ERDAL YILDIRIM

Date and place of birth (if available): Turkey, DOB withheld

Date and place of interview: Oct. 28, 2011, Calgary

Name of interviewer: Gordon Jaremko

Name of videographer:

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

Consent form signed: Yes

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Initials of Interviewer: GJ

Last name of subject: YILDIRIM

GJ: I want to talk about your biography a bit more. Where are you originally from?

YILDIRIM: I'm Turkish. But, I arrive in the US a long time ago.

GJ: When was that?

YILDIRIM: January 24, 1965. I came to Columbia University for doctorate in engineering science degree. While I was at Columbia, I got hooked up with the largest mining company in the world, Anaconda. It was primarily copper, uranium, etc. I was a graduate student for summer employment and then part-time employment, then full-time employment. And, just about that time Anaconda fell on hard times and their Chilean operations which was really the major cash-flow generator, were nationalized. So, at that time, they tried to reduce their spending expenses. They moved their headquarters from New York City, 25 Roadway to Tucson, Arizona where they had a research facility. And, I did not move with them, because a colleague he worked for me and informed me that there was a company called Cities Service Company. And, they were located at Wall Street. And, he put me in touch with the head of the group that was doing mining planning, mineral assessment, etc.

We had a fun conversation and I actually invited this head of the group to my office at Anaconda to see the things that we were doing. At the time, we didn't have any plotting facilities for making

maps. But, you could produce maps by using printers and digital, you know AA, BB and that kind of thing. All our walls were covered with these digital maps which lead you to resource evaluations, mine planning, etc. This fellow was very impressed and he set up a meeting with his boss. So, I had an interview and the man who interviewed me was a higher ranking member of the organization and he basically flattered me saying, "We needed well educated, well trained people." So, in no time I had a job. I also had a job offer from Columbia University. But, the industry always paid well and I really didn't want to stay in New York City because I had two young children. So, I worked for this company for less than a year. And then, they moved me to New Jersey. They used to have a research centre there. And, initially it was minerals primarily, because this company had mining assets in Chattanooga and Arizona. But, bit by bit, I became familiar with that. They were also looking at oil shale and oil sands. This coincided with the Oil Embargo of 1972 or 1973.

Suddenly, I became an instant expert on oil shale, oil shale processes and oil liquefaction and coal densification. Later came, oil sands. I was attending a conference at the Plaza Hotel. I ran into the vice-president of what is called, Alternate Fuels for Cities Service Company. He was at the headquarters and I was the research facility. And, we only had maybe two or three minute exchange and I explained what subjects I was dealing with. And, I didn't realize that he was the chairman of Syncrude Management Committee. And, Syncrude was just getting started. This is in 1973/1974 and I met this fellow and I forgot all about it. I'm looking at coal densification and coal liquefaction. Cities Service got into some kind of relationship with Burlington Northern that had huge coal lands in northwest Wyoming, that area. And, also oil shale; we had a lot of oil shale in Colorado.

So, you're going from one part of the country to another finding technology; densification technology, oil shale production technology and oil shale processing technology. And, keeping an eye on the copper business, the copper mining business in Arizona as well as in Tennessee; I was still going to Tennessee, I was still going to Arizona. But, at home my private work was modelling of the oil shale business from the tonnage of ore, grade of ore to price of oil all the way to project economics. So, this fellow, vice-president of Alternate Fuels for Cities Services Corporation whom I didn't know was the chairman of Syncrude Management Committee calls the research director that I'm reporting to. And, he doesn't remember my name. He says, "This young fellow from Columbia University." That's how I was basically recognized. "Send him to Edmonton, let him help Syncrude."

So, my research director calls me to his office, always corner office. He says, "Dick Galbraith, the vice-president of Alternate Fuels, brand new division wants you to go to Edmonton and help out Syncrude. That is your mandate and he wants you to go Edmonton." I said, "Where is Edmonton." I'm Turkish and I'm still in North America, I didn't know Edmonton from St. John's. So, to make a long story short, I arrive in Edmonton at the Baker Centre. The first group of people I met basically were primarily geologists and mining engineers. And, the biggest issue at the time was conversion of drilling data from manual records to computerized records. And, you had to define record length to basically contain the important numerical data associated with the amount of bitumen, the amount of solids, water and minerals. You're very high on heavy minerals like, 180 titanium, zirconium, etc. How long should the computer record be to accommodate not only oil, water, sand but some other

things. So, this was April, 1974. Then, I was sent back again in July, 1974. This time I met the people at the finance building. And, they were looking at different aspects of the Syncrude project, coal upgrading. Mining geology, front-end and this is the tail-end. I met these people and some of them were around for a long, long time. Again, your net contribution is very limited because you are there for three days and on the fourth day, you go home. Last trip in that year was November, 1974. First we had what is called, Owners Technical Committee. It was in Edmonton in one of the facilities on 103rd Street.

One day, two days and on the third day, they chartered about all these DC3s with skis and we flew to Fort McMurray. We were met at the lower camp, taken to the project site and all you see are these gigantic tents under which draglines and bucket-wheels were being assembled. And then, we visited the site of the extraction plant. The hole was already excavated, but they were filling parts of it with clean sand before the foundation is poured in. So, that was a tremendous learning experience. As of that day, Syncrude had four partners. One was called: ACI Group, Atlantic Richfield, Cities Service and Imperial; each had 30% ownership. And, Gulf Canada, which I understood took over Royalite had 10% of Syncrude. This is November, within a month ARCO, Atlantic Richfield makes a decision that they're going to pull out of Syncrude and invest in exploration programs in Alaska, North Slope. So, that's the beginning.

The first three or four months in 1975, was kind of pause. There wasn't much activity going on because 30% of ownership has walked away. And, later on I understood that all the senior people form the remaining three companies started visiting government agencies, Alberta Government, Federal Government and Ontario Government. And, in the end, they were really shuffling of ownership. Alberta took 10%, Federal Government 15% and Ontario Government 5%. And then, original three owners also changed their ownership; Imperial's ownership and Cities Services came down, Gulf's came down a little bit. So, those numbers are no longer fresh in my mind; maybe they came down to 22%. Gulf came down to 13%, something like that. But, in the meantime, Gulf and Cities Services basically borrowed money from the Alberta Government. And, one of the conditions of government lending was that at any time, they can convert their funds into ownership of Syncrude, part ownership of Syncrude.

At the time of this arrangement, neither Gulf nor Cities Services expected that government will actually convert their funds to ownership and they did. During the construction period or just about the time we were to start production, they basically took away 15% from the two or 10%. They formed AEC, Alberta Energy Company and sold 5% to Hudson's Bay. And, Ontario Government sold its share to Pan-Canadian, 5%. So, we had three new owners each with 5% ownership. So, there were six companies around the table, no more than that; eight companies. Atlantic is gone. That was replaced by Petro-Canada. It became PCI Group; Petro-Canada, Cities Service and Imperial Group. And then, Alberta Oil Sands Equity, they were around the table and that is four. And, three more new partners. So, seven or eight and I'm missing one company.

GJ: During this time, what was your assignment as an engineer?

YILDIRIM: Monitoring the construction. We had two levels of owners committees. One was management committee, one is member and the other one is basically, kind of associate member, second in command. If you are not there, I will step in for you; primary member/secondary member. So, there was the management committee. There was Participant Review Group, PRG. This is now year 1976/1977/1978. And, in 1978, we started making the opening cut with draglines. At the beginning, mining didn't go to well. But, 1979 we struggled and as a result in February, 1980 we formed what is called, Participants Mining Group; to basically interact with Syncrude's mine planning and mine operations people.

GJ: What do you mean, "We struggled?" What was going on?

YILDIRIM: There were issues with overburden, softness of overburden. And, we had draglines initially to do overburden removal and draglines were sitting on this overburden formation that was really soft and made the high wall, higher than what was the original plan. I think the draglines were supposed to operate at about 150 to 155 foot high wall. But, with the overburden that became something like 160-165.

GJ: Feet high?

YILDIRIM: Yeah.

GJ: By the time you got down to the ore?

YILDIRIM: Yeah. The boom was 350 foot. So, you are sitting about maybe, 80 metres or 80 feet (I forgot the numbers). You have a setback from the edge of it. And then, the bucket goes down and basically scrapes your overburden and casts it in open space. Well, dragline is not very efficient in removing overburden. And, as it cast the overburden it also rested at the foot of oil sands at the bottom. So, there was re-handling, for example and dilution of the grade. So, in February, 1980 we formed this committee for better brainstorming and looking into operations. And, I was one of very few individuals with mining and petroleum background. The other fellows were mostly from refining, because of Imperial. So, as a result I became the chairman of the group.

GJ: So, right from the start, you would think as an outsider it's simple. You just dig a hole in the ground. But, that's not so then?

YILDIRIM: Nature is not always cooperative. For example, that ground over oil sands formations at times, was soft and could not carry the heavy machinery. So, there was always the risk of sinking a machine or of the side wall, the high wall of the mine collapsing on you. Even the oil sands are not really limestone or granite. You're sitting on a natural resource is that unconsolidated to some degree. And, if there is too much pressure the wall can pop out from under your machine. So, there was always this risk. Therefore, the machine had enough setback from the high wall. Over the years, there have been slope failures, but thank God no machine was lost.

GJ: So, from a mining point of view, this was very different from what you would expect say if you were doing copper?

YILDIRIM: Oh definitely. First of all, you don't really have too many resources in the world. You know, you have, let's say 150 foot is what 50 metres, 25 metres of overburden and 25 metres of oil sands. Coal may be a similar resource, but copper or those things are usually cone shaped mines, open pits. This was initially a slot that had four quadrants, ones that took machinery in every quadrant and it basically progressed to the east and to the west and this initial slot opened up and ultimately reaching the boundaries, which was a rectangular shape. So, it was much different than a copper mine in Montana, for example.

GJ: So, we're told there is no exploration risk in oil sands. In a way there is, though. In the sense that, I guess you're exploring how to use a technology that was developed for say, cone shaped mines into a square open pit.

YILDIRIM: The word exploration is relatively narrow. It is used in the way of determining whether or not an actual resource exits beyond some ground cover and if so, what is the depth, what is the thickness and what is the quality? It really doesn't address some other things like, how much pressure it can take during mining operations and whether or not ground can carry the big machinery. Later on as production operations progressed, one thing we observed was that when trucks travelled on oil sands, it was like being on a water bed. You are always pushing away. You know surfers, surfer are always in front of the wave. Our trucks were always behind the wave, pushing it and creating that wave further and further away. That's because during the summer months the ground is warmer and the ground doesn't have this capacity to really carry very, very large loads, heavy loads. And, to this day that cuts into efficiency and horsepower requirements. If you had a very firm ground, probably you wouldn't need that kind of horsepower. You can achieve higher speed with less energy consumption, etc.

GJ: So, the oil sands are full of surprises then?

YILDIRIM: Oil sands operators faced many, many surprises at Suncor and Syncrude and part of these surprises were the result of climate. The McMurray area can be very hot and when the temperature is high, your oil sands are not exactly like chewing gum, but there is a certain softness in it. Digging is relatively difficult. You have to expend more energy to get it out. While, come winter, -22°C, -40°C that natural resource assumes the characteristics of steel, almost like steel, and digging it becomes very, very difficult. That's why the machinery got bigger and bigger, more and more powerful. And, in the early days I was told that Suncor used to drill the benches, blast and then mine the blasted ore. The very first set of machinery used in the oil sands came from the coal industry. And, they were not designed for the characteristics of oil sands as well as the change associated with the climate. For example, draglines; huge, huge base, there is a thing called, tub. Tub started cracking, because the ground is not totally solid and you are also impacting a fair amount of dynamic force while digging, especially in the winter. So, draglines started tub to cracking and they were replaced. And, these bucket-wheel reclaimers, the front-end always had problems digging parts

connected to the body of the machine; there they had problems. So, they were not designed absolutely for oil sands. They were from warmer climates, coal applications and coal is softer. But, in time I think companies adjusted their selection of machinery to the conditions of mining. And as a result, you have more powerful shovels or hydraulic excavators, which have very, very strong front-ends. That's where dynamically you tackle the resource in front of you, the mining bowl, I should say. And, draglines are retired, but the reclaimers are required. Today, you have very large either shovel, rope shovels or hydraulic excavators that can put the blade anywhere you want and separate out if there is any undesirable low quality material and complimented by trucks, very large trucks; 360 tonners. So, belt conveyors diminished and bucket-wheels and draglines are gone. So, today's machinery is more suitable to the conditions of mining in oil sands.

GJ: Did you participate in the development of those machines we see now?

YILDIRIM: No. Syncrude is the operator. I'm sure the same is true with Suncor. They come together with the manufacturer of certain machinery they are looking at. And, they basically transferred their experiences in the mining. What are the weak points of the machine? And, as a result the manufacturer comes up with a better design, better material and better this. So, really, improvements are done by the manufacturers. But, they receive very, very good operational data from the operators. So, it's not like Caterpillar coming up with the best truck; it was Caterpillar with Syncrude or Caterpillar with Suncor that came up with the best truck.

So, our pioneer operators made a tremendous contribution to the growth of the mining machinery. Because, it's an issue of the economies of scale; you can have one truck at 120 tonne per load, for example, which requires a driver or you can have one truck at 360 tonne also requiring one driver, replacing three. And, the same thing applies to the digging machinery. As opposed to producing, let's say, 25 tonne per load, when you increase it to 50 tonne per load you reduce two operators down to one and labour is expensive. So, I think the original operators of oil sands have done a great service to the industry in general. And, as a result, I believe that this is personal belief that Shell and CNRL are probably benefiting from such learnings. First of all, the manufacturers are better aware of the mining conditions when they approach a new operator, they will look for something that can be further refined, because of Syncrude and Suncor's industry.

GJ: So, you were at Cities Service, Occidental and Canadian Occidental?

YILDIRIM: Yes.

GJ: Until 1998.

YILDIRIM: Yes.

GJ: Various management responsibilities for Syncrude, PCEJA?

YILDIRIM: That's the Institute Drilling Venture with Petro-Canada, Cities Services or Canadian Occidental, Esso and JACOS. P, Petro-Canada; C, initially Cities Service then of course, it became Canadian Occidental, both of them have a capital C in their names; E, Esso and J, JACOS.

GJ: Japan Canada Oil Sands.

YILDIRIM: We had extensive lands that were not amenable for surface mining, meaning that oil sands were beyond the mining depth. So, Petro-Canada was the operator initially. And, they did a lot of test work. Well, first of course, exploration. You do drilling to understand how deep, how rich; just to characterize the resource itself. And then, that led to some huff and puff pilot. And, I became connected to in-situ operations -- I moved from Tulsa, Oklahoma to Calgary in 1983, fall of 1983. And, I also had responsibilities for PCEJA on the technical committee, primary representative of the company and technical committee and second, member of the management committee on behalf of Canadian Occidental.

GJ: So, at that time, by the early 1980s, the technical side is starting to move the industry over towards in-situ production?

YILDIRIM: Yes. Well, when you have a resource, you have to do something with it. For example, parallel to Syncrude we also had another joint-venture with surface minable resources and that was called OSLO, Other Six Leases.

GJ: Did you work on OSLO?

YILDIRIM: I was the technical committee representative of my companies and various sub-committees and the second person on the management committee.

GJ: OSLO never happened? What happened to it? What was the matter with OSLO?

YILDIRIM: Our understanding of the resource increased and it started looking at detailed engineering and capital cost estimation. And, there came a point, I can't really tell you exactly. 1990 or 1989, the capital cost estimate reached $4.5 billion, $4.6 billion. And, for a smaller capacity: it was less than 100,000 barrels per day. So, the owner said, "No. We're not going to..." And, oil prices were not doing too well. They were going up and down, up and down. In 1993, for example, it came down to $13.00 or so.

GJ: That was the infamous time when Bill Hopper had a news conference in Ottawa and said, "Well, no. We don't want to do OSLO, OSLO is a dog." Was OSLO a dog?

YILDIRIM: No, no. OSLO became a dog because of inflation, rising labour costs, rising material costs. So, if the economics are not positive, a project can be technically feasible but economically, not. So, I would not call OSLO a dog, because technically it was a very well conceived project with good resource base and everything else. And, it was in the hands of Imperial. They were good

operators. So, it had all the positive elements. But, capital costs requirements vis-a-vis the price of oil, owners could not swallow it.

GJ: I remember that era, very well, as a matter of fact. When OSLO and there was also Alsands ran into the same problem.

YILDIRIM: Oh, Alsands actually stumbled, much earlier than OSLO, practically eight years earlier, either 1981 or 1982.

GJ: That's right too, yes.

YILDIRIM: Alsands was basically put on the shelf early in the 1980s. OSLO is either late 80s or early 90s. Interesting, I'm not a person that takes notes and my memory is fairly good but of course, in time, even the good memory fails. So, I don't remember exact dates or exact numbers. And, I have to admit that.

GJ: So, were these problems, Alsands and then OSLO and the sort of, continuing instability of the oil markets and prices what led to the formation of the Oil Sands Task Force then?

YILDIRIM: Let me make a couple of comments in regards to the OSLO and PCEJA. The remedies to really improve (a) recognition of this resources and (b) how do you overcome some of the impediments. In PCEJA, Petro-Canada conducted a field test and I would qualify it as a reasonably good test. And, I was with the side together with other owners' representatives and when we were returning to Calgary, the space shuttle blew up. Was it 1986?

GJ: I think 1986, yeah.

YILDIRIM: On that day I was on the airplane and driving from the airport. So, I was so pleased that in turn I produced a memo saying that's about time to take in-situ recovery seriously. So, there was a fair amount of accomplishment on the PCEJA side. We knew our lands. We had done a fair amount of drilling. The OSLO progressed, we knew the land. I think it was a permit number 31. Imperial and owners did a lot of lab work, large scale testing at Alberta Research Council research building on 37th Avenue NE in Calgary. And, they came up with new ideas. For example, core temperature/extraction of bitumen and hot temperature processing of froth, things like that. So, it was a very creative period.

This is now 1993 and OSLO didn't phase out in the 80s, it continued into mid-90s. In 1993, they were still using this facility. And, that facility operated by Alberta Research Council, later on they shut it down and industry lost certain capabilities. ARC rationale was that there are no users. And, I used the same facility on behalf of Canadian Occidental to prove another technology that we had integrally. So, both OSLO and PCEJA, could have been successful under better price scenario or maybe, under less inflation in labor costs and material costs. So, within Canadian Occidental starting 1987, I was also given the responsibility of research, new technology, coal and minerals. Up to that date, it was oil sands and oil shale. An oil shale company had a property in New Brunswick about 22

miles south of Moncton. It has always been known as Albert Mines. So, that became my responsibility and I think it was 1987 I opened the test pit and produced some oil shale rock to be burned with high sulphur coal by the New Brunswick Electric Power Commission. I inherited a research team from Occidental Petroleum. Occidental Petroleum used to have very modern research facilities in Tulsa, Oklahoma. But, they shut down the place as a research facility and rented out buildings to companies doing mass data processing. But, we at Canadian Occidental kept one of those buildings and the personnel that used to work in that building; to do research. And, this started in 1984. The very first task was to develop what is called emulsion making and emulsion pipelining technology. So, you basically mix large amounts of bitumen with lesser amount of water and some surfactants and specially designed chemicals to make a very stable emulsion that has a lot less viscosity. So, it's a viscosity reducer. And, we had a test loop in our pilot plant.

We used to run the emulsified bitumen again, again and again around this test loop. Later on, again in Tulsa we rented a four inch pipeline and shipped emulsified crude from one end of the pipeline to the other end of the pipeline. And, finally we came to Alberta, made a deal with Norcen Energy. They used to have a heavy oil operation. So, we set up shop where the oil was collected, emulsified it, basically sent it to the water recovery central processing area where you knock out the water and produce clean, heavy oil. So, we made a fair amount of progress, but we also found that shipping emulsified crude to a country like the U.S. would have tremendous resistance from the people. Exporting of water was a no-no. And, the refineries that we visited on the West Coast, like Texaco, Chevron, etc, did not have enough water processing capacity.

So, emulsification for the purposes of pipelining kind of was a no-go. There have been some special applications here and there but we didn't really pursue those. This was the result of 1985 incident at Syncrude. We blew up one of the cokers and my boss at the time said, "We are able to produce bitumen. Why can't we ship it?" It was August, 1984 or August, 1985. I think it was August, 1984. So, as a result we heavily engaged in oil sands, bitumen emulsification. I had good people in Tulsa who started reporting to me at the end of the month, and we received an invoice for the building and then people. So, we became the owner and operator of that facility and the people. But, that taught us a lot of other things. We had this chemist, young chemist, very imaginative with a PhD and he started designing new surfactants to make emulsification less expensive and using lesser amount of chemicals, surfactants. So, we tested the surfactants in a heavy oil field, in one of Canadian Occidental's fields.

We injected surfactants into the ground and boosted the production basically. There again, it would have been feasible if this were a very large operation and we had more people as operators. But, it was a small operation and we only had a handful of people assigning another person with a truck bringing surfactants, mixing them, putting them in the ground and getting more recovery was not economically feasible. We were also sanding the well and that required frequent service, $3,000 per shot. So, that didn't go to well.

GJ: Where was that? Where this was used?

YILDIRIM: Canadian Occidental had a couple of small, maybe Boulder Field near Lloydminster.

GJ: So, in the Lloydminster region then?

YILDIRIM: In the Lloydminster area.

GJ: So, this technology work follows a pattern, where you might have a problem? Like, you want to ship emulsified bitumen, discovering you can't do that. But, in working on the technology...

YILDIRIM: You move something up into something else.

GJ: Yeah. One sort of leads to...

YILDIRIM: This is not the end. We took two more steps which could have been very, very useful and other people are pursuing some of these. One was what is called, emulsion combustion. So, you are creating a brand new market for emulsified bitumen. See bitumen in its natural state cannot really be injected into combustion chamber at a power plant. Using emulsified bitumen would create a new market for us. So, we use the Canmet facilities for using this as fuel in their combustor. We also used a university laboratory, I think it was in New York State, to analyze vaporization. You have to have special nozzles to vaporize so that every particle is small enough. So, that you don't have unburned carbon. Just about that time, Venezuela had its own technology together with BP. They made emulsified crude and take ore emulsion. And, they started marketing around the world. They had 25 people in London, I visited them several times, just for marketing. And, they were able to sell the idea to New Brunswick Electric Power Commission.

This is a time when we were about to supply oil shale to the New Brunswick Electric Power Commission to burn with high sulphur coal. But, coal and oil shale; both of them are solids and they also produce a fair amount of ash. Ash has a disposal problem. When Venezuelans approached the Electric Power Commission, most likely offered some funds to convert one of their power plants from solid fuel to liquid fuel and the power commission got into a contract with Venezuela. And, the Venezuelan company that created this business and emulsified heavy oil and sold in Italy in Eastern Canada and some other countries, basically got out of business because within a few years a lot of upgraders were built in Venezuela. Why send bitumen around the world, heavy oil around the world and compete with coal as opposed to adding quality to it and competing with conventional oil and even getting premium depending upon the quality. Do you follow me?

GJ: Yeah.

YILDIRIM: So, that really killed my potential oil shale business with Electric Power Commission. And, left the Electric Power Commission empty-handed because contract was not fulfilled. For a few years, they probably supplied ore emulsion. So, ore emulsion or emulsified bitumen was important for us. And, then we went further. A certain percentage of total bitumen is called asphaltines. That is the heaviest end of the bottom or the barrel, actually. It can range depending upon what field you are at; anywhere from 15% to 25% asphaltines. So, asphaltines are not very

desirable. You have to spend a lot of money to convert it to a lighter product. So, we thought that maybe since we are able to emulsify bitumen as a whole, maybe we will be able to emulsify asphaltines and use that as the boiler fuel. And, we were successful in that as well. In the bitumen extraction there are stages. You have the primary extraction, the secondary extraction, froth treatment and solid recovery, etc. And then, pure bitumen goes into the upgrading. And at the time, in-situ producers started producing some products which required knocking out the water. So, since we were able to emulsify bitumen which contained oil and water, why can't we upgrade this as is without knocking out? So, we worked with Canmet over a year period and that was successful and we had a patent. What happened in 1993, my main sponsor the president of Canadian Occidental lost his position and new coming presidents didn't want to spend much time on research.

GJ: So, what did lead to...

YILDIRIM: Oil Sands Task Force?

GJ: Yeah. That was formed in 1993. Way back?

YILDIRIM: In 1984, we had our first Task Force. We had the meeting formally in Nova Building on 7th Avenue and 7th Street and now it's called Nexen Building. And, it has this history. When we were working as OSLO committees, the environment for doing business was not very conducive. It was not very encouraging. There was this petroleum and gas revenue tax. And, there were some other burdens and rules and regulations. So, within the technical committee, I proposed something. I said, "Look, to deal with environmental issues, we have an environmental Task Force and an environmental committee." To reduce the footprint of our operations, clean the water, clean the air, etc. How about a committee that we call, Business Environment Improvement Committee? I had a colleague at Gulf and you may have heard his name because he was quite functional with APEGGA [Association of Professional Engineers, Geologists and Geophysicists of Alberta], Dr. Dave Devenny. He and I became the spokespersons for this Business Environment Improvement Committee. One time, he was the recipient of an award. And, one time he was the president of APEGGA.

So, as a matter of fact two of us made a presentation to AOSTRA [Alberta Oil Sands Technology and Research Authoity] that certain things will have to improve so that developers don't face all these difficulties. Time passed and in August, 1982 we had a meeting at Syncrude. This time they an office at what is called 7th Street Plaza, 14th floor was their board. And, there we had a meeting. And, the senior person representing Syncrude was their vice-president of mining, a very nice fellow by the name of Dennis Love. So, after the meeting most people left, because some of them are in Calgary, some of them are in Edmonton whereas we were to Tulsa, Oklahoma. So, there is not an immediate. So, we stayed around for a drink. So, Dennis took us down below and there was a restaurant and bar, three of us sat there and started basically covering everything under the sun. And, I had this one or two page write-up about the concept of improving business environment, tackling the PGRT, the resource allowance, etc. This is August 1982. At the time I didn't know, Dennis Love was either on the board or the president of Alberta Chamber of Resources. So, time passes. 1983,

we have a brand new Alberta energy minister, John Zaozirny. And, three people from Alberta Chamber of Resources, three board members, two board members and general manager are going to visit with John Zaozirny and propose my little text, now cast into some kind of slide. They had one slide with four or five points. And, before the meeting they invited me to Edmonton and I was in Calgary. So, I grab my bags. Before I return to Tulsa, I go over there. This is January 5th, 1983. It's my son's birthday, so I will never forget that. And, I'm not invited to attend the meeting. But, at least go over the items on my list one more time, PGRT, resource allowance, etc. One window approach to approvals and things like that. So, Dennis Love is part of the group and he or someone from Alberta Chamber of Resources presented seven or eight points to the energy minister. And, the energy minister receives these points with enthusiasm saying, "Well, these are really good points, but you really have to conduct some studies, come up with some more specific recommendations."

So, this feedback goes back to the Board of Alberta Chamber of Resources. And, the board says, "Okay. Let's form a Task Force." There was a young fellow, good speaker, didn't know oil sands quite well and he was made spokesman on behalf of Alberta Chamber of Resources, as well as the chairman of the very first Task Force. John Nichols, he was with this bit Acumen company that sells Caterpillar. I think they're in Vancouver?

GJ: Finning – a huge operation.

YILDIRIM: Huge operation.

GJ: Big caterpillar dealership.

YILDIRIM: So, these businessmen working for successful companies have a lot of free time on their hands. As a result, he became a spokesperson and went around as a lecturer. And then, when we came together we became the very first task force. So, our very first meeting was held in May, 1984. Just remember, the idea started in 1982. Finally, it found a home and the people coming together at the Nova Building. It was a Nova vice-president and also on the sales side of the business. And then, I remember some of the members that were there. And, Pan-Canadian had all their geologists, older than us Gordon. So, the very first group was small and all I did was basically, explain the idea of how we can focus on things and come up with specific proposals. A few months or a year later, led to what is called, central upgrader concept. At the time, Don Getty was the premier and in summer of 1985, he made a statement or two to one of the newspapers that we producing bitumen and it will be nice if we process it in Alberta. So, some of my colleagues cut this up and came to my office at Canadian Occidental. This is the whole portion that our Task Force should pursue. So, we formed this Task Force studying merits of a central upgrader. And, the concept was not any different than these gas processing plants. Just remember, gas processing plants do not serve a single field. Gas comes from several different fields and they may or may not be owned by the gas processing plant. The central upgrader concept is the same. You have an upgrader by some owners, basically receiving bitumen from others. And, the drive behind this concept is that just remember, in surface mining you can increase your capacity from zero to a hundred in a short time to supply an upgrader. In in-situ, you go in baby steps; a thousand barrels, two thousand

barrels. No in-situ operator can actually afford an upgrader early on, but half a dozen in-situ operators can supply an upgrader. So, this activity became a major activity on the oil sands Task Force. And, we had a team. We actually hired a project manager. Suncor dedicated a full-time person and we gave him an office at Canadian Occidental. CIBC dedicated a half-time person to keep track of expenses. We were working on the base of both monetary contributions as well as contributions in kind. During that time, there were very, very interested parties. I had two parties from Germany and one contributed $100,000, the other one $50,000 worth of engineering. Shell contributed $50,000.

So, in no time we built a war chest to pay the project manager and some report writing, report printing, etc. The rest of us did not regularly receive any compensation. But, the total value of the project was about $1.2 million. We looked at three technologies and you evaluated every single one of them. And, you calculated the capital requirements, operating cost requirements, etc. And, we came up with numbers. Guess what? In no time, Husky was building their upgrader, a residual upgrader. And, we were looking at $22,000 per daily barrel capacity for a 30,000 barrel unit. Then, Husky announced that their 45,000 barrel per day plant is going to cost $1.8 billion. So, $22,000 per daily barrel capacity versus $40,000 per daily barrel capacity, it was almost double. As a matter of fact, in the end it doubled because they exceeded that $1.8 billion. So, how can you be a spokesperson based on a paper study that you have a good number, $22,000 per daily barrel capacity and operating costs is visible and promote this idea to bring at least one or two companies like Amoco that will actually get into it together with partners, we will build an upgrader.

We came up with schemes for example, floors and ceilings for the cost of the bitumen and cost of product. You will buy bitumen at a cost no lower than the bottom, no higher than the top for example and the revenue or profit distribution schemes in proportion with the capital investment; very creative financing schemes. So, Husky's announcement and their overrun of budget as well as schedules, it killed the concept. However, three or four years ago, there were at least two or three other entrepreneurs trying to revive this concept. Unfortunately, none really has been materialized yet, because upgrading is a very expensive proposition.

So, the Task Force did not stop there. In 1993, after we kind of cooled off on residual upgrader, I am now chairman of ARC board, president of ARC and chairman of it. This is 1992-1994 time period. During an executive meeting, they started looking at me saying, "What if we make the Oil Sands Task Force into a national Task Force?" Which really meant that you will try to engage the representatives of Federal Government as well as the Alberta Government; and the Task Force will have representatives not only from oil sands developers, but pipeline companies, technology companies and finance, like CIBC, native community. I had this fellow, Dave Tuccaro on my Task Force. Syncrude was represented by Eric Newell. Suncor was represented by Bert Lang. Imperial was represented by Howie Dingle. What was the original name of the pipeline company Enbridge?

GJ: Interprovincial.

YILDIRIM: Interprovincial, Pat Daniel was on my Task Force. The initial Task Force was really formed to come up with position papers to overcome this notion that oil sands are just a pilot plant. Here are a bunch of guys in the west, spending a lot of time and money, even though Syncrude and Suncor were legitimate commercial production facilities. The overall concept was not that, this was just research experimentation. So, our goal initially was to override that impression. Now, that we got more serious at the national level, to address some more serious issues like, taxation, resource allowance, one window approach for regulations, etc. And, we had sub-committees looking at the impact on the community, social economic impacts. And, so I became the chairman of that. I had a board of about 17, 18 people from diverse disciplines with a participation of a couple of ADMs from Ottawa and Myron Kanik and some others from Alberta Energy.

So, we worked hard and frankly, that was my rider. Towards the end we had some very major disagreements. Up to that point, there were only two commercial projects. And, the projects that had been evaluated pointed out that capital costs was still high; something like $50,000 per day per barrel capacity. So, things like that. So, as a Task Force what we were looking at were 1 million barrel production addition by year 2020. It came to basically, coming up with the best estimate of what it will really mean in terms of capital requirements to achieve that capacity. We were not really too specific, how much of it would be just bitumen, how much of it would be upgraded/integrated plant. But, we were up to a million barrels and I was the main producer of numbers and ideas and Frank, constantly visiting with me and constantly writing. And, we published a number.

I gave the number and Frank published. And, it was not accepted. The number was something like $45 billion for 1 million capacity and in my opinion, that was something like 60/40. 60% comes from integrated plants where you have per daily barrel capacity of 60,000. And then, 40% comes from in-situ where daily barrel costs you $20,000, together pipelines and infrastructure and everything else. I mean we lump summed everything to $45 billion. Well, some of my dear colleagues wanted to reduce it down to $20 billion.

GJ: This is the executive summary and the Task Force -- in fact, the published number became $21 to $25? So, they cut that down...

YILDIRIM: They did. There was this Peter Marshall from Syncrude. He took over the report writing. Frank was made a scapegoat. And, I was really put in a very, very bad position. My number was a lot more realistic. $21 to $25 is it. But, we also kind of maybe target barrels more flexible. We said 800,000 to 1 million or 1 million to something like that. We gave a range to barrels and then a range to... I was beaten up. Gordon, time is an interesting thing. If you live long enough, you really see who was right and who was wrong. Today, an integrated plant is probably $100,000 per daily barrel capacity. We saw that at Sunoco and others, Petro-Canada for example. So, building an integrated plant is not cheap. You could not produce a million barrel capacity at $20,000. It was just... but, you know. Some prominent figures are beating you and by then, I really didn't have much backing from Canadian Occidental because my original sponsor was no longer there. They liked what I was doing. But, I didn't have a budget to travel. Plus, by that time I was seconded to Syncrude Canada Limited. I was in Edmonton for three years and those are the final reports. Good

things came out of it. I think regulations have been streamlined. We formed CONRAD, Canadian Oil Sands Network for Research and Development, to basically go deeper and research. We concluded that single companies don't really have the funds and the personnel to make a significant progress in oil sands research. And, through CONRAD we wanted to go deeper than what individual companies can achieve. And then, I formed two more committees, one was called, Black Oil Pipeline Network and the other one, CO2 Synergy Research Network. Black Oil Pipeline Network meant that we wanted to enlighten the pipeline companies that the tide is coming in the form of production. Through our meetings every three months, to bring the producers and the transporters under the same roof and to basically explore what is coming and what kind of pipeline we need.

Up to that point, pipeline companies approached, "Show me where the barrels are. I'll build you a pipeline." But, you couldn't really point out a single location for supplying pipelines. So, it will be two, three, four, five operators who supply one pipeline for example. So, that really became very, very instrumental for two big achievements that no one really knows exactly. And, history will not record it. One was: I used to be very close Trans-Mountain people. Mid-80s when we were producing emulsion products, emulsified bitumen, we were looking at Trans-Mountain to basically ship it to the West Coast. As a result, I had a good relationship with them. They visited us. We visited them. For them, it was additional barrels to ship. So, it expanded business. But, as I indicated West Coast Refineries would not deal with water and water export seemed to be impossible. So, that relationship kind of fizzled. But, once you establish trust among the members of two different companies, that trust doesn't really disappear.

So, when I formed this Black Oil Pipeline Network I started inviting a fellow by the name of Bob Vergette out of Trans-Mountain. Bob and at times, some of his colleagues, started coming to my meetings. And, they used to be held at McDougal Centre on the 4th floor this was this huge conference room. Now, 55 seats, two levels, two rings actually and standing room only. I used to provide lunch as well. A lot of information, free of charge. In this day and age, something like that can be presented as a conference and you can charge an arm and a leg. And, that's what is happening, actually. We charged nothing. This was Alberta Chamber of Resources. And, we always found a place because of our relationship with Alberta Energy was very good. And, we always found a sponsor for lunch, coffee. So, everything three months we had these meetings.

Our agenda usually included people from both pipeline side of the business and production side of the business. One of them was Neil Camarta. Neil made a presentation about their project. He's a good speaker. Subject was very interesting at a time that nothing else was going on or happening. Shell basically broke the silence, started their brand new project and it was exciting. So, the fellows from Trans-Mountain approach Neil Camarta. I find that out later from Bob Vergette saying that your meeting really created an atmosphere for us to come together and start working towards a deal.

GJ: So, those are the roots of the expansion that they've been going through at Trans-Mountain. They built additional facilities across the Rockies through Jasper National Park and Robson Provincial Park, Mount Robson Provincial Park. And, as of actually, this week they are holding their

second try at an open season to sell capacity for an expansion of the full line for something like $3.8 billion. And, they'll double its capacity up to 600,000 barrels a day and they want to do. And, a lot of that would go into tankers and go overseas. And, I follow that one maybe more than Enbridge/Gateway, because it strikes me that industry likes to do things one step at a time. And, Trans-Mountain already has got that right-of-way and it's got that pipeline and it can do that; whereas Enbridge has got to start from scratch.

YILDIRIM: In a small way I take pride and credit for creating a forum within which this connection was created. And, as a result Trans-Mountain ended up building a pipeline for Shell's project.

GJ: The Corridor.

YILDIRIM: Corridor. In the beginning of the Black Oil Pipeline Network...

GJ: I should just say that the Corridor Pipeline is very different from the Trans-Mountain, Edmonton to Vancouver pipeline. Corridor is the one that runs between the Athabasca Oil Sands Project mine north of Fort McMurray and the Shell upgrader down at Scotford east of Edmonton, and Trans-Mountain initially built that.

YILDIRIM: Yes. That's the pipeline. But, it's the result of Neil Camarta who was a presenter on that day and Bob Vergette all the way from Vancouver connecting and pursuing towards a deal. Second, I consider a major accomplishment was in relation to Suncor. When we formed the committee at the beginning it was just a pipeline company as the producers didn't really have much interest. And, Neil was the person urging me to bring the producers as well. He happened to be one of the early attendants of these meetings. So, you have a half a dozen guys, one dozen guys from pipelines but very few producers. So, then I expanded inviting wider audience and moving from Canadian Occidental conference rooms to the McDougal Centre. Now, I told you during National Task Force on Oil Sands Strategies, Pat Daniel was on my committee. Plus, he was also a board member at our Chambers of Resources. So, we had some rapport. So, that's side information.

One day, he sees a little blurb that Suncor is going to build a pipeline from their own site to Edmonton. They used to have a pipeline division. And, I met the key people during these meetings. Well, here is Enbridge which is a full-fledged pipeline company. Suncor's primary business is bitumen production. The pipeline will require capital. Why take away from production operations? So, our executive manager of Alberta Chamber of Resources was Don Curry, he has been general manager during that time. He was my most loyal cheerleader. I called Don and I said, "Don, I have this idea. We heard that Suncor is trying to build a pipeline, whereas Enbridge is a pipeline company. I think I should bring this subject to Pat Daniel's attention. Can you set up a meeting with Pat Daniel?" At the time, I don't know where Pat lives right now, because my relationship with him disappeared. But, at the time he was in Edmonton office, something like 103rd Street.

GJ: Yeah, it's about 103rd and Jasper.

YILDIRIM: Yes. I took along one other fellow who really helped me out. I think he was very instrumental. He knew refining business quite well. His name was Terry Camp. So, Don Curry, myself and Terry Camp had an appointment with Pat Daniels. It was a miserable, cold winter day. I travelled from Calgary to Edmonton and met at Don Curry's office which was at the Oxford Building. So, on foot from Oxford to Enbridge, so Pat Daniel received us kindly. And, I made the introduction that I have this Black Oil Pipeline. He probably knew because I used to report to the board of directors at ACR about all these activities, both on CO2 matters as well as Black Oil Pipeline matters. And, I told him that I just became familiar with Suncor's desire to build a pipeline and since you are the pipeline company, I think you should take a look at this plan. He said, "Yeah, that's great." He said, "Rick George is on our board and I should have a talk with him."

GJ: Way back when you were thinking about creating this Oil Sands Task Force, you sort of looked there and you said, "Well, we've got a committee for the environment." This is way back in the 1980s to reduce the footprint. Was that always a concern in the oil sands industry, the environmental effects?

YILDIRIM: I wouldn't say it was a concern. It was an opportunity. The only way I can really present this to you as an opportunity is a little story that goes back to 1975/1975. There was a very good geologist at Syncrude, East Indian fellow, very likeable, very knowledgeable and I was coming from New Jersey at the time. I was still in New Jersey in 1974. Since, I had these one-on-one discussions with Syncrude mining people and geology people, suddenly he projected that I was an important person. The thing is that, at the time, I wasn't. I was just a worker. My company said, "Go there. You go there. You here and you go there." I had a doctorate in engineering science degree. My management appreciated having different talents for different areas. But, no one really gave me an award or said that, "Best employee of the year," type of thing. No. I am just a worker.

As a matter of fact, the first time I arrived in Edmonton I ended up on the corporate jet, my company's corporate jet. When we were arriving at the Municipal Airport, the captain or the pilot or assistant pilot asked whether we need cabs. No one said, "Yes," because they all arrange limousines. And, I'm at the back of the bus saying, "I need a cab." So, we arrive there at the Municipal Airport, six guys go into two limousines. I go into a yellow cab. I go to the Holiday Inn on 7th Street and they go to Edmonton Plaza. You can't really walk on water. But, as someone on the management committee, you don't exist. That was the situation. So, this guy calls me and says, "Erdal or Dr. Yildirim," I don't know how he addressed me. He said, "Look, we are trying to plan this tailings pond on the some of the best reserves." And, he's looking for help that I will do something to change it. Well, there is no way, plans were made, Syncrude started building the dykes to make and I never really raised the issue to anyone because I have no voice. Later on, I gained some voice by coming up with ideas in the mining area and the extraction area, but initially, I had no say.

So, when we started looking at OSLO, we wanted to have a scheme dealing with tailings primarily. Before the purpose of not really occupying very large land in the form of a tailings pond, not impounding so large a water body and everything has to... So, my concept at the time was, to have cells to accommodate one years or two years of tailings to freeze and thaw basically. We first

separate the course tailings from the fine tailings and fine tailings in these cells, you basically dry up the tailings and you cap it and move to the next one. And today, I see in one of the CAPP ads [advocacy advertising by the Canadian Association of Petroleum Producers] someone comes up with a dried fine tailings saying this is a new technology. Guess what? In 1981/1982 we were discussing that. So, the concern is really a bigger word than what I would say. It was more opportunity.

GJ: Opportunity in the sense of being able to get at more of the resource?

YILDIRIM: Efficiency, less water, less land, smaller footprint. Tailings ponds are created with an enormous amount of volume of rocks and sand to establish these dykes. So, within which you can impound very large volumes of water. I never really liked the idea. As a matter of fact, one time there was a tornado in Edmonton. It really scared me. And, I said, "Well, what if this tornado takes place in Fort McMurray and you breach the sides of the dyke." Actually, I didn't want to get into that. Maybe you can strike it. There are times one gets worried about some natural events and natural causes creating difficulties for our operations.

GJ: Is the environmental criticism that we hear about the oil sands now, correct? Is it right?

YILDIRIM: Look, bitumen has higher carbon content, less hydrogen content. And, if you want to bring it to the same level of conventional oil it would have emissions associated with it. However, conventional oil coming from Kuwait or Saudi Arabia is not without any emissions. All that transportation creates emissions. So, if you look at the full picture from the ground to your vehicle or to an airplane, I really don't think that you can qualify oil sands crude, dirtier crude. Firstly, I challenged my colleagues in the industry. There were a group of people and they actually adopted the word dirty crude or something like that. I had to challenge them saying that, the crude that you put into the pipeline, 99.5% pure. It is processed otherwise it is bitumen and it's still supposed to be very high quality. So, what goes into the pipeline is not a dirty thing. The process may be dirtier than pumping oil, but all things consider, emissions from Kuwait to US or Kuwait to some European countries, added to the production emissions are equalizers. Just understand that real emissions are produced in the use of these products, not necessarily in the production.

GJ: Yes. So, the other question I had was in all of this time in oil sands, when you look back on it, how important would you say government is to the development of the resource?

YILDIRIM: I think the Alberta Government has been very supportive. In the toughest times of Syncrude consortium, both the Alberta Government and Federal Government came forward to really pick up the slack from Atlantic Richfield. So, one should never really forget that, including the Ontario Government. They took up 5% at the time, the project cost was estimated somewhere around $2 billion. 5% of $2 billion is a significant amount. And, Ontario Government took that and later on, Pan-Canadian bought it from the Ontario Government. So, right at the beginning there was tremendous support from these sources. I think the government's interest in oil sands or heavy oil upgrading kind of subsided a little bit when the Husky upgrader became an issue. Initially funded by Alberta Government and Saskatchewan Government, both governments basically sold their shares

at a discount price and got out of there and after that, governments have been a little bit reluctant to have equity interest in oil sands or heavy oil operations. But, I know that Alberta Government is still spending money looking at options. How they upgrade and where they upgrade? AOSTRA was a tremendous contribution to the growth of oil sands, not necessarily in the surface mining area even though they supported the projects for bitumen extraction and tailings. But, for in-situ Bill Yurko one of the chairpersons spent $7 million to put those two shafts in the ground and then the tunnels. And, tried to basically prove the concept that you can actually drill horizontal wells into the oil sands formation, heat the formation and reduce the viscosity and let it flow back to a central location and pump it to surface. And, this is at a time where horizontal drilling technology was not advanced enough to drill horizontal wells from the surface.

So, you had to go below the formation with a short band from the wall of your tunnel into the oil sands and forward. That was easier, but for that machinery had to be brought down in pieces and put together to do horizontal drilling. So, that was the main. But, it proved a concept, that through horizontal drill holes you can reach much larger areas than vertical huff and puff and you produce much larger volumes of bitumen. So, steam assisted gravity concept was proven. And, ever since it is improving and I think some people will use solvents or maybe, improve the oil ratios and things like that. So, steam assisted gravity as well as variations will not stay the same five years down the road, ten years down the road. And, I think both economically and environmentally, the in-situ operations will improve. But, surface operations will not stay the same and companies are doing a lot of good work in reducing emissions, reducing tailings, size of the tailings by separating coarse sand, getting rid of it and then dealing with the fine sands.

As early as the 1960s, Suncor spent something like $190 million to build a sulphur plant to capture more sulphur than what was allowed in the original permit, operating permit. Now, since then, I'm sure both companies and maybe even the new companies have much tighter sulphur capture systems. So, operations are improving. All this noise first started in Canada and then in the US, "Dirty oil, dirty oil." It is really unfair. Oil itself is not dirty. Producing that one barrel, whether it's upgraded synthetic crude or bitumen may be considered dirtier, but companies are doing their very best with the best dedicated scientists and engineers to really make improvements in all aspects of their work. For example, I understand that Suncor is setting up a facility near the tailings ponds instantly to recover oil and return it to the processing plants. So, how do you accuse the companies of not being environmentally sensitive?

GJ: Oil Sands Task Force, we set aside that oil question of the cost estimates. You said it had this target of achieving a total volume of 800,000 barrels a day to 1.2 million barrels of day of bitumen and upgraded crude oil by 2020. Well, you got there basically ten years early.

YILDIRIM: Yes, we did.

GJ: What happened?

YILDIRIM: A lot of things. I take some pride and credit with Task Force's work. Those numbers are really irrelevant. No one operates with someone's estimate of the day to get into business. People's decisions to get into oil sands business are based on what is the resource, what is the quality, what is the technology and what is the price? And then, what is the market? Can market pay the price and absorb the additional capacity? In some industries, there is excess capacity. This morning, I heard that one of the manufacturing dishwasher/washing machinery, reducing their personnel by 5,000 people, cutting plants, etc. They said, "People are not buying refrigerators and washing machines and dryers anymore." And, oil is that way. There are underdeveloped nations that are constantly absorbing more and more liquid fuels. Not every country is lucky as Canada. There are countries with a drop of internal productions, domestic production. So, they rely on others. So, on the capacity side, I think investors have always been confident.

There may be some doubts that occasionally, it's happening this year. If progress in China is not taking place then the demand is going to down, etc. But, I can assure you if the Chinese demand goes down, other people will be consuming more petroleum products. The price has been very good. I think even the high cost operators have been able to make money. And, as a result if volumes can be absorbed by the market and market pays a reasonable price for you to recover your capital cost return on investment and operating costs, then you are in a good position to get into business. Now, Task Force's major contribution has been that someone like Eric Newell who was a member of the Task Force and his PR division was able to set up meetings all over Canada, even in the US. I did that to some degree myself. I made presentations locally in Edmonton. I went to Venezuela and made a presentation. I went to China, Japan. But, Eric Newell had a much wider net going to places and maybe even talking to investors. So, he made a big contribution based on the Task Force's work.

GJ: Also, your second recommendation as I recall, was a new generic fiscal regime? Has that not been a large factor?

YILDIRIM: Yes, definitely. Until then, it was one and one with Alberta Government. If you're a potential producer and you had a project, you went to the Alberta Government and basically established the ground rules about the royalty. This uniform royalty sets the stage. There is no uncertainty. I think during our past premier, waters have been a little clouded. He put together a committee. The chairman was a lumberman, forestry man and not an oil sands man. I had known him from Alberta Chamber Resources. And, they really did some things and I don't know the details, because by then I lost interest in promoting anything because the whole world is promoting oil sands. And, there are zillions of experts. My expertise doesn't count anymore. Any guy that comes from the east and gets a job at Suncor, six months later he can teach you. So, with that kind of atmosphere I kind of shrunk. I make no presentations. I look at these conferences, for example, content is not worth the money. Yet, these conferences are pulling a lot of people in.

GJ: Yeah. There are some people you know, who say it might've been a bad idea to go around in the late 90s and early 2000s with this estimate that the ERCB developed with 175 billion barrels and call

everybody's attention to the oil sands. That only waved a red flag in front of the environmentalists. Is that right?

YILDIRIM: No. Each nation promotes its resources, its capabilities, its technologies. Look at the Germans; they live on their technical skills and technologies. And, they are around the world. A company like Shell is always marketing their upgrading technologies and classification technologies. You have to stand up and be counted. It's a competitive world. And, if you want to attract attention of the investors, you have to speak up. Did we wake up the environmentalists? Environmentalists do not sleep anyway. They are looking for a cause to get at you. Look at those people occupying places in New York City. Should the bankers come down and write a cheque for everyone? So, there are a lot of people who have plenty of time looking for a cause. A handful of people can be very sincere about oil sands impact on the environment. But, the mob behind them, do not have a clue what oil sands is all about.

Former movie actress, Daryl Hannah is speaking against oil sands. Have you seen the place? Have you seen the process? Have you visited any cone of the operating plants? Attract the attention of the media, maybe, you will be sorted out and you will become important. Honestly, it's a competition again for the airwaves. A lot of nobodies are being interviewed. Now, I am sad that mindless people go against a resource in the open and making this commodity dirty oil. One time, when Barack Obama visited the East Coast, he had an interview with Peter Mansbridge. I like this guy, but after that interview I lost all the respect for Peter Mansbridge. Because, he used the "dirty oil" phrase and that's unfair.

GJ: But, you notice Barack Obama didn't. The only other question is: So, when you get done your day and you want to stop thinking about oil sands and oil shale and mining and upgraders and all that, what do you do? Are you a motorcycle rider?

YILDIRIM: No, no. During the summer months I hike when the weather allows. But, this year I had a lot of conflicts. I enjoy being in the field, drilling or mining or casting something. See, all my career has been one foot in the exploration, research and technology and one foot in the operations area. So, I really feel very fortunate that I learn all the time. This conference we attended suddenly, two or three new technologies were presented on oil shale. And, I immediately approached the people making these presentations and one of them sent me the electronic copy, it is a source of information that provokes thought. So, I'm communicating with these people. So, my mind needs some fuel or some reason to fuel itself and keep coming up with new ideas.

After, cutting off Occidental, now called Nexen, I joined Mike Supple and Chris Hopkins at Synenco. And, I had quite a few creative ideas. I wanted to eliminate, for example, trucks. Go back to conveyers. But, not Syncrude type or Suncor type of application. Get rid of all the sand near the mine face and basically, little distances of belt conveyors from the mine to the crusher, from the crusher to processing plant, on-site and then pipeline. So, I wanted to eliminate a lot of space by tailings, by taking the coarse material out of the tailings, you are reducing the total volume down to maybe 15% of the mass and with it water content also reduces. So, you can pipeline it and basically

put in these cells and let them dry within a year or two. And then, cap it and move to next cell to accommodate one, two, three years production. On the upgrading and densification area, working with companies like KVR and Shell, you learn. As you learn, you also start asking questions and coming up with ideas. And, it's happening the same way in oil shale, for example, existent processes achieve certain results. But, as you become very familiar with these processes you are able to suggest some improvements here and there. So, that's what I'm doing right now. I heard a claim at Synenco that I will have a plant design much improved than anybody else's. But, unfortunately, Synenco was sold and I no longer have any voice. At Oil Sands Quest, I came with the idea of using a combination of vertical wells as well as horizontal wells to maximize the recovery. After a while, I was asked to take responsibility for oil shale. That became half-baked. I'm just satisfied that I had these opportunities to think and come up with solutions, whether or not those solutions were implemented. It's important, but the circumstances don't always allow such applications.

GJ: Did you ever go back to Turkey?

YILDIRIM: My last visit was about four years ago. I lost both my parents. I have a sister there and then secondary relatives; cousins, cousins' families. Last year my sister was here and as a result, maybe next year. I don't miss it anymore. I feel misfit in that. A lot of men waste a lot of time sitting in the shade, smoking their cigarette and playing card game. Thank God their economy is better than most European countries. But, it could be better. Infrastructure is not to my liking. Last week, when we were in Colorado for example, you go out to the middle of nowhere, there are bridges, there are asphalt roads and there are sidewalks. Well, that's the U.S. And, Canada, I go to eastern Saskatchewan and farm roads are all over the place. I have not built any road in Saskatchewan so far, and therefore it did not cost a penny to go to a drill site or cost us to pay the guy, the owner of the field, but as far as road building. No.

So, Turkey can do much better strengthening its infrastructure, especially in the east. You know what happened last week, 400 plus people died and 1,300 people injured. There is a lot of illegal construction. The State doesn't have the economic strength and financial strength to have good controls and provide good guidelines. I don't believe that every builder in Calgary is being controlled every day, but they know the norms. And, they have the integrity to build buildings that will not collapse. I can't make the same claim for Turkish builders. They use something called cement and it does not have concrete and it doesn't have enough cement in it.

GJ: Along the way, you became a Canadian Citizen?

YILDIRIM: No. I'm an American Citizen.

GJ: American Citizen still?

YILDIRIM: Yeah.

GJ: But, you spent most of your career in Canada?

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YILDIRIM: Yes.

GJ: Do you go down to the States much?

YILDIRIM: Occasionally for conferences. I go to Hawaii, that's a State, and conferences.

[END OF RECORDING]