaborating on things when you are 90 percent of the industry, collaborating on things that involve production, in other words making money, it looks like a cartel.

PMB: So this would be, for example, American Competition Law, or would that be in Canada?

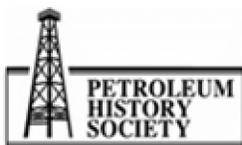
PRESTON: Canadian as well, yes.

So the Froth Treatment Consortium and the Bitumen Production Fundamentals Research Group Consortium could not go to COSIA, and under OSLI the Technology Breakthrough Working Group couldn't go to COSIA. The Stakeholder Relations -- I've forgotten the precise name of that group - I think it's Stakeholder Relations Working Group, but I can't quite remember - that is off on its own for now because there's no natural home for it yet. But they were left in limbo, and the companies decided they still wanted to work on those areas, but not the full COSIA group because froth treatment relates only to mining-based operations, so just the seven operators who are part of CONRAD.

So we were invited, along with PTAC, and the other option might have been a consulting company, to offer to run on a fee-for-service basis those consortia, and any new competitive type of collaborations. And we found out in January of this year that PTAC won that competition probably because we hadn't had the time to properly mature from a volunteer-run organization to a staffed organization, and PTAC was better set up to properly manage intellectual property with Chinese walls between consortia. And a decision had already been taken to dissolve OSLI by March 31st, and as I mapped things out it became clear that that was the best time to dissolve CONRAD.

PMB: So the big picture is that CONRAD and OSLI are being disbanded in favour of an expanded COSIA?

PRESTON: COSIA and PTAC, yes.



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PMB: And PTAC.

PRESTON: And PTAC. So COSIA is only environmental.

PMB: But then there are a few stranded bits of committees and task groups that will have to find a home sometime.

PRESTON: Correct. Yeah, yeah.

PMB: Okay. Boy, that's a powerful story. Now I want to ask you, before I thank you, you told me that CONRAD has not been involved in VAPEX?

PRESTON: Correct.

PMB: But could you please explain to History how that technology works?

PRESTON: It was invented by a former professor at the University of Calgary whose last name is Butler.

PMB: Oh, Roger Butler?

PRESTON: Roger Butler, that's correct. Yes, Roger Butler. And it is basically using propane rather than steam/heat to mobilize the oil sands by acting as a solvent. So it reduces the viscosity of bitumen and allows you to drain the bitumen into another -- you know, so you inject propane, and actually you can use methane, ethane, propane, or butane, as it turns out because they've actually field piloted this when I was at the Petroleum Technology Research Centre in heavy oil around Lloydminster. And you use solvent to mobilize the oil and drain it into another horizontal well to pump it out of the ground.

And there was actually a consortium run under PTAC, believe it or not, that I was involved in in the mid-2000s. Am I correct? Yes. To demonstrate VAPEX in the oil sands at the underground test facility that was being operated by Dover at the time. And it wasn't --

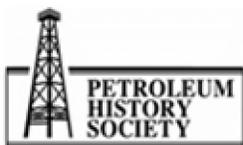
PMB: It was being operated by whom?

PRESTON: Dover, I believe.

PMB: Dover.

PRESTON: Operating Company. Yeah, I believe it was Dover, on behalf of the consortium. And they determined it wasn't economic because they lost too much solvent to the reservoir, 'cause the solvent is expensive 'cause it's actually used to dilute bitumen by SAGD producers.

PMB: So it really has not been so far a proved or effective technology?



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PRESTON: It's not economically viable at this point in time. It may prove to be, but they have some challenges in trying to contain the solvent.

PMB: Okay. I know that Imperial is now doing, I think it's a \$100 million experiment on --

PRESTON: Non-aqueous extraction?

PMB: You've got it. Non-aqueous extraction.

PRESTON: It means non-water based. Yeah.

PMB: Okay. Well that's great. You know, I told you I was going to ask you 24 questions. I think I got to the third one.

PRESTON: Set questions, 24 set questions.

PMB: Let me just have a quick look. Oh, notable figures that you've encountered. You probably didn't ever meet Roger Butler or did you?

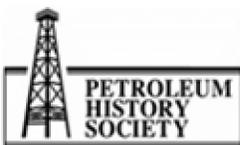
PRESTON: No.

PMB: A couple of general questions: Role of government in oil sands development: Supportive? Has it been supportive? Has regulation been effective? Should it be more stringent?

PRESTON: Well, the role of government -- I think without government investment, in the early days for mining, that being providing Great Canadian Oil Sands, and Syncrude in particular, as a consortium itself, with funding to build an operation, we never would have seen commercialization of the oil sands.

And the same credit goes to AOSTRA, and the Government of Alberta when it comes to SAGD for in situ production, apart from the Cold Lake operation run by Imperial.

Regulation? I think, again, that is another way in which government hasn't actually kept up with the scale of operation, but we've seen some very good attempts at trying to manage the environmental consequences of the oil sands; Directive 74, to deal with tailings, although the ERCB may not have structured it the same way. It's incredibly technically oriented so they've tried to mandate what kinds of technologies companies would use to remediate the tailings rather than, under the LARP tailings management framework, they've come up with reducing -- basically you have to reduce the volume of the tailings by such-and-such by such-and-such time. That leaves it more open to companies to decide the best technology they can use to do that, rather than requiring them to meet some technical specs that the ERCB demanded. And I think if the new single regulator that is emerging focuses more on allowing some flexibility by industry, that's a positive move.



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PMB: Now, you've just said some really important stuff but it's not very clear because you have to explain what LARP means and what directive -- and I know that it's Reclamation Program; I can't remember what the L-A stands for.

PRESTON: L-A?

PMB: Yeah.

PRESTON: It's the Lower Athabasca Regional Plan.

PMB: Okay. But you also talked about Directive, was it 47?

PRESTON: Directive 74 of the Alberta Resources Conservation Board is a directive regarding tailings ponds reclamation, and the fact that they have to actually start reclaiming some tailings ponds. It's about trafficability of land.

PMB: This again is a comment that Joy Romero made in her interview a few weeks ago, that by mandating the certain kinds of technologies in some of those tailings ponds the tailings ponds are actually bigger than they need to be in a few cases. Can you say a little bit about that, please?

PRESTON: Oh, I don't really know enough to comment on that, actually. Alan Fair would know far more than I do about that. You need to talk to him.

PMB: Okay. Well, I haven't thought -- he's living out in --

PRESTON: He's in Edmonton, but he's in Calgary every week.

PMB: Is he?

PRESTON: Yeah.

PMB: Well, I thought he was living out in the BC Interior somewhere.

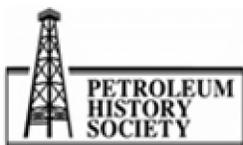
PRESTON: Oh, he has a vacation home in Vernon, BC and another one in Parksville, BC, 'cause he's actually from Victoria originally.

PMB: Okay. Well, I will get in touch with him.

PRESTON: But he spent 32 years working for Syncrude, and he spent a huge chunk of that managing tailings.

PMB: I will get in touch with him. That's great. Or get my colleague in Edmonton to do that.

PRESTON: I have his contact information because we used to work together.



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PMB: Great. And I interviewed him for something a few years ago.

And you've covered most of it. Oh, I was still going through, I still have 23 questions to ask you. And I guess the last one is this: Can you suggest other people we should interview for this project, and what -- well two questions. Who are some of the really notable people that you've met and worked with? So that's point 1. And then point 2, whom do you suggest we should also interview?

PRESTON: Some of the most notable people I ever worked with. Bruce Stewart, who was the Director that changed the course of my career at -- he was the Director at the CANMET Energy Technology Centre was what it ended up being called when I left, in Devon. He was the Director from 1995 to 2004, and he actually was heavily involved in the National Taskforce in Oil Sands Strategy, and the development of CONRAD and PTAC, for a civil servant, somebody who was definitely more Albertan than he was federal.

PMB: Do you still have contact information for him?

PRESTON: I do.

PMB: Great.

PRESTON: I do indeed. He spends the winter in Arizona now. He'll be back in Canada, he told me by email last week, I think it's the beginning of April. But he has an acreage outside Edmonton, and won't be coming back until the snow is gone.

PMB: In other words, August.

PRESTON: Yeah, they've got a lot of it. He doesn't like the weather too much lately.

And who was another big notable person? I guess Eddy Isaacs would be one.

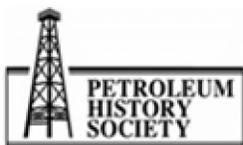
PMB: We have interviewed him.

PRESTON: You have interviewed him. My husband Bill Dawson would be another one because he started a unique partnership in upgrading, and I know how to get hold of him. He's at home.

PMB: Bill Dawson.

PRESTON: Bill Dawson. He has lots of interesting stories to tell because he actually worked on a -- he can tell you about the technology pathway for oil sands and upgrading because he started working for CANMET in 1983 on the CANMET hydrocracking process, which has finally been licensed to UOP.

PMB: What was his background before 1983?



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PRESTON: Before 1983 he worked for Union Carbide in Charleston, West Virginia. He's a Canadian though.

PMB: Well, that's interesting. What was he doing with Union Carbide?

PRESTON: An NMR spectroscopist. He's an organic chemist. Yeah.

PMB: Well, actually I haven't interviewed a lot of scientific types, so it's a particular pleasure.

PRESTON: Oh, another real character, another real character I've come across in my career is a man by the name of Ted Cyr, who worked for AOSTRA for a very long time.

MB: Oh, his name has come up. I'm wondering whether -- we might have already interviewed him.

PRESTON: Yeah.

PMB: I think we might have, but I'll ask --

PRESTON: Very, very knowledgeable person, very interesting character.

PMB: And he's up in Edmonton?

PRESTON: He's in Edmonton.

PMB: Yeah, I'm pretty sure that we have interviewed him.

PRESTON: Yeah, yeah. Duke Duplessis, another one.

PMB: Yeah, he works right over here, doesn't he?

PRESTON: No, he doesn't. He actually works downtown. He works for Eddy Isaacs now.

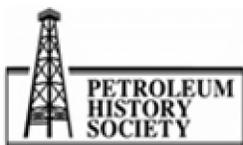
PMB: His name keeps coming up.

PRESTON: He used to be with the Alberta Research Council.

PMB: I've met him. And he was actually working at Great Canadian Oil Sands in the 1950s. You know, his experience is huge and deep, and why he hasn't retired a long time ago I don't know.

PRESTON: No, 'cause he keeps his brain active working. He's a very interesting man. And then there is Roger Bailey who ran AOSTRA for a while, and metamorphosed into ARI before he retired. He's on Vancouver Island now. He used to be in Canmore.

PMB: I think actually we have his name.



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PRESTON: Yeah.

PMB: In fact I think you gave it to us.

PRESTON: Yeah, I think I did, yes.

PMB: Okay, well I think that covers it off.

PRESTON: Oh Eric Newell, too. A real character. Last time I saw him he was Chancellor of the University of Alberta and was having -- I brought my son over because Julie Payette was speaking, and my oldest son was 8 years old at the time, and absolutely fascinated with outer space, and had been with me to visit NASA in the Houston area. And we went to listen to Julie Payette talk, and Eric Newell introduced her, and he sat there with her, and he walked out with us. And I have to tell you, for somebody who had been as low down in the food chain as me at CANMET when I had met him, he remembered me.

PMB: Wow. And Julie Payette.

PRESTON: One of Canada's first astronauts.

PMB: Yes. Okay, I'm going to stop it right there. Eric Newell, by the way, he's one of the guys who stood behind this project when we first --

PRESTON: Oh wonderful.

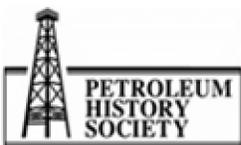
PMB: -- proposed it.

PRESTON: Wonderful.

PMB: He was one of the first people we interviewed.

PRESTON: Wonderful.

[END OF RECORDING]



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