

LEGISLATIVE ASSEMBLY OF ALBERTA

Standing Committee

on

The Alberta Heritage Savings Trust Fund Act

Monday, September 25, 1978

1:30 p.m.

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Chairman: Dr. McCrimmon

1:30 p.m.

MR. CHAIRMAN: We can call the meeting to order. We have with us this afternoon the Minister of Energy and Natural Resources. On page 16 are some of the items that come under his purview as the minister responsible. So with respect to your area of the Alberta heritage trust fund, Mr. Minister, do you have any opening remarks?

MR. GETTY: No, Mr. Chairman.

MR. CLARK: You're not going to announce any new oil fields this year, Don?

MR. GETTY: Well . . .

MR. CHAIRMAN: If you have no opening remarks, are there any questions from the committee to the minister? Mr. Notley.

MR. NOTLEY: Mr. Chairman, I wonder if we could start on page 16 with AOSTRA, and the minister could bring us up to date. I'm particularly interested in where things now stand on the Shell plant in Peace River, how far along they are towards completion, and what the total cost of that particular proposal would be. But I wonder if we could have a rundown on all the current projects, while we're at it.

MR. GETTY: Mr. Chairman, I wonder in responding to a question like that if the committee wouldn't really enjoy having Dr. Bowman in the meeting. My giving a rundown of all the AOSTRA items would only be very superficial. I know the kind of thing Mr. Notley might like, and I also know that Dr. Bowman would be quite happy to do it. It would mean scheduling another meeting, perhaps.

MR. CHAIRMAN: Well, what does the committee think of this?

MR. NOTLEY: I think that since we're talking about a substantial amount of money, if Dr. Bowman is ready to come in and the minister has no objection to his coming, then it would be appropriate at some time, if we could arrange a time that would be convenient, to go into the different proposals.

MR. GETTY: I think the committee would enjoy it, Mr. Chairman, just while they're considering whether or not they're going to make that decision. I think they would be captured, perhaps, by the size of the enthusiasm and the type of feeling that Dr. Bowman has now acquired about the potential for success. It would be very helpful to the committee.

MR. TAYLOR: Would it be possible to have him in this afternoon?

MR. DIACHUK: Or tomorrow afternoon.

MR. GETTY: I could check that. I've already talked to him about the possibility, because I thought that if questions got to details on this matter he should be ready. He was trying to keep his schedule open.

MR. NOTLEY: Even this afternoon.

MR. GETTY: It's possible.

MR. NOTLEY: If it were possible to check it out, it might be possible then to complete your department in one meeting.

MR. CHAIRMAN: Would you like to give him a call, Mr. Minister? Then perhaps we could carry on with the balance of your department if it's feasible at all. This afternoon would be ideal, if we could manage it. Is that agreeable to the balance of the committee?

HON. MEMBERS: Agreed.

MR. CHAIRMAN: We'll excuse you for a moment, Mr. Minister, while you make your call.

MR. GETTY: He'll be here at 2 o'clock.

MR. CHAIRMAN: Excellent. Perhaps we could switch to one of the other areas which you're responsible for, with questions in the interim between now and the arrival of Dr. Bowman. Mr. Clark.

MR. CLARK: Mr. Chairman, I know the minister would feel disappointed if I didn't ask him to tell us how the Alberta Energy Company is doing. Mr. Minister, how many ventures is the Energy Company now involved in?

MR. GETTY: They're involved in Suffield; they're involved in Syncrude, in both the power project and the pipeline, and as you know they're evaluating the option; they're involved in the Simpson Timber project, 20 per cent interest; they're involved in the Luscar-Sterco coal mine, 25 per cent interest; they have a 50 per cent interest in Pan-Alberta.

MR. CLARK: What does Pan-Alberta do?

MR. GETTY: Pan-Alberta is the company that sells natural gas to Quebec. I don't have the Energy Company report with me, but I think that . . .

MR. NOTLEY: Steel Alberta.

MR. GETTY: Yes, they have a 50 per cent interest in Steel Alberta, which means the holding of half of the 20 per cent of the shares of Interprovincial Steel and Pipe Company. And they are investigating additional steel projects.

MR. CLARK: Mr. Minister, are they involved in petrochemical ventures, or have they made any commitments to become involved in them to date?

MR. GETTY: They've made the application to the ERCB to proceed with a benzene plant. The cabinet has approved the positive recommendation from the ERCB. The company now has 90 days -- they have about 60 left -- in which to present to the board a construction start time.

MR. CLARK: That's with Hudson's Bay Oil and Gas and Mitsubishi?

MR. GETTY: Mitsubishi, yes. They refer to it as Petalta.

MR. CLARK: Any other Suffields? What about the area north of Cold Lake?

MR. GETTY: They have acquired from the government, as you know, the Primrose Lake property. The Primrose Lake property is still in the process of negotiating access with the Department of National Defence. That access may be completed, I would hope, within the next two weeks or so. It will be like Suffield; it will follow the Suffield model, in which they will separate the total base area into six or eight sections. If it ends up being six sections, the military will move to five and clear one of them and AEC will be able to operate there. Then they'll keep rotating until they're able to move to all six.

They have anticipated that they will be able to get this access cleared, and they've asked industry to present farm-out proposals. I don't know how many firm ones they will do, but they had an information meeting and I believe some 50 companies came who are interested in making proposals to AEC to take farm-outs of AEC properties. However, AEC will operate on the Primrose base.

MR. CLARK: Mr. Minister, do you have any heavy oil interests?

MR. GETTY: No.

MR. CLARK: For the benefit of the committee, can you tell me whether they are expanding their own internal operation to the point where they've got some heavy oil expertise in the company?

MR. GETTY: I believe they have, but I'm not familiar with the inner workings of the company.

MR. CLARK: Could you check that out for us and see if they've got some, and what their heavy oil interests are?

MR. GETTY: You were talking about people -- personnel.

MR. CLARK: Yes, that's correct. At what stage are negotiations now with the government, the federal government, and the Alberta Energy Company -- and I guess DND also -- with regard to the Wainwright military establishment?

MR. GETTY: Wainwright? We haven't been talking to them about it at all.

MR. CLARK: Has the Alberta Energy Company made overtures to the federal government?

MR. GETTY: Not that I know of.

MR. CLARK: Have there been discussions between the Alberta government and the Alberta Energy Company with regard to the possibility of trying to work out a Suffield type of deal for the Energy Company for the Wainwright military base?

MR. GETTY: Not with Energy and Natural Resources. I can't speak for Mr. Hyndman's department. I don't know whether it might have come up in any discussions, but certainly none that we're involved in.

MR. CLARK: Ordinarily, if they follow the Suffield and Primrose Lake pattern, it would be done through your department first?

MR. GETTY: No. As a matter of fact, Federal and Intergovernmental Affairs headed up the access negotiations.

MR. CLARK: So they could well be negotiating and your department wouldn't really be involved in negotiations. Is that it?

MR. GETTY: I don't think negotiations. I think we'd know if they were in negotiations. But if there has been any discussion, I'm not sure.

MR. CLARK: Could you check that out for us also?

MR. GETTY: Yes.

MR. CLARK: Can you give us some indication as to the procedure the Energy Company is using in making a decision as to whether they're going to pick up those convertible debentures?

MR. GETTY: You mean exercising the option?

MR. CLARK: Exercising the option, yes.

MR. GETTY: Well, I'm sure what they will be doing is trying to figure out if they can make money on it by exercising the option, which I understand would be something like \$500 million. It's a minimum 5 per cent and up to 20 per cent. They will have to judge whether it's economic for them to do it and whether it would be in the best interests of the shareholders. So it will be a financial assessment.

MR. CLARK: Has the Alberta government given any commitment to its partners in Syncrude that if the Energy Company doesn't pick up that portion the Alberta government, through the heritage fund, will pick it up?

MR. GETTY: No.

MR. CLARK: There have been no such discussions?

MR. GETTY: No.

MR. CLARK: Could you shed any light, Mr. Minister, on any deadline when the Energy Company has to make a decision on whether they will exercise this option or not?

MR. GETTY: It's provided for in the agreement, and it's within six months of the on-production date. The on-production date means a certain volume of barrels must be produced, and at that point the plant is on production. They have not reached that point yet. I shouldn't, in this committee, guess at the figure because I haven't reviewed the agreement for some time. But something like 4 million barrels of oil would be the point at which they say, okay, you're now on production. Then within six months of that time, the Energy Company would have to decide. But since, if they don't take it, there has to be a period for the government to judge whether it would in any event -- because it reverts to the government if the Energy Company doesn't take the option -- we've told them that they would have to tell us three months before.

MR. CLARK: Half-way, then.

MR. GETTY: Half-way.

MR. CLARK: Then the government would have the option of picking it up itself, or it will be spread around through the partners. Is that right?

MR. GETTY: Well, the partners already have it, yes.

MR. NOTLEY: We're looking at an option all the way from 5 per cent to 20 per cent -- the \$500 million I assume is the 20 per cent -- so it could be any figure in between. So the minimum would be about \$125 million?

MR. GETTY: Yes.

MR. NOTLEY: I see. So at this stage in terms of the mechanism, the Energy Company would be determining that completely on its own as a business proposition. There would be no consultation with your office, for example. Only after they choose not to exercise it would the government of Alberta or your office in any way, shape, or form become involved. Would that be a fair statement?

MR. GETTY: Yes.

MR. NOTLEY: What about the convertible debentures -- the \$100 million to the two companies, Gulf and Cities Service? Where do things stand in terms of converting those into equity?

MR. GETTY: Well, they've been fully taken down, as I understand it -- the amounts of money, the \$200 million. But Energy and Natural Resources wouldn't make the judgment there. It would be made by the heritage savings trust fund, presumably through Mr. Leitch's responsibility.

MR. NOTLEY: Where would things stand at this point in terms of those two convertible debentures? Has the investment committee begun evaluation of them, as it sort of implies here in the report if I'm not mistaken?

MR. GETTY: Syncrude equity have monitored the expenditure of the funds, but we as a government in the investment committee have not started to look at them as to whether or not we should convert. The plant only started, as you know, sometime this year, but we officially opened it on September 15. I think

we'll want to see a lot of the 'debottlenecking' worked out before we get to that position.

MR. NOTLEY: I take it we have more flexibility in terms of dealing with the convertible debentures than the option, a larger time frame to assess whether we want to convert them or not.

MR. GETTY: Yes. They were negotiated by Treasury, so I don't want to get into their business too much. But as I recall, the longer you wait, the less percentage you can convert over the life of the . . . But you'd better ask the Treasurer that.

MR. NOTLEY: In other words, there would be sliding sort of . . .

MR. GETTY: A declining option.

MR. NOTLEY: But that would be a sliding scale after production has reached a certain point, I assume.

MR. GETTY: Yes, but I think again you'd better ask the Provincial Treasurer that one.

MR. NOTLEY: What would the \$100 million represent? It would be 5 per cent originally when we're looking at 1975. But what would it represent now? Suppose we were to go the route of the 20 per cent option which is now going to cost us \$500 million and the \$200 million conversions. What would be the total possible equity the province could obtain under existing agreements, were it to choose to do so?

MR. GETTY: Assuming it also took the Energy Company and the Energy Company did not, 36 per cent.

MR. NOTLEY: That would be the 10 per cent we already have, the 20 per cent option, which would bring it to 30, and these convertible debentures would only represent 6 per cent of the total?

MR. GETTY: No, they represent each 5 per cent. But you're taking away from some of your 10 per cent on some of these conversions, so they work out to 36 per cent.

MR. NOTLEY: I see.

MR. GETTY: You take from everybody. Everybody reduces.
For the benefit of the committee, Dr. Clem Bowman has just joined me, the chairman of AOSTRA.

MR. CHAIRMAN: Dr. Bowman, do you know the members of the committee? Of course you know Mr. Getty beside you. Mr. Taylor, Mr. Clark, Mr. Planche, Mr. Shaben, Mr. Kroeger, Mr. Diachuk, Mr. Notley, Mr. Horsman, and Mr. Appleby. My name is McCrimmon. We're delighted that you could come to speak with us this afternoon.
Do you want to carry on in this other section, or would you like to go on to the section that Dr. Bowman is responsible for? Mr. Minister, I think it's probably your choice.

MR. GETTY: Mr. Chairman, I think since Dr. Bowman adjusted his schedule to be here, we probably should go ahead with him.

MR. CHAIRMAN: I think it would be the proper thing to do, if the committee agrees. So we'll go into the area of AOSTRA and ask questions with respect to that section of the portfolio.

MR. NOTLEY: Perhaps we could just begin by asking Dr. Bowman, Mr. Chairman -- I just put the question to the minister -- perhaps Dr. Bowman could give us a summary of the projects that are presently being funded under the heritage trust fund.

DR. BOWMAN: Certainly I can try to do that as briefly as possible. We have several kinds of projects. Perhaps the best place to start is with the projects with technology that has advanced to the point that it's ready for testing in the field. What we're doing at present is testing a recovery process in the Peace River deposit, in the Athabasca deposit, and in the Cold Lake deposit, in major field experimental programs, which are the step before going to a commercial plant.

What we've done is to attempt to put together the best technology that the oil companies have been working on for the last decade or two in their labs. We've put these together into programs that we feel are suited for these three deposits. It's a different experiment we're carrying out in each deposit. We feel these are the most advanced technologies the companies have. They were chosen on that basis.

MR. TAYLOR: Could you name those three deposits again?

DR. BOWMAN: Yes. The Peace River deposit: in this deposit we're doing the experiment fifty-fifty with Shell Oil.

MR. NOTLEY: Could you give us the costs while we go over these?

DR. BOWMAN: Certainly. The first phase of the Shell project is a total of \$58 million, of which we're paying half -- \$29 million. That phase should be over in the early part of 1980. Then the second phase, which will mainly be the operational phase as opposed to the construction phase, will be about another \$60 million, of which AOSTRA will be spending half. This is by far our largest commitment to a single project.

MR. NOTLEY: It would not be anticipated at this time that heritage money would be used for the second phase, this operational?

DR. BOWMAN: I don't think I could say that. We've committed funds. In the cash-flow forecast we've shown that has been presented to Treasury, moneys have been allocated for the second stage of the Shell project. That hasn't been committed through formal legal agreements with Shell, but we've allocated this in our cash-flow forecast.

MR. TAYLOR: It would be useless to carry out the first phase and leave it dangling there.

DR. BOWMAN: Yes, absolutely. That's the reason we didn't enter into it until we had funds approved by cabinet for the full two phases.

MR. NOTLEY: What I'm really getting at is is not the question of whether we would follow through -- I assume we would; we've spent \$29.9 million on the first phase of it -- but whether or not the second phase would be funded from the operational budget of the province as opposed to the heritage trust fund. Because it is essentially an operational cost. That's a distinction that I . .

MR. GETTY: It's not Dr. Bowman's responsibility as to where the money comes from, but rather the government's. I guess it would be a judgment of the government that it continue to be in the heritage trust fund.

MR. NOTLEY: I see. Okay.

MR. CLARK: What are we looking at as a price tag on the second phase?

DR. BOWMAN: About the same order as the first: \$60 million.

MR. CLARK: Supposedly half would come from you?

DR. BOWMAN: Yes. I might mention that in these three field projects, of which this is one, the key criterion we were looking at was recovery -- the amount of oil that would be recovered from the deposit. We're looking at this more than economics. We wanted to make sure that we were doing a lot better than anything achieved up to this time, even in the conventional oil industry. We're targeting for something like 50 per cent, at least. This is where the technology barrier is. It's relatively easy to go in and get 5 per cent or 10 per cent of the oil out. But to economically go in and get 40, 50, or 60 per cent is where the big challenge is.

MR. PLANCHE: Did you say that you were looking at 50 per cent as a criterion?

DR. BOWMAN: Yes.

MR. PLANCHE: On the Shell project?

DR. BOWMAN: Yes.

MR. NOTLEY: What is the reserve of that particular deposit in the Peace River area, compared to the McMurray sands?

DR. BOWMAN: It's 75 billion barrels in Peace River. So it's a little more than a tenth as big as the Athabasca deposits.

MR. NOTLEY: The second phase of the program would be how long?

DR. BOWMAN: Approximately three to four years. I'm afraid I'm going a bit on memory here. I don't have all the figures right at my fingertips. But as I recall it's in that order.

The second phase is one complete experiment, or one test. The process involves pressurizing the deposit with steam and then depressurizing it to recover the oil. This will recover a certain percentage of the oil near the base of the tar sand. The next phase, if there's a third phase -- which we, the authority, do not have to enter into if we don't choose to -- will involve

repeating the experiment to get the oil in the upper area by pressurizing and depressurizing again.

MR. NOTLEY: We would be looking at how long before a company like Shell could seriously entertain a major \$2, \$3, or \$4 billion investment -- 10 years?

DR. BOWMAN: Yes. I would think at the end of the second phase, which is '83-84, the company should be in a very good position to know if it has a winner on this and could start laying the groundwork for a commercial plant.

The reason we built the third phase in is that our experience in the past has been that companies have never completed a test. They go in there and go through maybe one-half of the test program they have laid out, then the business climate changes a little bit and they drop out and don't finish it. To us, they've always dropped at the most interesting point. So we have a commitment that if Shell does not want to do phase 3 we can go in there and do it on our own, so we're not sort of stopped at that point. Alternatively, if we feel at the end of phase two we've got enough description of the technology to go out and market it, and the third phase is just to tidy things up a little bit, then we can let Shell go and we don't have to, and we still own all the technology that's come out to that point in time. We've left a number of options in this.

MR. PLANCHE: Does that mean that it's possible that AOSTRA will continue into this thing without a partner in the private sector?

DR. BOWMAN: If we have to. But it would only be as a last resort, if there was some missing technology and the company felt it didn't need this to make its decision for a commercial plant on that particular lease, but we felt we needed to do the third phase and we could do it. Now, we'd have to be forced into it before we'd want to do it on that basis. We're attempting to do all our projects fifty-fifty with the companies.

MR. NOTLEY: There might be some reasonable doubt, though. If Shell has decided after the second phase that they don't want anything to do with it at all, then of course it becomes a little iffy whether or not we should proceed too.

DR. BOWMAN: Absolutely, absolutely. I think the example might be that they feel that they have enough knowledge, that it's very encouraging and they feel they've done enough to commit to a commercial plant, and yet we may feel that to use this technology, for instance in some other deposit, we'd want to complete it. We just left this as an option -- no commitment, but an option. So I guess our approach is that at that point we've spent maybe \$60 million on equipment and we want the right to go in there and use that equipment for free to finish the experiment, if we deem . . .

MR. NOTLEY: So we could conceivably be completing that third phase while Shell is in the process of committing themselves to a major project. We could have that kind of thing.

DR. BOWMAN: It could be that way. I don't think it's likely. I think if we deem it's advisable to go on, it's likely the company will as well.

MR. TAYLOR: Dr. Bowman, under the agreement, after phase two does Shell have the first right of refusal to go into commercial operation, or does some other company have a chance to review the technology and go into it?

DR. BOWMAN: To go into commercial operation would be a prerogative of Shell. They would make that decision on their lease, based upon the technology as they saw it. We wouldn't participate with them in the commercial venture. But there are other properties at Peace River that other companies hold, and we would have the prerogative of licensing the Shell-AOSTRA technology to that other company. We're the owners of it and we're the sole licensing agent in Canada.

MR. APPLEBY: Is this developmental work going ahead on the Shell lease at present?

DR. BOWMAN: Yes. It's a sea of mud right now with all the rain we've had, but we're still struggling. It will be completed towards the end of '79 and ready for operation early in the next year. It's going ahead quite well.

MR. NOTLEY: How many barrels will it produce?

DR. BOWMAN: About 3,500 is my recollection. It's not a large production, in view of the capital investment. It's strictly an experimental scheme.

MR. NOTLEY: How would that compare with Imperial Oil's prototype at Cold Lake?

DR. BOWMAN: Not nearly as well from the standpoint of productivity for an experimental scheme. Imperial is producing around 5,000 barrels a day and their investment is considerably less than that.

MR. NOTLEY: Why would that be?

DR. BOWMAN: Due to a number of reasons: one, the steam boilers Imperial is using are boilers they picked up from industry in a very depressed market, and they got a good buy on them; secondly and perhaps more importantly, the Imperial scheme is just designed -- I shouldn't say "just", because I think this is an advance they've made -- on the basis of 20 per cent recovery of the oil. All they've demonstrated up to this point is about 10 per cent recovery. They hope to move this up to the 15 to 20 per cent range. So it's not designed to recover, to our way of thinking, a satisfactory level of production in the long term. For the first *in situ* operation it appears that it may be appropriate. But for the next generation of technology, we in AOSTRA feel we've got to achieve much higher recovery levels. It's going to require a much larger capital investment to achieve this. But we think the economics will be comparable. You get more oil out, but you spend more money.

MR. APPLEBY: Dr. Bowman, in the Peace River field, as you mentioned a while ago, you said it might produce 10 per cent of what Athabasca's potential is. Right?

DR. BOWMAN: The amount of in-place reserves is about 10 per cent of the Athabasca deposit, yes.

MR. APPLEBY: How does Cold Lake compare to Athabasca?

DR. BOWMAN: It's about the same order as Peace River. Again I can look at the actual figure, and it's . . . I'm sorry, it's 164, about twice what the Peace River is. There's a fourth deposit, the Wabasca deposit, which has about the same order as Peace River. So there are two small ones around this 75 to 80 billion barrels, then Cold Lake about twice this, and the Athabasca about 10 times. That's the distribution of size.

MR. APPLEBY: With the technology that Imperial has at Cold Lake at the present time, 10 per cent rather than 20 per cent, what would this produce eventually if they use this process there on it right now?

DR. BOWMAN: Of course, they're just exploiting one lease and they hope to get 20 per cent of the oil out of their lease.

MR. APPLEBY: They're still hoping for 20.

DR. BOWMAN: Yes, that's what they're targeting for. But there are two separate percentages here: the size of the deposit itself -- the number of barrels in the whole deposit; then the extent of that that an operator will recover from his own lease.

MR. NOTLEY: So what we'd be looking at in the Peace River project would be an objective of 50 per cent in a given lease. Even if we achieved the breakthrough of 50 per cent, you then couldn't jump the next step and say, well, we'll get 37.5 billion barrels out of the Peace River deposits, because there would be, I suppose, varying qualities of lease and recovery, so that you would still have significantly less than 50 per cent recovery.

DR. BOWMAN: Absolutely. How much less that would be I don't know at this point. The more we learn, the more I think we'll be able to handle the poorer grades of tar sands. That's going to come through time, I would expect.

MR. NOTLEY: Why was the Peace River deposit chosen? Is there a particular reason for that, other than that Shell had done some work on their own over a number of years? Is it considered better than Wabasca? Are there certain reasons why it would have been chosen?

DR. BOWMAN: Well, it was originally selected because it has a geological characteristic that may make it easier than the Athabasca deposit. Very simply, it has a zone of high water saturation at the base of the deposit. This means you can inject steam into the deposit into this water zone, and the steam will go in in large commercially sized quantities. In the Athabasca deposit there is no zone which will accept high quantities of steam, and we're having a look at some other approach. So Shell had a process that seemed very suited for a zone which had what is called underlying water, and it was a good fit. It's one that could go commercial if the test project is firmed up and the experiment is successful. It had promise of early commercial success, is the way we looked at it when we were looking at the whole spectrum of applications that came in to us.

MR. SHABEN: Mr. Chairman, just to follow up on the Wabasca Gulf lease. Has Gulf reapplied to AOSTRA, subsequent to their initial application for a shared project?

DR. BOWMAN: Yes, they have. But not for the Wabasca deposit.

MR. SHABEN: For a different deposit?

DR. BOWMAN: Yes.

MR. TAYLOR: What recovery is Great Canadian Oil Sands getting?

DR. BOWMAN: They're getting, in the mining approaches where the tar sand is actually dug and conveyed to an extraction plant, 90-plus per cent of the raw oil. So, *in situ* I can't hold any promise we'll achieve levels like this. But in the conventional oil business they only recover about 33 or 34 per cent of the oil in place. So when I say a target of 50 per cent, that's still a pretty ambitious target.

MR. NOTLEY: What would be your estimate, Dr. Bowman, of the amount of all the oil sands -- the Wabasca, the Peace River, the Athabasca -- that would now be commercially extractable? We're talking about hundreds of billions of barrels. Has there been any significant change since the ERCB did a report several years back on the amount that would be commercially extractable? What would be the realistic limit to Canada's energy reserves now, on the basis of present technology?

DR. BOWMAN: I guess you're asking me a question that I really feel I shouldn't try to answer. It is the Conservation Board that has this responsibility. The figures they have published at this point have all been based on surface mining technology, and I think their figure was something like 26 or 28 billion barrels from the shallow leases. From the deeper area I think they have not shown any recovery as being commercially feasible. It all hinges on how successful we will be on these projects. If we're successful I would think it's not unreasonable that there be 200, 300, or 400 billion barrels of oil from those deposits. Two hundred, certainly. But five years from now we should know with a lot more certainty than we know now.

MR. TAYLOR: What was the second project, Dr. Bowman?

DR. BOWMAN: The second project is the Amoco project in the Athabasca deposit. It's south of Fort McMurray. It's a \$46 million project -- that includes the operational phase -- and we're spending half.

This is quite a different approach. What is being done here is to set the deposit on fire and burn part of the oil underground to provide the heat that's needed to recover the balance.

MR. APPLEBY: At what level would this be going on under the ground -- the burning process?

DR. BOWMAN: How much of the oil underground would be burned?

MR. APPLEBY: How far down? The depth beneath the surface.

DR. BOWMAN: It's around 800 to 900 feet, in that region. There's another question here, but I don't know if I've answered this one properly yet.

MR. NOTLEY: What's your target with Amoco?

DR. BOWMAN: Recovery?

MR. NOTLEY: Yes.

DR. BOWMAN: We're still looking at 50 per cent. The companies have estimated between 40 and 50 per cent. Our own estimates are higher than the company figures. I'd be very disappointed if we don't get 50 per cent.

MR. CLARK: What time line are we looking at, Dr. Bowman?

DR. BOWMAN: The project started up a year ago last August, so it's well along. The initial operational phase will be over in late '79 or very early 1980; we'll have the first indication of success or lack of it. It's significantly ahead of the Shell project. It's a more difficult technology, though -- a much higher risk on it than the Shell project. If it's successful, it will be the kind of technology I think we'll use throughout the Athabasca deposit. But it's a difficult one. Amoco has worked on it for a long period. They've had numerous field projects before that they've carried to a certain stage of completion and then abandoned and gone back in.

MR. CLARK: And \$46 million is the total cost of the project? Phase 1 anyway.

DR. BOWMAN: Yes, phases 1 and 2. Phase 1 in the Amoco project is equivalent to phases 1 and 2 in the Shell project. There still is a second phase beyond, which is similar to the Shell project. The first operational phase of Amoco will get a certain percentage of the oil out; to push it to the 50 per cent level there is one additional phase to come on the end. It's established somewhat similar to the Shell project: we have the option to do it by ourselves if Amoco drops out, or vice versa.

MR. TAYLOR: After the burning you take the oil out in the conventional way?

DR. BOWMAN: Yes, through production wells.

MR. NOTLEY: There's another major project?

DR. BOWMAN: There is another project at the Cold Lake deposit with BP. It's smaller. It's approximately a \$19 million project, of which we're again paying half.

MR. NOTLEY: And it's slated for . . .

DR. BOWMAN: It's just starting up now. It's through the construction phase and in the process of starting up. It's a combination of the Shell and the Amoco projects, picking the best features of each and applying them to the Cold Lake deposit.

MR. CLARK: When will it be finished?

DR. BOWMAN: In 1984.

MR. SHABEN: Dr. Bowman, just to clarify. In the last one on BP you mentioned that it's a combination of the two. Are two separate procedures going on? I

just have difficulty in understanding combining steam and burning. They don't seem to go together.

DR. BOWMAN: We start with steam and we obtain as much oil as possible through a steam approach. This gives early oil and early revenue. Then we follow with the combustion or fire-flood to obtain the high recoveries. The Cold Lake deposit will produce oil quite readily via steam. Of course this is what Imperial is planning to do at Cold Lake. So we're trying to take the advantage of steam to bring an early amount of oil in, then the fire-flood to complete the job.

MR. CLARK: What kind of recovery are you looking at, Dr. Bowman?

DR. BOWMAN: Fifty per cent.

MR. CLARK: To the minister. What kind of recovery, then, is Imperial looking at in the project that's now before the ERCB?

MR. GETTY: I'm not sure I have that figure. Of course they haven't got to present their case before the ERCB yet. But if I just pull a number out of my memory, I think it's around 25 to 30 per cent. Do you know the figure?

DR. BOWMAN: I think the figure they had in their application is 20. Their economics are based on 20 per cent.

MR. TAYLOR: If these experiments are successful, will it partially avoid the situation that resulted in our coal mines for many, many years, where we left half the coal there? We took what was easy to get out and then kept on going. Now the mines are closed and a lot of coal is still under there that's going to be very uneconomical at this time to get out. This will avoid this in the oil business, I would think.

DR. BOWMAN: That's certainly our hope, because we feel that if one doesn't do the job properly in the first pass, it's going to be very difficult to go back in years later.

MR. NOTLEY: Dr. Bowman, I take it that AOSTRA has sort of closed the door on any kind of nuclear approach that was talked about several years ago. As a matter of fact, I think we even had you talking about it at one of our subcommittee meetings not so long ago. That's a dead issue at this stage?

DR. BOWMAN: It is to us, based upon our understanding of the technology: that it's not a suitable technology for the Athabasca or the Cold Lake or the Peace River deposits. This is due to a number of factors, but I think the comment I made at that subcommittee meeting was that there isn't a lot of heat in the size of atomic bomb one could set off in our deposits, due to the fact that they're quite shallow. There isn't very much heat. There's a lot of energy in a short period of time, I think is the comment I made before, but it's dissipated very quickly and you're left with very little heat. This was a point that was missed by most people who looked at this before.

MR. NOTLEY: Dr. Bowman, could you outline for the committee the role of AOSTRA in evaluating the various projects that are presented to you. It's a fairly straightforward one. But what mechanism do you have for monitoring, how big a

staff, what kind of progress reports, who looks at those, how are they evaluated, that kind of thing, and the relationship between AOSTRA and the department and the minister?

DR. BOWMAN: The main vehicle we have for the control of the projects is through a management committee. There is an owners' committee for each project; we have a 50 per cent voice on the committee and the company has a 50 per cent voice. So it's this mechanism. All items that go up for approval on the owners' committee have to be approved by a majority vote. So we have to agree with the company. It means we can block a course of action if we deem it's wrong, and the company can do the same. It just forces us to work things out to a satisfactory solution.

We have a small staff. At present we have five engineers on staff. So we have a member of the AOSTRA board plus a staff man on each of the management or owners' committees. You're aware, I think, that the board of AOSTRA is comprised of six or seven people who are largely non-government people. They make the funding decisions. Then we have the small staff looking after monitoring the projects.

We also have a technical committee on each project. Our approach here is to second people from agencies such as the Alberta Research Council or the universities or consultants we engage to serve on the technical committee to assist the project. We get monthly reports from the company. We're following it as closely as we can with this kind of coverage.

A key aspect here is the fact that we are trying to put ourselves in the position of being able to market and license the technology to third parties. So we're having to acquire it in a form that we can understand and translate to someone else. So this is requiring a fair level of understanding of what goes on.

MR. DIACHUK: Mr. Chairman, just a question to Dr. Bowman. What has been the success of getting sufficient people from agencies such as the Research Council and the universities? Are there sufficient people around and, if not, where were you getting them in some of these research programs like Athabasca and Peace River?

DR. BOWMAN: Frankly, there aren't enough people around. This is the problem in the province. We're exploring a couple of new initiatives to assist us in this area. For example, next year we're going to hire seven summer students from third-year university and put these people on the various projects for training assignments. We have the right to put two of our staff on each of the projects, if we felt this was needed for learning assignments. This was foreseen in setting up the initial agreements. We've also brought a few people into the province.

Mr. Notley, there is one other aspect on this business of staffing or control. We do have a man in the company office who is our tech rep, in addition to the people I referred to. This is a man who is paid for by the project, so we're essentially paying half of his salary. But he is our guy; he is acquiring their technology and getting it back to our office for this licensing function. We've hired people to do this, almost exclusively at this point, on a contract.

MR. NOTLEY: They would be engineers, by and large, would they?

DR. BOWMAN: Yes, the ones we have at this point in time are all engineers.

MR. CLARK: Dr. Bowman, following up on your comment about the shortage of available people. We certainly appreciate that. What kind of initiatives has AOSTRA taken, either by itself or in co-operation with companies, to go to universities? When I look at the time lines we're looking at here, and the potentials from our point of view, whether it's a matter of establishing a chair at the university or funnelling some additional funds to the university, it would seem to me it would be a mighty good investment as far as Alberta is concerned to in fact train these people here. What kind of initiatives are you taking there?

DR. BOWMAN: Well, this has been the other string to our bow. In these field projects I referred to we've taken the most advanced technology the companies have had. But I guess we have recognized they do not have the full answer. So we have quite an ambitious university project. We've established a chair at three of the Alberta universities. These three professors we've appointed are each working on one of the major technological problems associated with the tar sands.

In addition, we've established a series of scholarships and fellowships. What we're seeing is these three professors who have the chairs are drawing around them a nucleus of researchers, somewhat akin to the German approach of many years back. We've also awarded in the order of 25 research projects that university professors are carrying out. These are both inside Alberta and, for a few examples, outside Alberta as well. So we feel a lot of university professors who were doing long-range research on topics that were of marginal interest in Canada are now doing equally long-term research, but on a resource that's vital to the country.

MR. NOTLEY: Could I just get a clarification of these fellowships? Are they related to the major projects we talked about, or other projects?

DR. BOWMAN: These are other projects, but with some connection to them. We're trying to focus the university people on trying to solve what we think are the problems these bigger projects are facing.

MR. CLARK: Could we get a list of the projects that have been approved, Dr. Bowman, and the names of the university people who are involved?

DR. BOWMAN: Yes. In fact, was this not tabled?

MR. GETTY: Yes. I was going to say, because of the flood of information that gets tabled during the Legislature . . . But each desk received this document. In it was a piece of paper with lists of university professors, locations, and the projects and the amount of money spent.

MR. CLARK: From the standpoint of student numbers, Dr. Bowman, where do we sit? What initiatives have we taken there, or is that of no concern to you?

DR. BOWMAN: The number of students who are going in for engineering-type disciplines?

MR. CLARK: Especially in this area.

DR. BOWMAN: Working on this kind of program. I have to break that into undergraduate students and graduate students. Undergraduate students: we have

not taken any initiatives ourselves to increase the number who would be going in for engineering or geology or these kinds of disciplines. I guess we're hoping that the opportunities for industrial work that will be coming about due to these larger projects will provide some encouragement for them to go into this area. In the graduate student area, though, a lot of the graduate students are now working on these 25-odd research projects that we're supporting. I could find out the exact number, but I'm not just sure right now. I would guess there is at least one graduate student working on each of the projects. There will be the principal scientist and then the small staff he'll have. So there'd be at least 25. There might be 30 or 35.

We did an estimate a little while back of the number of people now working on AOSTRA projects, both in the university and industrial area. It's up to 300 or 400. It keeps kind of rippling back, too. If you follow it back far enough, you find that someone is making a piece of equipment that someone is using for some program.

MR. PLANCHE: On that subject, if you're in a working partnership with a given company on a specific project that makes some kind of breakthrough, is AOSTRA free to carry that breakthrough to another project that the partner is in, or is each one competitive, isolated, and secret?

DR. BOWMAN: No, that's a very good question. We struggled with this a long time before we got a mechanism that seemed to work. If we come up with a breakthrough in one of the projects and we want to transfer it to the other project, it's moved under certain business terms. What is done is that we establish a value for the technology that we're moving. The way that's established is that we try to agree with the initial company that helped us generate that technology on what the market value is. If we fail to get agreement, then it goes to arbitration. But we have a mechanism for establishing that this block of technology is worth \$1 million, say, as an example, and we want to use it over in this project. Well, this project will pay \$1 million for that technology.

MR. NOTLEY: To AOSTRA?

DR. BOWMAN: To AOSTRA. Then we will give this company one-half of it. Of course, if we're already in this project over here, it's going to be a bookkeeping change for us to a certain extent. But if it's a company that does not have an AOSTRA contract, it's an arm's-length agreement in that the \$1 million will flow to us and we give half to the first company.

MR. PLANCHE: It's a cash thing, though, not an ongoing royalty. As it's building towards a conclusion the step-by-step progress is paid out in cash? I think I grasped what you're trying to do at the end of the project if it's successful in any kind of proprietary engineering, but in the phase-in step-by-step stuff are you still allowing royalties overriding (inaudible)?

DR. BOWMAN: It could be done on either basis. We would try to have it work out to the equivalent amount, whatever is established as its fair market value.

MR. TAYLOR: If you did that 29 times, both Shell and the government would make all the money back.

MR. NOTLEY: But how would you do that? That's the point. Let's take the Shell case as an example. We're not talking about a small piece of relatively exotic type of research but something that's going to cost us, in the case of Shell, almost \$60 million, and Shell close to \$60 million. How do you arrive at what is a commercial value on something as large as that?

DR. BOWMAN: With difficulty.

MR. NOTLEY: Well, the technology itself may be a very small part of the project. But the entire project is necessary to develop the technology.

DR. BOWMAN: If I can break that into two cases as well. If we had completed, for example, the Shell project, and we had a technology that was well described and very successful, and we wanted to market it or transfer it to another firm working in a different area, what should be the value of this? There is no risk involved. The project is over. They're likely talking about a \$3, \$4, or \$5 billion project. So I would think a price tag on the technology in the order of \$20 or \$30 million would not be inappropriate. For example, in the case of the Syncrude project they license one block of technology -- not the whole plant; just a piece of it -- from the Exxon group, and they paid around \$7 million for it. So in future funds for a technology that sort of opens up a deposit that would not be capable of commercialization, I would think \$20 or \$30 million would be a fair price.

On the other hand, we're also developing a procedure of the licensing of the technology on an ongoing basis where this company over here that has an interest in the Shell process doesn't want to wait until the project is over, and we're attempting to decide on what the price should be. Well, it should be a much lower price, because that company is sharing the risk of the project -- whether it's going to be successful or not. So we're attempting to establish a price on an ongoing basis, and then there will be another price established once the project is over. It's not easy to do, but it . . .

MR. HORSMAN: Could I supplement that, because I wanted to ask the question later on. In the report it says all revenue received from the sale of technologies accrues to the AOSTRA fund. In the statement we have a net figure, I take it, as to the outlay in 1978 of \$29 million. Where is there a system that shows the income that you have received from these various sales of technologies and licences and so on? Do we have those reports supplied to us in another form in the Legislature, or how do we get to see what your income picture is, so to speak?

MR. GETTY: The AOSTRA annual report is filed in the Legislature -- must be filed and is. However, I'm not sure that you are receiving income.

DR. BOWMAN: Well, we have received small amounts. We have sold some data packages. They'll be shown in the report which will be tabled next month. But I expect in reports from here on, the income will be a significant quantity. For instance, this year we sold one package at \$400,000. That will not be in this report because it occurred after the end of the last fiscal year. But these will be shown as a separate item. I don't know if we'll show the company that paid it or not. We haven't struggled with that; I don't know how they'll react to it. But we'll certainly put in the total amount.

MR. TAYLOR: Does that money go back to general revenue or into your funds?

DR. BOWMAN: I don't know if I can answer that question, Mr. Minister, where the money will actually flow back.

MR. GETTY: It will go back to general revenue.

MR. HORSMAN: I take it then that we will be receiving information as to the revenue. Of course we can't expect you to have received too much revenue at this stage, but certainly down the road, as you are receiving revenues from these techniques that you are developing, we will be receiving as legislators statements of that revenue in your annual report, but not necessarily in the report of the Alberta heritage savings trust fund. Is that correct?

MR. GETTY: That's subject to checking with Mr. Leitch, but I think . . .

MR. HORSMAN: It may be worth while following that up as a supplementary in future years that it would be included as part of this report so that we don't see just a net outflow from AOSTRA when in fact there is additional income.

MR. GETTY: I know Dr. Bowman is quite optimistic that the kind of dollars we're talking about are really dollars that are an investment that will all be coming back many times.

MR. HORSMAN: I'm just thinking for future years it might be more understandable as far as I'm concerned.

MR. NOTLEY: Dr. Bowman, in evaluating projects, could you outline for us what weighting -- I guess all we can really ask for is general weighting -- yourself as chairman of the board would put on, for example, the national need to be self-sufficient in energy, the intrinsic interest in research for research's sake, and the question of risk in view of the fact that we're talking about heritage trust fund money here and that some types of research can be fairly exotic and not terribly remunerative. In making a decision, how would you weigh those factors?

DR. BOWMAN: I guess the important criterion in risk is balancing the dollars that have to be committed with the risk. For instance, I think one can justify carrying on quite a large number of exploratory, high-risk projects at a very early stage of development, where you're only spending thousands of dollars on each project with the hope that maybe 5 or 10 per cent will be successful. I think you can afford to have your feelers out on a wide breadth of technology or search over a wide spectrum of technologies. Then as you start to get into the more expensive programs where you're building large pilot plants or you're testing ideas in the field, you have to be more selective. You want to pick a few of them that have the greatest promise of success. I think it is standard in any research activity that you try to get a portfolio of programs along this line.

MR. CHAIRMAN: Would you like to break five minutes for coffee?

NON. MEMBERS: Agreed.

MR. CHAIRMAN: I think we can carry on. Perhaps we should wait for the Minister.

MR. CLARK: I don't think Dr. Bowman will get his foot in any tar sands while the minister is away.

MR. CHAIRMAN: Mr. Horsman, did you complete your questions? You had a supplementary.

MR. HORSMAN: I had another question on a somewhat different topic than the one we were pursuing on the income picture for AQSTRA in the future.

MR. CLARK: Could I just follow up there then, if I might, Mr. Chairman.

MR. CHAIRMAN: Yes, you can finish the one subject, if you'd like, Mr. Clark.

MR. CLARK: Dr. Bowman, I asked you this during the break. What's the possibility of Alberta, and your organization in particular, being able to market the kind of technology whose prospects you rather glowingly talked about here, in the rest of Canada and on a broader front across the world?

DR. BOWMAN: Well, of course, we feel that this will be one of the major benefits in the program if we are able to be in a position to license and market the technology worldwide. We've had a number of discussions, for example, with Venezuela. In fact we have a couple of quotes out to them already on different packages of technology. We've met with the Venezuelans a number of times. They recognize that we're the leaders in this area. There are smaller oil sands and heavy oil deposits in the States. We've had meetings with the Department of Energy people from the States. They've been up to have a look at many of our projects. In addition there's a multitude of smaller developing countries which have heavy oil deposits. They call them heavy oil, but they're very similar to what we call oil sand here. We've offered internationally to carry out a small program of analysis where we'll receive samples from these countries and will go through a number of tests for free, and will advise them on the kinds of technology that we think will work. I hate to use the term "loss leader", but that's probably rather close to it.

It's interesting that this morning I had a call from a group that's arranging a United Nations conference in May of next year. It's one that's to be focussed on the oil sands and heavy oil, and they wondered if we would like to attend. It would be some place in California next spring. I said, well, the only objection I had, you didn't seem to be going to the focal point of the industry; I think you should have it here in Edmonton. They were rather enthused about that. The only reason they didn't think about this before was that they thought we had no hotels that could accommodate a group of 200 people. And I said, well, I thought we could . . .

MR. NOTLEY: I'm sure the Corona and Mayfair could.

AN HON. MEMBER: A little renovation on the Mayfair.

DR. BOWMAN: So I have high hopes.

MR. CLARK: Our office in Los Angeles is not doing its job. Secondly, Dr. Bowman, just following up on that, I think it's pretty well recognized that from the standpoint of energy conservation, the Energy Resources Conservation Board has pretty well been the place where many countries have come to set up their own conservation programs. I take it from

your comments that that's the kind of thing you'd be looking at for AOSTRA; the standpoint not of conservation here, but of technology.

DR. BOWMAN: Yes.

MR. NOTLEY: Could I just ask a question following up from the answer Dr. Bowman gave with respect to meeting the people from elsewhere in the world. Five years ago we had a report tabled in the Legislature called the Levy report that among other things said that there was some sizable risk of the United States moving ahead rapidly with the oil shales and getting a significant lead. Now I understand that they've had rather substantial difficulties with the whole process, and that in fact that is not a very serious proposition today. I wonder if you could, in terms of the discussions we've had with American officials, bring us up to date on just where things stand vis-a-vis our developments here compared to the United States.

DR. BOWMAN: My understanding of the oil shales situation is that they have just about given up on a surface mining approach, and this is analogous to what we're doing in the surface mining area where they dig the oil shales and transport them to a pyrolysis plant where they burn off the oil. I think they've given up on this. The economics look poor. There's a lack of water in the area they require for the processes, and I think it looks pretty bleak.

One area they're still working on, though, is an *in situ* approach where they're going to burn the shale underground; somewhat similar to the concept we're doing with the Amoco project. But this is at a very early stage. I would think they're -- they may not agree with this -- a good part of a decade behind what we're doing in Canada. I don't think it's competitive to anything we're doing here in the tar sands.

MR. NOTLEY: I see. So that the concern of five years ago is something that we can reasonably set aside now in terms of charting our own course. We do have a clear-cut advantage here that would be of competitive significance.

DR. BOWMAN: That would be my interpretation.

MR. CHAIRMAN: Mr. Horsman.

MR. HORSMAN: I just wonder, in discussing the projects in which you are engaged at the present time, whether or not you have any projects under way or under consideration with regard to the Alberta Energy Company deposits which they have discovered, in small measure at any rate as indicated in the report, and certainly we've had information since, in the Suffield Block. Is there anything going with AEC on those oil deposits?

DR. BOWMAN: Yes. They are an applicant to us. Actually the original application is from Westcoast Petroleum, and at present AEC is a partner of Westcoast in the development of the Suffield heavy oil block. They have got through our approval system, we've accepted it as a viable and worth-while experiment to carry out, and we're presently negotiating. They're no easier, though, than the other oil companies are, so we're still in that process. I hope that we'll have a letter of intent signed in the next few weeks, though.

MR. HORSMAN: At this stage perhaps it's premature, but what are the nature and extent of the reserves of this heavy oil that are under review in southern Alberta? Do you have any estimate on that, or is it too early to say?

DR. BOWMAN: I think the estimates that most people are talking about now are in the order of a billion barrels of heavy oil in the southeastern area. But I think we have hopes that it may be as high as five. Almost every place people are drilling in the southeastern part of the province they're finding small pools of this heavy oil. It's material they just disregarded before, and there's a lot of it. But I would put it in this range of 1 billion to 5 billion barrels, which makes it perhaps a little smaller than the Lloydminster area, but about the same size as what Alberta has in the Lloydminster area.

MR. HORSMAN: So it could be a very significant development, then?

DR. BOWMAN: Yes. I think it would be very suitable for smaller oil companies who want to have a modest operation, perhaps with that oil feeding into major up-grading plants, but on a sort of pool basis.

MR. HORSMAN: I'll look forward to next year's report on your negotiations.

MR. CHAIRMAN: Mr. Planche.

MR. PLANCHE: I don't know who best to address this question to, but I'm wondering: during the negotiations when you go into partnership with a producing company, do you specify in any way, or attempt to encourage in any way, the source of the hardware purchasing?

DR. BOWMAN: Yes, we do, but again with difficulty. We have restrictions on where the hardware is to be purchased. It's essentially just what you'd expect, with Alberta to come first, the rest of Canada second, and offshore third. A company has to justify to us -- when they purchase equipment outside Canada they have to come to us, and we have to approve the bid list. By and large we've been successful, I think, except in the area of large specialized equipment -- steam boilers and air compressors are very difficult to get inside Canada. But with the exception of maybe a handful of equipment, they've been pretty good about purchasing inside. We find this takes a lot of policing. They drift back into purchasing practices that they've used in the past. They have established contacts with a U.S. supplier and they tend to drift back into it if we don't really watch it very closely.

MR. PLANCHE: I'm delighted with your answer. I'm wondering whether now if you'd take me just one more step; and that would be, when you say "Alberta first", you're talking about all other things being equal.

DR. BOWMAN: Yes.

MR. PLANCHE: Are you talking also about monitoring on an ongoing basis, or do you spot-monitor, or do you tut-tut, or how do you handle the thing?

DR. BOWMAN: Well, it's done through a variety of procedures, and we probably don't have the final answer on this. But the company gives us its bid list first of all, and, for instance, if there are no Alberta suppliers on the bid list this sort of gets our attention very quickly. Frequently we will ask for

companies to be put on the bid list where we think that they've got a predominance of offshore suppliers. Then when the bids come in, if they're major bids -- I forget what the value is that's specified in the project; I think it's above \$50,000 -- the company has to come to us and seek our approval on it.

We've had some fairly heated discussions in this particular area, and we actually have not had a lot of success in moving companies in some areas, as I mentioned, the steam boilers and what not. There just does not seem to be a workable alternative yet in Canada. We've wondered whether we should start to take some initiatives to fill these deficiencies. We haven't come up with any good ideas yet, but we're still . . .

MR. PLANCHE: Just one more question, then, if I may. Would you expect the private sector to be making representations to AOSTRA to be put on a bid list?

DR. BOWMAN: We haven't had as much of that as I would have expected. We've had maybe three or four examples. But we've worked with the Department of Business Development and Tourism to find out who the suppliers are for different commodities, and we ourselves have suggested companies to go on a bid list. But we have had very little contact ourselves from the companies.

MR. PLANCHE: Would you consider that to be a useful thing to have?

DR. BOWMAN: Well, it certainly wouldn't hurt, and it just improves our store of knowledge of who can do what. I certainly wouldn't discourage it. I'm almost afraid to encourage it in case we're flooded.

MR. PLANCHE: I don't want to put you on the burner here, but you're right, it's hard to break old habits in buying. It's a chicken and egg deal. If we're going into this AOSTRA thing on a long term and you can't buy steam boilers and compressors and one thing and another, but you're going to use them, then you know it's not unthinkable that somebody will begin to build them on the come. But if you sit back and say, well, we don't have them now and therefore we're not going to encourage you to seek out sources here, or receive sources here . . . I'm not so sure I want the government in the thing at all. I'm just trying to get a feel for how best to do it. There are some pretty inventive guys in the smaller shops and so on, you know, component parts and one thing and another, who can get together on consortium bids. I'm not in any way being critical, because I'm not sure I have a response in place of what you're telling me, but it would seem to me that there's quite a future here for the hardware merchant, and if there could be some kind of catalyst or clearing house or some kind of indication of what kind of activity he can expect or what's happened in the past and one thing or another, that could be useful.

DR. BOWMAN: I certainly agree. I think we could do more ourselves in this area than we've done. There is an example where we tried to encourage an eastern company in Canada to bid on a steam boiler and they refused to do it. They were too busy. I just couldn't believe their response. But they weren't even interested in coming down and talking to us about it.

MR. PLANCHE: Well, sometimes it's the customer, too.

MR. GETTY: You think a guy could make a living at it?

MR. PLANCHE: I haven't been able to, but it's possible. It could be the man, too, you know.

MR. GETTY: One of the things that I've really found interesting is that Dr. Bowman has told me that tunnelling for oil sands is now looking -- it once was just brushed aside as probably unrealistic, but for the deeper oil sands it is now really something to get enthusiastic about, which is really something to believe: that they will go down and actually sink tunnels and put the people down there to put the steam in. And the second thing he hasn't mentioned is this research that he's proposing on the carbonate rock. While we're talking maybe 900 billion barrels of oil, the carbonate rock has an additional potential one trillion. If these kinds of things start to reach some breakthroughs, you can see the fantastic potential for Alberta.

MR. PLANCHE: In context, what would that be with Saudi Arabian reserves, Don?

MR. GETTY: Twice.

DR. BOWMAN: The oil sands deposits are approximately twice what the mid-East is . . .

MR. NOTLEY: The entire mid-East.

DR. BOWMAN: The entire mid-East. That's the in-place reserves. And then there's a carbonate reservoir which is to the west of the Athabasca deposit. It's a heavy oil just like the Athabasca oil, but it's in a solid rock, a carbonate rock, as opposed to being interspersed around sand. It has been guessed to be about twice what the mid-East oil is. So we don't recognize how much we've got yet.

MR. NOTLEY: How would that compare with other major deposits such as the oil shales and other types of unconventional deposits in the world?

DR. BOWMAN: There are only three others we know of as large. The oil shales in the States, if you look at the in-place hydrocarbon, it's been estimated up in the 2 trillion to 3 trillion barrel range. So it's enormous. The Venezuela heavy oil deposit: the official estimate is just under a trillion, but in private discussions with a number of their researchers, they've opened up two or three new areas and they've estimated it may be up around 3 trillion to 4 trillion. So, again, in the same league. And we understand there's one in Russia that's very large, in this order too, but we have very limited information on it.

Most of the other heavy oil and the oil sand deposits are a lot smaller, at least an order of magnitude smaller, and they're in countries like Madagascar, Rumania. There's a number of them; I just can't spiel them off here.

MR. CHAIRMAN: Mr. Kroeger.

MR. KROEGER: Dr. Bowman, when you're quoting these figures, are you talking about the estimates on the recoverable?

DR. BOWMAN: No, I'm not; the in-place.

MR. KROEGER: You're talking about what's there, and worry about the recovery later.

DR. BOWMAN: Yes.

MR. CHAIRMAN: Mr. Taylor.

MR. TAYLOR: I'd like to pursue this matter of equipment, as a supplementary to what Mr. Planche was saying. My question deals with conventional drilling equipment. I understand that this is getting more and more difficult to bring in from the States. Many of our drillers now are using pretty antiquated equipment; they need major repairs carried out on it, and there are only two suppliers in the whole province who actually carry out these renovations or repairs. Have you had any experience in this regard, in conventional oil drilling equipment?

DR. BOWMAN: No, we haven't had very much, but I would agree that I think it's a very important area for some innovative research. I would say this from the standpoint that in these *in situ* operations we're going to be drilling thousands of wells, not hundreds of wells, and so even a modest improvement could really help the economics. We feel that we're probably going to take some initiatives ourselves and invite proposals for new modern drilling techniques. We've done this in a couple of other areas where we thought there were improvements that could be made but industry didn't seem to be operating in.

Another example is the water treatment problem. This is what Imperial is facing over at Cold Lake. The treatment of the water that comes up with the oil is a mammoth job, and there's a big economic penalty on treating this water to the form that they can make steam out of it again for reuse. But I think the drilling equipment is the same thing. I think there are some advances that could be made in this area.

MR. TAYLOR: There's a long-time farm machine dealer in Drumheller who has carried out some research on this, and he's just been swamped, just can't keep up with it. And now he wants to expand into a real secondary business from the long-time farm equipment dealerships. They're having difficulty getting the necessary capital for it, but as far as I can understand the industry is most anxious for them to get going. There's a plant available but it's difficult to get capital. They figure they've carried out the research themselves and now what they need is some operating capital to get going.

DR. BOWMAN: We're the kind of agency that's been established to help people out if they've got something that would apply to drilling in the tar sands, and we'd certainly like to hear.

MR. TAYLOR: They're more conventional oil drilling.

DR. BOWMAN: The drilling itself isn't that different, though, from the conventional to the oil sands. It's still drilling holes in the ground. I'd be very interested to hear more about this.

MR. TAYLOR: Thank you very much.

MR. CHAIRMAN: Mr. Shaben.

MR. SHABEN: Mr. Chairman, I would like to direct a question to the minister. After hearing the comments of Dr. Bowman and the sort of exciting long-term prospects, and though there hasn't been a breakthrough hopefully there will be a breakthrough, and it would mean just a tremendous resource for Canada -- one of the things that I wonder about in just watching what's happened over the past few years is that Alberta's conventional production has been dropping steadily, and yet I understand we have substantially greater capacity than what we're producing. In negotiations -- and maybe this is getting into another area -- it would seem to me that we should be producing conventional oil at a greater rate in the interests of the Canadian needs in view of our long-term supplies and our potential supplies. I was wondering what the minister's view of the situation is.

MR. GETTY: Well, the sort of self-sufficiency argument is that you can only deal with known reserves, and the National Energy Board at present feels that known reserves do not include most of the figures we've been talking about. They do accept the oil sands mineable portion that the ERCB includes. But we've been arguing with the federal government that we should be able to put more oil into Montreal. It's connected, and there's a pipeline that's running at half capacity, 250,000 barrels. The federal government's uneasy. They argue, well, let's not use up our reserves faster than we need to; let's take some from across the sea. That has some validity, but only some, because obviously it's got the transfer of payments problem, it's got the shut-in capacity problem, and the management of surplus with activity. I think in the coming year the oil going into Montreal will increase by about 100,000 to 150,000 barrels a day, which will mean more Alberta oil going to eastern Canada. However, there's no question that without getting more oil sands, mining plants, or breakthroughs here or *in situ*, the Alberta conventional oil productive capacity would not in 1981 or '82 meet Canadian needs.

MR. CLARK: The 150,000, Mr. Minister, you talk about getting into the Montreal market this year: that would take about what, about a third of our shut-in capacity now?

MR. GETTY: Yes, we have about 400,000 to 500,000 barrels a day shut-in capacity.

MR. CLARK: And we're producing about 1.2 now, something like that?

MR. GETTY: No, we're just up and down, getting to the million and under.

MR. CLARK: So we have a capacity of about 1.4 million or 1.5 million.

MR. GETTY: Right.

MR. CHAIRMAN: Any further questions to either Dr. Bowman or the minister?

MR. CLARK: Mr. Minister, would you check with the Energy Company just to see that they haven't got involved in any other areas in addition to the areas which you mentioned to us today? I'd hate for that to happen (inaudible).

MR. GETTY: Yes.

MR. CLARK: That was Suffield . . .

MR. GETTY: Yes. I'll have the benefit, I imagine, of the transcript of the ones you mentioned.

MR. CHAIRMAN: Yes. The Hansard transcript will be available, Mr. Minister. Thank you very much, Dr. Bowman, for coming on such quick and short notice, and your comprehensive overview of the situation in Alberta. We appreciate it very much. You have a wiser committee before you than before you came, I hope. Thank you, Mr. Minister; if you would provide the information that's requested and you agreed to, if you will send it to my office we'll see that it's distributed.

MR. GETTY: Thank you, Mr. Chairman. I'll look forward to the recommendations from the committee, while I may not have a chance to do anything about them.

MR. CHAIRMAN: Do you wish to go back to the tabled motion now, or do you wish to discuss it tomorrow morning?

MR. CLARK: Let's discuss it now.

MR. HORSMAN: Now is as good a time as any.

MR. CHAIRMAN: All right. We have the motion with respect to the recommendation of the trip by the committee to Airdrie by Mr. Clark, and tabled by Mr. Horsman until this meeting. What is the wish of the committee, or what do we have to discuss?

MR. SHABEN: Mr. Chairman, first I'd like to apologize, because I wasn't here last Tuesday when the motion was raised. In the minutes of course it was somewhat sketchy, and I'd like to get a better handle on the reason for the proposal, in view particularly of the response we received from Mr. Chambers, the Minister of Housing and Public Works, on the project. I'd appreciate it if the mover of the motion -- I think it was Mr. Clark -- would outline to the committee the reasons for making the visit, if he would, please.

MR. CLARK: Mr. Chairman, I'd be pleased to. I asked Mr. Chambers, the minister, with regard to the mobile-home subdivision project in Airdrie, how successful it had been. He indicated he thought it had been quite successful. I think you'll find that in the minutes, and also in the transcript. And then I asked the minister if he would have any objection to us going down to have a look at the project, and he indicated -- I think the transcript will show this -- that no, he didn't have.

So I moved the proposition, Mr. Shaben, primarily for three reasons. First of all, phase one of the Airdrie mobile-home subdivision is getting close to being finished. I think it's fair to assume that in addition to phase two going on there well may be other projects like this being funded out of the heritage savings trust fund in the future. Therefore it seemed reasonable to me that the members of the committee might very well spend, I suggested, next Monday morning in Airdrie, meeting with some of the residents, in addition to that also the town council who have worked on the project, and then return to Edmonton in the afternoon to get on with the job of making recommendations with regard to the overall scope of the committee's work. It's really a matter of going and looking on the spot at this Airdrie project, which we've now got a substantive amount of money into. I think, to be quite candid, there have been some problems there. We'd have a chance to look at those and

to make some, I would hope, pretty concrete recommendations to the government with regard to phase two and other similar mobile-home subdivisions in other areas across the problem.

So that's basically the background, Mr. Shaben, for the proposition I put forward.

MR. SHABEN: So, Mr. Chairman, Mr. Clark, I understand that the basic reason is just to go down and look at it because they're nearing completion of phase one. And the second portion is that there have been some difficulties. Now is the nature of the difficulties, something that the committee should be aware of in advance or something that the member could enlighten us on?

MR. CLARK: No, really, I'm in no position to say, you know, I'll give you a list of half a dozen problems that they've had. In fact it's interesting, the minister was down there last Friday, following the discussion of the committee. He was down to Airdrie last Friday, and it may well be that we would want to take him along with us, down to have a look at the project.

MR. SHABEN: Mr. Chairman, I understand, just from checking, that of course we're all aware it's been raining in the past month, so that's caused a fair number of problems with construction delay; and also I understand there's been a work stoppage as a result of some labor difficulties. I was wondering whether the concern was related to the timetable or the actual expenditure of funds, or was it related to some problem with method of expenditure of funds, or was it merely to look at a mobile-home park?

MR. CLARK: I think it would be very helpful to the hon. member and other members if he had a chance to visit with some of the people who have now lived in the mobile-home park since last fall and perhaps had the opportunity to hear some of their views as to some of the problems that they've had, Mr. Shaben, so we wouldn't have those kinds of problems with regard to phase two of this particular project and other projects that the province may well fund out of the heritage savings trust fund in the future.

MR. SHABEN: I understand now, Mr. Chairman, that the purpose is to visit with the residents rather than to view the project.

MR. CLARK: And also to meet with the town council there, too.

MR. CHAIRMAN: Mr. Taylor.

MR. TAYLOR: There are two points that I'd like to make. I saw part of the TV broadcast on Airdrie. I think it was Calgary CBC. It quoted some of the people there as being very concerned about a number of things. I believe where there are difficulties like that it would be advantageous for us to go and show the people there that the government and the committee are concerned, and see first hand if something can be done. I think just to shrug our shoulders and say it will be looked after is hardly sufficient when we are set up to look after the funds of this committee. I think it would be very advantageous to spend whatever time is necessary, whether half a day is sufficient, to go over the project, even if we go in gumboots. If the people have to walk through this all day and all year round or all summer, we can surely walk through it for one day. I think it gives us a better appreciation

of some of the difficulties the minister is running into with regard to this particular project.

I'm not so sure that half a day is going to be sufficient, though, and if we're going down I would much rather provide the day and see everything we want to see while we're there and everybody we want to talk to. I've just come from mainstreeting in that area, which is not part of my constituency, but might be someday. I say "might be": I'm not taking it for granted. A number of people have spoken to me about not having been consulted about certain things, and these are pretty stable people. I think they would welcome this type of trip, and I think we could gain a lot ourselves.

Secondly, the reason I suggest that we not confine it to one half-day is that when we get into a meeting with the town council and with other people, an hour and a half soon slips by so fast, and I'd hate to have a deadline on discussion with people like that. It leaves a bad taste. Better not to go than if you're going to half hear them and then walk out. I think we should provide whatever time's necessary during Monday.

My third reason for suggesting that we don't try to rush back is that I would wonder if we couldn't continue the meeting in Calgary, as some of us are down there already. I will be down there on Sunday, and it's very simple to stay rather than come back here and then go down there again. The Calgary members are in there, quite a few members are in the south end. It would give them a break for once, and maybe we could have a two-day meeting in Airdrie and Calgary.

MR. CHAIRMAN: Mr. Notley.

MR. NOTLEY: Mr. Chairman, I certainly think first of all that Mr. Taylor's suggestion of a day-long meeting, if need be, is a wise one, because it could be that it will only take half a day, but if it takes more than that I think we have to have the latitude to fully meet with the council and the local people who have concerns.

Quite frankly, I don't know very much about it other than what I've read in the paper and seen on television, and so I'm not in any position to know whether the thing has gone seriously awry or not, except there does seem to be some public concern about it.

It strikes me that there is merit, however, in our committee's doing this, for the simple reason that we are a watchdog committee. We considered last year the feasibility of whether or not we would go and view the Syncrude site. I think there is merit in from time to time having on-site visits if we're going to fulfil our watchdog job. Not only should we look at the successes, but I think we have to quite frankly look at some of the problems that exist. And if there are problems down there -- I don't know whether there are or not -- but if there are problems and people are concerned about it, it does seem to me that due to the fact it's funded under the heritage fund we should go down. We may or may not agree with the concerns that are expressed, but I think we have an obligation to the people to at least let them have an opportunity to make representation to the committee. Coming from the Peace River country, the thought of gumboots is not intimidating; so therefore I don't mind slogging it out, and I personally think we should go.

MR. CHAIRMAN: Mr. Horsman.

MR. HORSMAN: Last week when this matter was raised I made the tabling motion because I thought it was useful to obtain the background material which the

minister has been good enough to make available to us. I wonder if we could also include in our meeting the leaders of the union which precipitated the 230-day strike which surprised me considerably.

MR. CLARK: We could even include the minister who let it go on that long.

MR. HORSMAN: So perhaps we might look at that as well. But it seems to me that if we're going to go into Airdrie, we can't go in there in an unstructured type of meeting and just sort of wander around, if you will. I think that the meeting, if we're going to undertake it, should be organized under the auspices of some official body such as the town council or the minister through Alberta Housing Corporation as such, where we would hear people's points of view put forward rather than just, as I say, floating around the area in our gumboots, or whatever. So I think that we would have to ensure that there is some form to our visit if we're going to go, and I think that suggestions on that form would be useful at this stage before we break for today. So perhaps those of you who are more familiar with the operation there might have some suggestions as to just how the meeting should be conducted.

MR. CHAIRMAN: Mr. Clark.

MR. CLARK: Mr. Chairman, it seems to me that the logical place to start there -- and I agree with the point, maybe we could spend more than half a day -- is with the mayor and the town council. They're the locally elected officials. It seems to me we could also ask them to arrange for a group of people from the mobile-home area to meet with us -- they're the people who live with the situation. So I hope the town council would take that initiative. I suspect they would. So that would be a reasonable way of going about it.

MR. CHAIRMAN: Unless I'm mistaken, I think what Mr. Horsman meant is, who is going to run the show. In other words, is it going to be under the minister's auspices, and then we can set up the program. He can invite the town council and have them set up the thing, so the committee knows where it's at as a committee, rather than . . .

MR. CLARK: Mr. Chairman, obviously I see this committee running the show, and you as chairman getting hold of the mayor of Airdrie and saying, look, the committee has passed a motion -- I hope -- that we would like to come to . . .

MR. CHAIRMAN: This is a point of discussion.

MR. CLARK: Okay. Next Monday we'd like to meet with you and the town council; would it would be possible also for you to arrange for us to meet with a group of people from the park, and we'd like to tour the park, and would be arriving at whatever time. The committee is going down and doing it; we're not waiting for the minister. We're the committee that's going to make the recommendations.

MR. TAYLOR: I think Alberta Housing people should be there too.

MR. NOTLEY: It seems to me that the proper approach is that the chairman, representing the committee, should ask the council to obviously organize a meeting of the council and invite the local people. Then we invite Alberta

Housing to be there -- I think Mr. Taylor is right -- but they are there to a meeting of the committee. We're not going through the Department of Housing and Public Works. We're a committee on our own, a committee of the legislature, and they are invited to come in the same way that the local people are and the town council is. I think, Mr. Chairman, that you are sort of the go-between here, of we can put you in that position. But I think in terms of maintaining the legislative perspective we have to do that.

MR. CHAIRMAN: Any further discussion? Are you ready for the question?

MR. APPLEBY: Before we have the question, Mr. Chairman, are we voting to make this excursion on the basis of the discussion that we've had here, that you would be making the arrangements and so on?

MR. CHAIRMAN: Well, if that's the procedure that the committee so desires. Now I imagine the point in question is: are we going or are we not going?

MR. CLARK: After we decide that, then we can decide the other.

MR. CHAIRMAN: If we are going, then we will make the arrangements. If we are not going, there's no object in making any arrangements.

MR. APPLEBY: I just wondered how these arrangements were planned to be made, because . . . I think we're having a general discussion, as the chairman has said, about all these things and (inaudible).

MR. TAYLOR: I agree. I think if we're going the chairman of our committee should be in charge of the whole thing, and he'll chair the meetings down there.

MR. CHAIRMAN: Mr. Shaben.

MR. SHABEN: Mr. Chairman, in that regard I would suggest that the committee leave you a little flexibility. It may be Monday and it may be Tuesday, that we don't pin you to . . .

MR. CHAIRMAN: It would suit me better on Tuesday, as chairman, quite frankly. I have some reasons why it would be more convenient for me to be there on the Tuesday. So if that's agreeable to the committee, if it makes no difference to the committee . . .

Mr. Kroeger.

MR. KROEGER: Mr. Chairman, you have the Premier at 11 on Tuesday.

MR. CHAIRMAN: That's tomorrow. You're one week out.
Mr. Horsman.

MR. HORSMAN: On a point of order, so that we know what we're talking about, the notion Mr. Clark made was that we take the morning of October 2, 1978, to stop at the Airdrie mobile-home area that the AMHC has developed and spend some time with the residents there and meet with AMHC representatives and members of the town council and then return to Edmonton for the afternoon session. So that was really very specific in its intent as to the morning of

October 2. Perhaps it would be better to withdraw that and then move a motion to accommodate the Chairman's Tuesday request.

MR. CLARK: I'd be very pleased to withdraw the motion, Mr. Chairman, and move that the committee spend Tuesday in Airdrie, and that the chairman be empowered to make the necessary arrangements so the committee meets with people who live in the park, the town council, and other people the chairman feels (inaudible) to meet with.

MR. CHAIRMAN: Is that agreeable to everybody? Is there any discussion on that? Are you agreed?

HON. MEMBERS: Agreed.

MR. CHAIRMAN: Fine. Then we'll consider it on the Tuesday. I think we should vote: are we going or not going. That has to be a motion that we'd have to make a decision.

MR. CLARK: Didn't we vote on that just now?

MR. CHAIRMAN: I think it was worded badly, quite frankly. So are you agreed?

MR. TAYLOR: I move we go.

MR. CHAIRMAN: Moved by Mr. Taylor that we go.

MR. NOTLEY: Second the motion.

MR. CHAIRMAN: Seconded by Mr. Notley. Are you agreed?

HON. MEMBERS: Agreed.

MR. CHAIRMAN: I will set it up probably about 10 or 11 in the morning on Tuesday.

MR. NOTLEY: Mr. Chairman, I wonder if there is a possibility that we could get it reasonably early, like 10 as opposed to 11, or even 9, because the only way I can get back, and I've got to get back to my constituency that night, is to catch a flight at 3 o'clock. So if it were possible for us in the north to have it at 9 in the morning, that would be a bit more convenient.

MR. CHAIRMAN: It's just the logistics of getting there. We may have to . . . at the usual time of 10, probably. I don't know. We'll notify you, anyway. There will still be the meeting on Monday morning at 10 o'clock here. Tomorrow morning is the meeting at 10:30. Any further points to be brought up at this meeting?

MR. PLANCHE: You don't want to put "weather permitting" on the end of that Airdrie thing, do you?

MR. CLARK: People got to live there, Hugh, weather permitting.

MR. PLANCHE: They don't live outdoors there, Bob.

MR. CLARK: But they do have houses there. You should see them.

MR. CHAIRMAN: If there is no further discussion, the meeting is adjourned until tomorrow morning at 10:30.

The meeting was adjourned at 3:40 p.m.