MICROFILM DIVIDER

OMB/RECORDS MANAGEMENT DIVISION
SFN 2053 (2/85) 5M

ROLL NUMBER

DESCRIPTION

2170

2005 SENATE FINANCE AND TAXATION

SB 2170

2005 SENATE STANDING COMMITTEE MINUTES

BILL/RESOLUTION NO. **SB 2170**

Senate Finance and Taxation Committee

☐ Conference Committee

Hearing Date **February 2, 2005**

Tape Number	Side A	Side B	Meter #
# 1	X		0.5 - 28.5
#2	X		22.5 - 26.4
Committee Clerk Signature	Sharon Lenfesty		

Minutes:

SEN. WARDNER: prime sponsor appeared in support of the bill and to explain the bill stating this deals with tertiary oil recovery and dropping the sales tax on CO2 gas.

SEN. O'CONNELL appeared as cosponsor in support stating this creates jobs and the state isn't going to lose any money on this one at all. It's going to enhance our income to the general fund and feels its a win win situation all the way around. I think its really sad that we leave 2/3 of the oil in the ground when we have the technology now days to bring another 1/3 or better out than not leave it there.

REP. FROSETH: appeared as cosponsor in support stating this would extend the life of those oil fields possibly 10 to 15 years and be able to extract a great deal more oil and therefore making it economically feasible to produce, make another 15% of the recovery oil from those fields. This process would be extremely beneficial through Western North Dakota and the economy in Western North Dakota.

RON NESS: President of the ND Petroleum Council appeared in support with written testimony.

SEN. WARDNER: We need to point out that they can plan out what the oil would be from primary recovery, so we are only talking about the incrementals, the oil that is produced because of the secondary or tertiary recovery.

SEN. URLACHER: When those wells get down to a certain point and aren't producing, have you totally lost it or can you come back into those wells and start them up again with CO2?

LYNN HELMES answered: Director of the ND Industrial Commission Oil & Gas Division, the Industrial Commission as a whole has not taken a position on this bill so I will appear in a neutral position and presented 3 handouts. The potential target here is enormous, 262 million barrels of oil potential from carbon dioxide enhanced oil recovery. To answer Sen. Urlacher's question: we have rules in place to allow industry to temporarily abandon wells and units. They have to go in and isolate the producing formation from the casing and mechanically test (pressure test) those wells every five years to make sure there are no leaks. If they leak for some reason, we make them plug the wells but if there are no leaks, they can renew that one year at a time. They have to have some plan, they have to justify to the oil and gas division that we are indeed planning tertiary recovery at some point out in the future. But we do have a program in place that will allow them to preserve those well borers and make use of them under tertiary recovery.

SEN. COOK: what does MMTCEC stand for?

ANSWER: It does stand for million metric ton equivalent.

SEN. WARDNER: do we have trunks going off of that pipeline that goes up to Canada, so for us to build the infrastructure would be just an extension of that out there and attached to the different areas that we may do tertiary recovery?

ANSWER; there are currently no trunk lines off of that pipeline but there are valves all along that line as it runs up into the Canadian border.

SEN. TOLLEFSON: is $40 realistic, so you think today or low or high?

ANSWER: what we are anticipating happening to oil prices is that some time this year expecting them to drop into the mid 30's and then over the biennium to drop to $30 a barrel. OPEC is losing money selling to Europe.

SEN. EVERY: Is that CO 2 leaks and if it is, how do you cap them or plug them?

ANSWER: fill the well boar with water, fresh water and pressure it up with fresh water, so if anything leaks its actually treated fresh water.

SEN. COOK: what other states in the United States are into tertiary recovery? Is there a lot of it going on elsewhere? Or do we have a good source of CO 2 that enables us to do it here?

ANSWER; there are several other states that are deep into tertiary recovery, but the one that is doing CO2 the most is Texas. We're utilizing a lot of things that they learned in that process. It's one more tool to edge us closer to getting more barrels.

JOHN HARJU: Assoc. Dire. For Research a the University of North Dakota's Energy & Environmental Research appeared in support with written testimony and handouts stating as CO2 markets mature, ND industries may also benefit by selling CO2 credits on the open market. I believe that EOR represents a very significant opportunity for ND's future.

DALE NIEZWAAG: of Basin Electric appeared in support with written testimony stating this bill gives an incentive for ND oil producers to use carbon dioxide for enhanced oil recovery. The infrastructure development for using carbon dioxide is expensive.

SEN. URLACHER: Will the Canadian usage, I imagine that's contracted over a long period of time?

ANSWER: we have a 20 year contract

SEN. URLACHER: will there be sufficient capacity to satisfy our needs and their needs?

ANSWER; the capacity we've got is outlined in testimony is 165 million cubic feet. We are currently have capacity for 120, so we've got about 45 __ cubic feet available for sale right now, our potential is there.

NO OPPOSITION.

SEN. COOK: help with converting cubic feet to tons

ANSWER: 100 million a day we are selling right now, is approximately is 5,000 tons per day of CO2.

Closed the hearing.

AFTERNOON COMMITTEE WORK

SEN. EVERY: I move the amendments, seconded by Sen. Wardner

SEN. WARDNER: what is does is eliminates the true existing tertiary place which then eliminates the fiscal note. And it could only be from this time forward.

SEN. TOLLEFSON: please explain again about no fiscal note.

SEN. WARDNER: we didn't think there was a fiscal note and then there was 2 small tertiary ____ out there, one by Stanley and not sure where the other one is, but its up in that area. The oil

and gas people within the tax dept. Knew about those, so that's why there was a fiscal note then. So what were doing is, this legislation won't affect that they didn't even plan on to begin with. By taking them off the table, the fiscal note will be basically zero. So that's what this does, it only talks about moving forward from this point and that's why its June 30, 2005.

VOICE VOTE: 5-0-1 Amendments pass.

SEN. WARDNER: made a motion for **DO PASS AS AMENDED**, seconded by Sen. Every.

ROLL CALL VOTE: 5-0-1 Sen. Cook missing, but it was noted that the vote will be left open for him to vote if he wishes. Sen. Wardner will carry the bill.

Sen. Cook voted - Vote is 6-0-1

FISCAL NOTE

Requested by Legislative Council
03/03/2005

Amendment to: Engrossed SB 2170

1A. **State fiscal effect:** *Identify the state fiscal effect and the fiscal effect on agency appropriations compared to funding levels and appropriations anticipated under current law.*

	2003-2005 Biennium		2005-2007 Biennium		2007-2009 Biennium	
	General Fund	Other Funds	General Fund	Other Funds	General Fund	Other Funds
Revenues						
Expenditures						
Appropriations						

1B. **County, city, and school district fiscal effect:** *Identify the fiscal effect on the appropriate political subdivision.*

2003-2005 Biennium			2005-2007 Biennium			2007-2009 Biennium		
Counties	Cities	School Districts	Counties	Cities	School Districts	Counties	Cities	School Districts

2. **Narrative:** *Identify the aspects of the measure which cause fiscal impact and include any comments relevant to your analysis.*

Engrossed SB 2170 with house amendments grants a sales tax exemption for carbon dioxide used for enhanced recovery.

3. **State fiscal effect detail:** *For information shown under state fiscal effect in 1A, please:*
   A. **Revenues:** *Explain the revenue amounts. Provide detail, when appropriate, for each revenue type and fund affected and any amounts included in the executive budget.*

Sections 3 and 4 of Engrossed SB 2170 with house amendments provide a sales tax exemption for carbon dioxide used in enhanced oil recovery. Currently CO2 is not used in enhanced oil recovery. The fiscal impact of this provision would depend on if a CO2 project is undertaken in the biennium, the cost of the CO2 and the amount used in the project, all of which are unknown.

Sections 1 and 2 have no fiscal impact.

   B. **Expenditures:** *Explain the expenditure amounts. Provide detail, when appropriate, for each agency, line item, and fund affected and the number of FTE positions affected.*

   C. **Appropriations:** *Explain the appropriation amounts. Provide detail, when appropriate, of the effect on the biennial appropriation for each agency and fund affected and any amounts included in the executive budget. Indicate the relationship between the amounts shown for expenditures and appropriations.*

Name:	Kathryn L. Strombeck	**Agency:**	Office of Tax Commissioner
Phone Number:	328-3402	**Date Prepared:**	03/04/2005

FISCAL NOTE

Requested by Legislative Council
02/08/2005

Amendment to: SB 2170

1A. **State fiscal effect:** *Identify the state fiscal effect and the fiscal effect on agency appropriations compared to funding levels and appropriations anticipated under current law.*

	2003-2005 Biennium		2005-2007 Biennium		2007-2009 Biennium	
	General Fund	Other Funds	General Fund	Other Funds	General Fund	Other Funds
Revenues						
Expenditures						
Appropriations						

1B. **County, city, and school district fiscal effect:** *Identify the fiscal effect on the appropriate political subdivision.*

2003-2005 Biennium			2005-2007 Biennium			2007-2009 Biennium		
Counties	Cities	School Districts	Counties	Cities	School Districts	Counties	Cities	School Districts

2. **Narrative:** *Identify the aspects of the measure which cause fiscal impact and include any comments relevant to your analysis.*

Engrossed SB 2170 grants a sales tax exemption for carbon dioxide used for enhanced recovery. The bill also exempts from the oil extraction tax the incremental production from a new tertiary recovery project.

3. **State fiscal effect detail:** *For information shown under state fiscal effect in 1A, please:*
   A. **Revenues:** *Explain the revenue amounts. Provide detail, when appropriate, for each revenue type and fund affected and any amounts included in the executive budget.*

Sections 1 and 2 of Engrossed SB 2170 provide a sales tax exemption for carbon dioxide used in enhanced oil recovery. Currently CO2 is not used in enhanced oil recovery. The fiscal impact of this provision would depend on if a CO2 project is undertaken in the biennium, the cost of the CO2 and the amount used in the project, all of which are unknown.

Section 3 grants a permanent exemption from the oil extraction tax for incremental production from a tertiary recovery project certified after June 30, 2005. Because current law grants a ten-year exemption, the fiscal impact of this provision will affect the 2015-2017 biennium and beyond.

   B. **Expenditures:** *Explain the expenditure amounts. Provide detail, when appropriate, for each agency, line item, and fund affected and the number of FTE positions affected.*

   C. **Appropriations:** *Explain the appropriation amounts. Provide detail, when appropriate, of the effect on the biennial appropriation for each agency and fund affected and any amounts included in the executive budget. Indicate the relationship between the amounts shown for expenditures and appropriations.*

Name:	Kathryn L. Strombeck	**Agency:**	Office of Tax Commissioner
Phone Number:	328-3402	**Date Prepared:**	02/09/2005

FISCAL NOTE

Requested by Legislative Council
01/12/2005

Bill/Resolution No.: SB 2170

1A. **State fiscal effect:** *Identify the state fiscal effect and the fiscal effect on agency appropriations compared to funding levels and appropriations anticipated under current law.*

	2003-2005 Biennium		2005-2007 Biennium		2007-2009 Biennium	
	General Fund	Other Funds	General Fund	Other Funds	General Fund	Other Funds
Revenues			($610,000)	($406,000)		
Expenditures						
Appropriations						

1B. **County, city, and school district fiscal effect:** *Identify the fiscal effect on the appropriate political subdivision.*

2003-2005 Biennium			2005-2007 Biennium			2007-2009 Biennium		
Counties	Cities	School Districts	Counties	Cities	School Districts	Counties	Cities	School Districts

2. **Narrative:** *Identify the aspects of the measure which cause fiscal impact and include any comments relevant to your analysis.*

SB 2170 grants a sales tax exemption for carbon dioxide used for enhanced recovery. The bill also exempts from the oil extraction tax the incremental production from a tertiary recovery project.

3. **State fiscal effect detail:** *For information shown under state fiscal effect in 1A, please:*
   A. **Revenues:** *Explain the revenue amounts. Provide detail, when appropriate, for each revenue type and fund affected and any amounts included in the executive budget.*

Sections 1 and 2 of SB 2170 provide a sales tax exemption for carbon dioxide used in enhanced oil recovery. Currently CO2 is not used in enhanced oil recovery. The fiscal impact of this provision would depend on if a CO2 project is undertaken in the biennium, the cost of the CO2 and the amount used in the project, all of which are unknown.

Section 3 grants a permanent exemption from the oil extraction tax for incremental production from a tertiary recovery project. It is estimated that Section 3 of SB 2170, if enacted, will result in a reduction in oil extraction tax revenue totaling $1,016,000 for the 2005-07 biennium.

   B. **Expenditures:** *Explain the expenditure amounts. Provide detail, when appropriate, for each agency, line item, and fund affected and the number of FTE positions affected.*

   C. **Appropriations:** *Explain the appropriation amounts. Provide detail, when appropriate, of the effect on the biennial appropriation for each agency and fund affected and any amounts included in the executive budget. Indicate the relationship between the amounts shown for expenditures and appropriations.*

Name:	Kathryn L. Strombeck	**Agency:**	Office of Tax Commissioner

Phone Number:	328-3402	Date Prepared:	02/01/2005

50282.0101
Title.

Prepared by the Legislative Council staff for
Senator Wardner
February 2, 2005

PROPOSED AMENDMENTS TO SENATE BILL NO. 2170

Page 1, line 20, after "1991" insert ", and before July 1, 2005" and remove the overstrike over "for a"

Page 1, line 21, remove the overstrike over "period of ten years from the date the incremental production begins" and after the period insert "The incremental production from a tertiary recovery project that has been certified as a qualified project by the industrial commission subsequent to June 30, 2005, is exempt from any taxes imposed under this chapter."

Renumber accordingly

Date: 2.2.05
Roll Call Vote #: 1

2005 SENATE STANDING COMMITTEE ROLL CALL VOTES
BILL/RESOLUTION NO. *SB 2170*

Senate **Finance and Taxation** Committee

☐ Check here for Conference Committee

Legislative Council Amendment Number 50282.0101

Action Taken Adopt Amendment

Motion Made By Every Seconded By Wardner

Senators	Yes	No	Senators	Yes	No
Sen. Urlacher	✓		Sen. Bercier	✓	
Sen. Wardner	✓		Sen. Every	✓	
Sen. Cook					
Sen. Tollefson	✓				
Voice Vote					

Total (Yes) 5 No 0

Absent 1

Floor Assignment

If the vote is on an amendment, briefly indicate intent:

Date: 2-2-05
Roll Call Vote #: 2

2005 SENATE STANDING COMMITTEE ROLL CALL VOTES
BILL/RESOLUTION NO. *SB* 2170

Senate **Finance and Taxation** Committee

☐ Check here for Conference Committee

Legislative Council Amendment Number

Action Taken Do Pass as Amended

Motion Made By Wardner Seconded By Every

Senators	Yes	No	Senators	Yes	No
Sen. Urlacher	✓		Sen. Bercier	✓	
Sen. Wardner	✓		Sen. Every	✓	
Sen. Cook	✓				
Sen. Tollefson	✓				

Total (Yes) 6 No 0

Absent 0

Floor Assignment Wardner

If the vote is on an amendment, briefly indicate intent:

REPORT OF STANDING COMMITTEE

SB 2170: Finance and Taxation Committee (Sen. Urlacher, Chairman) recommends **AMENDMENTS AS FOLLOWS** and when so amended, recommends **DO PASS** (6 YEAS, 0 NAYS, 0 ABSENT AND NOT VOTING). SB 2170 was placed on the Sixth order on the calendar.

Page 1, line 20, after "1991" insert ", and before July 1, 2005" and remove the overstrike over "~~for a~~"

Page 1, line 21, remove the overstrike over "~~period of ten years from the date the incremental production begins~~" and after the period insert "The incremental production from a tertiary recovery project that has been certified as a qualified project by the industrial commission subsequent to June 30, 2005, is exempt from any taxes imposed under this chapter."

Renumber accordingly

2005 HOUSE FINANCE AND TAXATION

SB 2170

2005 HOUSE STANDING COMMITTEE MINUTES

BILL/RESOLUTION NO. **SB 2170**

House Finance and Taxation Committee

❑ Conference Committee

Hearing Date **February 23, 2005**

Tape Number	Side A	Side B	Meter #
1		**x**	**36.9**
Committee Clerk Signature	Janice Stein		

Minutes:

REP. WES BELTER, CHAIRMAN Called the committee hearing to order.

SEN. RICH WARDNER, DIST. 27, DICKINSON Introduced the bill. See attached written information relating to the bill, giving an example of primary recovery, secondary recovery and tertiary recovery of oil and gas.

REP. BELTER We have the coal gasification plant, but they are setting up in Canada?

SEN. WARDNER There is sales tax on here.

Not only do we talk about CO2 coming out of the gasification plant, we are hoping to get an ethanol plant out in Richardton, and that also will produce CO2, and they are looking for that as a by-product to sell for oil recovery.

REP. IVERSON What would stop them from going from the primary recovery to the tertiary recovery?

SEN. WARDNER That is a good question, it is called politics out there. When it comes to unitizing those fields, it is not easy.

REP. KELSH Has there ever been any taxation as a main impediment to using field tools as a tertiary recovery?

SEN. WARDNER Up to now, I don't think that has been the main reason. We are trying to make it as easy for them to do that. On that pipeline that goes up to Canada, there are places where you can attach an injunction and get that CO2 into North Dakota. If we could get a field ready for that, it sure would make it easy, if they don't have to pay the tax on it.

REP. KELSH The geology in North Dakota would allow for that recovery?

SEN. WARDNER Yes

SEN. DAVE O'CONNELL, Testified in support of the bill. On the tax issue, when it goes out of the country, there is no sales tax on it, but if you use it down here, there would be sales tax. I look at this bill as a jobs environment bill. There is no sense in leaving oil in the ground when the price of it is down. This is just another tool to keep the dependence of foreign oil out. Right now, Basin Electric uses two 1800 horsepower engines to push the gas north. If you get into the older fields like in my area, there would probably have to be a couple more pumping stations, which creates more jobs and also it is good for our power companies.

REP. CONRAD Are other states doing this?

SEN. O'CONNELL I am not aware of other states using CO2. The only place I am aware of is Canada. This could be another tool that would keep these fields going another twenty years.

REP. DROVDAL I was looking at the original bill of 2170, at that time you took off a ten year exemption which was on the books, but yet, your testimony was that there is no tertiary recovery in North Dakota at the present time, why would there be a million dollar fiscal note?

SEN. O'CONNELL You got me on that, deferred the question to Sen. Wardner

SEN. WARDNER That first fiscal note, remember when I said there were two projects which are tertiary in the state, up in the Stanley area, on the amended bill, they are amended out, so the fiscal note is wrong.

REP. MATT KLEIN, DIST. 40 MINOT testified in support of the bill. I had the opportunity some time ago to go to Canada and visit the people that are involved in doing this. Submitted a handout relating to oil recovery, which showed a field at Weyburn, Canada. Visualize the amount of oil that is coming out because of the CO2 injection. At the time we were there, they were producing an additional 800 to 900 barrels per day by injecting the CO2. He went on to describe the experience of visiting the geological research center in Canada. There are 210 producing wells in that area and 71 of those respond with an incremental production of 9,000 barrels per day. They are looking to get to 30,000 barrels per day. The system is proven.

RON NESS, PRESIDENT OF THE NORTH DAKOTA PETROLEUM COUNCIL

Testified in support of the bill. See attached written testimony.

REP. NICHOLAS By your own comments, you stated that this isn't going to make any difference, it is really price driven, this tax break, what we pass on to you, it won't make an impact of fifty dollar barrel of oil it won't make a difference, whether they go after this oil or not, right?

RON NESS The fifty dollar oil right now today, the company is not doing their economics on fifty dollar oil. You know when you sit down and do a project, you are going to pencil it out, if the value of what you think you are going to receive, people are still doing their economics for projects over the next ten years, this is just one additional tool. This is a tax placed on a gas that shouldn't be. We actually thought about rewriting the code and take this out of the taxable entity, it shouldn't be a tax.

REP. NICHOLAS We brought millions of acres in marginal land and production in the 70's, because of the price of wheat and the price of all commodities were high. We paid the tax on that marginal land, I surely think you would want to pay the tax here, when you are bringing in marginal production, I am going to have to pay tax somewhere else to give a break to your industry. We have given you about every break there is right now.

RON NESS I would have to disagree with that. When you look at a current 11 1/2% production tax, in addition to all of the other taxes. We pay an enormous amount of taxes. There might be breaks off of the 11 1/2% of tax, but you are still paying a production tax on top of all of your other personal incorporated taxes.

REP. NICHOLAS 12 1/2% of a variable tax.

RON NESS You are still paying the normal tax, everyone else does. On a production tax, you are paying on what you are producing, not in addition to your income tax.

REP. CONRAD I see in the Senate, they took out the sunset, was that your request?

RON NESS Yes, that is what Sen. Wardner explained. There were two projects out there that used gas early on, they were qualified, we didn't know they were in there, at the tertiary project, even though they weren't using CO2, this was intended for new projects.

REP. CONRAD Would you have any objection to sunseting this in ten years?

RON NESS Yes I would, these are very long term projects. We might not even get one of these done in ten years.

REP. CONRAD How long are you talking about then?

RON NESS This is the future of a tremendous amount of the state and counties' funding sources, if we can find a way to develop a tertiary recovery unit, and maintain it, otherwise we won't have that source of income, revenue, or jobs that are associated with that. What we are looking at here, how do you extend the life of an oil well. That is what we are trying to do with tertiary recovery.

REP. DROVDAL What this bill is asking, is exempting the 15% tax on CO2, is it also asking that the extraction tax be exempt from the oil produced under the CO2 project?

RON NESS This bill is asking to exempt the five percent sales tax on CO2 when used in enhanced oil recovery and it is also asking to extend a permanent exemption instead of a ten year exemption for the 6 1/2% oil extraction tax.

REP. KELSH What is the known reserves in North Dakota right now?

RON NESS Deferred to Lynn Helms

The governor held a news conference on this bill on the day before the hearing in the Senate, he has been very supportive of this as have the Industrial Commission as a whole. They understand the economic gains to the state if you can get these projects moving forward.

REP. KELSH You said we are missing forty percent by not using tertiary methods of extraction?

RON NESS I believe the number will be somewhere in there. You are going to leave that much of a reserve behind. The same as if you don't unitize the field and use water or something else to push that oil out.

LYNN HELMS, DIRECTOR OF THE OIL & GAS DIVISION, UNDER THE NORTH DAKOTA INDUSTRIAL COMMISSION Testified in support of the bill. Presented several handouts showing the potential of enhanced recovery using CO2.. See attached copies. There are twenty two fields identified on the handouts which have potential for CO2 enhanced recovery in North Dakota. Those twenty two fields represent about 262,000,000 million barrels of incremental oil, which is just about equal to the one field in Saskatchewan. That oil in Canada is found at about 3,500 feet and in North Dakota it is anywhere from 9,000 to 11,000 feet. That 262,000,000 barrels of oil has the potential to generate about ten and a half billion dollars. If you take the five percent production tax that goes to cities and schools, you are talking about 524,000,000, which would not go to those places if we don't extend the life of these oil reservoirs.

REP. WEILER Can we get some kind of guarantee from you, that you aren't going to come back next session, and ask for a tax exemption to buy all of this equipment?

LYNN HELMS I am not the right person to give you that guarantee.

REP. FROELICH Related to one of the handouts, is there any federal tax credit right now for CO2?

LYNN HELMS Not to my knowledge. The Department of Energy is funding seven regional partnerships to go out and do some pilot projects and some research in this area, but there are

currently, no federal tax incentives for doing this. What we are talking about here, is taking human generated CO2 and utilizing it in some beneficial way.

REP. FROELICH This is good for the environment, but it is cost prohibitive, we aren't benefiting the environment right now by doing it, are we?

LYNN HELMS We aren't benefiting the environment in North Dakota. What we hoped to do with these small incentives is to push it a little over the hump, to where, for example, Red Trail Energy who is looking in to putting in an ethanol plant in Richardton, would have the incentives in place to cut a contract with some of the operators around Dickinson, and have a long term source of income from CO2 sales, that would get their investment over the hump and get the plant built.

REP. KELSH How much additional CO2 would be released by burning the additional 30,000 barrels of oil you would be extracting?

LYNN HELMS The 30,000 barrels of oil per day probably would generate close to a wash. You would leave behind as much CO2 in the oil reservoirs as you generate in burning the fossil fuel you produce.

REP. DROVDAL I was looking at Sen. Wardner's information and he has 15% tertiary recovery, I don't understand where that comes in at the 5% sales tax and the 6 1/2% extraction tax.

LYNN HELMS The 15% he is referring to the volume, it is a volume metric number. When we discover an oil reservoir, you can pick out anyone of those twenty two down there, if we don't do anything except produce it, we are only going to get fifteen to twenty percent of the oil that is in that reservoir. If we water flood it, we can get about a third of the oil. If we add the CO2 layer

to it, we can push it to about half or another fifteen percent. That fifteen percent is the volume we can extract. We are still leaving half of the hydrocarbon resource in that reservoir. There is a lot of research going on about microbes, lots of different ways to get at that other half. That is the 15% versus the 5% sales tax and the 6 1/2% extraction tax.

REP. DROVDAL Currently, we are doing some pooling, and I think you said, putting water in to increase extraction to 15%, can we tax that water?

LYNN HELMS No, the water is not being taxed. In the few tertiary projects we have underway, they are using high pressure air, the air is not being taxed either. When we took a look at this, initially, we did not realize there would be a fiscal note, under the current scenario, but we realize that there are some existing high pressure air projects that would have benefited from this tax incentive, that is not our purpose with this legislation, we want to incentivize something new.

JOHN HARJU, ASSOCIATE DIRECTOR FOR RESEARCH AT THE UNIVERSITY OF NORTH DAKOTA'S ENERGY & ENRIVONMENTAL RESEARCH CENTER Testified in support of the bill. See written testimony together with a handout regarding Plains CO2 Reduction Partnership.

REP. FROELICH Do we have a surplus of CO2 now?

JOHN HARJU Yes, but it is small, I think someone from Basin Electric will speak to that. There are some ethanol plants at which the CO2 is currently not being captured.

FLETCHER POLING, REPRESENTING BASIN ELECTRIC POWER COOPERATIVE, Testified in support of the bill, see written testimony.

REP. BELTER Do you have all types of capacity to produce this CO2?

FLETCHER POLING Yes

REP. FROELICH right now you are at a hundred twenty cubic feet per day, you are supplying Saskatchewan, what can you produce in a day?

FLETCHER POLING The latest figures I read that we are shipping up there is in the neighborhood of one hundred million, and a yearly basis, we average about one hundred sixty million cubic feet per day. To put it in perspective, right now, we are doing about six thousand tons per day of carbon dioxide, to Weyburn, and we can go up to about nine thousand tons per day. The plant, itself, for all of Basin Electric, does in the neighborhood of thirteen or fourteen million tons per year. We are able to reduce the emissions of carbon dioxide for Basin Electric by about 20%, when this expansion is done.

REP. FROELICH Right now, you are exporting about 2/3's of what you actually produce?

FLETCHER POLING About 50%, we will be going close to 60 or 70% within six months.

REP. WEILER If you are exporting 70%, and you are limited to what you can produce, how will you produce enough?

FLETCHER POLING I don't think it was said at any time that we had the capacity to produce everything we could utilize in North Dakota. We can't produce that.

With no further testimony, the committee hearing was closed.

2005 HOUSE STANDING COMMITTEE MINUTES

BILL/RESOLUTION NO. **Sb 2170**

House Finance and Taxation Committee

☐ Conference Committee

Hearing Date **March 1, 2005**

Tape Number	Side A	Side B	Meter #
2		**X**	**13**
Committee Clerk Signature			

Minutes:

COMMITTEE ACTION

REP. DROVDAL Submitted amendments to committee members. This amendment takes the excise oil tax out of the bill. The reason being, to do this project, they need to get rid of the five percent sales tax so that they can start planning for it.

REP. DROVDAL Made a motion to adopt the amendment as presented.

REP. KELSH Second the motion. Motion carried by voice vote.

REP. DROVDAL Presented another amendment to the committee. This amendment lets landowners be responsible for water wells which could be damaged during exploration.

REP. DROVDAL Made a motion to adopt the amendment as presented.

REP. BRANDENBURG Second the motion. Motion carried by voice vote.

REP. CONRAD Made a motion for a **do pass as amended.**

REP. BRANDENBURG Second the motion. **MOTION CARRIED.**

13 VOTED YES **0 NO** **1 ABSENT**

REP. DROVDAL Was given the floor assignment.

Date: 3-05
Roll Call Vote #: 1

2005 HOUSE STANDING COMMITTEE ROLL CALL VOTES
BILL/RESOLUTION NO. SB 2170

House FINANCE & TAXATION Committee

☐ Check here for Conference Committee

Legislative Council Amendment Number 50282.0202

Action Taken Do Pass as Amended

Motion Made By Rep Conrad Seconded By Rep. Brandenburg

Representatives	Yes	No	Representatives	Yes	No
BELTER, WES, CHAIRMAN	✓				
DROVDAL, DAVID, V-CHAIR	✓				
BRANDENBURG, MICHAEL	✓				
CONRAD, KARI	✓				
FROELICH, ROD	✓				
GRANDE, BETTE	✓				
HEADLAND, CRAIG	✓				
IVERSON, RONALD	✓				
KELSH, SCOT	✓				
NICHOLAS, EUGENE	A				
OWENS, MARK	✓				
SCHMIDT, ARLO	✓				
WEILER, DAVE	✓				
WRANGHAM, DWIGHT	✓				

Total (Yes) 13 No 0

Absent 1

Floor Assignment Rep. Drovdal

If the vote is on an amendment, briefly indicate intent:

REPORT OF STANDING COMMITTEE

SB 2170, as engrossed: Finance and Taxation Committee (Rep. Belter, Chairman) recommends **AMENDMENTS AS FOLLOWS** and when so amended, recommends **DO PASS** (13 YEAS, 0 NAYS, 1 ABSENT AND NOT VOTING). Engrossed SB 2170 was placed on the Sixth order on the calendar.

Page 1, line 4, replace "subdivision b of subsection 5 of section 57-51.1-03" with "sections 38-08.1-01 and 38-08.1-04.1"

Page 1, line 5, replace "an oil extraction tax exemption for incremental production from a tertiary" with "definitions and exploration permit requirements to conduct geophysical exploration"

Page 1, line 6, remove "recovery project"

Page 1, after line 7, insert:

"**SECTION 1. AMENDMENT.** Section 38-08.1-01 of the North Dakota Century Code is amended and reenacted as follows:

38-08.1-01. Definitions. As used in this chapter, unless the context requires otherwise:

1. "Commission" means the industrial commission.

2. "Geophysical exploration" means any method of obtaining petroleum-related geophysical surveys.

3. "Operator of the land" means the surface owner or the surface owner's tenant of the land upon or within one-half mile [.80 kilometer] of the land on which geophysical operations are to be conducted.

4. "Permitting agent" means a person who secures a permit from an operator of the land to conduct geophysical exploration activities.

5. "Person" means and includes any natural person, corporation, limited liability company, association, partnership, receiver, trustee, executor, administrator, guardian, fiduciary, or other representative of any kind, and includes any department, agency, or instrumentality of the state or of any governmental subdivision thereof.

SECTION 2. AMENDMENT. Section 38-08.1-04.1 of the North Dakota Century Code is amended and reenacted as follows:

38-08.1-04.1. Exploration permit.

1. Upon filing a complete application for permit to explore pursuant to section 38-08.1-04, the commission may issue to any person desiring to engage in geophysical exploration a "geophysical exploration permit". A person may not engage in geophysical exploration activities in this state without having first obtained a geophysical exploration permit from the commission.

2. The permit must show, at a minimum:

   a. The name of the person.

   b. The name and address of the resident agent for service of process.

c. That an application to engage in geophysical exploration has been duly filed.

d. That a good and sufficient surety bond has been filed by the person, naming the surety company and giving its address.

3. The permit must be signed by the director of the commission's oil and gas division or the director's designee. The permit is valid for one year.

4. Within seven days of initial contact between the permitting agent and the operator of the land, the permitting agent shall provide the operator of the land and each landowner owning land within one-half mile [.80 kilometer] of the land on which geophysical exploration activities are to be conducted a written copy of section 38-08.1-04.1 and chapter 38-11.1.

5. The ~~permitholder~~ permitting agent shall notify the operator of the land at least ~~three~~ seven days ~~prior to~~ before the commencement of any geophysical exploration activity, unless waived by mutual agreement of both parties. The notice must include the approximate time schedule and the location of the planned activity.

~~5.~~ 6. The permit or a photostatic copy thereof must be carried at all times by a member of the crew during the period of geophysical exploration and must be exhibited upon demand of the landowner or tenant operator or county or state official.

~~6.~~ 7. The permitholder shall notify the county auditor or the auditor's designee at least twenty-four hours, excluding Saturdays and holidays, before the permitholder commences geophysical exploration in the county. Notice must include the approximate time schedule and location of the planned activity."

Page 1, remove lines 16 through 23

Page 2, remove lines 1 and 2

Renumber accordingly

2005 TESTIMONY

SB 2170

North Dakota Petroleum Council

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Senate Bill 2170

Senate Finance and Taxation Committee

February 2, 2005

Mr. Chairman, and members of the Committee, my name is Ron Ness, President of the North Dakota Petroleum Council. The North Dakota Petroleum Council represents more than 100 companies involved in all aspects of the oil and gas industry including oil and gas production, refining, pipeline, mineral leasing, consulting, legal work, and oil field service activities in North Dakota, South Dakota, and the Rocky Mountain region. I appear before you today in support of Senate Bill 2170.

I want to provide a brief update on oil and gas activity in North Dakota.

There were 4,135 direct jobs in oil and gas industry in 2004.

Many immediate and long-term employment job opportunities

- **251 openings posted with Job Service North Dakota since October**
- **211 openings filled in past 3 months –most over $50,000/year income**
- **Future needs - 50% to 75% of employees will retire over the next 2 to 12 years.**

Leasing activity is high

- **Over $7 million at the past two state sales – Nearly $13 million at last week's federal lease sale**
- **Still mostly speculative leasing on North Dakota side of the border**
- **Demand for rigs is high**

Budget forecast for 2003-2005 biennium includes nearly $190 million oil and gas tax revenue

- **$ 71 million to general fund**
- **$ 41 million to Permanent Oil Tax Trust Fund**
- **$ 42 million to counties/cities/schools**
- **$ 16 million to Resources Trust Fund**
- **$ 5 million to Oil Impact Fund**
- **$ 7 million from federal leases and royalties to General Fund**
- **$ 7 million from federal leases and royalties to counties/cities/school with federal lands**

Senate Bill 2170 provides a sales tax exemption for CO_2 that is used for enhanced oil recovery. In Section three, the bill also removes the ten-year time limit on the oil extraction tax exemption for incremental oil from tertiary oil recovery projects and makes it permanent.

The permanent extraction tax exemption is significant because of the significant up front cost of tertiary recovery projects and the associated risk, since it can take several years of injection to begin to see positive results. The permanent extraction tax exemption allows a company to amortize the tax savings over a longer period. The five percent gross production tax will be in place over the life of the project and the oil extraction tax will be in place for all of the oil that would have been produced without the project. That proposed tax exemption would apply only to the incremental, or additional, recovery.

Eliminating the sales tax on CO_2 that is injected for enhanced oil recovery, in essence, delays the tax collection until the oil is recovered. If the CO_2 was injected for storage purposes only, it would not be taxed since there is no economic value to the CO_2. Injecting the CO_2 into an oil-producing reservoir sequesters the greenhouse gas in an environmentally friendly matter and provides the economic benefit of additional recovery of oil.

Why pass this bill:

- CO_2 from North Dakota is being used effectively in Canada to enhance oil production in aging oil fields and the pipeline transporting the CO_2 runs right through several North Dakota oil fields that have potential for CO_2 use. The economics in Canada are vastly different than in North Dakota. In Canada, the government owns most of the minerals and the recoverable oil from those fields currently using CO_2 rivals the combined potential of many of the North Dakota fields that may be candidates for tertiary recovery projects.
- Win-win situation – sequestering a greenhouse gas and recovering additional oil
- Tertiary recovery provides the state with long-term tax revenues by extending the life of wells
- Should we be taxing a greenhouse gas?
- If the CO_2 wasn't sold and used, it would likely be vented into the atmosphere
- Sales tax will be collected on the infrastructure needs in the oil field for CO_2 injection

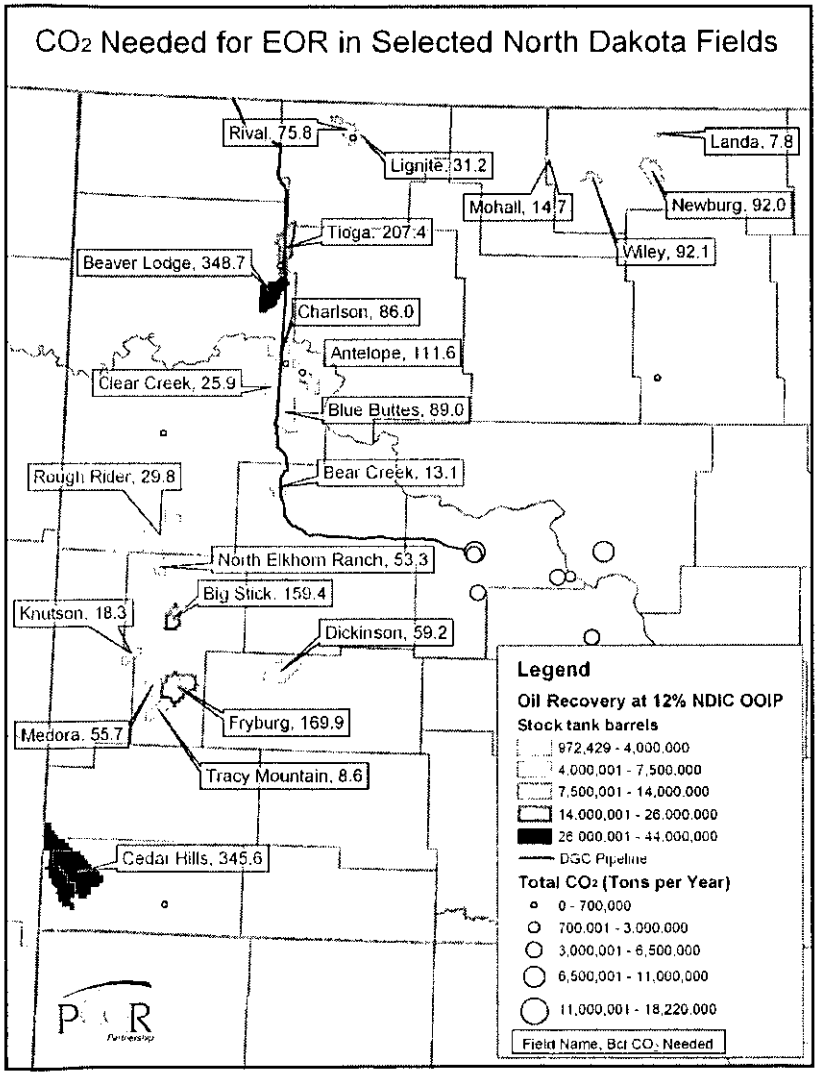
- Gross production will be collected when the oil is produced as a result of CO_2 injection
- President Bush's Global Climate Change Initiative (GCCI) commits the United States to an aggressive strategy to reduce greenhouse gas (GHC) intensity by 18% over the next 10 years. This would be part of an overall U.S. effort as an alternative to the Koyoto Agreement.
- Tertiary recovery could add 15–30 years to life of many wells and continue the economic benefit equated with each of those wells. Many of these wells may otherwise be plugged in the next 10 years if we don't use tertiary recovery.

There is no question CO_2 can be used to increase oil recoveries. Providing an economic way to sequester the gas helps make the coal gasification plant at Beulah, as well as, some ethanol plants, more economically secure and environmentally friendly. Getting the gas to the oil fields is an expensive and risky proposition. While there isn't much government can do about the costs involved, this bill is a signal that the State of North Dakota wants to encourage responsible use of CO_2, continued operation of the gasification plant, and increased production of oil.

Currently, there are no tertiary recovery projects using CO_2 in North Dakota. This bill is not a silver bullet toward getting these projects moving. The cost of CO_2 and economics will determine if companies move forward. However, this bill is a start and we urge your support for it. I would be happy to answer any questions.

Lynn Helms

EOR CO_2 Demand



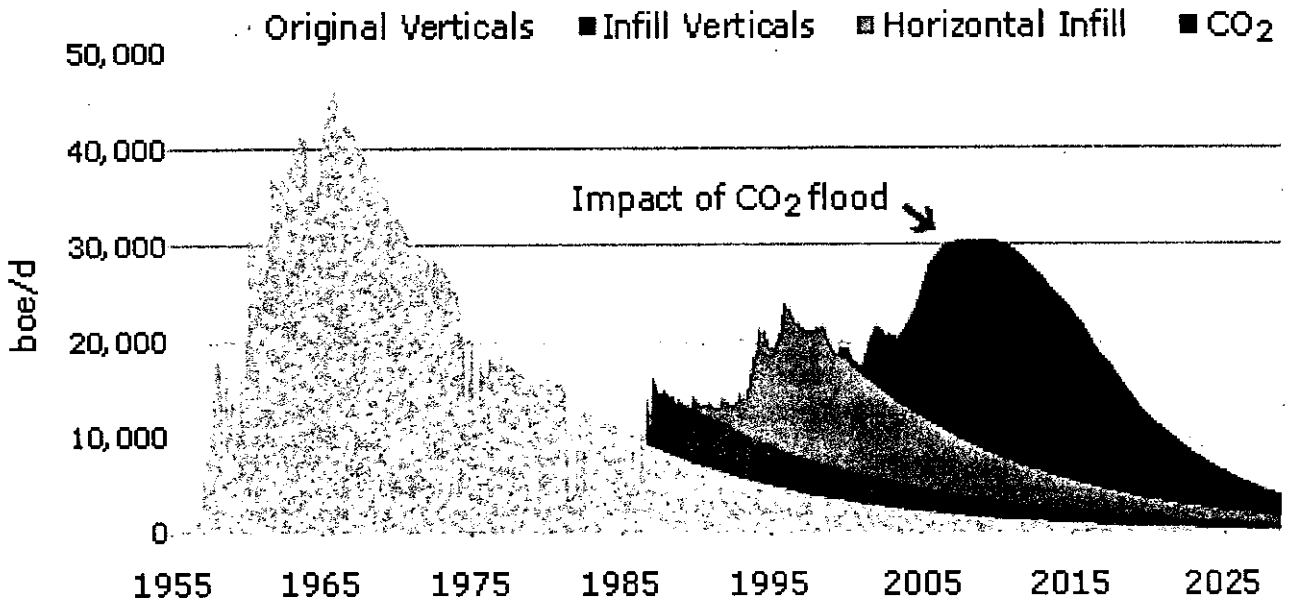
- Estimated 19 MMTCE of CO_2 needed for maximum tertiary EOR operations in 22 selected fields in North Dakota.
- Represents approximately 262 million barrels of incremental oil.
- At $40/bbl = $10.48 billion.

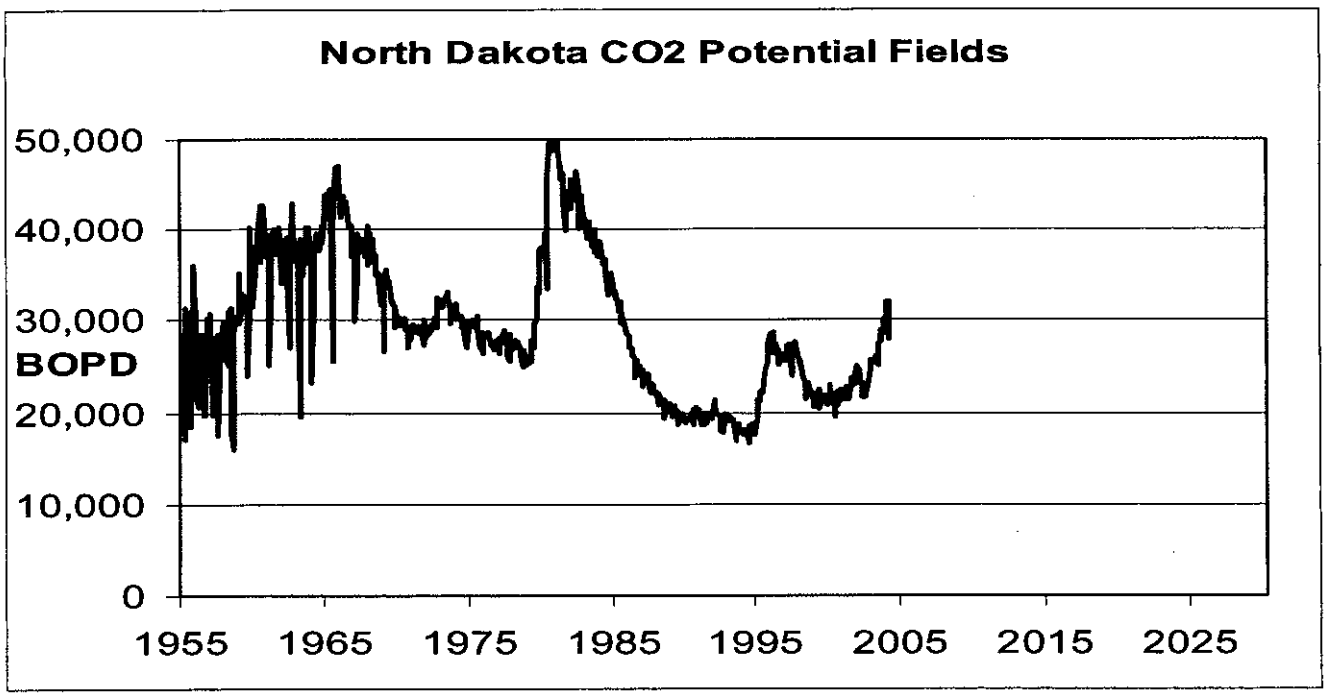
(ND sweet price = $41.30/bbl on11/9/04)

EERC
Energy & Environmental Research Center

SB 2170
Lynn Helms

Historical production and predicted CO2 response





Lynn Helmes

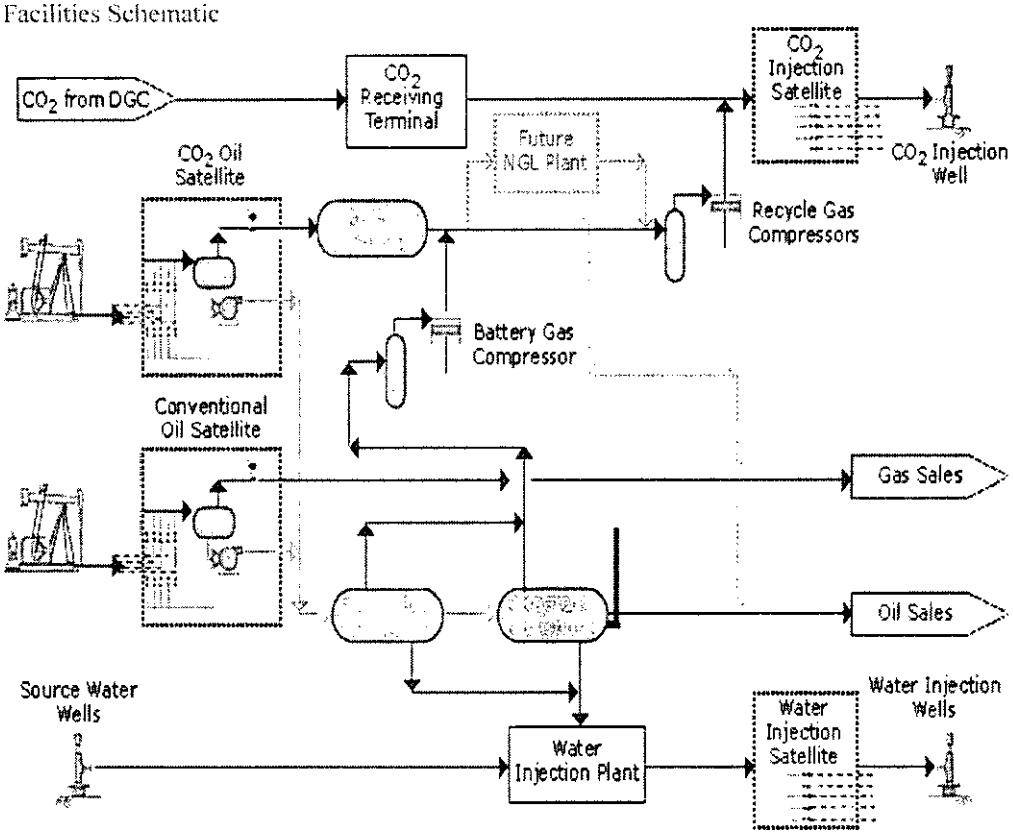
WEYBURN CO2 FLOOD FACILITIES

previous facilities in the Weyburn field were built to handle oil and water production and a very small amount of solution gas (GOR 190 standard cubic feet - scf/bbl). New facilities built for the miscible flood project include a free water knock-out vessel, battery and recycle gas compression packages, and an upgraded flare system.

A network of medium pressure gas gathering lines transports the solution gas and CO2 mixture from the production satellites to the new recycle central compression station. The recycled mixture is then blended with purchased CO2 and re-injected using a new CO2 injection distribution network.

The CO2 facilities added to the Weyburn field represent an increase in complexity to previous waterflood operations. EnCana recognizes this, and is committed to operating the project in a safe and environmentally responsible manner.

Facilities Schematic



Senate Bill 2170

Senate Finance and Tax Committee

February 2, 2005

Same speech to House

Mr. Chairman and members of the Committee, my name is John Harju, Associate Director for Research at the University of North Dakota's Energy & Environmental Research Center (EERC). I am responsible for the management of the Plains CO_2 Reduction (PCOR) Partnership. The PCOR Partnership is a diverse group of public and private sector stakeholders working together to better understand the technical and economic feasibility of capturing and storing CO_2 emissions from stationary sources of CO_2 in the northern Great Plains and adjacent areas. The PCOR Partnership is one of seven regional partnerships funded by the U.S. Department of Energy's (DOE's) Regional Carbon Sequestration Partnership Program and a broad range of project sponsors. Our partnership currently covers portions of nine states and three Canadian provinces, and we have more than 40 partners from industry, government, and nongovernment organizations. Please refer to the fact sheets attached to my testimony for more details. I appear before you today in support of Senate Bill 2170.

The PCOR Partnership is supporting the President's Global Climate Change Initiative, which calls for an 18% reduction in U.S. CO_2 intensity by 2012. The President's Global Climate Change Initiative is working to develop technologies and strategies to reduce greenhouse gas emissions and provides an alternative to the Kyoto Protocol. CO_2 sequestration refers to the act of capturing and storing CO_2 in plant and soil materials or deep underground in geologic reservoirs. There is a growing world market for monetary credits associated with reducing CO_2 in the atmosphere by sequestration. Because our region is a major energy producer and is also

rich in agricultural resources, we have the potential to sequester very large amounts of CO_2 and reap the positive economic benefits. CO_2 is also a valuable commodity with respect to enhanced oil recovery (EOR). CO_2 is being used in Saskatchewan, Texas, Wyoming, and elsewhere to recover millions of additional barrels of oil and extending the economic life of oil fields. With CO_2 EOR (often referred to as tertiary recovery), we truly have a win–win situation in which the economic life of oil fields is extended and CO_2 is sequestered in the process. Capture and sequestration of CO_2 from regional power plants would, in turn, allow for expanded utilization of North Dakota lignite and other western coals for future power generation without raising concerns regarding climate change. As CO_2 markets mature, North Dakota industries may also benefit by selling CO_2 credits on the open market. I believe that EOR represents a very significant opportunity for North Dakota's future.

Although a proven technology elsewhere, EOR requires significant up-front investment, and the development of new CO_2 sources can be problematic. At the present time, there are no CO_2 EOR projects in North Dakota. The PCOR Partnership, working in conjunction with the North Dakota Industrial Commission's (NDIC's) Oil and Gas Division and the North Dakota Geological Survey, selected 22 North Dakota fields most suitable for CO_2 EOR based on reported original oil in place (OOIP) and other reservoir characteristics—reconnaissance-level calculations estimate 261 million barrels of total potential incremental oil production from those 22 fields if CO_2 is utilized.

Senate Bill 2170 will do much to enhance the potential for CO_2 EOR projects in North Dakota.

Plains CO_2 Reduction (PCOR) Partnership

Practical, Environmentally Sound CO_2 Sequestration

What Is CO_2 Sequestration?

Carbon dioxide (CO_2) is a major by-product of energy use. CO_2 sequestration means capturing CO_2 and putting it into environmentally sound temporary or permanent storage. Indirect sequestration is capturing CO_2 from the air and storing it for some period of time in soils or vegetation. Direct sequestration is capturing CO_2 from exhaust or process gas and placing it in relatively permanent storage, usually in underground geological formations.

What Is the PCOR Partnership?

The PCOR (Plains CO_2 Reduction) Partnership is a diverse group of public and private sector stakeholders working together to better understand the technical and economic feasibility of capturing and storing CO_2 emissions from stationary sources of CO_2 in the northern Great Plains and adjacent areas. The PCOR Partnership is coordinated by the Energy & Environmental Research Center (EERC) at the University of North Dakota and is one of seven regional partnerships funded by the U.S. Department of Energy's (DOE's) Regional Carbon Sequestration Partnership Program and a broad range of project sponsors.

PCOR Partnership Region

CO_2 and Sequestration – Did You Know?

- While CO_2 emissions increased, U.S. CO_2 intensity (CO_2 emissions per dollar of gross domestic product [GDP]) decreased by one-third in the 1990s.[1]
- The nine states of the PCOR Partnership region generate about 11% (163 million tons carbon equivalent) of the annual CO_2 emissions for the United States.[1]
- CO_2 emissions in the region are split between mobile (29%) and stationary (71%) sources.[1]
- Croplands, wetlands, and forests in the region represent opportunities for indirect sequestration projects.
- Unminable coals, depleted oil and gas zones, and deep saline reservoirs in the region represent opportunities for direct sequestration projects.
- The PCOR Partnership region is currently home to a major direct value-added sequestration demonstration project.

Why Sequester CO_2?

There is concern that the ongoing accumulation of CO_2 and other greenhouse gases in the atmosphere from human activity will affect global climate. The President's Global Climate Change Initiative, issued in the spring of 2003, calls for an 18% reduction in U.S. CO_2 intensity by 2012. Conservation, more efficient power systems, renewable energy, and sequestration are all tools to help reduce CO_2 intensity.

What Role Will the PCOR Partnership Play?

The partnership will assess and prioritize the opportunities for sequestration in the region and identify and work to resolve the technical, regulatory, and environmental barriers to the most promising sequestration opportunities. At the same time, the partnership will work to inform policy makers and the public regarding CO_2 sources, sequestration strategies, and sequestration opportunities.

Sources

1. http://yosemite.epa.gov/globalwarming/ghg.nsf.
2. Jerrell, P.M., Fox, C.E., Stein, M.H., and Webb, S.L., 2002, Practical aspects of CO_2 flooding, Richardson, Texas, Society of Petroleum Engineers, Inc., Figure 1.9, p. 8.

Who Is Involved in the PCOR Partnership?

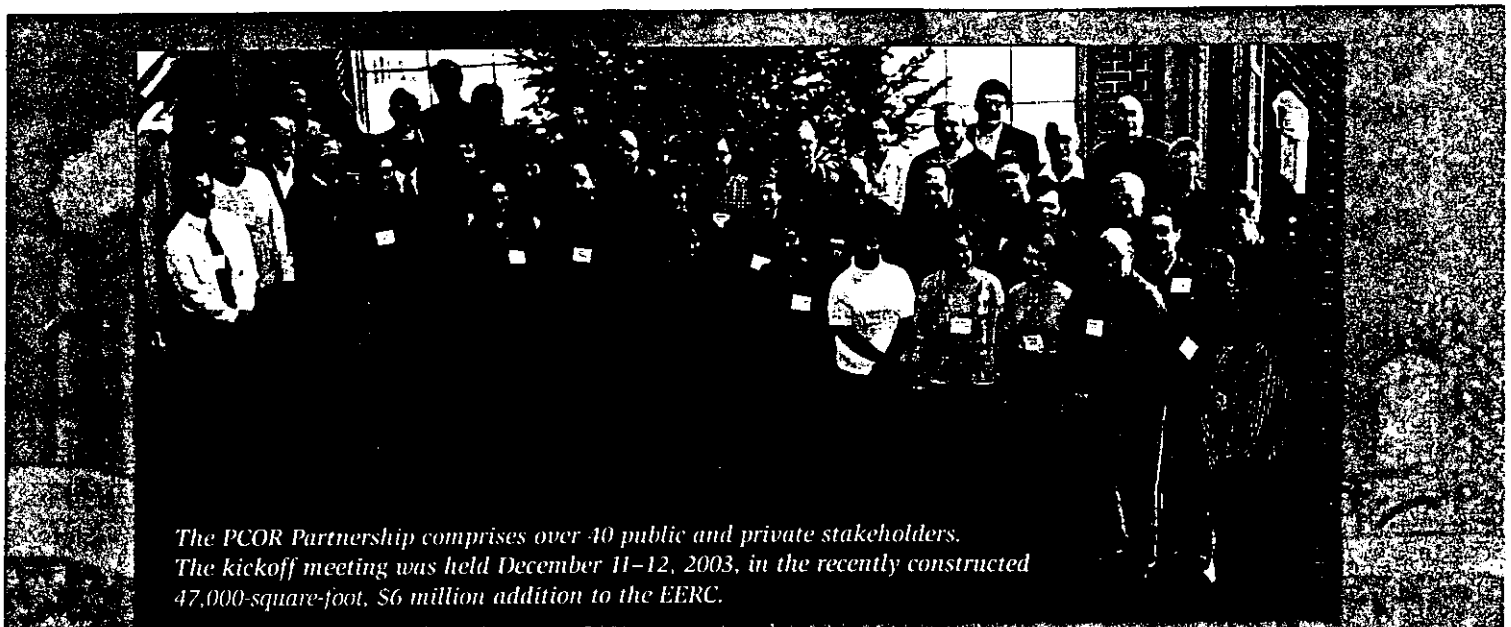
Through the coordination of the EERC, the PCOR Partnership includes more than forty public and private sector stakeholders from the region and elsewhere that represent expertise in agriculture, forestry, economics, energy exploration and production, geology, engineering, and the environment. The partnership also includes members with practical experience with direct and indirect sequestration, including value-added projects.

The partners include the following:

- Alberta Department of Environment
- Alberta Energy and Utilities Board
- Alberta Energy Research Institute
- Amerada Hess Corporation
- Basin Electric Power Cooperative
- Bechtel Corporation
- Center for Energy & Economic Development
- Chicago Climate Exchange
- Dakota Gasification Company
- Ducks Unlimited Canada
- Eagle Operating, Inc.
- Encore Acquisition Company
- Energy & Environmental Research Center
- Environment Canada
- Fischer Oil and Gas, Inc.
- Great Northern Power Development
- Great River Energy
- Interstate Oil and Gas Compact Commission
- Kiewit Mining Group
- Lignite Energy Council
- Manitoba Hydro
- Minnesota Pollution Control Agency
- Minnkota Power Cooperative, Inc.
- Montana-Dakota Utilities Co.
- Montana Department of Environmental Quality
- Montana Public Service Commission
- Natural Resources Trust
- Nexant, Inc.
- North Dakota Department of Health
- North Dakota Geological Survey
- North Dakota Industrial Commission Oil and Gas Division
- North Dakota Petroleum Council
- North Dakota State University
- Otter Tail Power Company
- Petroleum Technology Research Centre
- Petroleum Technology Transfer Council
- Prairie Public Television
- SaskPower
- Saskatchewan Industry and Resources
- Tesoro Refinery
- University of Regina
- U.S. Department of Energy
- U.S. Geological Survey – Northern Prairie Wildlife Research Center
- Western Governors' Association
- Xcel Energy

What Will the PCOR Partnership Produce?

- A comprehensive regional assessment of CO_2 sources and sinks.
- Identification, ranking, and action plans for promising sequestration demonstration projects.
- Key geographic information system products for CO_2 sources and sinks, infrastructure, and regulatory issues.
- Recommendations for monitoring and verification systems
- Outreach materials including fact sheets on key regional sequestration topics, a Web site, and a 30-minute informational video.



The PCOR Partnership comprises over 40 public and private stakeholders. The kickoff meeting was held December 11–12, 2003, in the recently constructed 47,000-square-foot, $6 million addition to the EERC.

[illegible] collaborative framework to assess regional sequestration opportunities. New members are welcome. [illegible] contact

Sponsored in Part by the U.S. Department of Energy

PCO2R Partnership
Plains CO_2 Reduction (PCOR) Partnership
Practical, Environmentally Sound CO_2 Sequestration

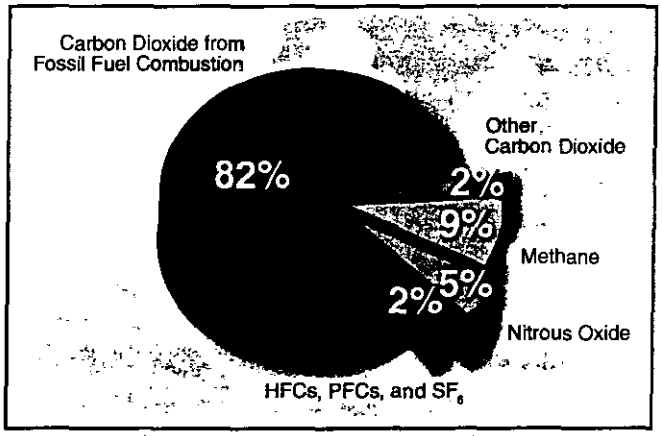
Carbon Dioxide (CO_2) Sequestration – Controlling CO_2 Emissions to the Atmosphere Through Capture and Long-Term Storage

What Is CO_2?

Carbon dioxide is a gas composed of one atom of carbon and two atoms of oxygen. CO_2 occurs naturally in the atmosphere, is essential to plant life and, as a greenhouse gas, helps create the greenhouse effect that keeps our planet livable.[1] CO_2 is exhaled by humans and is used to put the bubbles in soft drinks, as a coolant (dry ice), and in fire extinguishers.

Why Consider Carbon Management?

Greenhouse gases, including carbon dioxide (CO_2), trap a portion of the sun's energy in the Earth's atmosphere and make our planet warm enough to support life. Human (anthropogenic) activity, including the use of fossil fuel, generates a significant volume of greenhouse gases like CO_2. There is concern that the anthropogenic greenhouse gases entering the atmosphere are causing increased warming and that this warming will affect climate on a global scale. CO_2 sequestration—the capture and long-term storage of CO_2—is one of several actions that would help to stabilize and eventually reduce CO_2 levels in the atmosphere.



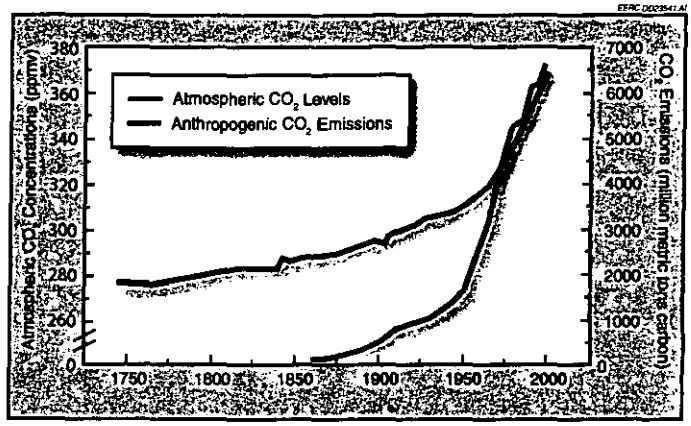
Percentage of greenhouse gases released to the atmosphere by the United States in 2001.[2] CO_2 accounted for most of the 1883.4 million metric tons of carbon equivalent (MMTCE).

What Is CO_2 Sequestration?

Sequestration is the capture and long-term storage of CO_2 either before or after it has entered the atmosphere. Sequestration is one of several actions aimed at controlling the release of anthropogenic CO_2. There are two types of sequestration: direct and indirect.[3]

Direct CO_2 Sequestration

Direct sequestration involves capturing CO_2 at a source before it can be emitted to the atmosphere.[3-5] The most efficient concept would use specialized equipment to capture CO_2 at large stationary sources like factories or power plants and then inject the CO_2 into secure storage zones deep underground (geologic sequestration) or into the deep ocean.



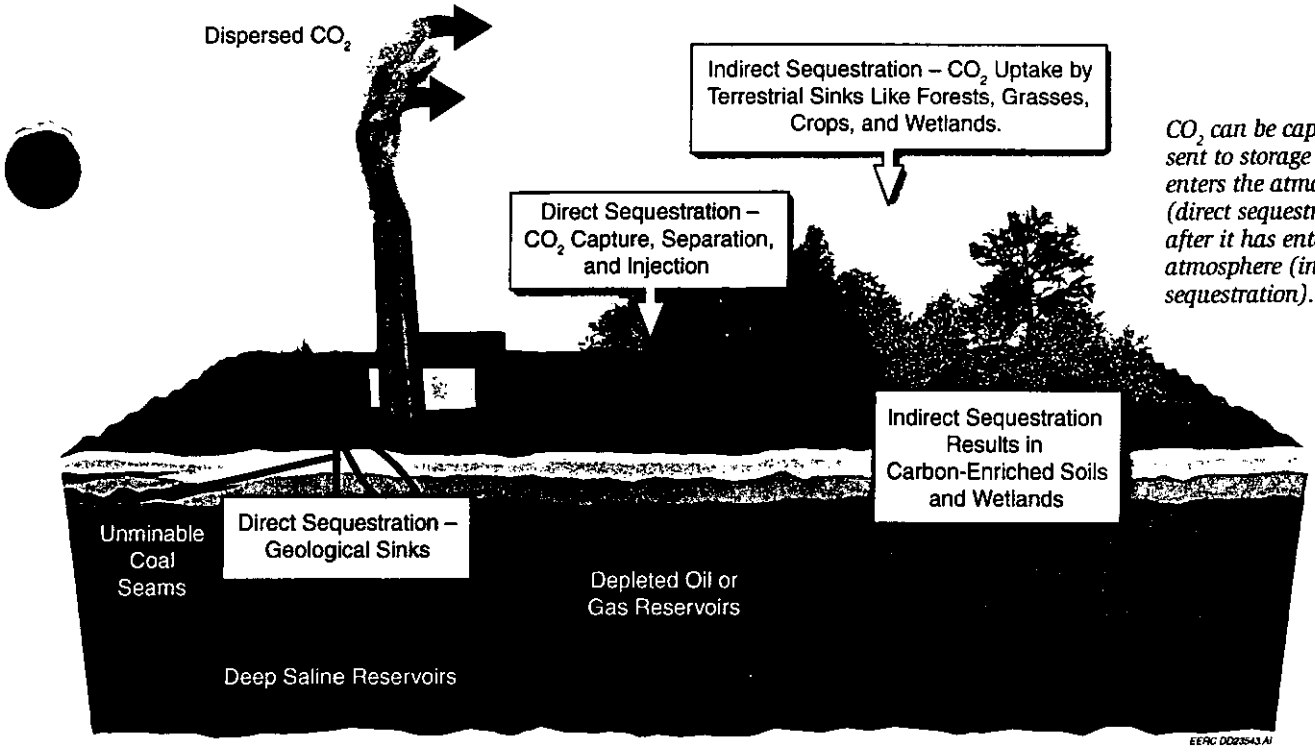
Since the beginning of large-scale industrialization about 150 years ago, the level of CO_2 in the atmosphere increased by about 25%.[1,2]

Indirect CO_2 Sequestration

Indirect or terrestrial sequestration involves removing CO_2 from the atmosphere.[3,5,6] Indirect sequestration uses land management practices that boost the ability of natural CO_2 sinks like plants and soils to remove carbon as CO_2 from the atmosphere, regardless of its source. Opportunities for indirect sequestration can be found in forests, grasslands, wetlands, and cropped lands.

What Is the Status of Direct Sequestration?

The injection and control of CO_2 in underground formations has been done safely for more than 30 years by oil companies.[7] Developing CO_2 capture systems, determining the best underground storage sites for long-term storage of CO_2, determining the best way to monitor sites to guard against CO_2 migration, and determining a workable regulatory framework for sequestration projects are issues that require significant effort. There is considerable worldwide effort under way to address these issues.



CO_2 can be captured and sent to storage before it enters the atmosphere (direct sequestration) or after it has entered the atmosphere (indirect sequestration).

Direct Sequestration Projects in the Northern Great Plains Region

The Weyburn oil field in Saskatchewan is currently the site of active CO_2 flooding to improve oil production. Weyburn is also the site of a major international effort, coordinated by the Petroleum Technology Research Centre, located in Regina, Saskatchewan, to assess geologic sequestration practices. Thus far, studies have demonstrated the site to be safe and secure for sequestration, and it is expected that more than 20 million tons of CO_2 will be successfully sequestered there by 2025.[8–10]

What Is the Status of Indirect Sequestration?

Land use practices can cause soils to trap carbon (sinks) or release carbon (sources). Agricultural practices like no-till and low-till keep more carbon in the soil than conventional practices. Current research activities in the northern Great Plains include determining the amount of CO_2 that can be taken up in different settings like forests, grasslands, tilled lands, or wetlands; developing monitoring practices to determine the amount of carbon staying in place; and determining optimal land management practices for carbon storage in different ecoregions and settings.[11,12]

What Is the Role of the PCOR Partnership?

The PCOR Partnership is currently characterizing CO_2 sources and sequestration opportunities in the northern Great Plains region. This includes cataloging CO_2 sources, identifying sequestration opportunities, assessing monitoring technologies, and assessing regulatory needs for successful sequestration projects in the region. The PCOR Partnership is one of seven partnerships funded by the U.S. Department of Energy that are working to complete this activity for much of North America by the fall of 2005.

References and Notes

1. http://www.grida.no/climate/ipcc_tar/wg1/index.htm. **2.** http://www.eia.doe.gov/oiaf/1605/ggccebro/chapter1.html. **3.** http://www.nrcce.wvu.edu/news/03NRCCEpart1.pdf, slide number 8. **4.** http://www.netl.doe.gov/coal/Carbon%20Sequestration/Resources/faqs.html. **5.** http://www.midcarb.org/sequestration.shtml. **6.** http://www.epa.gov/sequestration/faq.html. **7.** Benson, S.M., and others, 2004, Lessons learned from natural and industrial analogues for storage of carbon dioxide in deep geological formations: Lawrence Berkeley National Laboratory Report 1170. **8.** www.ieagreen.org.uk/weyburn1.htm. **9.** www.prtc.com (Web site of the Petroleum Technology Research Center). **10.** PCOR Fact Sheet No. 3; www.undeerc.org/PCOR. **11.** http://www.soilsci.ndsu.nodak.edu/Deibert/Papers/SAREreport.pdf. **12.** http://www.npwrc.usgs.gov/npscinfo/factshet/wetlands.htm.

The Plains CO_2 Reduction (PCOR) Partnership is a group of public and private sector stakeholders working together to build a better understanding of the technical and economic feasibility of sequestering CO_2 emissions from stationary sources in the northern Great Plains. The PCOR Partnership is coordinated by the Energy & Environmental Research Center (EERC) at the University of North Dakota and is one of seven regional partnerships under the U.S. Department of Energy's Regional Carbon Sequestration Partnership Program. To learn more, contact:

Edward N. Steadman, Senior Research Advisor, (701) 777-5279, esteadman@undeerc.org
John A. Harju, EERC Associate Director for Research, (701) 777-5157, jharju@undeerc.org

Visit the PCOR Partnership Web site at www.undeerc.org/PCOR. New members are welcome!

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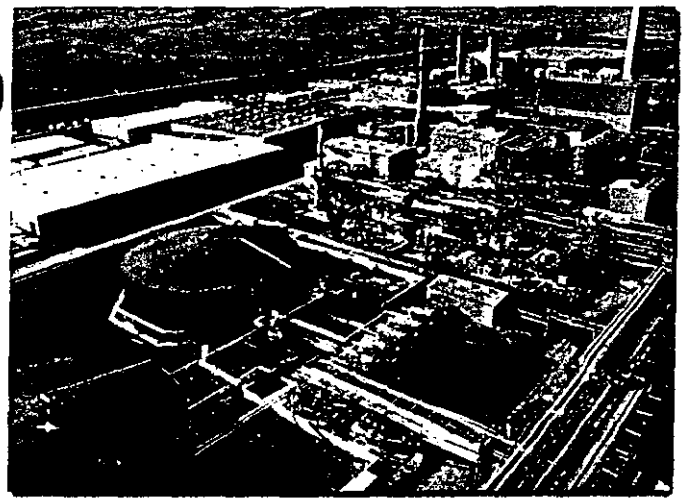
PCOR Partnership

Plains CO_2 Reduction (PCOR) Partnership

Practical, Environmentally Sound CO_2 Sequestration

The Weyburn Oil Field – A Model for Value-Added Direct CO_2 Sequestration

Carbon dioxide (CO_2) has been used safely and effectively for the past 30 years to help increase the production of oil and natural gas from underground formations.[1] This practice, called CO_2 enhanced oil recovery (EOR) or CO_2 flooding, can be modified to result in the permanent storage of CO_2 in underground formations. Storing CO_2 underground, referred to as geologic CO_2 sequestration, is one of several ways to control atmospheric emissions of CO_2 from human activities. Combining CO_2 flooding and CO_2 sequestration is an example of value-added sequestration. The Weyburn oil field in southern Saskatchewan is a real-world laboratory for an international effort to determine criteria for developing, assessing, and implementing safe and effective value-added direct sequestration in depleted oil fields. The results indicate that direct value-added CO_2 sequestration can be safe and effective given the right combination of site characterization, site monitoring, geologic conditions, and site operations. The Weyburn project is one of the sequestration activities involving members of the PCOR Partnership.



The Great Plains Synfuels Plant (Dakota Gasification Company) in Beulah, North Dakota, generates the CO_2 used in EOR operations in the Weyburn, Saskatchewan, oil field.[2]

What is the role of CO_2 in the Weyburn oil field?

The Weyburn oil field had original oil in place of 1.4 billion barrels. It has produced 356 million barrels of oil since its discovery in 1954.[2] In the late 1990s, oil production had decreased to the point that the oil field was being considered for abandonment even though operators knew that additional oil remained in the production zones. In 2000, EnCana Resources initiated a CO_2 flood program designed to recover an estimated 130 million barrels of this additional, or "incremental," oil.[2] This action is expected to extend the life of the oil field until 2025 and bring significant economic benefits to the region. Over the life of the CO_2 flood, about 20 million metric tons of CO_2 will be sequestered in the production zones, which is the equivalent of taking 3.2 million cars off the road for 1 year.[2]

What is value-added sequestration?

- "Value-added" means that the economic value of a product or process has been increased through changes in practices or processing.
- Operations that use CO_2 to help produce oil or natural gas and then put the CO_2 into permanent storage generate an additional economic return so they are said to be value-added when compared to operations that simply capture and store the CO_2.
- The economic return in value-added sequestration provides a near-term incentive to undertake sequestration activities.

Where does the CO_2 come from for Weyburn?

The CO_2 for the Weyburn CO_2 flood and sequestration activities comes from the Great Plains Synfuels Plant owned by the Dakota Gasification Company in Beulah, North Dakota. Each year, the Synfuels Plant converts about 6 million tons of lignite coal to 54 billion cubic feet of synthetic natural gas.[3] The coal gasification process produces nearly pure streams of several by-products, including CO_2. A portion of this CO_2 is transported 320 km (200 mi) by pipeline from the Synfuels Plant north to the Weyburn oil field for use in CO_2 flooding and sequestration.[2]

How does CO_2 flooding work?

CO_2 is pumped into the production formation through an injection well. Once in the production zone, the CO_2 dissolves in the oil, reducing the oil viscosity and making the oil flow more easily to the production well. The CO_2 also causes the oil to swell, helping to mobilize the oil trapped in the pores in the rock and forcing it into channels where it can move through the rock. Much of the CO_2 remains in the production zone dissolved in oil that cannot be moved or as liquid CO_2 in the rock. The CO_2 that comes to the surface with the produced oil is separated, recompressed, and injected back into the reservoir to begin the process again.

What about CO_2 sequestration at Weyburn?

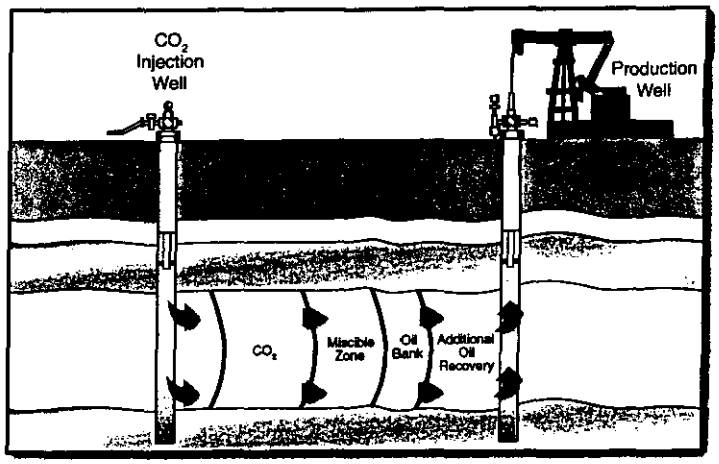
Ultimately, the CO_2 flooding could result in sequestering 20 million metric tons of CO_2 in the Weyburn oil field.[2] The Weyburn site is a field laboratory for a multiyear, international sequestration research effort called the International Energy Agency (IEA) Greenhouse Gas R&D Programme Weyburn CO_2 Monitoring and Storage Project.[2] Begun in 1999 and now in its second phase, the multiyear effort is assessing economics, long-term fate, and security of CO_2 storage in geologic formations. The project is coordinated by the Petroleum Technology Research Centre located in Regina, Saskatchewan.

Who is participating in the IEA Weyburn CO_2 sequestration assessment?[4]

Industry Partners	Government Partners
EnCana Resources	International Energy Agency, Greenhouse Gas R&D Programme
SaskPower	Natural Resources Canada
Nexen Canada Ltd.	U.S. Department of Energy
Dakota Gasification Company	Saskatchewan Industry and Resources
BP	Alberta Energy Research Institute
Trans Alta Utilities	European Commission
ENAA Japan	
Total	

What are the results so far at Weyburn?

The research at Weyburn has confirmed the importance of impervious cap rock (seal on top of reservoir that holds in oil and will hold in CO_2), having detailed knowledge of the site, and the geologic stability of the site (lack of earthquakes and faulting).[5] The field test at Weyburn has also confirmed that existing oil field practices are, in large part, appropriate for ensuring safe CO_2 injection and guarding against the escape of stored CO_2 (given appropriate characteristics).



CO_2 is injected into the oil-producing formations in the Weyburn oil field to improve oil production and to sequester CO_2.[2]

What does Weyburn mean to CO_2 sequestration in this region? Worldwide?

The Weyburn project is the most extensive study of geologic CO_2 sequestration in the world, and its findings can be widely applied in planning and implementing CO_2 sequestration. The findings at Weyburn confirm that CO_2 sequestration can be done safely for humans and the environment at sites with characteristics like those at Weyburn. Weyburn also shows that sequestration can add value to conventional CO_2 flood operations.

Is Weyburn the answer to controlling CO_2?

The 20 million metric tons of CO_2 that will eventually be stored at Weyburn is less than one half of 1%[6] of the annual CO_2 output from energy use in the United States and about 3%[7] of the annual output from the U.S. portion of the PCOR Partnership region.[6-8] The sequestration projects that will build on the Weyburn experience will be a key part of a larger picture of CO_2 control that includes low-CO_2-emission power plants, greater use of renewable fuels, increased efficiency for power systems, and energy conservation.

References and Notes

1. Benson, S.M., Hepple, R., Apps, J., Tsang, C.F., and Lippmann, M., 2004, Lessons learned from natural and industrial analogues for storage of carbon dioxide in deep geological formations: E.O. Lawrence Berkeley National Laboratory Report 1170. **2.** www.ieagreen.org.uk/weyburn.htm. **3.** www.dakotagas.com. **4.** http://script3.ftech.net/~ieagreen/project_specific.php4?project_id=96 **5.** Kovscek, A.R., 2002, Screening criteria for CO_2 storage in oil reservoirs: Petroleum Science and Technology, v. 20, nos. 7 and 8, p. 841–866. **6.** 5.5 million metric tons of carbon (equivalent of 20 million metric tons of CO_2) sequestered at Weyburn divided by 1477 million metric tons of carbon (equivalent to 5406 million metric tons of CO_2) generated in 1999 in the United States (calculated using information from References and Notes No. 8). **7.** 5.5 million metric tons of carbon (equivalent to 20 million metric tons of CO_2) sequestered at Weyburn divided by 163 million metric tons of carbon (equivalent to 597 million metric tons of CO_2) generated in 1999 in the nine-state PCOR Partnership region (calculated using information from References and Notes No. 8). **8.** http://yosemite.epa.gov/oar/globalwarming.nsf/content/ResourceCenterPublicationsGHGEmissionsUSEmissionsInventory2003.html.

The Plains CO_2 Reduction (PCOR) Partnership is a group of public and private sector stakeholders working together to build a better understanding of the technical and economic feasibility of sequestering CO_2 emissions from stationary sources in the northern Great Plains. The PCOR Partnership is coordinated by the Energy & Environmental Research Center (EERC) at the University of North Dakota and is one of seven regional partnerships under the U.S. Department of Energy's Regional Carbon Sequestration Partnership Program. To learn more, contact:

Edward N. Steadman, Senior Research Advisor, (701) 777-5279; esteadman@undeerc.org

John A. Harju, EERC Associate Director for Research, (701) 777-5157; jharju@undeerc.org

Visit the PCOR Partnership Web site at www.undeerc.org/PCOR. New members are welcome!

Sponsored in Part by the U.S. Department of Energy

Dale Niezwaag - Basin Electric Power Cooperative
Supporting North Dakota Senate Bill No. 2170
Senate Finance and Taxation Committee
February 2, 2005

Mr. Chairman and Members of the Committee, my name is Dale Niezwaag representing Basin Electric Power Cooperative in support of S 2170. As you may know, Basin Electric's, subsidiary, the Dakota Gasification Company (DGC), currently makes carbon dioxide sales to EnCana, one of North America's largest oil and gas companies, for enhanced oil recovery in the Weyburn oilfields in Saskatchewan. We are also proceeding to expand our capability to deliver additional CO2 in late 2005 to Apache Canada Ltd for an enhanced oil recovery project in the Midale Unit, which is adjacent, the Weyburn Unit.

The idea for selling carbon dioxide from the DGC plant arose well before the plant was built in the early 1980's. The focus was to use carbon dioxide from the plant for injecting into aging oil fields and recovering oil that otherwise would be lost. In particular, enhanced oil recovery using carbon dioxide from DGC plant would make economic sense for certain reservoirs within the Williston Basin field which lays beneath parts of North Dakota, South Dakota and Montana in the United States and Manitoba and Saskatchewan in Canada.

DGC spent over $100 million to purchase compressors and build a 205-mile pipeline to Weyburn, Saskatchewan and the expansion is estimated to cost an additional $27 million. DGC currently has contracts for 120 million cubic feet of CO2 per day to oilfields in Saskatchewan, Canada and has the potential to for up to 165 million cubic feet per day.

This bill gives an incentive for North Dakota oil producers to use carbon dioxide for enhanced oil recovery. The infrastructure development for using carbon dioxide is expensive. EnCana and

its partners in the Weyburn field plan to invest $1.1 billion Canadian dollars over 15 years in the application of CO2 injection for enhanced oil recovery enhanced oil recovery method. This investment is expected to produce approximately an additional 120 million barrels of oil from the Weyburn field by 2025.

As you can see from our experiences, the investment is very large to undertake CO_2 enhanced oil recovery, but the payback can be also be large for North Dakota in more tertiary oil production that leads to more employment and stabilization of the North Dakota oil industry.

Mr. Chairman, I would support a "Do Pass" vote on SB 2170 and will try to answer any questions you or the committee members might have a this time.

SB 2170 TERTIARY RECOVERY AND CO2
SENATOR WARDNER

SB 2170 DOES TWO THINGS:

SECTIONS 1 AND 2 PROVIDE A SALES TAX EXEMPTION FOR CARBON DIOXIDE USED IN ENHANCED OIL RECOVERY

PRIMARY RECOVERY - 20%

SECONDARY RECOVERY – 15%

TERTIARY RECOVERY - 15%

1) Carbon Dioxide is a green house gas and we are looking for ways to cut the amounts of the CO2 in the atmosphere. Through tertiary oil recovery the CO2 is used to recover oil and then is sequestrated underground. Currently when CO2 Is used for enhanced recovery of oil it is taxed.

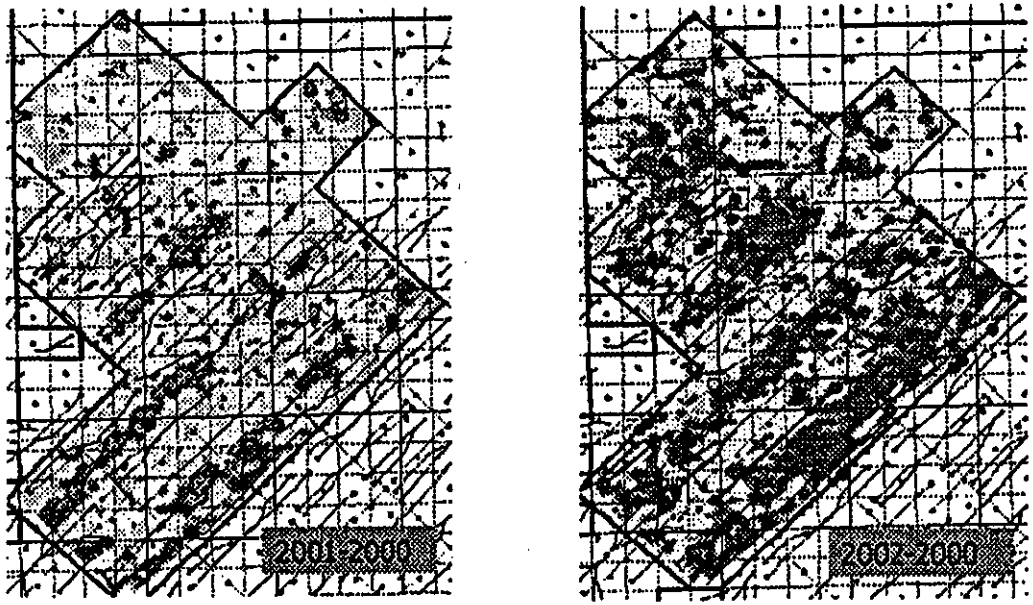
SECTION 3 GRANTS A PERMANENT EXEMPTION FROM THE EXTRACTION TAX FOR INCREMENTAL PRODUCTION FROM A TERTIARY RECOVERY PROJECT.

Incremental oil is the oil that is produced, because of the activity of the tertiary recovery.

Rep Matt Klein
SB 2170

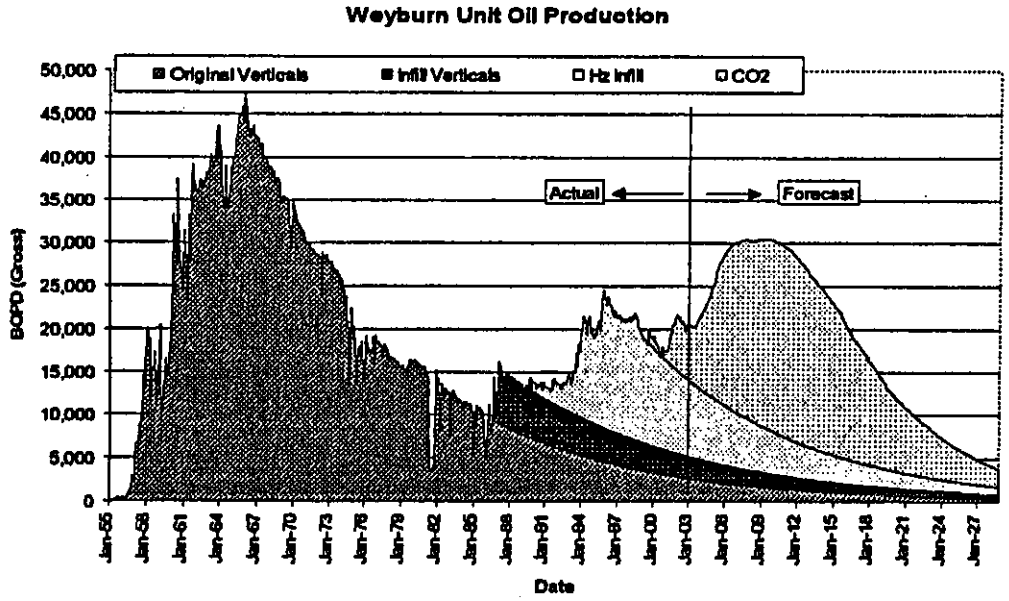
IEA GHG Weyburn CO_2 Monitoring and Storage Project

Exciting Results – We can 'see' the CO_2 in the ground



4D-3C Time-Lapse Seismic Surveys vs. Baseline survey (S ept. 2000)

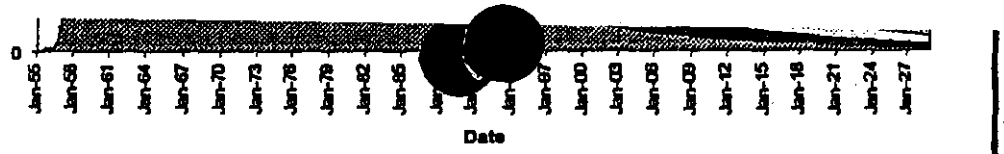
Production Curves



(2)

Operations Update (as of Feb. 29, 2004)

- **CO_2 injection into Phase 1A started September 15, 2000**



Operations Update (as of Feb. 29, 2004)

IEA GHG Weyburn CO_2 Monitoring and Storage Project

- CO_2 injection into Phase 1A started September 15, 2000
- 98 BCF CO_2 injected as of Feb 29th, 2004 (currently 5000 tons per day & the projected total is 20 million tons).
- Current CO_2 purchase is 105MMscfd
- 25 mmscfd of associated gas and CO_2 being recycled
- EOR Operations include Phase 1a (start Sept 2000), Phase 1b (start Oct 2002) and Phase 1c (start June 2003)
- Of the 210 producing wells in the EOR area:
  - 71 producers experienced operational response (CO_2 detected in casing gas)
  - 45 producers experienced production response (incremental production)
- Incremental production was projected at 4500 bbl/day
- Actual Incremental Production is 9000 bbl/day
- Current Unit production 22,400 bbl/day
- 130 million barrels are expected to be produced by CO_2 flooding.

What does it all mean?

- 14 million tons net CO_2 stored over 15 years – after GHG production and energy expenditure are balanced.
- Equivalent of:
  - the annual emissions of 345,000 cars or removing 345,000/year for 15 years (in 2003, there were 825,000 registered vehicles in Saskatchewan)
  - removing 5.2 million cars, or 40% of the vehicles in Saskatchewan, from the road for 15 years

4

Carbon Storage Risk Assessment

An exhaustive Risk Assessment program is planned for Weyburn Phase 2
➢The Weyburn database is critical for risk assessmet Benchmarking

North Dakota Petroleum Council

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Senate Bill 2170

House Finance and Taxation Committee

February 23, 2005

Mr. Chairman, and members of the Committee, my name is Ron Ness, President of the North Dakota Petroleum Council. The North Dakota Petroleum Council represents more than 100 companies involved in all aspects of the oil and gas industry including oil and gas production, refining, pipeline, mineral leasing, consulting, legal work, and oil field service activities in North Dakota, South Dakota, and the Rocky Mountain region. I appear before you today in support of Senate Bill 2170.

I want to provide a brief update on oil and gas activity in North Dakota.

There were 4,135 direct jobs in the oil and gas industry in 2004.

Many immediate and long-term employment job opportunities

- **251 openings posted with Job Service North Dakota since October**
- **211 openings filled in past 3 months –most over $50,000/year income**
- **Future needs - 50% to 75% of employees will retire over the next 2 to 12 years**

Leasing activity is high

- **Over $7 million at the past two state sales – Nearly $13 million at last week's federal lease sale**
- **Still mostly speculative leasing on North Dakota side of the border**
- **Demand for rigs is high**

Budget forecast for 2003-2005 biennium includes nearly $190 million oil and gas tax revenue

- **$ 71 million to general fund**
- **$ 41 million to Permanent Oil Tax Trust Fund**
- **$ 42 million to counties/cities/schools**
- **$ 16 million to Resources Trust Fund**
- **$ 5 million to Oil Impact Fund**
- **$ 7 million from federal leases and royalties to General Fund**
- **$ 7 million from federal leases and royalties to counties/cities/school with federal lands**

Senate Bill 2170 provides a sales tax exemption for CO_2 that is used for enhanced oil recovery. In Section three, the bill also removes the ten-year time limit on the oil extraction tax exemption for incremental oil from tertiary oil recovery projects and makes it permanent.

The permanent extraction tax exemption is significant because of the significant up front cost of tertiary recovery projects and the associated risk, since it can take several years of injection to begin to see positive results. The permanent extraction tax exemption allows a company to amortize the tax savings over a longer

period. The five percent gross production tax will be in place over the life of the project and the oil extraction tax will be in place for all of the oil that would have been produced without the project. That proposed tax exemption would apply only to the incremental, or additional, recovery.

Eliminating the sales tax on CO_2 that is injected for enhanced oil recovery, in essence, delays the tax collection until the oil is recovered. If the CO_2 was injected for storage purposes only, it would not be taxed since there is no economic value to the CO_2. Injecting the CO_2 into an oil-producing reservoir sequesters the greenhouse gas in an environmentally friendly matter and provides the economic benefit of additional recovery of oil.

Why pass this bill:

- CO_2 from North Dakota is being used effectively in Canada to enhance oil production in aging oil fields and the pipeline transporting the CO_2 runs right through several North Dakota oil fields that have potential for CO_2 use. The economics in Canada are vastly different than in North Dakota. In Canada, the government owns most of the minerals and the recoverable oil from those fields currently using CO_2 rivals the combined potential of many of the North Dakota fields that may be candidates for tertiary recovery projects.
- Win-win situation – sequestering a greenhouse gas and recovering additional oil
- Tertiary recovery provides the state with long-term tax revenues by extending the life of wells
- Should we be taxing a greenhouse gas?
- If the CO_2 wasn't sold and used, it would likely be vented into the atmosphere
- Sales tax will be collected on the infrastructure needs in the oil field for CO_2 injection
- Gross production will be collected when the oil is produced as a result of CO_2 injection
- President Bush's Global Climate Change Initiative (GCCI) commits the United States to an aggressive strategy to reduce greenhouse gas (GHC) intensity by 18% over the next 10 years. This would be part of an overall U.S. effort as an alternative to the Koyoto Agreement.
- Tertiary recovery could add 15–30 years to life of many wells and continue the economic benefit equated with each of those wells. Many of these wells may otherwise be plugged in the next 10 years if we don't use tertiary recovery.

There is no question CO_2 can be used to increase oil recoveries. Providing an economic way to sequester the gas helps make the coal gasification plant at Beulah, as well as some ethanol plants, more economically

secure and environmentally friendly. Getting the gas to the oil fields is an expensive and risky proposition. While there isn't much government can do about the costs involved, this bill is a signal that the State of North Dakota wants to encourage responsible use of CO_2, continued operation of the gasification plant, and increased production of oil.

Currently, there are no tertiary recovery projects using CO_2 in North Dakota. This bill is not a silver bullet toward getting these projects moving. The cost of CO_2 and economics will determine if companies move forward. However, this bill is a start and we urge your support for it. I would be happy to answer any questions.

State of
North Dakota
Office of the Governor

John Hoeven
Governor

NEWS

FOR IMMEDIATE RELEASE
February 1, 2005

Contact: Don Canton or Don Larson
(701) 328-2200

HOEVEN, LEGISLATORS ANNOUNCE EXPANSION OF OIL AND GAS TAX INCENTIVE

BISMARCK, N.D. – Gov. John Hoeven, Sen. Rich Wardner and members of the state Senate and House today announced the introduction of SB2170, a new bill that would expand the tax incentive for tertiary, or third tier, recovery of oil and gas using CO2 gas. The bill would provide a use and sales tax exemption for carbon dioxide that is used for enhanced oil recovery, and make the oil extraction tax exemption for oil from CO2 recovery projects permanent.

"North Dakota is the sixth largest energy producing state in the nation, and the ninth largest petroleum producing state," Hoeven said. "The technology that this bill encourages can help to substantially increase production in our state, generating good paying jobs for our citizens and added revenues for our rural communities."

"By encouraging tertiary recovery – that is, third phase oil recovery – this bill can help us recover 25 to 40 percent more of North Dakota's oil reserves and extend the life of existing oil wells by 20 to 30 years," said Wardner, the bill's primary sponsor. "To date, we have not used this technology in North Dakota."

Joining the Governor and Wardner for the announcement were the bill's additional sponsors: Sens. Stanley Lyson and David O'Connell, and Reps. Glen Froseth, Earl Rennerfeldt and Dorvan Solberg.

Also joining were Bob Mau, president and owner of Eagle Operating of Kenmare and chairman of the North Dakota Petroleum Council; Ron Ness, president of the North Dakota Petroleum Council; Dr. Gerry Groenewold, Director of the Environmental and Energy Research Center (EERC) at the University of North Dakota; and Lynn Helms of the North Dakota Oil and Gas Division (NDOGD).

The CO2 technique the bill encourages would not only boost the productivity of oil wells, but also reduce the venting of greenhouse gases to the atmosphere by sequestering it underground. The EERC and the NDOGD estimate that there are 261 million barrels of oil in the ground that will be accessible using the new CO2 technology.

The technology has been used for some time in Canada using CO2 produced and piped across the border, in some cases running through North Dakota oil fields. There are currently no such CO2 projects in North Dakota. SB2170 would eliminate one more obstacle to additional recovery in North Dakota.

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Fletcher Poling - Basin Electric Power Cooperative
Supporting North Dakota Senate Bill No. 2170
House Finance and Taxation Committee
February 23, 2005

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its partners in the Weyburn field plan to invest $1.1 billion Canadian dollars over 15 years in the application of CO2 injection for enhanced oil recovery enhanced oil recovery method. This investment is expected to produce approximately an additional 120 million barrels of oil from the Weyburn field by 2025.

As you can see from our experiences, the investment is very large to undertake CO_2 enhanced oil recovery, but the payback can be also be large for North Dakota in more tertiary oil production that leads to more employment and stabilization of the North Dakota oil industry.

Mr. Chairman, I would encourage a "Do Pass" vote on SB 2170 and will try to answer any questions you or the committee members might have a this time.