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COALBED METHANE DEVELOPMENT IN MONTANA

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COMMITTEE ON APPROPRIATIONS

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COALBED METHANE DEVELOPMENT IN MONTANA

SATURDAY, MARCH 10, 2001

U.S. SENATE,
SUBCOMMITTEE ON INTERIOR AND RELATED AGENCIES,
COMMITTEE ON APPROPRIATIONS,
Billings, MT.

The subcommittee met at 10:01 a.m., in the ballroom of the Student Union Building of Montana State University, Billings, MT, Hon. Conrad Burns (chairman) presiding.

Present: Senator Burns.

Also present: Senator Baucus.

OPENING STATEMENT OF SENATOR CONRAD BURNS

Senator BURNS. We will gavel this committee to order. This is the Appropriations Subcommittee on Interior Appropriations. And we have seen sort of a—over the past couple of years we have seen a law that the government did not write that is working very well right now, called the law of supply and demand. And, of course, the energy has been in the minds of and also in the pocketbooks of a lot of people in the last couple of years. We see a lot of things happening.

So I would like to thank our witnesses for coming today and everybody that is in here because it does indicate quite a lot of interest in what is going on, not only here in our State, but Wyoming and, of course, energy production across this country.

Everyone in this room is familiar with both the economic potential and the possible environmental concerns associated with coalbed methane development. I was pleased to see both KTVQ here in Billings and the Billings Gazette set the stage for this hearing for their recent series on coalbed methane development.

It is my hope that today will shed more light on some of the concerns mentioned in those articles and give us an idea as to how we can move ahead with responsible development that will allow Montana to capture the potential of this resource. Not only does Montana want to be a part of solving the problem on energy, but we also should participate in the benefits of those.

The economics of coalbed methane development are staggering. All estimates of gas volume in the area reach into the tens of trillions of cubic feet of available gas. The estimated value of that gas deposit has reached as high as $70 billion. A majority of potential lies in Wyoming, but Montana has the opportunity to capture a sizeable portion of this economic boom.

With our current budget concerns in the State, royalties and the tax base that this development will provide is a welcome addition to the State's revenue stream. This added money could be invested in our education system, used to foster economic development in new industry sectors, and new opportunity comes at a time when Montana needs it most.

And our congratulations goes to my colleague to my left here because he started this idea of economic development a year ago, been holding meetings. And we would hope that it would fit into his ideas and all of our ideas on how we turn this State around economically.

Montana has seen the boom and bust before, and the impacts sometimes were negative. Environmental concerns must be addressed, and they must ensure that we are not threatening the agricultural section of the region. Water is our most precious resource, and Montana's largest economic sector, agriculture, is dependent on it.

Montana has some of the most stringent environmental guidelines in the world because we recognize the land is the foundation for our quality of life as well as our economy. We must ensure that the Federal agencies have adequate funding and environmental impact statements prepared in a timely manner. We must explore options to mitigate the impacts of water disposal and find ways to do so in a manner that makes economic sense.

So I want to close by reminding everyone here of the greater potential available. Right now America is facing an energy crunch. I was struck by—I went and made a speech to the consumer electronics industry about a month ago, and especially we are seeing the blackouts and the rolling blackouts in California.

And some of that that is going on in California is self-imposed by their own State and their attitude towards energy, but they are a part of this Union. And their economy is so large. No matter what they do, they have impacts on the rest of us, especially us in the Northwest. So we want to be a part of the solution, not a part of the problem.

And we also know that fossil fuels—we are going to put more money into clean coal technology and in ways that we can use the energy, and we can be a positive answer before America. It is essential. I do not think there is anything that is contributing to the economic slowdown in this country right now as the energy impact is having on our country.

We have the best and the brightest in the room today. And I hope we can sit back, discuss these issues frankly in order to create a strong record of detailing the best option and then move ahead. Make the decision and do it.

And again I want to thank Senator Baucus, who is the ranking member on the Senate Finance Committee, for attending today. And, Max, thank you very much for coming. And if you have a statement, why, it's all yours.

STATEMENT OF SENATOR MAX BAUCUS

Senator BAUCUS. Thank you very much, Conrad.

This is clearly a very important decision for us in Montana. Wyoming has reaped huge benefits in the development of coalbed meth-

ane gas. I am struck with the disparity between our respective State legislatures' abilities to balance their budgets, and Helena having a very difficult time. And clearly Wyoming has a large surplus. And it is also true that a lot of people individually have benefitted from the development of coalbed methane gas.

We stated the obvious. We do know the problems that are associated—whether it is water quantity, water quality, erosion, other roads and fumes and whatnot—all the problems that are associated with development. I suppose they are not always problems, but they are problems to some people. So the real key question is how to best find balance and how best to mitigate against any potential problems that might arise so that we can have the benefits but minimize the problems; recognizing that there's no free lunch.

It is something we all know more and more as we grow older, that there always are trade-offs. There is compensation in everything. So that those who see large dollar signs might have to back off a little bit and help work to mitigate against some of the adverse effects. On the other hand, those who see nothing but disaster might have to also think a little bit more, back off a bit and look for ways to see if maybe they can—that there are ways to mitigate potential problems, and maybe they can find some benefits as well.

So I just urge all of us to—while we are giving facts and points of view, to also sit back a bit and listen, and particularly listen to the other guy's point of view and put ourselves in the shoes of the other person a little bit, because in so doing we are more likely to find, I think, a solution in how to deal with all of the questions that evolve around this.

We can learn a lot from Wyoming. And Wyoming, they're ahead of us.

Senator BURNS. And we cannot allow that to continue.

Senator BAUCUS. In all respects.

But we can learn. That's an advantage we do have here at home.

So I am just very honored to be here and be a part of this hearing and very much thank my colleague. You know, this 2001, this millennium is kind of a new era. The Montana delegation is really starting to work real well together here. Now, that might not be a good thing, but I think it is a good thing. And I just wanted to compliment Conrad for inviting me to join him here. And who knows? There may be some reciprocation on down the road. Let's get on with it.

Senator BURNS. Thank you, Senator, and we appreciate you being here.

We are going to open the panel up this morning with three representatives we think that can sort of lay the groundwork for us today and to take into consideration what they have to say and, of course, the questions we may have for them. We have Tom Richmond, who is the administrator of the State of Montana Oil and Gas Board; Mat Millenbach, who is the Montana State director for the BLM—and, Mat, congratulations on being named to that—and Bill Hochheiser, environmental program manager, Office of Natural Gas and Petroleum in the Department of Energy. So we appreciate you gentlemen being here today.

STATEMENT OF THOMAS P. RICHMOND, ADMINISTRATOR, MONTANA BOARD OF OIL AND GAS CONSERVATION

Senator BURNS. And we are going to ask Tom Richmond if he will open up with his testimony today, and we look forward to hearing from you.

Mr. RICHMOND. Thank you, Mr. Chairman, Senator Baucus.

Senator BURNS. You might want to pull that microphone up to you because we want everybody to hear every word they will hang on.

Mr. RICHMOND. I was going to thank you for making my Saturday interesting.

Senator BURNS. I figured you need one.

Mr. RICHMOND. Again, thank you for the opportunity to discuss coalbed methane development in Montana.

The Montana Board of Oil and Gas Conservation is the regulatory agency for oil and gas development activities on State-owned and private land in Montana. Our board consists of seven members appointed by the governor, including industry representatives, landowners, and public members.

We regulate industry activities to prevent economic and physical waste, to conserve oil and gas resources by establishing rules for exploration and production, and we protect the property rights of the owners of oil and gas. We are very interested in seeing that coalbed methane development occurs in a way that maximizes the recovery of the gas resource while protecting the land and water resources.

Through a process of notice and public hearing our board establishes the parameters that determine the density of wells; the minimum distances that wells can be drilled from property lines; and the drilling, completion, and producing practices appropriate for a particular area. We have been doing this since 1954.

The board developed a programmatic environmental impact statement in 1989 to incorporate environmental review and assessment processes into its regulatory activities. The board's environmental review process is required by the Montana Environmental Policy Act, legislation that mirrors the National Environmental Policy Act.

There have been CBM exploration activities in Montana for a number of years. In 1990, two wells were drilled in the vicinity of Decker, Montana, to test the wall and canyon coals of the Fort Union formation for potential gas production. One of those wells reported an initial production capacity of 75,000 cubic feet of gas per day.

In 1990 and 1991, a Billings-based operator drilled several wells in the Bear Creek area in Carbon County to test for gas in the Fort Union formation. And some gas was encountered in those wells.

In 1995, another operator drilled a well near Boyd in Carbon County to test deeper, geologically older wells in—older coals in Eagle formation. This well encountered no commercial shows of natural gas, but did encounter very high quality water.

Also in 1995, Redstone Gas Partners drilled seven CBM test wells in the Decker area. More CBM exploration and production activities occurred in Big Horn County in 1997 as Redstone expanded the Tongue River pilot project. In that year we permitted 31 CBM

wells. 41 more wells were permitted in 1998, and 156 wells in 1999.

We had issued an additional 24 permits by the time Northern Plains Resource Council filed its lawsuit against the board in March of 2000. I should note that not every permitted well is drilled. In the case of these several permits, a number of them have expired or been withdrawn.

As a result of NPRC's lawsuit, the board instituted a moratorium in new CBM permits. In June 2000, we agreed with NPRC to settle the lawsuit. The agreement provides for the completion of the Redstone project by authorizing the drilling of up to 325 wells, 250 of which may be produced commercially.

The drilling of an additional 200 wells on a statewide basis is allowed under the stipulations that prohibit commercial production and the discharge of produced water. The board agreed to prepare or participate in the preparation of an environmental document that would supplement it's 1989 programmatic to cover coalbed methane exploration and production.

A 1999 report from the Gas Research Institute attributes 39 trillion cubic feet of natural gas to the coalbeds in the Powder River Basin in Montana and Wyoming, 3.7 trillion cubic feet to coalbed—coal basins entirely within the State, and another 3 trillion cubic feet to the Big Horn Basin, also shared with Wyoming.

There are varying opinions as to the recoverable portion of gas attributed to Montana, but clearly our CBM resources present a significant opportunity for economic development in a part of our State where opportunities are scarce.

Development of natural gas from coalbeds presents unique challenges to regulatory agencies such as our board. No one in my organization believes we should trade away or impair the traditional agricultural base of the areas likely to be affected by CBM. Yet it is our experience that oil and gas and agriculture coexist, perhaps not without occasional conflict, but certainly without the need for one use to exclude the other.

Our challenge is to implement a regulatory framework that uses good sense and good science to manage the impacts of development. As we educate ourselves about CBM development, we also need to educate others about our existing regulatory framework and about those new problems we need to address. The CBM environmental impact statement will be the centerpiece of this education effort.

The board regulates oil and gas activities on private and State-owned lands, but has no power to determine when or if those lands are leased for oil and gas. The parties to the lease determine the terms and conditions of development. Our board is challenged by the need to assure equity in development of oil and gas resources. Each owner must be afforded the opportunity to recover his or her fair share of the resource.

We have had a long and mutually beneficial relationship with BLM in Montana in regulating the spacing and location of the wells to ensure that both the public interest and the interests of the private landowners are protected. The joint Federal/State EIS builds on that relationship and provides a measure of assurance that neither public nor private land will be disadvantaged by agencies of government failing to reach decisions concurrently.

The Senate Interior Appropriations Subcommittee's timely financial support of the CBM EIS in BLM's current year has allowed this effort to proceed within the time frame we had predicted would be needed if the board were to independently develop a supplement to our programmatic.

I want to thank the subcommittee for its support of some Department of Energy issues in two key areas important to us. The first is the database that we use to track and generate statistics for coalbed methane activities, as well as conventional oil and gas, and UIC in Montana, underground injection controls.

This is the risk-based data management system that was developed through the Ground Water Protection Council using DOE grant money. Montana was one of the original four test States to develop the system. Now 14 States use all or part of RBDMS, and the States of Alaska and North Dakota will soon be using RBDMS to run their oil and gas programs.

DOE's ongoing support of RBDMS has allowed us to develop a website that both industry and the public can use to obtain information and track development on a real-time basis. All of our permitting activities and completion reports and other information is updated daily.

The second DOE project that we are participating in involves the development of best management practices for CBM. And it will include a computer-based geographic information system to facilitate better decision making. An important part of this process is sharing data with both industry and the public.

Natural gas is a premium fuel and its demand to generate electricity for both new power plants and as a replacement for other fuels makes unconventional sources such as CBM economic to recover. Natural gas has been the fuel of choice for space heating in residential and commercial establishments for many years, and that demand continues to grow. Montana coal fields contain a significant resource of natural gas that can be developed with this need.

PREPARED STATEMENT

To add our resources to the nation's gas supply requires that we complete the necessary environmental planning, develop appropriate mitigation, and provide a framework necessary to assure good decisions. We have joined with our State and Federal partners in an ambitious schedule to accomplish these goals as quickly as possible. This committee's support of the DOE programs and the Federal/State EIS is very much appreciated.

Thank you for the opportunity to testify today.

[The statement follows:]

PREPARED STATEMENT OF THOMAS P. RICHMOND

Thank you for the opportunity to discuss Coal Bed methane development in Montana.

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curs in a way that maximizes the recovery of the gas resource while protecting land and water resources.

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As a result of NPRC's lawsuit, the Board instituted a moratorium on new CBM permits. In June 2000, we agreed with NPRC to settle the lawsuit. The agreement provides for the completion of the Redstone project by authorizing the drilling of up to 325 wells, 250 of which may be produced commercially in the Decker area. The drilling of up to 200 additional exploratory wells on a statewide basis is allowed under stipulations that prohibit commercial production and discharge of produced water. The Board agreed to prepare or participate in the preparation of an environmental document that supplements its 1989 Programmatic EIS to cover coal bed methane exploration and production activities.

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The Board of Oil and Gas Conservation regulates oil and gas activity on private and state-owned lands, but it has no power to determine when or if those lands are leased for oil and gas. The parties to the lease determine the terms and conditions of development. Our Board is further challenged by the need to assure equity in development of oil and gas resources. Each owner must be afforded the opportunity to recover his or her fair share of the resource. We have had a long and mutually beneficial relationship with BLM in Montana in regulating the spacing and location of wells to ensure that both the public interest and the interests of private owners are protected. The joint Federal/State EIS builds on that relationship and provides a measure of assurance that neither public nor private land will be disadvantaged by agencies of government failing to reach decisions concurrently. The Senate Interior Appropriations Subcommittee's timely financial support of the CBM EIS in BLM's current year appropriation has allowed this effort to proceed within the same timeframe we had predicted would be needed if the Board were to independently develop a supplement to our 1989 Programmatic EIS.

I also thank the subcommittee for its support of the Department of Energy budget in two areas important to CBM development and to my agency. The first is the database we are using to track and generate statistics for Coal Bed Methane activities as well as conventional oil and gas and Underground injection in Montana. The Risk Based Data Management System was developed through the Ground Water Protection Council using a DOE grant. Montana was one of four test states in the development of this system; now over 14 states use all or part of RBDMS to operate their Oil and Gas programs; the states of Alaska and North Dakota will soon be added to the list.

DOE's ongoing support of RBDMS has allowed us to develop a website both industry and the public can use to obtain information and track development on a real time basis. All our permitting activity, well completion information and production are replicated to our web server daily. The second DOE project in which we are participating involves the development of Best Management Practices and mitigation strategies for CBM based on production practices in specific environmental settings. A computer based geographic information system will be developed to facilitate better decision-making and manage environmental concerns on a site-specific basis. An important feature of the project is sharing of the GIS system and data with industry and the public using the Internet. We are just staring the initial phase of this project and have received a great deal of assistance and support from our DOE Program Manager, Mr. John Ford in DOE's National Petroleum Technology office in Tulsa.

Natural gas is a premium fuel and the demand for gas to generate electricity for both new power plants and as a replacement for other fuels in existing plants makes unconventional gas such as CBM economic to recover. Natural gas has been the fuel of choice for space heating in residential and commercial establishments for many years and that demand continues to grow. Montana's coal beds contain a significant resource of natural gas that can be developed to meet this need. To add our resources to the nation's gas supply requires that we complete necessary environmental planning, develop appropriate mitigation, and provide a framework necessary to assure good decisions. We have joined with our state and federal partners in an ambitious schedule to accomplish these goals as quickly as possible. This committee's support of the DOE programs and the State/Federal EIS is very much appreciated. Thank you again for the opportunity to testify today.

Senator BURNS. Thank you. And I failed to mention we are going to kind of hold you to anywhere around 5 minutes, if you can consolidate your statements. But your full statement will be made part of the record. But if you could consolidate, that would sure help us along.

STATEMENT OF MAT MILLENBACH, STATE DIRECTOR, MONTANA, BUREAU OF LAND MANAGEMENT

Senator BURNS. Mat Millenbach, who is the new director for the Montana District of Bureau of Land Management. And, Mat, congratulations, and thanks for giving up your Saturday today.

Mr. MILLENBACH. Thanks, Senator Burns, Senator Baucus. I appreciate the opportunity to appear here today and discuss the development of coalbed methane resources in the Powder River Basin in Montana.

First of all, I would like to introduce some of the folks that are here from the BLM. Al Pierson, down here in the front row, is the State director for Wyoming, who will be here to answer any question you might have about BLM development down there. And then Fred O'Farrell in the blue shirt and Jim Lidown in the blue sport coat are our coalbed methane experts in Miles City.

As you know, the Powder River Basin contains large coal deposits that have methane gas trapped in the coal seams. Recently there has been a significant increase in coalbed methane production within the basin, particularly in Wyoming, where over 8,500 private, State, and Federal coalbed methane wells have been

drilled. And it's estimated that roughly 50 percent of them are now producing.

Currently in Montana, there are about 215 producing coalbed methane wells. All of these wells are nonfederal wells. With rising natural gas prices, the industry is interested in coalbed methane development in southeastern and south central Montana. And we put up a couple of maps here so you can refer to those as you need.

More than 50 percent of the oil and gas estate within the Montana portion of the Powder River Basin with high or moderate potential for development of coalbed methane is federally-owned. Furthermore, approximately 60 percent of the Federal oil and gas estate in this portion of the Powder River Basin is already leased.

Recognizing that environmentally responsible development of coalbed methane resources can be an important element of our national energy strategy, I believe that we should have the following three guiding principles: First, we need to set resource protection standards and make sure those standards are met. Second, industry should be responsible for the costs of developing the resources, not the neighboring landowners or the taxpayers. And third, companies must clean up after themselves and restore the land when their activities cease.

Before we can make permanent decisions that respond to the new and greatly expanded interest in coalbed methane development we need to have an up-to-date analysis of its potential impacts. To make this analysis of both conventional oil and gas and expanded coalbed methane development, BLM and the State of Montana are preparing a joint environmental impact statement. A memorandum of understanding signed by the BLM and the Montana Department of Environmental Quality as co-leads is now being amended to include the Montana Board of Oil and Gas Conservation.

A memorandum of understanding has also been signed with the Bureau of Indian Affairs as a cooperating agency for the environmental statement. In addition, agreements are being developed that would add the Crow and Northern Cheyenne Tribes and the Environmental Protection Agency as cooperators.

BLM's part of the environmental statement will focus on amending our Billings and Powder River resource management plans. And those can be seen on the map outlined in the dark black line around south central and southeastern Montana.

Scoping for the environmental statement began in December of 2000. This past January more than 300 people attended public scoping meetings in Miles City, Billings, Ashland, Broadus, and Helena. BLM received about 200 letters during the scoping period. The major issues raised were related to the potential impacts of coalbed methane development on ground water and surface water resources, water quality, impacts to soil and land use, introduction of nonnative plants and noxious weeds, and air quality.

During preparation of the environmental statement, BLM will process applications for permit to drill for conventional oil and gas wells, but for coalbed methane wells we will only be approving drilling permits for drilling and testing in areas not previously explored. Drilling and testing coalbed methane wells will provide needed data that can be used in the environmental statement.

Until our environmental statement is completed, coalbed methane will not be produced for sale from any Federal wells, and any water produced from test wells will be contained on site in tanks or reserve pits.

We are planning to have a draft environmental statement available for a 90-day public review period by the end of this year. Using this schedule, a final environmental impact statement should be ready as soon as summer of 2002, followed by a 30-day protest period.

BLM has signed a contract with Arthur, Langhus & Layne to prepare the environmental impact statement. This contractor has a wide range of experience and skills, including expertise in hydrology, soils, wildlife, and tribal consultation. Work on the environmental statement between BLM and the contractor is progressing on schedule.

There are a number of important issues the environmental statement will address. Water is vital to the development of coalbed methane. The coalbed methane extraction process involves pumping water from the coal seams to the surface in order to reduce the water pressure that traps the gas in the coal.

BLM has met with the Montana Bureau of Mines and Geology, the Department of Environmental Quality, the Board of Oil and Gas Conservation, and our environmental statement contractor to discuss ways to analyze potential impacts to ground water. These parties agree that the analyses need to address the major issues at both the regional and local level. We will attempt to identify areas that could experience the greatest impact.

Finally, we want to include a level of detail to show what could be expected at a local level and provide landowners with information for negotiating water well mitigation agreements.

Managing the water produced with methane is a challenge to the oil and gas industry, as well as Federal and State regulators. We all need to work together to find the solutions and innovations to address the surface water issues and potentials. All water disposal options would be handled in accordance with applicable laws and regulations, and could include water injection, infiltration, treatment prior to discharge, discharge into waterways, and beneficial uses such as dust abatement, stock watering, creation of wildlife watering areas, and establishment of fisheries.

Monitoring wells will be used to assess the impacts to ground water, comparing actual drawdown conditions to those that are predicted in the environmental statement. Additionally, water quality sampling data will be obtained from other sites for this same purpose.

BLM Montana and Wyoming are presently discussing the appropriate model to use to assess the impacts to air quality in Montana. BLM in both States is committed to sharing all resource data in the northern portion of the Powder River Basin that straddles the States in order to better analyze cumulative impacts resulting from coalbed methane development in both States.

A major step in completing the environmental statement is determining how much future development is reasonable to expect. In the fall of 2000, the oil and gas industry predicted approximately 10,000 wells to be drilled in the northern Powder River Basin in

Montana. Although BLM's review is still in the preliminary stage, we believe that number could be considerably higher.

Public involvement is another important aspect of our environmental statement, and the public has many opportunities, through this process, to participate.

PREPARED STATEMENT

We also have the coalbed methane coordination group, consisting of Federal, State, and tribal agencies, landowners, industry and environmental groups. And we intend to keep that in place and use that for our deliberations.

This concludes my statement. I would be pleased to answer any questions that members may have.

[The statement follows:]

PREPARED STATEMENT OF MAT MILLENBACH

Mr. Chairman and members of the Subcommittee, I appreciate the opportunity to appear here today to discuss the development of the coalbed methane resources of the Powder River Basin in Montana.

COALBED METHANE DEVELOPMENT IN MONTANA

As you know, the Powder River Basin contains large coal deposits that have methane gas trapped in the coal seams. Recently, there has been a significant increase in coalbed methane (CBM) production within the Basin—particularly in Wyoming, where over 8,500 private, state and federal CBM wells have been drilled, and it is estimated that roughly 50 percent of them are now producing. Currently in Montana, there are about 215 producing CBM wells. All of these wells are non-federal wells. With rising natural gas prices, industry is interested in coalbed methane development in southeastern and south central Montana. More than 50 percent of the oil and gas estate within the Montana portion of the Powder River Basin with high or moderate potential for development of CBM is Federally-owned. Furthermore, approximately 60 percent of the Federal oil and gas estate in this portion of the Powder River Basin is already leased.

Recognizing that the environmentally responsible development of CBM resources can be an important element of our national energy strategy, I believe we should have the following three guiding principles:

(1) We need to set resource protection standards and make sure those standards are met;

(2) Industry should be responsible for the costs of developing the resource—not the neighboring landowners or taxpayers; and

(3) Companies must clean up after themselves and restore the land when their activities cease.

Before we can make permitting decisions that respond to the new and greatly expanded interest in CBM development, we need to have an up-to-date analysis of its potential impacts. To make this analysis of both conventional oil and gas and expanded coalbed methane development, BLM and the State of Montana are preparing a joint environmental impact statement (EIS). We began analyzing a 1998 industry proposal—by Redstone Gas Partners—to pursue limited CBM exploration and development in the Powder River Basin through an environmental assessment (EA). However, work on the EA was halted when our analysis showed that potential impacts were sufficiently significant to justify preparation of an EIS. The current EIS will include the Redstone area, and it will provide the foundation for oil and gas decisions made by each agency involved in this process.

For the State of Montana, the planning area (or scope) of the EIS is statewide with emphasis on the BLM planning area in southeast and south central Montana, and three areas in Blaine, Park and Gallatin Counties. A Memorandum of Understanding (MOU) signed by BLM and the Montana Department of Environmental Quality (DEQ) as co-leads is now being amended at the Governor's direction to include the Montana Board of Oil and Gas Conservation. An MOU also has been signed with Bureau of Indian Affairs (BIA) as a cooperating agency for preparation of the EIS. In addition, MOUs are being developed that would add the Crow and Northern Cheyenne Indian Tribes and the Environmental Protection Agency (EPA)

as cooperators in the EIS. The MOUs outline the roles and responsibilities of each agency and provide guidance through the EIS process.

At this time, it seems likely that the scope for BLM's part of the EIS will focus on amending our Billings and Powder River Resource Management Plans (RMPs). We will make a final decision on the geographic scope after the contractor has completed an analysis of the public comments received during scoping. The Powder River RMP area encompasses 2,522,950 acres of BLM-administered mineral estate, including oil and gas, in southeast Montana. The Billings RMP area encompasses the south central portion of Montana consisting of 662,066 acres of BLM-administered oil and gas mineral estate. These plans were written in the 1980s and were amended in 1994. At the time of the 1994 amendment, large-scale CBM development was not a major interest of industry. Our amendment reflected then-current and foreseeable needs and analyzed conventional oil and gas development and limited CBM exploration and production. The new EIS will include a reasonably foreseeable development scenario for both CBM and conventional oil and gas.

Scoping for the EIS began in December 2000. This past January, more than 300 people attended public scoping meetings in Miles City, Billings, Ashland, Broadus and Helena. The scoping period for the EIS ended January 31, 2001. BLM received about 200 letters during the scoping period. The major issues raised were related to the potential impacts of CBM development on groundwater and surface water resources, water quality, impacts to soil and land use, introduction of non-native plants and noxious weeds, and air quality.

During preparation of the EIS, BLM will process Applications for Permit to Drill (APDs) for conventional oil and gas wells, but for CBM wells we will only approve APDs for drilling and testing in areas not previously explored. Drilling and testing CBM wells will provide needed data concerning coal, gas and water that can be used for analysis in the EIS. Until our EIS is completed, CBM will not be produced for sale from any Federal wells, and any water produced from test wells will be contained on site in tanks or reserve pits.

Currently, CBM production only occurs from wells on private and State leases within the CX Field, which is located in Big Horn County. The State can approve up to 200 permits for drilling and testing CBM wells outside of the CX Field in Big Horn County in accordance with a settlement agreement with the Northern Plains Resource Council (NPRC). The State can continue to approve permits for conventional oil and gas wells during preparation of the EIS.

Industry has expressed interest in exploring for CBM in areas adjacent to the CX Field, as well as portions of Big Horn, Powder River, Carbon, Rosebud, Stillwater, Gallatin, Park and Blaine Counties. In response to this interest, these are among the areas that are likely to be evaluated in the EIS.

The NPRC also has served a Notice of Intent to file a lawsuit against BLM alleging that the Bureau approved APDs for conventional oil and gas and CBM wells in violation of the Clean Water Act. Although we believe we are in compliance with requirements of the Act, we are consulting with DEQ about each agency's roles and responsibilities under the Act. After completing the consultation, BLM will send a written response to the NPRC and also request a meeting to discuss the matter.

Presently, the EIS contractor is analyzing the public comments received during the scoping process to identify issues and alternatives for the draft EIS. The contractor is also collecting existing resource data that will be used to analyze impacts. We continue to consult and exchange information with State, Federal, and tribal agencies, as well as other interested parties. A newsletter detailing the status of the EIS will be available by June 2001.

We are planning to have a draft EIS available for a 90-day public review by the end of this year. Using this schedule, a final EIS could be ready as soon as the summer of 2002, which would be followed by a 30-day protest period.

BLM has signed a contract with Arthur, Langhus & Layne (ALL) to prepare the EIS. A subcontractor will assist ALL in the preparation of the EIS. Both companies have a wide range of experience and skills—including expertise in hydrology, soils, wildlife, and tribal consultation—that is needed to address oil and gas operations and to analyze their potential impacts. Work on the EIS between BLM and the contractor is progressing on schedule.

IMPORTANT ISSUES TO BE ADDRESSED

Water issues

Water is vital in the development of CBM. The CBM extraction process involves pumping water from the coal seams to the surface in order to reduce the water pressure that traps the gas in the coal. Coalbed methane wells are drilled into the coal seam with the casing sealed above the coal. A standard water pump is used to de-

liver water to the surface. The combined effect of many wells pumping simultaneously reduces the water level in the coal in the vicinity of the wells that are pumping. This lowers the water pressure and allows the methane to migrate up the well. Among other things, the public is concerned about potential cumulative effects to groundwater, how long it will take to recharge aquifers, and any potential harm to private water wells and springs.

BLM has met with the Montana Bureau of Mines and Geology (MBMG), the Department of Environmental Quality, the Board of Oil and Gas Conservation, and our EIS contractor to discuss ways to analyze potential impacts to groundwater. In order to complete the EIS, these parties agreed that the analyses need to address the major issues at both a regional and local level. We will attempt to identify areas that could experience the greatest impacts. Finally, we want to include a level of detail to show what could be expected at a local level to provide landowners with information for negotiating water well mitigation agreements. The approach agreed upon to address this analysis will result in a groundwater resources technical report. Part of this report will include 2-D Draw-down Models according to site-specific conditions representing 3 or 4 different groundwater situations and CBM development scenarios. The MBMG will actively participate by providing existing groundwater data and aquifer characteristics to the contractor and reviewing work products. After the Technical Report is completed, the groundwater analyses group, including the MBMG, the EPA and the other cooperators, will determine if the analyses' goals were achieved or if further analyses and more intensive modeling is necessary.

Managing the water produced with methane is a challenge to the oil and gas industry, as well as Federal and State regulators. We all need to work together to find the solutions and innovations to address the surface water issues and potential impacts to the entire land and water system, including soil, vegetation, and land use. All water disposal options would be handled in accordance with applicable laws and regulations and could include water reinjection, infiltration, treatment prior to discharge, discharge into waterways, and beneficial uses such as dust abatement, stock watering, creation of wildlife watering areas, and establishment of fisheries. The State of Montana, the BLM and the EPA are genuinely concerned with these water issues and will work to find the best options available. We will consider these water disposal options as we develop alternatives to analyze in the EIS. Our joint leadership in the EIS process, we believe, is the best course of action to achieve proactive solutions that will ensure any CBM development is conducted in an environmentally sound manner.

Monitoring wells will be used to assess the impacts to groundwater comparing actual drawdown conditions to those that are predicted in the EIS. Gauging stations have been installed to assess the impacts to surface waters from the discharge of produced water associated with methane production. Additionally, water quality sampling data will be obtained from other sites for this same purpose. Water quality samples are also required by the State of Montana's discharge permitting process to assess and maintain the quality of the receiving waters such that nondegradation standards are met.

Air issues

BLM Montana and Wyoming are presently discussing the appropriate model to use to assess the impacts to air quality in Montana. BLM in both states is committed to sharing all resource data in the northern portion of the Powder River Basin that straddles the state line, such as soil, water, air, vegetation, wildlife, cultural, economic, etc., in order to better analyze cumulative impacts resulting from CBM development in both states.

Reasonably foreseeable development

A major step in completing the EIS is determining how much future development is reasonable to expect. In the fall of 2000, the oil and gas industry predicted approximately 10,000 wells could be drilled in the northern Powder River Basin in Montana. Although BLM's review is still in the preliminary stage, we believe the number of CBM wells drilled in the area could be considerably higher than this estimate. Industry's analysis only took into consideration the upper Ft. Union sub-bituminous coals within the Powder River Basin in Montana and excluded the Ashland District of the Custer National Forest and Crow and Northern Cheyenne Tribal lands and bituminous coals. In addition to the areas included in the industry analysis, the BLM and State of Montana compilation of a reasonably foreseeable development scenario will include all mineral ownerships in the Powder River and Big Horn Basins in Montana, and several other areas of the state that contain coal resources. Because our analysis will be predicting CBM wells from the sub-bituminous

and bituminous coals, it will cover many other areas besides the Powder River Basin.

Subsurface gas drainage

No subsurface drainage of CBM from Federal or Indian lands in Montana has been identified to this point. Because of well spacing, mineral ownership patterns, and the relatively low number of existing wells, we do not expect drainage to be an issue in the short term. However, this is an issue that definitely will have to be considered over the long term.

PUBLIC INVOLVEMENT

Public involvement is another important aspect of the EIS process. The process is inherently open—as dictated by law, policy, and our desire to continually inform the public. As part of our outreach program for the EIS, we will continue to schedule meetings with the CBM Coordination Group. BLM was instrumental in the formation of this group that is composed of Federal, State and tribal agencies, landowners, industry, and environmental groups. The group was formed to discuss issues and share information related to the EIS. In addition, we will meet with other members of the public as often as needed or requested. Finally, BLM will provide information needed to keep the public fully informed on the EIS process.

This concludes my prepared statement. I would be pleased to answer any questions that members of the Committee may have.

Senator BURNS. Thank you very much, Mat. We appreciate that.

STATEMENT OF H. WILLIAM HOCHHEISER, MANAGER, OIL AND GAS ENVIRONMENTAL RESEARCH, OFFICE OF FOSSIL ENERGY, U.S. DEPARTMENT OF ENERGY

Senator BURNS. William Hochheiser, who is the environmental program manager, Office of Natural Gas and Petroleum, Department of Energy. Thank you and welcome to Billings, Montana.

Mr. HOCHHEISER. Thank you, Mr. Chairman, Senator Baucus. I appreciate the opportunity to be here today to talk about DOE's environmental research program for oil and gas.

I was asked to describe the program and specifically to give examples of where the Department of Energy has worked with government agencies and industry to address environmental programs and come up with solutions through research and analysis.

ENVIRONMENTAL RESEARCH

Our environmental research program mission is to promote cost-effective environmental protection and enhance environmental performance to encourage maximum recovery of U.S. oil and gas resources. I note that this mission emphasizes both recovery and environmental protection, goals that we believe are quite compatible.

We do this through technology development, risk analysis, and regulatory streamlining. And we are strong advocates of risk-based regulation and decision making. We conduct a variety of risk assessment studies to provide the scientific basis for such decisions.

We cover a spectrum of environmental issues, including air emissions, produced water treatment and disposal, solid waste management and disposal, underground injection, naturally occurring radioactive materials, or NORM, data management, remediation, and operations on public lands.

And while DOE is the principal Federal agency charged with the responsibility for the development of a national energy policy, it cannot effectively carry out that responsibility without close coordination with other Federal agencies. We also recognize that oil and gas exploration and production is primarily regulated by the

States, so we pursue cooperative efforts with State agencies and organizations also.

INTERAGENCY COOPERATION

A few examples of our intergovernmental activities include being a member of the core team of the Federal Leadership Forum, which is an interagency group that is working to streamline the National Energy Policy Act process for oil and gas development in the Rocky Mountain Region.

We have formed an oil and gas Federal lands technology partnership with BLM, in which we conduct research aimed at improving access to Federal lands. And in 3 years we funded 10 projects under this partnership.

We are also participating in a multi-stakeholder research and monitoring team that is looking at the impacts of oil exploration and development at the National Petroleum Reserve in Alaska.

And we have a longstanding and close working relationship with the Interstate Oil and Gas Compact Commission, an organization of governors of the producing States.

GROUND WATER PROTECTION COUNCIL

We also work closely with the Ground Water Protection Council (GWPC), and we fund research through that organization on underground injection and other water-related issues. One of our biggest successes with GWPC is the risk-based database management system, which Tom mentioned. I'll describe that a little bit more in a minute.

COALBED METHANE

On the subject of coalbed methane in Montana, we have just announced this project, which Tom mentioned, with Arthur Langhus Layne to help the Montana board complete their coalbed methane environmental impact statement more effectively and efficiently. Arthur Langhus Layne in conjunction with the board and BLM and other agencies, will examine current environmental concerns of coalbed methane production practices in Montana and investigate how recent advances in geographic information system technology can be applied as mitigation aids. DOE is providing $396,000 in total to support this project.

Through our Federal Lands Technology Partnership with BLM we are co-funding two projects on monitoring the impacts of coalbed methane production on ground water. One is in the San Juan Basin of Colorado; the other is the Wyoming portion of the Powder River Basin. These projects will help Federal and State agencies and industry understand the ground water impacts of coalbed methane development and whether current safeguards are adequate or if additional measures are needed.

ENVIRONMENTAL PROGRAM SOLVING

Now I would like to describe a few examples of where we have been asked by our stakeholders to help with environmental problems. In each case we have either provided a solution or we are working on providing the science needed to address the problem.

For example, California oil and gas producers and a State agency asked us to come up with a way to measure what happens to the emissions from oil field steam generators under stagnant, foggy conditions where airplanes and helicopters cannot fly. Our answer was to develop a small, helium-filled, remotely piloted airship with advanced instrumentation and tracer technology. And this winter, what we call Clean Airship I has demonstrated a successful collection of emissions plume data during stagnant weather events.

Also in California, we were asked whether emissions from tanks of heavy oil needed to be controlled. The State was concerned about this. We funded a national laboratory study to measure these emissions, and the result was that expensive vapor recovery systems will not be required.

RISK-BASED DATA MANAGEMENT SYSTEM

Now, oil and gas-producing States have need for data management—a data management system that would allow them to manage their data and use it to better do their jobs. In answer to this need we worked with the GWPC to develop the Risk-Based Data Management System (RBDMS). With this system, State agencies can analyze well performance and field-specific problems, issue notices of required tests and reports, track permits and inspections, generate letters to producers, and reports to EPA, and much more.

Now, at least 14 States and 2 EPA regional offices are using all or part of RBDMS. GWPC estimates that States have saved over $2 million with this system. And if I may brag a little bit, RBDMS was recently given an Energy 100 Award, designating it as one of the 100 most notable scientific and technological advances during the Department of Energy's 23-year history. A lot of credit goes to the States for helping with that development.

METHANE LEAKS

Another topic, methane leaks, are an economic, environmental, and safety concern. DOE, in conjunction with the Gas Technology Institute, has taken advantage of national laboratory technology to develop a video camera that actually sees methane and other hydrocarbon gases. We tested a van-mounted version of this system last year at an oil refinery, and it performed favorably compared to conventional technology. Next month we will test a portable, shoulder-mounted unit in another refinery. And if this technology is approved by EPA for use in refineries, a typical refinery could save $1 million a year.

AIR QUALITY

I wanted to talk about here in the Rocky Mountain Region, the question of reduced visibility in pristine areas. It is a very sensitive and complicated one, and the oil and gas industry in this region asked DOE to bring its scientific expertise to bear on this problem.

DOE is helping industry and Federal and State agencies understand the true contribution of oil and gas development on air quality. We do this through research on air quality models, atmospheric chemistry, emissions inventories, air quality monitoring, uncer-

tainty analysis, and on the science of visibility. And this is an ongoing effort requiring multiagency cooperation.

Now, we also help our stakeholders do analysis and other efforts that may not require as many dollars as applied research projects, but can have just as large an impact. Sometimes it is our sweat equity that makes the difference. Several States have asked for a more sound scientific basis for their naturally occuring radioactive material (NORM), requirements, one that takes into account the risk to human health and the environment. We funded a series of risk assessments for various NORM disposal options, and this was used by a DOE-supported committee of the Interstate Oil and Gas Compact Commission to develop model NORM regulations that can be adopted by the States with confidence that they are scientifically supported. The IOGCC also hosts a lab—a national lab-developed NORM website.

EPA's toxic inventory release—toxic release inventory program requires manufacturers and other companies to report their releases of certain chemicals to the environment. The EPA was considering adding oil and gas production to their program. The problem is that oil and gas production not a good fit for that program. It would have imposed considerable costs on producers.

Industry and the States asked DOE to help establish a dialog with EPA, which we did. And as a result, there is a deferral for oil and gas production industry from the TRI program.

At the request of the oil industry in Alaska, we sponsored a workshop on established exploration and production practices on the North Slope last April. The proceedings will serve as a database for new companies who want to work in that region, as a baseline for their development.

These are just some of the examples of areas where DOE has addressed specific environmental issues and problems brought to us by our stakeholders.

PREPARED STATEMENT

In conclusion, DOE promotes the safe, efficient, cost-effective recovery of our nation's oil and gas resources. Our oil and gas environmental research program can often help address environmental problems by contributing good science and sound analysis to effective risk-based regulation and decision making.

Thank you.

[The statement follows:]

PREPARED STATEMENT OF H. WILLIAM HOCHHEISER

Mr. Chairman, thank you for the opportunity to be here today to describe the Department of Energy's (DOE's) Oil and Gas Environmental Research Program.

I will give a brief overview of the program, discuss some of the cooperative efforts we have with other Federal agencies regarding oil and gas development on Federal lands, and then describe some examples of efforts in which we helped government agencies and industry to address environmental problems through research and analysis projects.

DOE believes that our domestic oil and natural gas resources are needed for economic growth, environmental improvement, and energy security. These vital and strategic resources can be recovered in an environmentally safe manner using improved technology and best practices.

The Oil and Gas Environmental Research Program is part of DOE's broader oil and natural gas research program which supports research and policy analysis to enhance the efficiency and environmental quality of domestic oil and natural gas ex-

ploration, recovery, processing, transport, and storage. It encompasses a wide variety of research and analysis activities on seismic imaging, drilling, completion and stimulation, enhanced production, storage, processing, and infrastructure reliability, as well as environmental issues and technologies. We work with a variety of stakeholders, including oil and gas producers and service companies, Federal and state agencies, tribes, environmental interest groups, universities, national laboratories and other research organizations, associations, and consumers.

The mission of the environmental research program is to promote cost-effective environmental protection and enhance environmental performance to encourage maximum recovery of U.S. oil and gas resources. Note that this mission emphasizes both recovery and environmental protection, goals that we believe are quite compatible.

We accomplish this mission through several types of work. The program sponsors technology development aimed at reducing the cost of complying with existing environmental regulations while improving environmental performance. We also work with Federal and state agencies and regulators to ensure that new regulations are based on sound science and are structured to avoid unnecessary costs while providing appropriate environmental protection. We are strong advocates of risk-based regulation and decision making and conduct a variety of risk assessment studies to provide the scientific basis for such decisions. Finally, we conduct regulatory streamlining efforts in partnership with Federal and state agencies to reduce costs for both government and industry.

Our efforts cover the spectrum of environmental issues, including air emissions, produced water treatment and disposal, solid waste management and disposal, underground injection, naturally occurring radioactive materials (NORM), data management, remediation, and operations on public lands. We set our priorities in these areas by proactively seeking out the opinions of our stakeholders and balancing that input with the appropriate Federal role.

INTERAGENCY COOPERATION

While DOE is the principal Federal agency charged with responsibility for the development of national energy policy, it cannot effectively carry out that responsibility without close coordination with other Federal and state agencies. Over half of the estimated undiscovered resource in this country is located under Federal land, onshore and offshore, so we must work with the Federal land management agencies. Also, oil and gas exploration and production is primarily regulated by the states, so we pursue cooperative efforts with state agencies and organizations. The following are examples of our inter-governmental activities.

—DOE is a member of the Core Team of the Federal Leadership Forum, an interagency group that is working to streamline the NEPA process for oil and gas development in the Rocky Mountain region and enhance interagency cooperation. DOE brings an energy policy perspective to the Forum, as well as expertise on technology and oil and gas resources.

—DOE has formed an Oil and Gas Federal Lands Technology Partnership with the Bureau of Land Management (BLM) to conduct research aimed at improving access to Federal lands. BLM identifies research needs which we jointly prioritize. DOE provides funding and BLM contributes land management expertise and helps to monitor the projects. In three years, ten projects have been funded under this partnership, ranging from analyzing compressor noise impacts to predicting the occurrence of archaeological sites to piloting web-based resource management planning.

—The Department is participating in a multi-stakeholder Research and Monitoring Team that is looking at the impacts of oil exploration and development in the National Petroleum Reserve in Alaska (NPR–A). An important part of this effort will be to assess the effectiveness and necessity of the many leasing stipulations in the NPR–A, and the effectiveness of technology in addressing those stipulations.

—We have a long-standing, close working relationship with the Interstate Oil and Gas Compact Commission (IOGCC), an organization of the governors of the oil and gas producing states. Our environmental research program funds a variety of activities with the Commission to increase communication and dialogue, streamline regulation, and generally encourage environmentally safe oil and gas recovery. For example, we have funded projects to assess the nation's idle and abandoned well population and develop strategies for dealing with such wells, to develop model state regulations for naturally occurring radioactive materials (NORM) based on scientific risk analysis, and to develop and give training on a variety of topics, such as waste minimization, NORM, and hydrogen sulfide

safety, to state personnel. I serve as the Department's official representative to the IOGCC.

—DOE works closely with the Ground Water Protection Council (GWPC) and funds research through that state-industry organization on underground injection and other water-related issues. One of our biggest successes, the Risk Based Data Management System, which I will describe below, has been developed and implemented through the GWPC. DOE also supports GWPC to conduct projects that promote innovative, cost-effective methods to protect underground sources of drinking water. Examples include assisting the State of Florida to assess and demonstrate their capabilities to assume regulatory primacy for Class II (oil and gas related) wells under EPA's Underground Injection Control Program, and helping obtain an exemption for an aquifer that is not at risk in Michigan.

On the subject of this hearing, coalbed methane (CBM) in Montana, we have just announced a new project that will help the Montana Board of Oil and Gas Conservation (MBOGC) complete their CBM environmental impact statement more effectively and efficiently. Arthur Langhus Layne—LLC, in conjunction with the MBOGC, the U. S. Bureau of Land Management and other governmental agencies, will examine current environmental concerns and coalbed methane production practices in the Montana portion of the Powder River Basin, and investigate how recent advances in Geographic Information Systems technologies can be applied as mitigation aids. DOE is providing nearly $400,000 to support this project.

Through our Federal Lands Technology Partnership with BLM, DOE is co-funding two projects on monitoring the impacts of CBM production on ground water. One is in the San Juan Basin of Colorado and the other is in the Wyoming portion of the Powder River Basin. These projects will help the Federal and State agencies and industry understand the ground water impacts of CBM development, and assist regulatory agencies in determining whether current safeguards are adequate or if additional measures are needed.

ENVIRONMENTAL PROBLEM SOLVING: RESEARCH

Now I would like to describe some examples where DOE has been asked by our government and industry stakeholders to help with an environmental problem through R&D or analysis. In each of these examples, we have developed a solution to the problem or are in the process of providing the science needed to address the problem. The following are examples of research projects that have addressed such problems:

—California's air quality problems are well-known and the contribution of oil and gas operations to those problems has been an issue for some time. The California oil and gas producers and the California Air Resources Board asked DOE to come up with a way to measure what happens to the emissions from oil field steam generators under stagnant, foggy conditions when airplanes and helicopters cannot fly. These are the episodes of greatest concern. Our answer was to develop a small helium-filled, remotely piloted air ship with advanced instrumentation and tracer technology. This winter, "Clean Air Ship I" has demonstrated the successful collection of emissions plume data during stagnant weather events. This data will be immensely useful to modelers and analysts who are trying to understand the transport of oil field emissions in this region.

—Another issue in California was whether emissions from tanks of heavy oil needed to be controlled. DOE funded Lawrence Berkeley National Laboratory to measure these emissions and work with the state regulatory agency. LBNL developed a low cost sampling device, lowering the cost to $20 from the previous standard $500 device, and showed that emissions from heavy oil are much lower than was being assumed by the agency. Thus, expensive vapor recovery systems will not be required.

—One of the big challenges in implementing risk based regulation and decision making is in collecting, storing, managing, and analyzing the data that is needed for those decisions. The oil and gas producing states had a need for a data management system that would allow them to manage their data and use it to do their jobs better. In answer to this need, DOE worked with the GWPC to develop the Risk Based Data Management System (RBDMS). A PC-based, fully relational data base with a user-friendly interface, RBDMS started as a system for underground injection information, but its success created a demand to expand its application to production, waste tracking, permitting, surface facilities, and other uses. With this system, state agencies can analyze well performance and field-specific problems, issue notices of required tests and reports, track permits and inspections, generate letters to producers and reports to EPA, and

much more. A web access module allows producers to access and analyze the state information on their operations. The states themselves formed a users group that guided development. Within this users group, states that have the system assist with implementation in other states. With DOE funding, the users group developed a "generic version" of RBDMS that could be customized and installed in any state for about $20,000, compared to the half a million dollars that each of the initial installations cost. Now, at least 17 states and two EPA regional offices are using all or part of RBDMS. GWPC estimates that states have saved over $2 million by using this system. RBDMS was given an Energy 100 Award, designating it as one of the 100 most notable scientific and technological achievements during the Department of Energy's 23-year history.

—Methane is a powerful greenhouse gas as well as a valuable commodity. Methane leaks from pipelines and equipment are an economic, environmental, and safety concern. DOE, in conjunction with the Gas Technology Institute (formerly the Gas Research Institute), has taken advantage of technology from Sandia National Laboratory to develop a video camera with a tuneable laser that "sees" methane and other hydrocarbon gases. A van-mounted version of this "backscatter absorption gas imaging" (BAGI) system was tested last year at an oil refinery and performed favorably compared with conventional "sniffers" currently used for EPA—mandated leak detection and repair programs. Next month, we will test a portable unit in another refinery. If this technology is approved by EPA for use in these inspections, a typical refinery could save up to $1 million per year. The technology is also being developed to detect leaks in natural gas distribution systems.

—The permitting of an underground injection well for enhanced recovery or produced water disposal requires an "area of review" (AOR) to be conducted. In general, conducting an AOR is an important procedure in assuring that the injected water does not contaminate aquifers or the surface. However, there are some situations when contamination is almost impossible, yet the AOR is still required. Four states, along with oil and gas producers, asked DOE to help them develop a system for granting variances, or exemptions, where downhole pressures are so low, or other geologic conditions exist, that injected water would never reach drinking water aquifers. Using a combination of RBDMS and appropriate data collection and analysis, DOE helped Texas, Oklahoma, Kansas, and California develop such systems. In Texas, a variance for a single field, the East Texas Field, saved producers an estimated $86 million.

—The Texas Railroad Commission handles more than 2 million pieces of paper each year. They asked DOE to help them develop an electronic permitting system that would eliminate much of that paper. Last year, Texas issued its first electronic permit with DOE's assistance and more electronic forms are being added each year. In a parallel effort, California also used DOE money along with other funds to develop an electronic permitting system.

—Here in the Rocky Mountains, visibility issues threaten to curtail oil and gas development. The question of how much oil and gas operations contribute to reduced visibility in pristine areas such as national parks and forests is a sensitive and complicated one. The oil and gas industry in this region asked DOE to bring its scientific expertise to bear on the problem. At Lawrence Berkeley National Laboratory we have some of the nation's premiere experts on air quality related research. They are helping industry and Federal and state agencies understand the true contribution of oil and gas development of air quality through research on air quality models, atmospheric chemistry, emissions inventories, air quality monitoring, uncertainty analysis, and the science of visibility. This is an ongoing effort requiring multi-agency cooperation.

—Michigan regulators and an oil field service company needed help with how to safely and economically clean up NORM contaminated soils at a petroleum pipe yard. Using technology originally developed by DOE to clean up Cold War defense sites, Argonne National Laboratory demonstrated an on-site soil sampling and testing method called the Adaptive Sampling and Analysis Program (ASAP). ASAP combines sophisticated, real-time sampling and testing with decision support software to dramatically cut costs, reduce the amount of soil that must be excavated, and shorten the time required to bring a site into environmental compliance. At this one Michigan site, ASAP cut the cost of clean up by 90 percent, reduced the amount of soil that had to be removed and disposed of by over 97 percent and saved the pipe yard owner at least $36,000 in disposal costs alone. Clean up was completed in four days, rather than the several weeks it would have normally taken and regulators were more confident that the result met their requirements.

ENVIRONMENTAL PROBLEM SOLVING: ANALYSIS

DOE also helps our stakeholders through analyses and other efforts that may not require as many dollars as applied research projects, but that can have just as large an impact. Sometimes it is our "sweat equity" that makes the difference. Here are some examples.

—Various states have interest in promulgating regulations for management of oilfield NORM. Several have put such regulations in place. But they expressed a need to have a more sound scientific basis for these requirements—one that takes into account the risk to human health and the environment. DOE funded Argonne National Laboratory to undertake a series of risk assessments for various NORM disposal options, such as underground injection and landfill disposal. These assessments were then used by a DOE-supported committee of the IOGCC to develop model NORM regulations that can be adopted by the states with confidence that they are scientifically supported. Individual states have also used the Argonne reports in their regulatory development. The IOGCC also hosts an Argonne-developed web site that contains a searchable data base of state NORM regulations and guidelines as well as information on commercial NORM-related services.

—Abandoned salt caverns can be an economical option for disposal of oil field wastes. But the risks of such disposal were uncertain. So Texas and other states asked DOE to investigate the risks, costs, and benefits of this disposal option. DOE formed a partnership that includes Argonne National Laboratory, Sandia National Laboratory, the University of Texas and the Solution Mining Research Institute to do a series of studies on salt cavern disposal, including the legal and economic feasibility, the risks of disposal of non-hazardous oil field wastes and NORM wastes, the engineering of salt caverns for long-term disposal, and the geology of salt cavern occurrence. DOE's National Petroleum Technology Office hosts a web site with salt cavern information. This site received over 10,000 hits in January.

—EPA's Toxic Release Inventory (TRI) Program requires manufacturers and other companies to report their releases of certain chemicals to the environment. EPA has been considering adding the oil and gas production industry to their program. The problem is that oil and gas production is not a good fit for that program. Reporting under its rules would give an inaccurate and inconsistent picture of releases from oil and gas fields. In addition, most fields are far removed from the population centers the program is meant to protect. Finally, the data that TRI would attempt to collect are already available from state oil and gas agencies, yet TRI would impose considerable costs on producers. Industry and the states asked DOE to help establish a dialogue with EPA. We funded IOGCC to develop a report on the data on releases and other environmental information that is currently collected by the states and to meet with EPA on this issue. This helped result in a deferral for oil and gas production industry from the TRI program.

—Synthetic drilling muds are environmentally superior and technically preferred for many offshore drilling applications, especially in very deep water. However, EPA's offshore discharge regulations did not take this new technology into account and so it could not be used in many instances. At the request of industry, DOE facilitated an industry—EPA dialogue that educated both sides and resulted in an "expedited rulemaking" that allows the offshore discharge of drilling wastes using synthetic muds.

—At the request of the oil industry in Alaska, DOE sponsored a workshop on established exploration and production practices on the North Slope in April 2000. This workshop served to bring together information on a wide variety of issues facing North Slope production and educated industry and federal and state agency personnel on current practices. The proceedings will serve as a data base for new companies that want to work in that region and as a baseline for future development.

PRODUCED WATER RESEARCH

These are just some examples of areas where DOE has addressed specific environmental issues and problems brought to us by our stakeholders. In addition, the environmental program conducts research on a variety of environmental technologies to reduce costs and improve environmental performance. One area of interest for coalbed methane production is produced water treatment and disposal. Our research on produced water includes such technologies as reverse osmosis, ozone treatment, microbial processes, "freeze-thaw evaporation", and downhole separators. These are in

various stages of development and may be of interest to coalbed methane producers as they reach commercialization.

CONCLUSION

In conclusion, DOE promotes the safe, efficient, cost-effective recovery of our nation's oil and gas resources. Our oil and gas environmental research program can often help address environmental problems by contributing good science and sound analysis to effective risk-based regulation and decision making.

Thank you.

Senator BURNS. Thank you.

And I will just start with a question to you, Mr. Hochheiser because I think it is very important. Over 95 percent of the new power generation plants that is on the drawing board now in this country will be powered by natural gas. And so that makes this discussion very, very important to our energy needs, not only to California, but across the nation. And we have the pipelines for distribution, where we can get them to the plants.

I guess what I want to hear from the Department of Energy and what I would—should we be concerned about the industry investing too much in new technologies, such as in water—maybe in the water treatment filtration example, and then worry about these new technologies returning anything when gas prices do stabilize. And we know from the industry what goes up must come down someday.

Should we be worrying about that? And also, the amount of dedication the Department of Energy has in fulfilling their obligation to make it work? I will give you the rest of the day to answer that.

Mr. HOCHHEISER. When we are developing new technology we have the goal in mind of cost-effective technology. We are trying to reduce the cost of compliance. Even with new technologies, they are generally more effective and can both reduce the cost of operation as well as increase the environmental performance.

So I think while the recent high prices may not be maintained, as they stabilize to a level that I have seen predicted for the next decade, I think they will continue to be economic. And I think we should be investing in them, demonstrating them, and adopting them, yes.

Senator BURNS. And as we move forward on this, what do you hear in your department to the degree of commitment to fossil fuels and the use of fossil fuels?

Mr. HOCHHEISER. We are very much committed to that, I think. The Energy Information Administration projects that in 10 years we will—well, currently we have 63, 64 percent of our energy comes from oil and gas. In 10 years we are going to have about the same proportion, about 65 percent. That is not going away.

We need our resources and technology to find them, to develop them, while protecting the environment in doing so.

Senator BURNS. Now, the kickr, does OMB agree with you?

Mr. HOCHHEISER. We will have to wait until the President announces the details of his budget.

Senator BURNS. By the way, for you folks, that is the folks that hold the purse strings over there.

Mr. Millenbach, I am interested in your EIS. And right now we have invested about, oh, a little over $4 million. Just last year, $1.3 million in the EIS. Give me an idea on your time line, and are you

satisfied with the way the work is progressing? It seems we spend a lot of money on environmental impact statements.

Mr. MILLENBACH. Yes, sir, that is correct. Our time line is such that we are on schedule with the schedule I laid out in my testimony. We expect something, wrapped up for public review by the end of the year, and then coming up this following summer, the summer of 2002, we should see the final one and go into the decisions that will be made.

As Mr. Hochheiser says, we are not in a position to talk about the details of funding for next year, for fiscal year 2002, because the President has not announced the budget until next month. But I can tell you that the level of activity that we have got going out with the environmental statement, the air quality and water quality studies that were currently underway will be going on into next year, and we anticipate that the same level of activity we are doing this year will be carried out into fiscal year 2002.

Senator BURNS. I have some more questions. And by the way, we will probably go over some questions that will take up way too much time. We may submit some questions in writing to you. If you could respond to those to the committee, I would certainly appreciate that.

Senator Baucus.

Senator BAUCUS. Thank you, Conrad.

The question I have is the EIS. There are a lot of questions revolving around the EIS. There are a lot of people that think that the EIS procedure is too complicated, it is too lengthy, too much paperwork, it takes too long, it is a great cottage industry for consultants. And I would just like your thoughts about all that, Mat. And when you are answering that question, if you could kind of also bring in the point that Senator Conrad made about costs. Do you think you have enough to get the job done?

Of course, the answer to that is no, we want more money. But if you could kind of give us a sense of all of that, that would be helpful. And comment on the complexity.

This is not an easy question to answer, clearly. I noticed in the very good coverage of the Gazette of this question of—I think it was the Gazette, quoting Stillwater. Maybe it was testimony that I read last night of one of the witnesses, that the operator of the Stillwater Mine, just up the road here, said that the EIS was good, that the process was good, it helped them.

And from my perspective, I think Stillwater has done a great job, that is, from an environmental perspective. You know, they have done it right. And it is clear—at least it is my impression from reading the testimony of Mike Caskey from Redstone, that they, too, want to do it right.

So do you hear from companies that the EIS process is way too lengthy and we should speed it up? I glanced at the testimony of Steve Gilbert of Northern Plains Resource Council, and he says it is the opposite, that it ought to take longer time because you are not developing sufficient baseline data to determine what the referred EIS should be. What do you think about all of that?

Mr. MILLENBACH. Well, there are a lot of views on that. The Federal environmental process has been in place for over 30 years now.

And, over that period of time we have developed the techniques and the cost savings and time-saving things I think can be done.

It is a long process. And the reason for that is because if you want to do a good, adequate job of bringing together all the available information and putting that into a document that people can understand and make some sense out of, it does take a fair amount of thought and work.

The other part of it that takes a lot of time when people talk to us about trying to cut back is that there is a lot of public involvement in it. There are these various scoping meetings, reviews of the draft, public hearings. There is an opportunity to maybe participate in the final analysis as well.

So when you start building in those—the work, the public involvement, more work, more public involvement, that all adds up. And that is why it does take the time it does.

As to the funding for this past year, we are in good shape. We have the funds for the environmental statement. And we are anticipating that will be the case next year.

As to the baseline studies and that kind of thing, we agree that one of the things that needs to be done ultimately is to—once we have got the important issues identified—get monitoring studies and that kind of thing put in place so we can keep track of it as we go through the development of this resource, and what the impacts to the environment are so that we can make adjustments as we go forward.

Senator BAUCUS. I think that is important. Many years ago, when I was in the House Appropriations Committee, there was a lot of potential development up in the Flathead Basin, north in Canada, the big coal mines, et cetera. And people were concerned because of all the environmental adverse effects would flow south with the air and water and Canada would get the benefit. And people came to me with the idea of a multiyear baseline data analysis, and I thought it was a good idea, so that when projects came along, we had the baseline data in order to determine what the effects of it may or may not be.

Of course, we cannot know everything about everything. There comes a limit, diminishing returns, et cetera. But could you tell us a little on this whole process of EIS, what parts do you feel good about, what parts are going to cause problems, whether it is water quality or quantity? If you could just give us a sense of that. Maybe the other two panelists might be—to the agree that they are involved in EIS, because I guess you are too. Let us know what you think about that.

What do you feel comfortable with and what have we got to come to? Maybe focus on—because the more this is out in the public, the more people can bring some technical expertise to it and kind of help you solve that one.

Mr. RICHMOND. Well, first of all, Senator Baucus, I feel very comfortable that the program manager that the BLM has appointed to this process, she seems to be very much interested in keeping it on track.

Senator BAUCUS. Who is that?

Mr. RICHMOND. Her name is Mary Bloom, and she works in Miles City. And she is, I think, a real asset to the process.

I can assure you that I have learned more about BLM's planning process than I ever wanted to know, but there are advantages to us going along with this process on the Federal/State partnership even though there are things being done that we would not necessarily have to do under our program that BLM has to do. But it is important to us to stay in lockstep so that when this process is done, it is done for all of us and there are not pieces left hanging out.

So I am comfortable with the process and comfortable that when we get done with the product it will be comprehensive and it will address all of our needs. We will have input into it, and I think we will get there.

Senator BURNS. The Senator—on that question, how—you know, we are going to go through this whole expense. It is going to cost, what, $6 million when it is all over? And I will have something to do with that. How many companies—realistically, how many companies are interested in doing business and developing this resource?

Mr. RICHMOND. That is really kind of hard to come up with, but I think at this time we can identify at least 10 companies that would be interested—that have expressed an interest at this time in coalbed methane in Montana.

Senator BURNS. And where do you see the major stumbling block that could slow down the whole thing?

Mr. RICHMOND. I think we need to resolve the water issues. I think that has been identified as the principal issue we are talking about here. We need to reassure people that they are not to dry up and blow away or that we are going to trade their prosperity for someone else's. And if we can answer that issue to the satisfaction of the people that live there, I think we will be finished.

Now, there are always other issues. And that is part of the process of EIS, is that you address a lot of issues that people may not be real interested in, but you have to focus on ones that deal with all of us.

Senator BURNS. We will get a lot of paperwork that people are not too interested in.

Mr. RICHMOND. Unfortunately, that is true.

Senator BAUCUS. One more question.

Senator BURNS. Go ahead.

Senator BAUCUS. I think it struck me that—I read your testimony last night, Mat—on page 2 he said there are three standards here. One is we need to set the resource protection standards; make sure they are met. Second, industry should be responsible for the costs of developing the resource, not the neighbors or the taxpayers. And third, the companies must clean up after themselves and restore the land when their activities cease. I found those to be pretty strong but fairly reasonable principles. I am wondering the degree to which you think that that—are you comfortable that is what is going to happen?

Mr. MILLENBACH. I am. These are my principles. They are the ones that I convinced the administration to adopt for this hearing, and they are the ones that I have been telling my staff and people I meet with that I think this is what ought to be done.

And so, when we go ahead and approve APDs and approve this program, these are the standards that I have set for myself and for the Bureau of Land Management here in Montana. I think they are reasonable, too.

Senator BAUCUS. One thing that struck me is—and I commend you for that. But there is no assessment here of what the economic benefits really might be. And I think they could potentially be huge. And I just—you guys, it is not really your job to make those determinations, but I am wondering if you have seen some data or seen some analysis, you know.

Wyoming, we know what they are in Wyoming because Wyoming has a little history here, more than we do in Montana. I am just curious what your estimates—what your sense of that is.

Mr. MILLENBACH. That will be part of the environmental statement, but maybe Al could talk about their experience in Wyoming.

Senator BAUCUS. Would you, Al?

Mr. PIERSON. Mr. Chairman, I do not have those numbers available to me. I could get them if you would like for the last year. But it is huge. As you well know, the State receives half of the Federal royalties, half of the bonus bids on lease sales. And so it is—as you correctly stated—a much different economic situation for the State legislature in Wyoming this year than perhaps yours. And it is huge.

Senator BAUCUS. At some point I think that is going to have to be factored in.

Mr. RICHMOND. I believe you have a witness on the next panel that will address——

Senator BAUCUS. I am sure we will.

Senator BURNS. That is it?

Senator BAUCUS. Well, I have one other question. Deep injection, what about it? Is that a good idea or not?

Mr. MILLENBACH. Well, that is part of the environmental statement that we are going to be taking a look at. And I think some of the witnesses on the next panel will be able to address that in more detail.

Senator BAUCUS. Well, good luck on your EIS. It is a very important effort that you are undertaking. And I know I can speak for the chairman in saying that we want to help you do it the right way, because I know that is what you want to do.

Thank you.

Senator BURNS. Thank you and you are excused.

The next panel will make their way up here. And it is made up Mike Caskey, president of Redstone Energy; and sitting in today for the director of mining and minerals for the Crow Tribe will be Mort Dreamer; Geri Small, president of the Northern Cheyenne Tribe; and Wayne Kelley, president of Omega Oil Company. If you folks would make your way up here, why, we will hear your testimony. Thank you for coming today.

Ms. OLD ELK. I'm Neta Old Elk. Mr. Birdinground had to leave. I'll be providing testimony.

STATEMENT OF MICHAEL C. CASKEY, VICE PRESIDENT, REDSTONE GAS PARTNERS, LLC

Senator BURNS. We are going to call on Mike Caskey, president, Redstone Energy. And, Mike, thank you for coming today. And I know you folks have as much experience down there with this matter as just about anybody. So we are looking forward to your testimony.

Mr. CASKEY. Thank you, Senator. I need to correct one thing. I am not quite the president yet. He is standing in the back of the room, but that is close enough.

Senator BURNS. Are you working on it?

Mr. CASKEY. Yeah, I am working on it. Sneaking up on him.

Senator BAUCUS. That is a good correction to make.

Mr. CASKEY. It is good to be here this morning. I want to welcome the Senators back to their home State here. I wanted to give you some oversight and overview into what we are doing down there as the only producer of coalbed methane in the State of Montana. We are fortunate enough to be one of the—or the only company that actually produces commercial quanties of coalbed methane on both sides of the State line. So we play in the Wyoming venue as well as the Montana venue.

We are proud of our operations. We would like to invite the Senators and their staffs, or whoever else wants to come along, and see what we do as a coalbed methane, coalbed natural gas operator. We feel that we have a very light footprint. And we do—as you said earlier, Senator Baucus, we try to do it right.

I want to commend Senator Burns for his ongoing efforts with this committee to fund various of the NEPA/MEPA documentation that is going on. And I would also like to thank Senator Baucus for his efforts to continue the development in Montana. And most particularly, Senator, I listened to NPR the other day, and I heard a quote you made. I know that is kind of a dangerous thing to start with here.

Senator BAUCUS. It sure is.

Mr. CASKEY. I enjoyed your comment on the Chinese character for change. We feel that the ability of this new technology and this new resource can do both things that you talked about. It can help cure the crisis we are involved in, as well as a very prosperous opportunity for the State of Montana. And we would like to proceed with that effort to develop the resource.

As we are aware, the crisis side of this is a national crisis. Gas is in high demand. Electricity is in short supply. Heating of homes and generation of electricity, what, with the Net and all of the appliances we each have in our homes is a very strong priority in the nation. The growing dependence on natural gas is getting ever stronger. We are 95 percent of the effort right now for generation of electricity. Any new electricity will be generated with the utilization of coalbed—or with natural gas, coalbed methane being a large piece of that potential.

We think that coalbed natural gas represents a real opportunity for the State. We feel that it is very applicable in the area where we are developing as a resource. We think that the prosperity for the area, which is one of the poorest areas of the State, can be en-

hanced with this development and should be done in the right manner, an environmentally-friendly manner.

I might mention that Representative Keith Bales is in the audience today. And he has told me that if you have questions of him as a Representative for the Otter area of southeast Montana, he would be glad answer any questions you might have.

Statistically I think it is important that I bring the Senators up to speed, as well as the public here, relative to where we stand with our project. It truly is a start-up operation. We are producing commercial quanties of coalbed methane. And that level of productivity right now is about 20 million cubic feet of gas per day. That would handle about, oh, on a cold winter day, the needs for a town—about four towns the size of Sheridan, Wyoming. So that gives you some sort of visual on what kind of productivity level that we have.

Thus far we have drilled 17 wells that have been abandoned; in other words, they were unsuccessful wells or exploratory wells. We have drilled 10 wells that are drilled and shut in outside of our producing are. Those would certainly be exploratory wells, but they will be gas—or data-gathering wells. We have 66 wells that are currently shut in, waiting on completion, waiting to be set up for completion and ultimate production.

We are producing from 162 wells currently. Those wells in January produced 985 gallons of water per minute that was pumped into the Tongue River under our MPDES discharge permit. Those same wells in February 2001 had declined and produced 907 gallons a minute into the Tongue River. Again, that is a—to give you an example of what that magnitude would be, one center-pivot irrigation system, the sprinkler system, generally uses about 1,000 gallons a minute. So that is what our equivalency is.

The average per well for each of the those 162 wells on the produced water issue is 7.3 gallons per minute. And that is down from an initial production rate of somewhere between 12 and 15 gallons a minute per well, down to that 7.3 gallons per minute in February. The average for the 12 months—the past 12 months in our operation for gallons-per-minute produced of produced water is 9.4 gallons per minute.

The water we have—or the water we produce actually meets all drinking water standards and is safe for the use of livestock. It is high in sodium. We don't argue that fact.

In 2000, another fact that we have, we talked about prosperity in the area that we are operating in. During the year of fiscal year 2000, calendar year 2000, Redstone paid $550,000 in production taxes. Now, that does not sound like a lot, but you have got to consider that that is really the first year of operational intensity that we have. It is also during a year when we are trying to figure out what this type project does and how it works. So we are in our infancy, but it is still producing a significant tax base for the State and the level that we are operating—in the area we are operating in.

Senator Baucus, you mentioned that Wyoming, which currently has a surplus of somewhere around $700 million, is ahead of the game on Montana. We recognize that, and we feel that being ahead of the game we can catch up. We can make the difference for Mon-

tana and, with a viable and environmentally-friendly approach, produce the gas that will help Montana handle its budget. While Wyoming is enjoying a surplus, we are still having trouble trying to figure out how Montana is going to pay for its valued education system for its children. We think we can have a dramatic impact on this by productions of this clean-burning fuel.

Water in this area, as we all know, and we have heard this morning from all of the previous testimony, is the issue. Redstone is trying to do it right. We have had some exceedences on our MPDES permits. Frankly, those were oversights on our part. We were testing. We had been monitoring. And we have put in place operational safeguards to prevent any of those exceedences from happening again.

The exceedences were actually stemmed from reworking operations we did within some of our wells, which stirred up some of the sediment that was in the wells. And we did not realize that that was—it really was not one of our focuses at that point. We did not realize that was happening until we saw the analysis come back. And we immediately rang the bell on ourselves and explained it to the DEQ, as well as the public. That trend and that approach to doing business is what we want to do for the State of Montana, to make sure that we are, in fact, doing it right.

I see that my time is about up. As most of the audience here can testify, I could go on for hours and hours about this and have at times. But I would like to thank you again for the opportunity to address this group and bring the public up to speed.

If there are any questions or if you want a tour of our operation—again, we are proud of what we do—we would love to have you out there touring the area.

PREPARED STATEMENT

Unquestionably, the laws of Montana are strong. The environmental laws are in place. We work within those laws and with those laws. We think the EIS system is a good system if it is timely-applied. There are rules that allow for the timeliness of the EIS documentation, and we are all for that. We are working within those rules and regulations and actually commend the BLM at this point in time for their efforts to stay timely with their activities.

Thank you very much. I'll be here for questions.

[The statement follows:]

PREPARED STATEMENT OF MICHAEL C. CASKEY

Good Morning Senators Burns and Baucus. I am Mike Caskey, Vice President—Land of Fidelity Exploration and Production Company and the managing partner of Redstone Gas Partners, LLC ("Redstone"), the only company producing coalbed natural gas in Montana. I want to, first, thank you for holding this Senate field hearing today in Billings, to discuss the development of clean-burning natural gas in Montana. I particularly want to thank Senator Burns for his instrumental role in obtaining the funding for the BLM's preparation of an EIS on coalbed natural gas in the Montana portion of the Powder River Basin and Senator Baucus for his sustained focus on economic development in Montana.

WHY DEVELOP COALBED NATURAL GAS IN MONTANA?

The discussion today could not be more timely, as the West faces rapidly rising energy prices due, in part, to a growing dependence on natural gas. We strongly believe that Montana can play a critical role in helping to meet that demand and can

do so in a way that will sustain, rather than harm, Montana's environment and agricultural economy. We think coalbed natural gas presents a real opportunity for a win-win scenario in southeastern Montana—the development of a natural resource in a manner that will help sustain a struggling agricultural economy in the poorest region of the State.

I know each of you are very familiar with the statistics that rank Montana's per capita income of less than $22,000 at anywhere between 46–48th for the lowest per capita income in the nation. Recently, State Representative Keith Bales of Otter, testified to the Montana House Natural Resources Committee about the potential of coalbed natural gas. He began by contrasting the economic fates of southeastern Montana and northeastern Wyoming over the last 30 years. He noted that while Montana and Wyoming had similar per capita income in 1970, by 1999 northeastern Wyoming per capita income had shot up to $24,280, while parts of southeastern Montana had sunk well-below even Montana's average per capita income to $15,842. While northeastern Wyoming's population has grown over those thirty years, the population of southeastern Montana has flattened into a decline. Unemployment in the area averages 8 percent and 22 percent of the area families are living below the poverty line. The situation is worse on the area's two reservations where unemployment is double—16 percent. The situation for southeastern Montana is summed up in one stark statistic—in 10 years the value of a mill in Powder River County had gone from $78,000 to $4,400.

While the 2001 Montana Legislature struggles with its budget to meet the basic necessities of education and mental health care, the 2001 Wyoming Legislature, by contrast, enjoys a $695 million surplus—largely as a result of coalbed natural gas development. Representative Bales believes that the development of coalbed natural gas in Montana can turn around the disheartening trends in southeastern Montana by providing jobs, much-needed tax revenue and additional income and water to agricultural landowners. We agree with Representative Bales.

WHO ARE WE?

Redstone is a wholly-owned subsidiary of MDU Resources Group, Inc., a name familiar to Montana homeowners. MDU Resources Group, Inc. includes an electric and natural gas utility, natural gas pipeline and an oil and natural gas production company serving Montana, North and South Dakota and Wyoming. The Company's ties to Montana are strong; its Chairman and CEO, Martin White, is a Butte native. Redstone has been engaged in the development of coalbed natural gas in Montana since 1997, and began producing coalbed natural gas in late 1999. As a result of litigation filed by the Northern Plains Resource Council (NPRC) against the Montana Board of Oil and Gas Conservation ("Board"), we are the only producer of coalbed natural gas in Montana. *Northern Plains Resource Council* v. *Montana Board of Oil and Gas Conservation,* CDV 2000–177 (First Jud. Dist. Lewis & Clark). Redstone's limited Tongue River Pilot Project in the CX Field near Decker is the sole exception to the moratorium on development imposed by this litigation and the BLM's decision to prepare an EIS before allowing development of any coalbed natural gas in Montana.

Under the terms of the settlement, Redstone is allowed to drill 325 wells to reach a total of 250 producing wells. Redstone has approximately 164 wells producing 21 million cubic feet of gas per day. In the year 2000, during which Redstone averaged 120 producing wells, Redstone paid the State of Montana, $554,000 in production taxes.

HOW REDSTONE OPERATES

Redstone believes that if coalbed methane development is done correctly, it is an environmentally sound way to provide a new source of clean energy. We, like other member companies of the Montana Coalbed Natural Gas Alliance, are committed to the development of coalbed natural gas in a scientifically sound, socially responsible and environmentally sensitive manner. In short, "Doing it Right." These are our principles:

1. To ensure that Montana's coalbed natural gas resource is developed in a prudent and orderly manner.
2. To ensure that such development complies with all applicable state and federal regulations.
3. To ensure that a balanced EIS is prepared before additional development occurs. Projects underway may proceed, under the established environmental and permitting review and regulations.
4. To ensure that Montana's agricultural economy, water quality, air quality, wildlife, soils, hydrologic regimes, cultural and historic resources, and local communities

are protected. We strive not only to protect these values and resources, but to enhance them, as well.

Thus, Redstone fully supports the joint BLM and Montana EIS on coalbed natural gas and worked to see that the EIS is produced in a timely fashion.

As I will explain, Redstone operates in a manner that endeavors to be "light on the land." We avoid unnecessary roads or duplication of sites. We clean up after ourselves. Redstone and our employees are committed to working with area landowners to construct our sites and operate our wells in a manner that least interferes with existing agricultural operations.

When we fail to live up to our environmental commitments, as we did in late February, Redstone will be straight with agency regulators and the Montana public and will promptly fix the problem. On February 27, 2001, we reported to the DEQ and the Montana public that our monitoring had disclosed that we had discharged more sediment into the Tongue River than our MPDES permit allows. DEQ's initial determination was that there was no environmental damage done by this exceedence. Although the environmental impact of this exceedence may have been minor, we promptly investigated the cause of the problem and put into place measures to ensure that it would not occur again. We will continue to work with Montana DEQ to investigate and resolve the circumstances that led to this exceedence. Samples taken after the problem was detected indicate the level of sediment has dropped back to well-below the permitted level. Redstone is operating a pilot project in Montana and the pilot project is doing what it should do, providing us and regulators with valuable data and experience on a small scale to help direct future development on a larger scale.

Redstone released this information to the public because we are committed to being a good steward of Montana's environment and we want to gain the respect and trust of the public on our commitment to be an environmentally responsible producer.

WHAT IS COALBED NATURAL GAS?

What is coalbed natural gas (CBNG) or coalbed methane (CBM)? It is a natural gas found in coalbeds and formed as a result of biogenic processes—bacteria working on ancient peat beds. These fossilized peat beds form the coal in the Powder River Basin in Wyoming and Montana. Methane can be described as having a Dr. Jekyll and Mr. Hyde personality. In its natural, fugitive state CBNG is a once-deadly gas that threatened the lives of underground coal miners and is now considered to be among the most potent of the greenhouse gases—20 times more potent than carbon dioxide. Yet when we safely capture it and use it as a source of energy, it is one of the cleanest burning fossil fuels, and among the most benign to produce. Indeed, EPA, as well as the U.S. Department of Energy have recognized the benefit of reducing the potential for greenhouse gas while simultaneously producing energy and have programs in place to encourage the "capture and utilization of coalbed methane." See e.g., <www.epa.gov/coalbed>.

Coalbed natural gas is adsorbed in the coal pores and coal cleats and is held in place by water pressure. CBNG is developed by lowering the water pressure in order to release the gas. Although water pressure is lowered the coal seams are not dewatered. Research in Wyoming has demonstrated that once production of CBNG stops, 80 percent of the water in the coalbed returns within weeks or months. The balance of the water will take longer to return, over a period of years.

PRODUCTION OF GAS

Coalbed gas wells in the Powder River Basin generally range from 400 to 1500 feet and extract gas from coal seams in the Wasatch and Fort Union formations. This is in contrast to conventional gas wells which are typically 4,000 to 12,000 feet deep in the Powder River Basin. Conventional gas wells initially produce large volumes of gas and very little water. Over time, gas production declines and water production may increase. In contrast, coalbed natural gas wells initially produce large amounts of water and small gas quantities. Gas production increases during the initial water pressure reduction phase and then levels off and start to decline. During this time the water production will decline.

Again, compared to conventional gas wells, the impact of CBNG wells on the land is minimal. Wells are drilled using truck-mounted water-well drilling equipment. In many cases, this avoids the need to construct roads. The pad for a coalbed methane well is much smaller than that for a conventional well; about 100 feet x 100 feet. Typically, very little construction is required at the well site and the only earthwork required is to dig a pit to hold drill cuttings, water and mud for the drilling. Nor-

mally one pit serves three wells. The well-site is visually low-impact—the wells are covered by a 4 foot tall beige box that blends well into the surrounding landscape.

For well construction, steel casing is run into the top of the coal and is cemented back to the surface. The casing and cement provide a complete hydraulic isolation or seal between the coal formation, where the gas is found, and any shale, sand or other water-bearing formation penetrated by the well. This seal prevents any fluids from migrating between formations—either from water flowing down into the coal or gas migrating up to a shallower aquifer. This protects landowners who depend on these shallow aquifers for water supplies.

A submersible pump is used to lower the water pressure. Production is begun by pumping water from the coal to the surface and through flow lines to the water discharge point. The water and gas exit out of separate pipes. Gas produced from the coalbed migrates up the inside of the casing to a separate flow line and is transported to a metering station, and then to a compressor or series of compressors to bring the pressure up to sales line pressure. The water is either stored to be used as stockwater or for other permitted uses or is discharged into surface water pursuant to a state-issued MPDES discharge permit.

WATER MANAGEMENT

The key environmental issue to be addressed in the development of CBNG is water. Each CBNG well will initially produce an average of about 12 gpm per well or 17,208 gallons per day per well or 516,240 gallons per month. This will decline to an average of 5 gpm per well over time. This volume of produced water raises two issues unique to CBNG development—the impact to water quality and to groundwater quantity.

WATER QUALITY

In the Montana portion of the Powder River Basin, the unaltered ground water is comparatively good, but of lesser quality than the Tongue River. The produced water is potable—it meets all Safe Drinking Water Act standards for human use and is suitable for domestic consumption, livestock and wildlife. However, it contains high levels of sodium bicarbonate which make it unsuitable for irrigation without special handling. The level of sodium, identified as the SAR (sodium adsorbtion ratio), in the produced water can harm vegetation and the soils upon which plant growth depends if special handling or treatment is not used.

Irrigators and NPRC have raised concerns over the impact that the discharge of this volume of CBNG produced water into the Tongue River could have on their ability to irrigate from the Tongue River. They argue that if all of the CBNG produced water is discharged into the Tongue River, that it would alter the quality of the Tongue making it unsuitable for irrigation. We agree that if all CBNG water were to be discharged into the Tongue that the Tongue River would not meet water quality standards designed to protect irrigation. However, we contend that existing Montana and federal regulations simply will not allow this scenario. Montana water quality standards already protect the beneficial use of Montana's waters, which in the case of the Tongue River includes irrigation. These water quality standards also include a nondegradation policy that does not allow existing water quality to be lowered. Thus, existing law would prohibit the discharge of all CBNG produced water into the Tongue River and would protect Montana farmers from the scenario described by NPRC.

For example, in the case of Redstone's pilot project, Montana DEQ limited Redstone's Tongue River Pilot Project MPDES permits in several ways to protect Montana water quality. First, Redstone was not allowed a permit to discharge into Squirrel Creek because the discharge could not meet the State's nondegradation policy for fluoride.

Second, the volume of water to be discharged into the Tongue River was lowered from 4000 gpm, which would have met all Montana water quality standards, to 1600 gpm in order to meet nondegradation requirements. Thus, Redstone's Tongue River Pilot Project was limited to a total of 1600 gpm for its projected 250 producing wells. DEQ determined that these permit limits would fully protect the beneficial uses of the Tongue River. This same analysis would have to occur for any future development and alternatives to discharge into surface water, as described below, would have to be developed.

In addition, the Montana DEQ and Wyoming DEQ are jointly addressing the potential impact that Wyoming CBNG development could have on the Tongue and Powder River as the BLM EIS process and State-moratorium hold Montana CBNG development static for 18 months. Montana and Wyoming DEQs are involved in negotiations to develop a "total maximum daily load" (TMDL) for CBNG discharges

into the Tongue and Powder River drainages. That is, the states are developing the maximum load of CBNG parameters of concern that these rivers can assimilate and still meet water quality standards and protect beneficial uses. This load or TMDL will be allocated between the states so that both states have the opportunity to develop coalbed natural gas. This TMDL development process is predicted to take two years. In the meantime, the Wyoming DEQ has agreed to "no measurable increase in concentration, for parameters of concern, at the state boundary" as a result of any Wyoming permits issued after January 3, 2001. (See attached Wyoming DEQ letter of January 26, 2001.) In addition, the information developed in this TMDL process will be incorporated into the on-going EIS, as appropriate. (See attached Montana DEQ letter of February 28, 2001.)

Unquestionably, there are strong laws, regulations and processes in place to protect Montana's water quality. We are committed to meeting those requirements—not because they are laws on the books, but because we want to be a good neighbor. We're determined to do it right.

GROUNDWATER QUANTITY

Landowners have expressed concerns that CBNG production could impact existing water rights. Again, existing legal mechanisms are in place to address this issue.

First, as described above, the steel and concrete well casing protects shallow aquifers from being adversely impacted by the CBNG drilling and pumping process. Second, the Montana Department of Natural Resources and Conservation and the Montana Board of Oil & Gas worked together under State law to establish the Powder River Basin Controlled Groundwater Area for coalbed methane development. This provides the following:

—Applies to all coalbed methane gas producing areas of the Fort Union Formation, including portions of Treasure, Big Horn, Rosebud, Powder River and Custer counties.

—Requires each coalbed methane well to receive a permit, before drilling, from the Board of Oil and Gas.

—Before a permit may be issued, the coalbed methane developer must provide an inventory and hydrologic assessment of existing wells, springs and streamflow and a proposed means to mitigate water resource impacts.

—Coalbed methane developers must offer water mitigation contracts to all owners of water wells or natural springs within one-half mile of a coalbed methane gas field. This area will be automatically extended one-half mile beyond any well adversely affected.

—The mitigation agreement must require the coalbed methane developer to promptly supplement or replace water from any natural spring or water well adversely affected by the coalbed methane project. The "burden of proof" is on the operator and not the landowner. This protection for water rights impacted by CBNG production is greater than water rights holders enjoy under the Montana Water Use Act for interference by a water well.

—Written notice must be provided by operators of proposed wells to all water rights holders within one-half mile of the coalbed methane well.

—Finally, the order establishing the Controlled Groundwater Area establishes a Technical Advisory Committee made up of State and federal technical people to characterize the hydrologic conditions in the targeted coal beds prior to development, and to continue monitoring groundwater levels both within and outside of the production field during development. See Board Order 99–99.

Thus, existing law provides strong protection for Montana water rights holders from loss of water quantity for coalbed natural gas development.

ALTERNATIVES TO DISCHARGE

The most significant environmental challenge to be addressed in the development of coalbed natural gas is how to handle the water produced in a manner that both protects existing environmental values and also enhances them. Montana is a state that places a high value on water, works to protect water quality and to prevent the waste of this valuable resource. Although the water produced from coalbed natural gas development contains salts that make it unsuitable for irrigation, without special handling or treatment, its overall quality is relatively high and can support livestock, wildlife and human use. How you protect water quality and, yet avoid the unnecessary waste of water is the issue. The most common means of handling CBNG include:

—Underground injection pursuant to an Underground Injection Control ("UIC") permit under the Safe Drinking Water Act. In the case of Montana, EPA Region VIII issues these permits. Redstone has been attempting to obtain Class V in-

jection permits in a timely manner in order to obtain information useful to the CBNG EIS alternatives analysis. We have been told by Region VIII, that unlike Wyoming, which issues these permits in two weeks, it will take at least 6 months, most likely longer to issue these permits. We hope that EPA can reorganize its priorities so that these permits can be issued sooner for use in the 2001 field season. Deep-well injection is the alternative NPRC has already decided is its preferred alternative, while we do not agree with this conclusion, it is important that the EIS analyze the pros and cons of deep-well injection. The most significant "con" of this approach is that while it may protect the environment, it does not enhance the environment or the ranching community that views additional water as a benefit. This approach takes relatively good water and injects it into water of much worse quality and stores it at a level where it is not available for use. Other injection alternatives include injection into the same aquifer from which the water was produced, in order to make it available for use.

—Discharge to surface water authorized by a Montana Pollution Discharge Elimination System ("MPDES") permit under the federal Clean Water Act and Montana Water Quality Act. As discussed above, Montana law will limit the amount of water that can be discharged to surface waters to protect existing water quality.

—Storage ponds for livestock and wildlife use pursuant to either a Montana Water Quality Act general permit or Montana Board of Oil & Gas-issued permit. Many landowners will welcome the opportunities that additional water supplies will provide for their livestock and hunting operations, particularly during droughts like the years Montana has recently experienced. CBNG water can support more efficient use of pastures, increase herd size and attract water fowl and wildlife. Again, there will be a natural limit to the number of ponds, reservoirs and stock-watering facilities that can be constructed.

—Treatment potential-reverse osmosis or filtration. Treatment alternatives are being actively examined, but the relatively good quality of the water and its volume present significant, technical and economic issues. The upside of treated water is its potential for use for irrigation in a water-poor area. Again, there will be some economic and technical limitations to wide-spread use of water treatment, but it is an important alternative.

The industry position is to maintain a menu of options that will allow us to work with affected landowners to best meet their needs. Like State Representative Keith Bales, we would like to find a win-win solution—develop CBNG and also provide good quality water to a water-poor area. This could involve some treatment of water for irrigation purposes; some water for wildlife and livestock use; some use for coal mine dust suppression; some re-injection and limited discharge to surface water. No one option is the best or only answer for all circumstances.

CONCLUSION

Redstone believes that coalbed natural gas development—done right—can be good news for an area of Montana sorely lacking in economic opportunity. This area of Montana is aging and depopulating as its children leave for western Montana or other states to find economic opportunity. Agriculture alone cannot be expected to support the county institutions necessary for a healthy community. We believe the tax and royalty income from coalbed natural gas development will give this area a shot in the arm for at least 20 years. No, CBNG will not last forever, but it can provide this area with a bridge to the future. And, in the short-term, if done right, CBNG development will provide jobs, taxes, a new source of energy and water that will sustain the area's agricultural community. Redstone is committed to working with regulators and the Montana public to find solutions to the environmental issues presented by coalbed natural gas development—to "do it right."

Senator BURNS. Thank you. And I might want to remind the folks, sitting behind us is staff people that—two of them, Ryan Thomas and Bruce Evans, is off the Senate appropriations staff, and, of course, Sharon Peterson, here with Senator Baucus.

Also, Congressman Rehberg has a staffer here too. Where is she? Right down there. Stand up. And she is listening, and those—and, of course, this will be passed on to the Congressman as we go along.

Ms. Old Elk.

STATEMENT OF NETA OLD ELK, DIRECTOR, CROW TRIBAL MINING AND MINERALS

Ms. OLD ELK. Thank you. I am Neta Old Elk, director, Crow tribal mining and minerals. I am honored to provide the following testimony on behalf of the Crow Tribe.

The Crow Tribe has one of the largest known coal reserves in the nation. Currently the Crow Tribe has approximately 5 billion tons of known coal reserves within its exterior boundaries. These reserves remain largely untapped. The Crow Tribe lost opportunities to reap the benefits of the coal boom of past decades due to the State of Montana's attempted imposition of its coal severance tax. The prospect of double taxation discouraged development and resulted in the shutout of Crow coal from the market.

Along with the untapped coal reserves on the Crow Reservation, geologic data indicates the coal reserves are rich with coalbed methane gas. With the nation's current energy crisis, coalbed methane gas at Crow has become an attractive prospect for immediate development.

The Crow Tribe greatly treasures the abundance of pure water, wildlife, and vegetation on the reservation. Further, the Crow Tribe has great respect and tradition connected to its homeland. However, the Crow Reservation does suffer from 70 percent unemployment, substandard housing, and a depressed economy. The Crow Tribe must explore all opportunities to improve reservation life for Crow people.

The Crow Tribe is anxious to participate in coalbed methane production in a reasonable and environmentally-protected manner. The tribe is concerned that a lengthy delay in development of the trapped coalbed methane gas may result in drainage of our gas due to our close reservation—due to our close neighbors off the reservation which are currently harvesting methane gas. We are motivated to establish mineral boundaries to prevent migration of our natural gas off the reservation.

Currently the Crow Tribal Minerals and Mining Office is conducting a geologic survey of the development area in the southeastern corner of the Crow Reservation, bordering Wyoming and eastern Montana. The coal data, ownership data, and land status are being examined very carefully by tribal engineers and technicians along with anticipated barriers to development, such as pipelines, leases, fee minerals, and environmental concerns. Based on the information gathered, the Crow Tribe will implement an exploration program to determine more accurately the Crow Tribe's coalbed methane reserve estimates.

The Crow Tribe has made a decision to aggressively explore its coalbed methane resources with a goal of reasonable development. This includes forming working alliances with numerous Federal agencies involved and strict compliance with all applicable Federal regulations. Further, the Crow Tribe, while fully intending to exercise its sovereign right to develop its natural resources, will attempt to acknowledge any concerns of its neighbors.

One of the biggest concerns to landowners and tribal members regarding coalbed methane development is the water associated with producing methane wells. Powder River Basin coal is full of water. In order to extract the gas, most coal seams require

dewatering. The policy in Wyoming has been to discharge water, treat the water, and use it for agriculture, or an experiment in Gillette, Wyoming, where they are treating the water and using it in their city water system.

The Crow Tribe is in the process of looking at several options with regard to the water concerns, one of which is reinjection, the other, of course, is ponding on clinker beds for natural absorption. However, the Crow Tribe at this time is examining all possible scenarios.

The biggest barrier facing the Crow Tribe today is funding for these activities. Assessment and exploration is very expensive. Between $2 to $3 million is needed for a full assessment and exploration. BIA currently has an RFP out for mineral assessment, and the Crow Tribe does meet all requirements to receive this grant. However, the maximum amount is $80,000. This will cover administrative costs associated with development—or with assessment, but several million more is needed.

The Bureau of Indian Affairs has been very helpful in assisting the Crow Tribe with information and data needed, specifically the BIA in Lakewood, Colorado. The Bureau of Land Management, along with the Montana State Department of Environmental Quality, are in the middle of a statewide environmental impact statement which specifically excludes the Crow reservation. BLM did send a draft MOU inviting the Crow Tribe to participate in the EIS. However, the MOU was not acceptable, and the Crow Tribe is in the process of revising it and sending it back for BLM review.

PREPARED STATEMENT

The Crow Tribe is currently looking at potential benefits from coalbed methane revenues. We are predicting 70 to 150 full-time jobs, which include well maintenance, roads, pipelines, geology, and engineering. We are looking at scholarship programs, health and prevention programs, retirement plans for elderly, homes, land acquisitions, and tribal infrastructure. We realize that the revenues are great and can greatly improve the tribe's economic base.

I will be happy to answer any of your questions on behalf of the Crow Tribe, and thank you for the opportunity.

[The statement follows:]

PREPARED STATEMENT OF NETA OLD ELK

Honorable Committee members, I am Neta Old Elk, Director of the Crow Tribal Minerals and Mining Office. I am honored to provide the following testimony on behalf of the Crow Tribe.

The Crow Tribe has one of the largest known coal reserves in the Nation. Currently the Crow Tribe has approximately 5 billion tons of known coal reserves within its exterior boundaries. These reserves remain largely untapped. The Crow Tribe lost opportunities to reap the benefits of the coal boom of past decades due to the State of Montana's attempted imposition of its coal severance tax. The prospect of double taxation discouraged developers and resulted in a shut out of Crow coal from the market.

Along with the untapped coal reserves on the Crow reservation, geologic data indicates the coal reserves are rich with coal bed methane gas. With the Nation's current energy crisis, the coal bed methane gas at Crow had become an attractive prospect for immediate development.

The Crow Tribe greatly treasures the abundance of pure water, wildlife, and vegetation on the Crow Reservation. Further, the Tribe has a great respect and traditional connection to our homeland. However, the Crow Indian Reservation suffers

from 70 percent unemployment, substandard housing and a depressed economy. The Crow Tribe must explore all opportunities to improve reservation life for the Crow people.

The Crow Tribe is anxious to participate in coal bed methane production in a responsible, environmentally protective manner. The Tribe is concerned that a lengthy delay in development of Tribe's coal bed methane gas may result in a drainage of gas to our close off reservation neighbors who are presently actively harvesting methane gas. We are motivated to establish mineral boundaries to prevent migration of our natural gas off the reservation.

Currently, the Crow Tribal Minerals and Mining office is conducting a geologic survey of the development area located in the southeastern corner of the Crow Reservation bordering Wyoming and eastern Montana. The coal data, ownership date and land status are being examined very carefully by tribal engineers and technicians along with anticipated barriers to development such as pipelines, leases, fee minerals and environmental concerns. Based on the information gathered, the Crow Tribe will implement an exploration program to determine more accurately the Crow Tribe's coal bed methane reserve estimates.

The Crow Tribe has made a decision to aggressively explore its coal bed methane resources with a goal of responsible development. This includes forming working alliances with the numerous federal agencies involved and strict compliance with all applicable federal regulations. Further, the Crow Tribe, while fully intending to exercise its sovereign rights to develop its natural resources, will attempt to acknowledge any concerns of its neighbors.

One of the biggest concerns to landowners and Tribal members regarding coal bed methane development is the water associated with producing methane wells. Powder River Basin coal is full of water, in order to extract the gas, most coal seams require de-watering. The policy in Wyoming has been to discharge the water, treat the water and use it for agriculture, or some places such as Gillette, Wyoming are treating the water and using it in their city water system. The Crow Tribe is in the process of looking at several options with the water concerns; one of which is re-injection, once the seams are de-watered, the water is then pumped several miles down the road and re-injected back into the ground anywhere from 1000 feet to 3500 feet, well below any producing aquifers. Another option is to pond the water on Clinker beds for natural absorption back into the earth. The Crow Tribe is examining all possible scenarios.

The biggest barrier facing the Crow Tribe today is funding for these activities. Assessment and Exploration is very expensive. 2 to 3 million dollars is needed for full assessment and exploration. BIA has put out an RFP for Minerals Assessment and the Crow Tribe does meet all the requirements to receive this grant, however, the maximum about is $80,000. The will cover administrative costs associated with Assessment, but several million more is needed. The Bureau of Indian Affairs has been very helpful in assisting the Crow Tribe with information and data needed, especially the BIA in Lakewood, Colorado. The Bureau of Land Management along with the Montana State Department of Environmental Quality are in the middle of a State wide Environmental Impact Statement which specifically excludes the Crow Reservation. BLM did send a draft MOU inviting the Crow Tribe to participate in the EIS, however, the MOU was not acceptable and the Crow Tribe is in the process of revising it and sending it back for BLM review.

Potential benefits to the Crow Tribe from Coal Bed Methane revenues:

—70 to 150 full time jobs (well maintenance, roads, pipelines, geology, engineering)
—Scholarship programs
—Health and prevention programs
—Retirement plan for elderly
—Homes
—Land acquisition
—Tribal infrastructure

Senator BURNS. Thank you, Neta. We appreciate that very much.

Now we have Geri Small, and congratulations to her, president of the Northern Cheyenne Tribe.

STATEMENT OF GERI SMALL, PRESIDENT, NORTHERN CHEYENNE TRIBE

Ms. SMALL. Thank you and good morning, Senator Burns and Senator Baucus.

I am Geri Small, president of the Northern Cheyenne Tribe. After a substantial background in tribal government I was elected president by a 72-percent vote on November 7, 2000. I will serve a 4-year term. I greatly appreciate the opportunity to present the concerns of the tribe with respect to coalbed methane, CBM development in areas surrounding our reservation.

Our unique vulnerabilities. Our 450,000-acre reservation lies in the heart of Montana's coal and CBM country. Among all communities in the region, ours is the most vulnerable to the downside of coal-related development and the least privy to its financial benefit. For decades we have experienced major negative impacts and scant benefits from coal mining and power plant projects to the north and south of us.

I have requested to Congress to—has trust responsibilities to the Northern Cheyenne Tribe. We are requesting approximately $8 million over the next 5 years to assist our tribal government's efforts to establish baseline data and implement a monitoring program for coalbed methane impacts to our reservation. As a tribal government, we need to—we need a Congressional appropriation to meet the expenses associated with the environmental review process. I am requesting for your immediate consideration to our appropriation request NEPA process because of the fast track.

Socioeconomic conditions on our reservation are much worse than those off-the-reservation communities. Our public services and facilities are grossly deficient. We receive no share of the vast royalties or taxes generated by the development surrounding us. There is no tax base on the reservation to generate funds to address our needs.

When left to their own devices, off-reservation mines and power plants do not employ Northern Cheyennes, even though we are the largest and most needy community in the region. The most readily available work force hovers around 70 percent. Despite longstanding and diverse efforts, we have been unable to generate appreciable economic developments on the reservation. As development proceeds around us, the gross disparity and quality of life between us and our off-reservation neighbors grows larger.

Physical and cultural conditions. In addition, we are uniquely vulnerable to the physical impacts of surrounding coal-related development because of our traditional beliefs and values. Our culture is entirely different from that of our neighbors. We believe that all living things are sacred. Our connection with our land and culture is of major importance. Those traditional values extend beyond the technical boundaries of our reservation, to lands to the north and south and to our original lands in the Tongue River Valley.

The depth of our commitment to our traditional values is manifest from our internal reluctance to exploit the abundant coal resources underlying on our reservation. In an act of extraordinary self-denial, we have thus far refrained from developing those resources for commercial gain because of our reverence to our homeland.

CBM impacts surrounding the reservation will magnify the entire range of socioeconomic, physical, and culture impacts we have suffered from encircling coal and power plant development. More-

over, those impacts will be augmented by the following new impacts:

Reservation ground water and subsidence: drawdowns and deterioration of water quality in reservation wells, dewatering of the reservation aquifer overlying the coal seams, impairment of vested ground water rights on the reservation surface lands due to dewatering of the subsurface.

Reservation surface water: pollution of tribal water in the Tongue River Reservoir and the Tongue River; noncompliance with tribal water quality standards; impairment of water rights secured to us in our water settlement with the United States and the State; impairment of on-reservation irrigation projects, including those secured to us by part of our water settlement.

Migration of CBM water: migration onto the reservation of CBM water discharges from off-reservation CBM wells; resultant damage to the reservation agriculture, land, fish, and wildlife and their habitats.

Reservation mineral resources: siphoning of reservation CBM reserves; siphoning of water from reservation coalbeds, which may damage our coal by compression or other means; on-reservation coal-seam fires.

Noise: CBM venting; noise from compressor stations and vehicles adversely affecting reservation residents, spiritual values, and fish and wildlife; hazardous CBM migration onto the reservation homes and water wells.

Air pollution and visibility impairment from CBM venting, coal-seam fires, carbon dioxide, dust, and other emissions, in violation of the reservation's Class I air quality standards.

Our socioeconomic concerns: increased traffic; increased stress on already inadequate on-reservation public services and facilities; increased law and order problems, especially in the light of reservation jurisdictional uncertainties among tribal, Federal, or State jurisdictions; inclusion of the tribe from development-related State and local tax revenues and Federal royalties that will accrue to State and local governments, exacerbating the gross disparities on-reservation and off-reservation public services and facilities; exclusion of tribal members from job opportunities available to others in off-reservation CBM projects, unless special measures are adopted to compel opportunities for the Northern Cheyenne.

Culture concerns: damage to the sacred wildlife and plants found on or near the reservation; damage to the sacred sites on and near the reservation; damage to the water spirits in the Tongue River and at the reservation springs.

Lessons from the 1982 Powder River coal sale: the Northern Cheyenne do not want the current initiative for regional energy development to be a reenactment of the failed 1982 Powder River coal sale. In studying and fashioning that 1982 sale, the United States did not identify, analyze, and require mitigation of reservation impacts. Before the 1982 sale we made a major effort to bring these failures to the attention of local, regional, and national and industry officials, to no avail.

Left with no other recourse, the tribe brought suit against the United States, and we prevailed. The Court held the United States had committed a massive breach of trust responsibility to the tribe

and violated the NEPA and other statutory and regulatory requirements. Judgment was entered, cancelling issued coal leases and holding the United States liable for the tribe's very substantial litigation costs and expenses.

We would hope that in considering and fashioning any proposed regional CBM development, Federal officials will not repeat the mistakes of the past. Specifically, to meet its trust responsibilities to the tribe, the United States must assure that the impacts described above will be carefully assessed and the appropriate mitigation will be adopted in light of the uniquely vulnerable and disadvantaged status of the Northern Cheyenne within the region.

Otter Creek tracts: finally, I must briefly address the proposed transfer of the Otter Creek tracts to the State. The legislation directing this was developed without even the slightest consultation with the Northern Cheyenne Tribe. It was fashioned without any consideration of the damaging impacts that implementation of the transfer would inflict on the Tribe.

Under section 503, massive amounts of Federal coal in areas adjoining the eastern boundary of our reservation will be transferred to the State. Well before the enactment of section 503 it was well-known to the United States that the adverse impacts of expanding coal development in the Tongue River Valley would fall heaviest on our reservation community and that our community would be uniquely excluded from the benefits of such development.

Again, development of the Otter Creek tracts will generate very large public revenues in the form of royalties and State and local taxes. Those revenues will enable off-reservation jurisdictions to cope with the impacts of Otter Creek development. None of those revenues will be available to the Northern Cheyenne to address the existing defects on the reservation public services and facilities or increased effects that the development will create. Also, the jobs and economic opportunities that would flow from Otter Creek development will not reach the Northern Cheyenne.

Well before enactment of section 503 it had been established in the Powder River coal sale litigation that the United States' trust responsibility to the Tribe requires that these adverse impacts to the—be identified and mitigated in the Federal coal leasing and the NEPA processes. But in complete disregard of the trust responsibilities, members of the Montana delegation engineered the unilateral transfer of these massive Federal coal resources to the State and thereby stripped the Tribe of the essential protections of the Federal coal leasing and NEPA processes.

Upon such transfer, the coal will be developed in accordance with the State processes, which, according to the State, provide no legal authority, under MEPA or strip-mining permitting act, to require operators to adopt mitigation measures to address impacts inflicted on the reservation. If we had been consulted about the legislation proposal in advance, we would have sought explicit inclusion of appropriate measures to remedy this fundamental defect.

Notwithstanding these failures, it remains our position to the Secretary of the Interior, as the Tribe's trustee, must consider and mitigate these impacts before transferring the Otter Creek tracts to the State. In advance of any transfer, the Secretary must identify and analyze these impacts and mitigate them via insertion of

protective stipulations in any patents transferring to the Otter Creek tracts to the State.

Finally, it is also clear that a condition precedent to the transfer of the tracts has not been satisfied. The requirement of Sections 503 (a)(1) and (b) that the Secretary and the Governor first endeavor to negotiate and agree to transfer of the 10 million in Federal mineral rights to the State.

PREPARED STATEMENT

It is only after the failure of such good-faith negotiation that the Otter Creek tracts are to be transferred. As we understand it, the Governor flatly refused to enter into any such negotiations and, therefore, we believe, violated Section 503. By its conduct, the State is, therefore, not presently entitled to the Otter Creek tracts.

Thank you for your opportunity to present the concerns of the Northern Cheyenne Tribe.

[The statement follows:]

PREPARED STATEMENT OF GERI SMALL

I am Geri Small, President of the Northern Cheyenne Tribe. After a substantial background in Tribal government, I was elected President by 72 percent of the vote on November 7, 2000, and will serve a four-year term. I greatly appreciate the opportunity to present the concerns of the Tribe with respect to coalbed methane ("CBM") development in areas surrounding our Reservation.

Our unique vulnerabilities

Our 450,000 acre Reservation lies at the heart of Montana's coal and CBM country. Among all communities in the region, our's is the most vulnerable to the downside of coal-related development and the least privy to its financial benefits. For decades we have experienced major negative impacts, and scant benefits, from coal mining and power plant projects to the north and south of us.

Socio-economic conditions

Socio-economic conditions on our Reservation are much worse than those in off-Reservation communities:

—Our public services and facilities are grossly deficient.
—We receive no share of the vast royalties and taxes generated by the development surrounding us.
—There is no tax base on the Reservation to generate funds to address our needs.
—When left to their own devices, off-Reservation mines and power plants do not employ Northern Cheyennes, even though we are the largest and most needy community in the region, with the most readily available workforce (our unemployment rate currently hovers around 70 percent).
—Despite long-standing and diverse efforts, we have been unable to generate appreciable economic development on the Reservation.
—As development proceeds around us, the gross disparity in quality of life between us and our off-Reservation neighbors grows larger.

Physical and cultural conditions

In addition, we are uniquely vulnerable to the physical impacts of surrounding coal-related development because of our traditional beliefs and values. Our culture is entirely different from that of our neighbors. We believe that all living things are sacred. Our connection with our land and culture is of transcendent importance. These traditional values extend beyond the technical boundaries of our Reservation, to lands to the north and south and to our original lands in the Tongue River Valley. The depth of our commitment to our traditional values is manifest from our internal reluctance to exploit the abundant coal resources underlying our Reservation. In an act of extraordinary self-denial, we have thus far refrained from developing those resources for commercial gain, because of our reverence for our Reservation.

CBM impacts

CBM development surrounding the Reservation would exacerbate the entire range of socio-economic, physical and cultural impacts we have suffered from encircling

coal and power plant development. Moreover, those impacts will be augmented by pernicious new impacts:

Reservation groundwater and subsidence

Drawdowns and deterioration of water quality in Reservation wells.
De-watering of the Reservation aquifer overlying the coal seams.
Impairment of vested groundwater rights on the Reservation.
Subsidence of Reservation surface lands due to de-watering of the subsurface.

Reservation surface water

Pollution of Tribal water in the Tongue River Reservoir and the Tongue River.
Non-compliance with Tribal water quality standards.
Impairment of water rights secured to us in our water settlement with the United States and the State.
Impairment of on-Reservation irrigation projects, including those to be secured to us as part of our water settlement.

Migration of CBM water

Migration onto the Reservation of CBM water discharged from off-Reservation CBM wells.
Resultant damage to Reservation agricultural lands, fish and wildlife, and their habitats.

Reservation mineral resources

Siphoning of Reservation CBM reserves.
Siphoning of water from Reservation coalbeds, which may damage our coal by compression or other means.
On-Reservation coal seam fires.

Noise; CBM venting

Noise from compressor stations and vehicles adversely affecting Reservation residents, spiritual values and fish and wildlife.
Hazardous CBM migration into Reservation homes and water wells.

Air pollution

Air pollution and visibility impairment from CBM venting, coal seam fires, carbon dioxide, Nox from compressor stations and vehicles, dust and other emissions, in violation of the Reservation's Class I Air Quality standard.

Socio-economic concerns

Increased traffic.
Increased stress on already inadequate on-Reservation public services and facilities.
Increased law and order problems, especially in light of Reservation jurisdictional uncertainties among Tribal, federal and State jurisdictions.
Exclusion of the Tribe from development-related State and local tax revenues and federal royalties that will accrue to State and local governments, exacerbating the gross disparities between on-Reservation and off-Reservation public services and facilities.
Exclusion of Tribal Members from job opportunities available to others in off-Reservation CBM projects, unless special measures are adopted to compel opportunities for the Northern Cheyenne.

Cultural concerns

Damage to sacred wildlife and plants found on and near the Reservation.
Damage to sacred sites on and near the Reservation.
Damage to water spirits in the Tongue River and at Reservation springs.

Lessons from the 1982 Powder River Coal Sale

The Northern Cheyenne do not want the current initiative for regional energy development to be a re-enactment of the failed 1982 Powder River Coal Sale. In studying and fashioning that 1982 sale, the United States did not identify, analyze and require mitigation of Reservation impacts. Before the 1982 sale, we made a major effort to bring these failures to the attention of local, regional, national and industry officials, to no avail.

Left with no other recourse, the Tribe brought suit against the United States and thoroughly prevailed. The court held the United States had committed a massive breach of its trust responsibility to the Tribe, and violated NEPA and other statutory and regulatory requirements. Judgment was entered canceling issued coal

leases and holding the United States liable for the Tribe's very substantial litigation costs and expenses.

We would hope that in considering and fashioning any proposed regional CBM development, federal officials will not repeat the mistakes of the past. Specifically, to meet its trust responsibilities to the Tribe, the United States must assure that the impacts described above will be carefully assessed and that appropriate mitigation will be adopted in light of the uniquely vulnerable and disadvantaged status of the Cheyenne within the region.

Otter Creek tracts

Finally, I must briefly address the proposed transfer of the Otter Creek coal tracts to the State. The legislation directing this was developed without even the slightest consultation with the Northern Cheyenne Tribe. It was fashioned without any consideration of the damaging impacts that implementation of the transfer would inflict on the Tribe.

Under section 503, massive amounts of federal coal in areas adjoining the eastern boundary of our Reservation will be transferred to the State. Well before enactment of section 503, it was well known to the United States that the adverse impacts of expanded coal development in the Tongue River Valley would fall heaviest on our Reservation community, and that our community would be uniquely excluded from the benefits of such development.

Again, development of the Otter Creek tracts will generate very large public revenues, in the form of royalties and State and local taxes. Those revenues will enable off-Reservation jurisdictions to cope with the impacts of Otter Creek development. None of those revenues will be available to the Northern Cheyenne to address the existing deficits in Reservation public services and facilities or the increased deficits that the development will create. Also, the jobs and economic opportunities that would flow from Otter Creek development will not reach the Northern Cheyenne.

Well before enactment of section 503, it had been established in the Powder River Coal Sale litigation, that the United States' trust responsibility to the Tribe requires that these adverse impacts be identified and mitigated in the federal coal leasing and NEPA processes. But, in complete disregard of this trust responsibility, members of the Montana delegation engineered the unilateral transfer of these massive federal coal resources to the State, and thereby stripped the Tribe of the essential protections of the federal coal leasing and NEPA processes. Upon such transfer, the coal will be developed in accordance with State processes, which, according to the State, provide no legal authority (under MEPA or the strip-mine permitting Act) to require operators to adopt mitigation measures to address impacts inflicted on the Reservation. If we had been consulted about this legislative proposal in advance, we would have sought explicit inclusion of appropriate measures to remedy this fundamental defect.

Notwithstanding these failures, it remains our position that the Secretary of the Interior, as the Tribe's trustee, must consider and mitigate these impacts before transferring the Otter Creek tracts to the State. In advance of any transfer, the Secretary must identify and analyze these impacts, and mitigate them via insertion of protective stipulations in any patents transferring the Otter Creek tracts to the State.

Finally, it is also clear that a condition precedent to the transfer of the tracts has not been satisfied—the requirement in sections 503 (a) (1) and (b) that the Secretary and the Governor first endeavor to negotiate and agree on the transfer of $10 million in federal mineral rights to the State. It is only after the failure of such a good faith negotiation, that the Otter Creek tracts are to be transferred. As we understand it, the Governor flatly refused to enter into such negotiations and therefore, we believe, violated section 503. By its conduct, the State is therefore not presently entitled to the Otter Creek tracts.

Thank you for the opportunity to present the concerns of the Northern Cheyenne Tribe.

Senator BURNS. Thank you.

And now we hear from Wayne Kelley, president, Omega Oil Company.

Wayne, thank you for coming today. You want to pull your microphone over there.

STATEMENT OF WAYNE L. KELLEY, PRESIDENT, OMEGA OIL CO.

Mr. KELLEY. Coalbed methane is a near-term opportunity to solve much of the country's current energy crisis. However, the de-

velopment of that methane needs to satisfy three fundamental criteria. As the custodians of our resources, we need to ensure that those resources are developed efficiently and that they are also developed in an economic manner. And as the trustees for our environment, we need to also make sure that that development is an environmentally satisfactory fashion.

I have brought some charts, which I think you have copies of, Senators. And I want to give a very brief overview of the production of oil and gas and what Omega offers that is new to try to satisfy these concerns.

The mechanical premise under which oil and gas is produced really has its history back in the 1860s, with Drake's well, and those mechanics remain unchanged as the state-of-the-art today. Those mechanics are dependent upon the migration of oil or gas or fluids associated with gas, through a permeable membrane to a well bore, and then they are lifted by a mechanical means to a surface-located wellhead.

In the 1970s concepts were developed whereby lateral or horizontal segments of those vertical wells could be drilled, the premise being that by mitigating the distance that the fluids or the gas have to migrate, that you get a more effective recovery. And I want to represent that a vertical well in most cases in this country recovery only about 9 to 12 percent of the original oil in place under primary recovery, and that this advance using horizontal drilling increases that recovery factor by maybe 50 percent, resulting in, on an average, 15-percent recovery of the original oil or gas in place.

Now, this horizontal technology has become rather widespread during the 1980s, but it is not really applicable to coalbed methane, the reason being that these types of wells are expensive to complete and they also require a fair amount of distance below the earth's surface in order to get the drill pipe turned to make this 90-degree turn.

The Omega technology, which we represent may solve some of the problems in the production of coalbed methane, relies on a very different mechanical premise. The mechanical premise being that the wellhead is actually located below the reservoir in a mine.

The chart that you see here, the well bore that is going down through the earth's surface is approximately 10 feet in diameter. The area where the wellheads are are approximately 90 feet in diameter. But this allows the effective placement of up to 144 well heads at one single location.

What this does in terms of the efficiency or the effectiveness of the recovery is that the recovery of the resource is, on average, 200 percent greater than the mechanical recovery from conventional surface-located wellheads. The cost of putting in a facility like this, because of the amount of acreage that is covered by this type of facility, is roughly equivalent of developing surface-located wells, but obviously you get a much better economy because you are recovering more than twice the amount of the initial resource.

This also has no considerable environmental consequences, and it has some considerable application to coalbed methane. By the location of the wellhead below the reservoir, you are able to produce simultaneously all of the coal seams, all the gas from all the coal seams, whereas a conventional-located well on the surface only al-

lows the production of one coal seam at a time. This results in, you know, more efficient and a faster rate of recovery, and it also results in a much more effective rate of recovery.

We have some charts here that kind of show the benefits of coalbed methane of this type of production.

Senator BAUCUS. They are in here, too, right?

Mr. KELLEY. They are in here, too, that is correct.

Now, this also has a benefit in terms of the water, because by the production of up to, say, 8,000, 8,500 acres of one central location, it allows all that water that is produced to be brought to one central location for treatment and disposition.

And the next diagram I would like to show is what a conventional series of well pads would like for the production of 8,500 acres. You'll see that it requires 220 well sites to produce 8,500 acres. And those well sites all need electricity. They all need a pipeline to get the gas to a central collection point. They all need access for servicing, whereas the technology we have developed requires but one well site.

Now, how does this relate in terms of the water? The water, of course, is all drawn to one location. And by the volume of water that is produced at this one location, this permits the effective and economic use of wetlands filtration. We are proposing to use for wetlands filtration a process that was jointly developed by the United States Department of Energy and Texaco. And I have some photographs of that development which are in Wyoming. They are the—or at Naval Petroleum Reserve No. 3.

What you are looking at here is wetlands filtration. These are an aquatic species of plant. And what they do is they attach the sodium or heavy metals or any number of contaminants in the water to the roots of the plants. The plants can then be harvested and disposed of as either agricultural feed or for several other uses. This is the water movement between cells in the wetlands treatment area. And this shows another one of the cells of the wetlands treatment. This is an organic method of treatment. It is highly effective and it allows for extremely clean water that can be used either as potable water or it can be used for agricultural use.

PREPARED STATEMENT

Again, we think that this method of production is good stewardship of the environment. It satisfies many of the key issues of treating water. It obviously gets greater recovery of gas, and results in a considerable reduction of the environmental disturbance.

Thank you.

[The statement follows:]

PREPARED STATEMENT OF WAYNE L. KELLEY

No opportunity to solve America's energy crisis is more promising than developing a method to extract the huge methane gas reserves in the Powder River Basin and across the United States efficiently, inexpensively, and in an environmentally benign fashion. Omega Oil Company, Inc. proposes just such a method.

That method solves three distinct problems: the treatment of the large quantities of water brought to the surface with coal bed methane, the considerable surface disturbance caused by the large number of closely spaced wells required when drilled vertically, and the large quantity of gas stranded or left behind by conventional drilling methods. Let's deal with each of these questions in turn.

WATER PURIFICATION

The initially high volume of water associated with coal bed methane production, though it declines over the life of any project, brings to the surface undesirable salts and minerals. Mechanical methods of removal are feasible but involve significant quantities of energy and create visual pollution.

Wetlands filtration removes the minerals from produced water by absorption into aquatic plants. These plants, with their low levels of minerals, are then harvested and disposed of. The treated water is then essentially mineral free and may be reintroduced into the aquifer, used for domestic or agricultural application or simply be disposed of by surface drainage without risk of loading mineral concentrations at the point of discharge.

Omega proposes the use of an organic alternative wetlands filtration process developed by Texaco and demonstrated with success jointly with the United States

Department of Energy at the department's Rocky Mountain Oilfield Testing Center near Casper, Wyoming (Fig. 1).

SURFACE DISTURBANCE

Coal bed methane reservoirs by nature have poor internal communication, meaning that the gas is not able to migrate more than a few hundred to two thousand feet at most from its original location to the well bore. Hence, coal bed methane wells must be closely spaced and, when drilled vertically in a conventional fashion from the surface (Fig. 2), create considerable surface disturbance. Omega's development method concentrates all of the wellheads at a centralized location that is not only below the surface; but below the gas reservoir as well and likely to be below any locally exploited freshwater aquifer. Long horizontal wells are drilled out from that central location by state-of-the-art coiled tubing drilling methods by which all fluid and gas collection is at a centralized location. This centralization greatly reduces surface disturbance (Fig. 3) and makes for more efficient production facilities.

PRODUCTION EFFICIENCY

We are the custodians of earth's limited resources. Therefore, we are responsible to ensure efficient exploitation of those resources when we choose to utilize them. The Omega production method has the capacity to recover a greater portion of the original gas (or oil) in place for a variety of reasons:

1. Geologic variances or discontinuities often impede oil or gas migration. The high concentration of closely spaced horizontal well borings in the Omega method cross many barriers to migration that result in stranded or left behind resources when exploited by conventional methods.
2. The Omega well bore configuration makes for a more favorable rate of production because fluid (the water in the de-watering phase in CBM production) migrates naturally in a downward direction toward the underground control location that is below the gas or oil reservoir.
3. The low operating cost of Omega configured wells allows economic operations at production volumes lower than conventional wells, thereby extending the decline curve and improving the recovery factor.
4. Conventional coal bed methane wells can produce from only one coal seam at a time. The Omega wells can produce multiple seams simultaneously.

Depending upon the unique reservoir characteristics of any given field we believe the Omega production method, when employed in oil and gas production, on average will improve primary recovery factors by as much as 200 percent and total recovery rates by as much as 100 percent. The prospect of greater rates and factors of recovery is not only a question of operating efficiency, but reduces significantly the number of oil or gas fields required to be in active production at any one moment. Hence, a greater ratio of gas to water is achieved over the life of a project by utilizing the Omega technology.

The combined effect of wetlands filtration and Omega's below the reservoir production technology is greater than the sum of its parts. Water treatment by wetlands filtration can be achieved at a single location without any requirement to transmit produced water from a remote well location. This advantage further reduces surface disturbance by reducing the number and distribution of wetlands sites, pipelines, treaters and right-of-ways for transporting water to a central wetlands.

Although our production concept is new to coal bed methane production we believe that we can demonstrate in the laboratory the effectiveness of wetlands filtration at a specific Powder River project location and accurately forecast the surface disturbance savings, the exact development footprint, subsurface configuration and pro-

duction forecast before the implementation of any on site development. The steps to commercial implementation of coal bed methane production utilizing wetlands filtration and Omega's below the reservoir production technology are:

1. Laboratory demonstration of wetlands filtration and production site design for technical and economic evaluation.
2. Proof of concept at commercial scale.

SUMMARY

Methane gas production can be a vital source of fuel for electric power production and for clean burning fuel cell driven transportation. It is therefore a major element toward energy reliability and independence.

Omega's method of production of coal bed methane and its treatment of the water it produces by wetland filtration offers a near-term tangible advance in the production of much needed, clean burning energy and a quantum improvement in the environmental consequences of gas production.

Fig. 1

Fig. 2

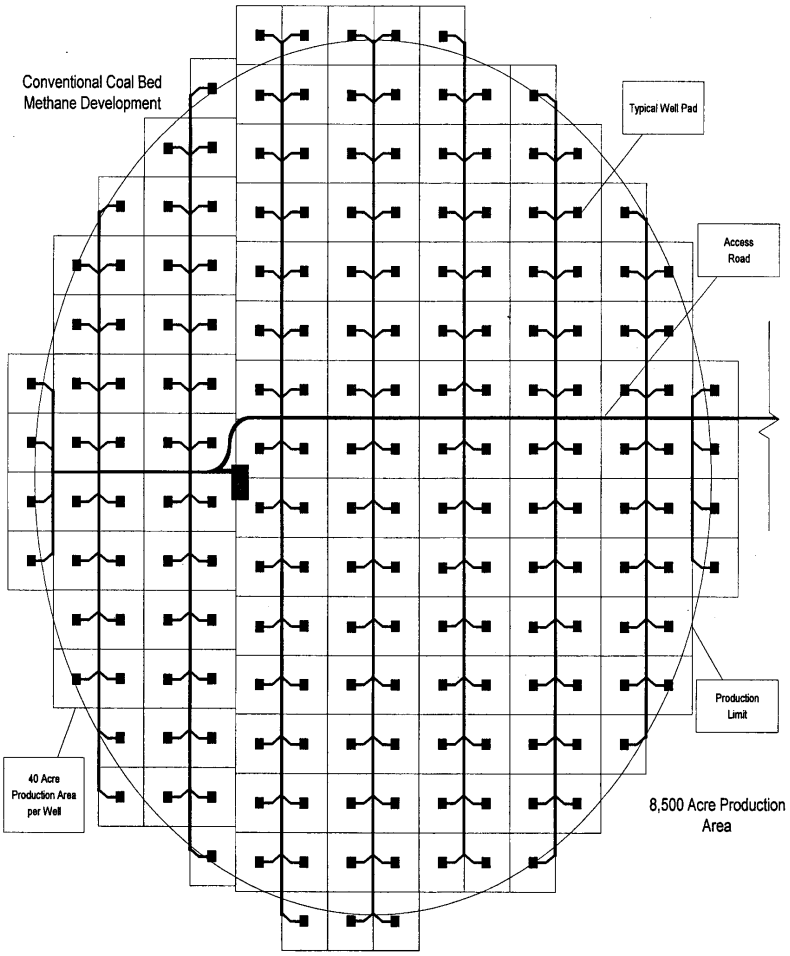
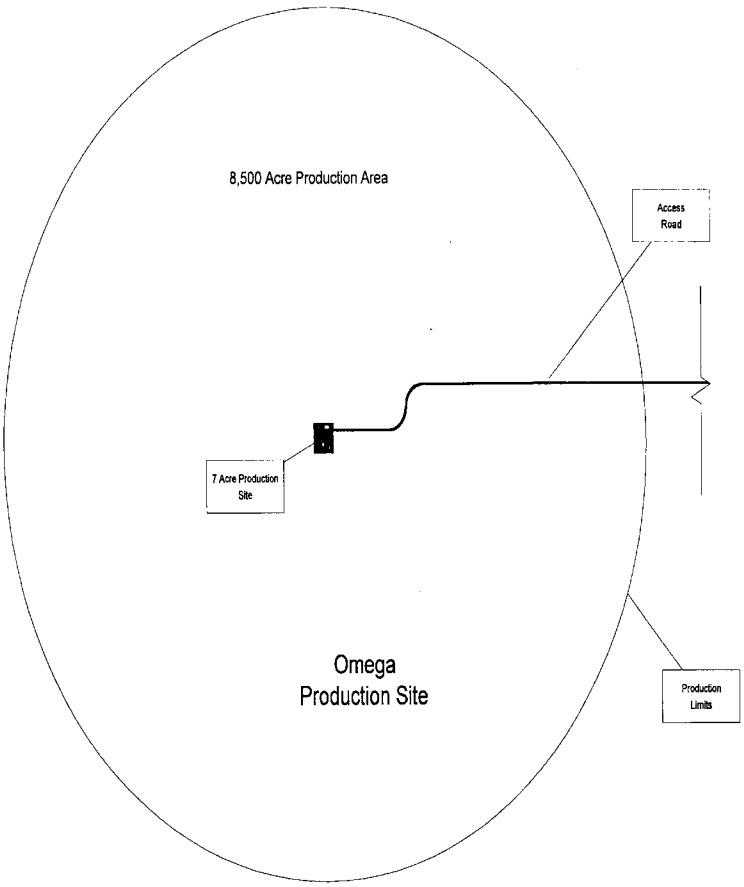

Conventional Coal Bed
Methane Development
Typical Well Pad
Access
Road
Production
Limit
40 Acre
Production Area
per Well
8,500 Acre Production
Area

Fig. 3



Senator BAUCUS. We do not have that one.

Mr. KELLEY. We will get it to you.

Senator BURNS. Can you imagine they only left one page out.

Mr. KELLEY. We did not want to bore you with all the engineering.

Senator BURNS. Let us take that a little further. If—and it seems like as we hear the dialogue on developing this resource, Mr. Kelley, that water management is at the center of the discussion. Tell me about, in your experimentation and the work that you have done in the national petroleum part of that thing, how much has that added to your costs?

Mr. KELLEY. Senator, it is a very nominal increase in the cost. The treatment of this water compared to the cost per barrel of oil is in the pennies. And it has been very, very effective, from what I understand, at Naval Petroleum Reserve No. 3. And we think

that the—because of the consolidation and the ability to do this on a large scale and it is a centrally-located facility, that the cost would be insignificant. It would be cheaper than any type of mechanical means of treatment.

Senator BURNS. See, the reason I ask that question is because when the price finally stabilizes and maybe goes down a little bit, do we risk environmental damage to cut corners to keep the wells in production? That is what I am saying is how much this adds to the cost, the final cost of the product before you even transport it.

Also, Ms. Old Elk, I am interested in the tribe's area. How far along are you in your process of increasing your production on the reservation?

Ms. OLD ELK. We currently have no production on the reservation. We are in the middle of getting a reserve estimate of our gas potential, of our resource. We first are doing a geologic survey and running economics on coalbed methane development. The next step, of course, is exploration and getting a few holes drilled for exploration, some coring done. Of course, that takes money and time.

The geologic assessment I suspect we will have done by May, and then at that point move forward into exploration and a pilot project. But I think as a tribe, with 5 billion tons of coal, we first need to get a reservoir estimate of our gas potential.

Senator BURNS. Have you made contacts of energy companies or engineering firms to do that work for you?

Ms. OLD ELK. Actually, we have been contacted by energy companies since this administration took office in July. Approximately 30 to 40 different gas companies have approached the tribe for development.

Senator BURNS. Ms. Small, you registered a pretty strong opposition to this moving forward. Is that the consensus of the Cheyenne Tribe, that they do not want to participate in this or are opposed to the development in and around the reservation.

Ms. SMALL. It is a very controversial issue, so right now we have not really—any of that yet.

Senator BURNS. Okay, Max.

Senator BAUCUS. Thank you, Conrad.

One of the interesting sort or technical questions I have—perhaps Mr. Caskey or Mr. Kelley can answer it—is how much drawdown or flow or leakage is there when, say, there is development on private land right next to BLM land? And BLM and I know that the tribes—I know that the Crow, for example, maybe Northern Cheyenne as well, are both concerned oh, my gosh. First of all, Wyoming, it is all kind of flowing south to Wyoming underground. Second, it is at the expense of not only private landowners, the expense of BLM land, the expense of tribal land. I know it is a difficult concept to generalize, but just how serious is that from a geological perspective?

Mr. CASKEY. I will take a crack at it, Senator. Both the Oil and Gas Conservation Commission in Wyoming and the Board of Oil and Gas in Montana have rules and regulations that require certain spacings for development of wells. Those spacings try to do a couple of things. They try to prevent drainage and waste of the resource, and they also try to prevent drilling of unnecessary wells.

So with proper engineering and development oversight, what they pass is the——

Senator BAUCUS. I appreciate that. That is really not the question I asked. I probably did not make myself very clear. I just read testimony of the State's, a couple of the tribes, BLM too, thinking we got to get going here because this stuff is leaking over to private lands, leaking over to Wyoming. We better get moving so we can get some for us too. It is that question I am trying to address.

Mr. KELLEY. Mr. Baucus.

Senator BAUCUS. Yeah.

Mr. KELLEY. The migration of fluids in the permeable membrane are dictated by Darcy's law.

Senator BAUCUS. Darcy's law?

Mr. KELLEY. Darcy's law.

Senator BAUCUS. Will you explain Darcy's law to us.

Senator BURNS. Is it anything like Murphy's?

Mr. KELLEY. Darcy's law is a universally accepted engineer law that dictates the behavior of fluids and gases in permeable membranes. And it is dictated by the viscosity of the fluid. It is dictated by the pressure and by the porosity, the permeability of the membrane.

The long and the short of it is that a 5- or 6-mile impact would be a tremendous distance, based upon the types of pressures, the types of membrane that you are dealing with, the depths, the volumes of the fluids.

Senator BAUCUS. Five would be great. Half of that could be significant? Two and a half miles?

Mr. KELLEY. Obviously, the impact becomes less and less as you go out further from the radius. But a 5- or 6-mile measurable distance is—from the data we have seen, about five or six miles is normally what you see as far as impact.

Senator BURNS. Wayne, the frequency, you know, when they locate these wells, if you look at them, they are all fairly close together. So that would tell me that the migration distance is not as great as one would suspect.

Senator BAUCUS. So people should not be that concerned about migration to Wyoming, to private——

Mr. KELLEY. No, it is not going to migrate that far. There are geological barriers as well as the issue of just how far can you get it to migrate assuming it were all homogeneous.

Senator BAUCUS. Again, Mr. Caskey and Kelley, perhaps you can address this. Mr. Caskey, you mentioned that the Montana laws are basically sufficient, if I have a sense of your testimony.

Mr. CASKEY. That is true.

Senator BAUCUS. Could you kind of be a little more explicit, like which—particularly with water, because I think that is the greatest concern here. And as I recall, there has been a lot of controversy in the State on where it is right now and about nondegradation. And obviously, it depends upon, you know, who is located where and what water is—perhaps with the Tongue River, where and when and how much. But could you just give us a little flavor and try to expand on that, please.

Mr. CASKEY. We feel, or it is our opinion, that the current laws that are in effect, that are in place right now in Montana are suffi-

cient. It is application of those laws by the regulators that either makes us available for an economic operation or slows us down. The things that are in place to help protect the quantity of the water being produced, which we fully supported once we understood what it was supposed to do, is the controlled ground water area that was established by the DNRC. That oversees the amount of water that is being produced from the aquifers, including the coals.

There is also the MPDES system that has to be accomplished prior to any discharge into a—for instance, the Tongue River. Those permits have to be acquired. And if they are not acquired or they cannot be acquired, you are not allowed to discharge into the rivers and streams of the State.

Therefore, there is an oversight readily available to the State to control the amount and quality of the discharges that might be available for the rivers and streams.

Senator BAUCUS. Is it fair to say that Montana statutes, our environmental statutes that are applicable here are stronger and tighter than those in Wyoming?

Mr. CASKEY. We certainly feel so. We think that the laws are much more finite and more stringent than what we see in Wyoming. It is also more—excuse me?

Senator BAUCUS. Is that an impediment to development?

Mr. CASKEY. It is kind of a loaded question, but the——

Senator BURNS. It is better than a loaded gun.

Senator BAUCUS. I mean, if I am a businessman, it is a question I have got to ask myself.

Mr. CASKEY. It does—I mean, it is obvious. We have had—there is a lot more development in Wyoming. Now, granted, it started in Wyoming, so you would expect a certain degree of that.

It is more difficult to do business in Montana because of the regulatory hurdles you have to step over.

Senator BAUCUS. Now, is it too much more difficult? You know, that is a tough question to answer. But I mean, as a businessman you are looking at Wyoming, you are looking at Montana. You look at Montana statutes and then you hear the concerns of people. And yet, you see the opportunities, the economic opportunities here. As a businessman, is it too strong, too stringent? Can you live with it? Can you not live with it?

Mr. CASKEY. Certainly I see where your drift is. As a businessman, we have been fighting with this for 3 years, trying to get the right mix of regulatory issues and information established. I think it is workable. I think the application of the law should become more consistent. We need to streamline some things. But I think it is workable.

I think right now we have an historic issue for an industry, particularly extracting mineral industries, whereby Montana has not been very friendly in the past. And I think a lot of that still enters into people's decisions to invest in Montana.

Senator BAUCUS. Now, this question, though, with respect to coalbed methane, where does Montana have to be more friendly? Where are the biggest impediments, more precisely? You started to talk about the need for streamlining. Are there other areas?

Mr. CASKEY. I think that there are—the voice of the environmental community—granted, the environmental community plays a huge piece of the activities of the State of Montana, as well as Wyoming. But I think the credibility issue and the issues associated with is the development of the State's resources—as you said earlier, there is a give and take. It does not happen as a free lunch. There will be impacts. To address them as only concerns and not try to seek solutions is very difficult. That is probably the most single difficult hurdle we have in investing in the State, frankly.

Senator BAUCUS. That is the perception that too many people are not trying to find solutions, but are——

Mr. CASKEY. Too many cooks.

Senator BAUCUS [continuing]. Trying to create barriers and not trying to find solutions?

Mr. CASKEY. Correct. Too many cooks with concerns, not enough people making the sauce. I mean, that is kind of how I would equate it.

Senator BAUCUS. I do not disagree with that. There is a bit too much of that, I agree. And I think it is in lots and lots of areas and probably occurs here.

But I think you have an opportunity, by addressing the science and technology in the various ways of dealing with water, because I think the more people are less concerned and less worried the more they can find some—the more they can see some solutions to this. I know you agree that if you were a rancher, you know, you would be kind of concerned yourself. And I am sure the rancher would agree that, hey, these guys have come up with something, and it is—you know, it is not perfect, but it is—you know, I can work with it. So you have a real opportunity to develop the science and the technology to make that happen, it seems to me.

Do you want to say something, Ms. Old Elk?

Ms. OLD ELK. No.

Senator BAUCUS. I have got lots of questions, but we do not have a lot of time.

Senator BURNS. That is kind of like my checkbook. I always end up with a lot of checks and no money.

I have got a couple of questions with regard to water and the amount of water you are bringing up and its relation to the amount of gas that you are getting. Is there a point of diminishing returns there?

Mr. CASKEY. Diminishing returns, the life of these wells in the field, generally a well life will be 10 to 12 years, we think. Now, it is still a fledgling industry, and the longest CBM we have got is 12 years down in Wyoming. Probably a field life is 20 to 25 years, somewhere in there, depending on the developer and the development.

Water production, as I alluded to earlier, starts out relatively high. And as the—there is two lines. As your gas production comes on, it tends to replace, we think, some of the water production. In other words, water production declines; gas production goes up. You can see in the areas down in Wyoming at this point in time where early on wells were producing 15, 20 gallons a minute. Now those same wells may be producing a gallon or two a minute.

In our scenario, or in the Tongue River area, we are not to the point yet to where we have seen the decline stopped on the water side, nor the increase in gas stop. We are currently producing an average of about 124,000 cubic feet of gas per day from each of our 162 wells.

Senator BURNS. What was that number again?

Mr. CASKEY. 124,000 cubic feet of gas per day.

That is economic. Those are little wells, but there is a lot of them. And it combines to be a fairly significant stream of productivity.

Senator BURNS. Well, I have some more questions, but I will get them to you in writing. And we are going to—this is all I have for this——

Senator BAUCUS. I cannot resist one more.

I was stunned, Mr. Kelley, with your charts. I mean, it is amazing. You do good charts. But I mean, it is this one here compared to that one there. And is this a technology that is becoming readily available throughout the industry? Because if it is and if it works, just off the top of my head, knowing not as much as I would like to know yet about this problem, this is—you are on the way to some solutions.

Mr. KELLEY. Yes, it is available. Thus far, Texaco, Gulf, Phillips, Marathon, and Penneco, several other oil companies have licensed it from us. We are partners with them. We invest in the projects.

And when you are saying it is stunning, that is why around our house we buy Omega stock.

Senator BURNS. That is a pretty good recommendation. But, you know, with that, though, this allows them, on the treatment of that water, to do it pretty——

Mr. KELLEY. More efficiently.

Senator BAUCUS. Mr. Caskey, are you utilizing this? Are you looking at utilizing this technology?

Mr. CASKEY. I just met Mr. Kelley this morning. I will be looking at it.

Senator BAUCUS. We may have put something together here.

Mr. CASKEY. There is definitely an opportunity to look at it. We have already set that up.

Senator BAUCUS. Good. Thank you.

Senator BURNS. Thank you. Thank you kindly. We appreciate that very much.

Our last panel today is made up of Mike Nicklin, President, Nicklin Earth & Water; Steve Gilbert, who represents the board members of the Northern Plains Resource Council; and David Heinz, district manager, CMS Oil and Gas Company. We appreciate you folks coming today and looking forward to your testimony. Gentlemen, thank you very much for coming today.

Could we have order in the room, please. Could we have order in the meeting room, please. The testimony that these folks will offer is very important to us and to the American people, and we try to provide everybody with an environment in which they can make their case.

Mr. Nicklin, president, Nicklin Earth & Water. Thank you for coming today. Pull the microphone up. You have got to drown out the talkers.

STATEMENT OF MICHAEL E. NICKLIN, Ph.D., PE, PRESIDENT, NICKLIN EARTH & WATER

Mr. NICKLIN. Thank you, Senator Burns and Senator Baucus. I appreciate the opportunity to come before you today to testify about the important subject of coalbed methane development.

From my perspective, the two most significant water resource issues related to CBM development are CBM well water discharge and the sodicity salinity of that water. These issues are intertwined as we need to know how much water and what the quality of this water will be in order to define proper water management schemes. The focus of my testimony is on the water discharged from coal aquifers. In other words, how much water are we going to get.

I have found that by carefully examining available data one can generally use that information to predict with reasonable accuracy how an aquifer will respond when it is tapped or used for whatever reason. For instance, I have used computer models to represent coalbed aquifers. Some of the examples include two different ground water modeling efforts in the Colstrip area in Montana. And I have also done ground water modeling for different coalbed methane projects in Campbell and Sheridan Counties, Wyoming.

Each individual coalbed aquifer, as in the case of any aquifer, possesses a finite water-bearing capacity. This water-bearing capacity is a function of the following parameters: formation of hydraulic conductivity, which is measure of the ease at which water flows through the aquifer. It also depends upon coalbed thickness. In general, all other factors being equal, the thicker the coal, the more water that coalbed will produce.

Aquifer hydrostatic pressure, which is essentially the height that water will rise in a well tapping the coal, the greater the pressure, the more water will be produced. There are other technical factors as well, but those are the key ones for today.

The following are typical events and observations that arise as a coalbed methane field is developed. During early phases only a few wells have been completed and are operating. At that time water discharge rates per well will be at their highest. With time, the formation water levels will be drawn down and some reduction in average flow rates will occur. When operations expand and as more wells are added to the project, less discharge per well is required to maintain water level drawdowns. Hence, individual or average well water flow rates become smaller. The more wells we add, then the smaller the individual well discharge rates become. In addition, we have two phase flow or the preferential flow of methane gas in the formation.

Now, these concepts seem simple and logical. Yet, I have seen various documents and press reports stating that discharge rates from CBM development will somehow center or stabilize at individual flow rates typically averaging about 10 to 20 gallons per minute. This flow range likely grossly overprojects the average CBM well discharges which will arise with development in the Powder River Basin of Montana.

There are at least two reasons that some believe flows between 10 and 20 gallons per minute are reasonable. These are the following: rates have been defined on the basis of early phases of CBM development. As I stated before, it is in the early phases of

CBM project development that rates are at their highest. Those rates are probably based in part upon reported flows from more southern portions of the Powder River Basin, where coals tend to be thicker than what they are in Montana.

The coals in the Montana portion of the Powder River Basin do not possess the hydraulic characteristics which will allow wells on an average to sustain flows in excess of 10 gallons per minute for most CBM projects where development is significant. Moreover, my recent discussions with the Bureau of Land Management confirm there is evidence that the flow estimates in southern portions of the Powder River Basin have been inflated over actual flow rates. There is a database lesson to be learned here for the people doing the EIS. In essence, it is likely that average well flows in even the southern portion of the Powder River Basin are less than 10 gallons per minute.

Let me discuss closely a case history involving a CBM project in Wyoming. It is in the LX Bar Creek watershed in northern Wyoming, and it is near Montana. One of the operations there has been kind enough to provide me data on well flow rates from metered flow rates. And in that particular operation they are producing from two coals, one about 300 feet below ground surface and one about 700 feet below ground surface, each about 30 to 35 feet thick.

They have 56 producing wells. As of the latest average flow rates, they are at 3.1 gallons per minute, which is far below the 10- to 20-gallons-per-minute rate that has been presupposed by some. I went ahead and used some of my computer model techniques and compared the model parameters that I needed to get those discharges with those coals in Montana. The purpose was to determine if these coals possessed water-bearing characteristics similar to the coals of the Montana portion of Powder River Basin.

Indeed, the results were very similar, very similar hydraulic characteristics, and, in fact, reading the Montana Bureau of Mines and Geology literature, found that those parameters were also consistent with what I have seen there. In other words, we are not going to be seeing, on average, 10-gallons-per-minute or more in most projects.

In summary, it is obvious to me that the projected flows, which will arise with time, as CBM projects evolve on the Montana side of the Powder River Basin, have been greatly overestimated. In fact, we are much more likely to see average flows in the range to 1- to 10-gallons-per-minute as CBM development proceeds and matures.

PREPARED STATEMENT

In any event, I believe that using systematic approaches will allow us to provide reasonable protection of flow rates as CBM development progresses. Developing more realistic projections of produced water quantities makes the water management planning process more meaningful. The implications of overall lower average flow rates are obvious. Lower flows also provides for a much greater flexibility in defining water management control schemes which will eventually be employed to address environmental concerns associated with CBM development.

Thank you.

[The statement follows:]

PREPARED STATEMENT OF MICHAEL E. NICKLIN

COAL-BED METHANE WELL WATER DISCHARGE PROJECTIONS

Introduction

I appreciate the opportunity to come before you today to testify about the important subject of Coal-Bed Methane development. I am Michael Nicklin, President of Nicklin Earth & Water, Inc. which is a Bozeman, Montana based consulting firm specializing in ground-water and surface water resource problem solving. I personally have about 27 years of experience working both as a hydrogeologist and as a civil engineer. I have worked as an academician and as a consultant. For the last 14 years I have been a consultant assisting clients, ranging from the U.S. government to industry, in solving environmental and water resource related problems.

The two most significant water resource issues related to CBM development are CBM well water discharge and the Sodium Adsorption Ratio (SAR) of that water. These issues are intertwined as we need to know how much of this high SAR water must be dealt with in order to define proper water management schemes. The focus of my testimony is on the water discharge issue.

I will be using the term aquifer frequently. For those of you who are not familiar with the term aquifer, an aquifer is a geologic unit which transmits water which may be tapped and used for a variety of purposes. Nearly all my life's work has centered around aquifers and their interaction with surface waters. Coal-bed aquifers are my primary subject today.

I have found that by carefully examining available data, one can generally use that information to predict with reasonable accuracy how an aquifer will respond when it is tapped or used for whatever reason. In some situations, there are sufficient data available to develop and utilize mathematical tools, such as computer models, to predict how an aquifer will respond when it is used. For instance, I have used computer models to represent coal-bed aquifers. Two representative examples are the following:

—I developed two separate ground-water models to evaluate coal-bed aquifers in the vicinity of Colstrip, Montana. The focus was to evaluate historic, current and projected impacts to aquifers in response to coal-bed strip mining. I performed this work for Western Energy Company.

—I utilized ground-water modeling tools as part of a Water Management Study addressing CBM well water discharge for a project in Campbell and Sheridan Counties, Wyoming. The study area is located at the east flank of the northern Powder River Basin and is just south of the Wyoming/Montana border. This work was performed under the auspices of the Geosolutions Group, LLC. This work was requested by and was performed for a consortium of CBM energy firms. One of the key questions that must be answered in any Water Management Study related to CBM activity is "How much water will be produced from each coal-bed formation as it is developed?"

Coal-bed aquifer water bearing capacity

Each individual coal-bed aquifer, as in the case of any aquifer, possesses a finite water bearing capacity. This water bearing capacity is a function of the following parameters:

—Formation hydraulic conductivity. This is a measure of the ease at which water flows through the aquifer. All other factors being equal, the higher the hydraulic conductivity the more easily water flows through the coal.

—Coal-bed thickness. In general, all other factors being equal, the thicker the coal the more water that coal-bed will produce.

—Aquifer hydrostatic pressure. This is essentially the height that water will rise in a well tapping the given coal. The greater the pressure (or water level height) the more water will be produced.

The following are typical events and observations that arise as a coal-bed methane field is developed:

—During early phases of development only a few wells have been completed and are operating. At that time, when well numbers are small, water discharge rates per well will be at their highest. With time the formation water levels will be drawn down and some reduction in average flow rates will occur.

—When operations expand and as more wells are added to the project, less discharge per well is required to maintain water level draw downs. Hence, individual or average well water flow rates become smaller. The more wells that are added to the project the smaller the individual well discharge rates become.

These concepts seem simple and logical. Yet, I have seen various documents and press reports stating that discharge rates from CBM development will somehow center or stabilize at individual flow rates typically averaging about 10 to 20 gallons per minute (gpm). This flow range likely grossly over projects the average CBM well discharges which will arise with development in the Powder River Basin of Montana.

There are probably at least two reasons that some believe flows between 10 and 20 gpm are reasonable. These are the following:

—Rates have been defined on the basis of early phases of CBM development. As I stated before, it is in the early phases of a CBM project development that rates are at their highest.

—Those rates are probably based in part upon reported flows from more southern portions of the Powder River Basin where coals tend to be thicker there than what they are in Montana.

The coals in the northern portion of the Powder River Basin do not possess the hydraulic characteristics which will allow wells on an average to sustain flows in excess of 10 gpm for most CBM projects where development is significant. Moreover, my recent discussions with the Bureau of Land Management (BLM) confirm there is evidence that the flow estimates in the southern portions of the Powder River Basin have been inflated over actual flow rates. In essence, it is likely that average well flows in even the southern portion of the Powder River Basin are less than 10 gpm.

Approach

Representative case history

Let us examine more closely the case history involving the CBM project I described to you before. That project includes the LX Bar Creek watershed in northern Wyoming. I have chosen this project as it is in the Powder River Basin and it is near Montana.

There are two coals which are currently being produced in this watershed by Petroleum Development Corporation (PEDCO) and they are the Anderson Coal and the Canyon Coal. Each of these coals is about 30 to 35 feet thick in the immediate vicinity of the PEDCO operation. The Anderson Coal is about 300 feet below ground surface. The Canyon Coal is about 700 feet below ground surface. PEDCO's operation in LX Bar Creek has been in place slightly less than one year and there are a total of 56 CBM producing wells.

These PEDCO wells were measured beginning with the latter part of the Summer of 2000 and we have obtained the discharge data from these wells. The respective average discharge rates by coal are tabulated below:

Month	Anderson Coal Wells (gpm)	Canyon Coal Wells (gpm)
August, 2000	1.80	7.80
September, 2000	1.60	5.30
November, 2000	1.60	5.80
December, 2000	1.00	5.30
January, 2001	0.74	5.40

The January, 2001 average flow rates for all 56 wells is currently at 3.1 gpm. This is far below the 10 to 20 gpm rate that has been presupposed by some.

Comparing water bearing hydraulic characteristics of coal

I developed computer model representations indicative of the PEDCO operations in the LX Bar drainage in order to back-calculate the formation parameters of these coals. The purpose was to determine if these coals possess water bearing characteristics similar to the coals of the Montana portion of the Powder River Basin. For instance, are they similar to the coals near Colstrip, Montana where I have developed and applied ground-water models?

The results of the computer model simulations demonstrate that the coals beneath the LX Bar Creek drainage possess hydraulic characteristics consistent with the coals of the Colstrip area of Montana. Further evaluation reveals they possess characteristics similar to data summarized in Memoir 62 completed by the Montana Bureau of Mines and Geology (MBMG). Coupled with the Colstrip data and the MBMG data, we have data to demonstrate that actual CBM well-water production rates in

the Powder River Basin of Montana will likely average substantially less than 10 gpm.

Summary and implications

In summary, it is obvious to me that the projected flows which will arise with time as CBM projects evolve in the Montana side of the Powder River Basin have been greatly over estimated. Rather, it is more likely that average CBM flows for a project in excess of 10 gpm will be the exception rather than the rule. In fact, we are much more likely to see average well flows in the range of 1 to 10 gpm per well as CBM development proceeds and matures.

In any event, I believe that using systematic approaches will allow us to provide reasonable projection of flow rates as CBM development progresses. Flow rates will vary considerably depending upon the situation. For instance, we will need to know the depth of that coal, the hydrostatic pressure in that coal and its thickness. If we know these coal-bed attributes, we can project flow rates that are much more reliable than presupposing flow rates that have been suggested by some.

Developing more realistic projections of produced water quantities makes the water management planning process more meaningful. The implications of overall lower average flow rates are obvious. Lower flows also provides for much greater flexibility in defining water management/control schemes which will eventually be employed to address environmental concerns associated with CBM development.

Senator BURNS. Great timing. Great timing.

With us today, Steve Gilbert, who is a board member and representing the Northern Plains Resource Council. Thank you for coming today.

STATEMENT OF STEVE GILBERT, BOARD MEMBER, NORTHERN PLAINS RESOURCE COUNCIL

Mr. GILBERT. Senator Burns, Senator Baucus. Good morning. I am Steve Gilbert, consulting biologist from Helena. I am a board member and a coalbed methane committee member of the Northern Plains Resource Council. I am not a farmer or rancher, but other members of the committee are in the middle of calving and asked me to represent their interests.

The roughly 3,000 members, about half of whom are farmers or ranchers, are protective stewards of thousands of acres of Montana's rich prairies, river bottoms, and the social and cultural fabrics that tie Montanans to the land. The council states that its mission is committed to land stewardship and social justice principles that ensure future generations a healthy quality homeland. It also believes that rural, urban, and tribal communities in the region can prosper without destroying the land.

Our goal is to ensure that Montana's CBM resource is developed in a prudent, orderly manner, that the existing agricultural economy, water quality, air quality, fisheries, wildlife, soils, hydrologic regimes, cultural and historic resources, and local communities are maintained in a condition as good or better than prior to development, that such development complies with all applicable State and Federal regulations, and that a meaningful EIS is prepared before any additional development occurs.

An EIS is being prepared, so why should we continue to have very grave concerns that the process is not quite right? Here are some of the things that concern us right now. To quote the BLM's work plan on this EIS, the total planning area total exceeds 3 million square miles. The plan for preparing the EIS/RMP amendment is based on the need to minimize the schedule, maximize the efficiency of production and review, and produce a document that is consistent in its style and easily understood by the public.

I applaud the final statement about making the document easily understood. To inform the public is clearly one of the specific tasks of NEPA. I am, however, deeply concerned by the industry-sounding language that says the NEPA process is on the very fast track.

I spent 25 years working with NEPA, gathering baseline data, writing technical reports and the biological portions of EISs. An EIS without enough baseline data to back up its assumptions does not go very far as a planning document, as a mitigative tool, or as an information source for the public.

I see this particular fast-track EIS as one that will have the thinnest, bare-bones database. There is no time allocated to gathering new water quality, fisheries, wildlife, social, or cultural data related to an extractive, short-term development process that will potentially be the largest ever of any kind in Montana in terms of total affected surface acres and effects on surface and ground water.

Jan Sensibaugh, director of Montana DEQ, which is co-lead on the EIS for Montana, said to NPRC in a recent meeting that there is no intent by any of the EIS team to gather data past March of this year. I have heard that the 3 million acres this EIS focus on are in the data-rich area. I do not believe this, since over 70 percent of the surface ownership potentially affected by CBM development is in private ownership. Private property where any data has been gathered in this area in the past 20 to 30 years is primarily an existing permitted mine property and on data from the CX Ranch field, which has already been deemed inadequate by the BLM.

I know what some of the surface and wildlife impacts from this type of development will be. I toured the CX Ranch CBM field last June with Redstone employees. That does not necessarily say much. But I think what may something—may say something is that I worked a week a month for 7 years on the CX Ranch doing wildlife, fisheries, aquatic, and vegetation surveys for Consolidated Coal Company's mine permit from 1979 through 1986. I am intimately familiar with what this property looked like then from a biological perspective, and I was stunned at the impacts I saw from less than 2 years of activity and 160 or fewer wells in action.

Picture 9,500 wells over the next 10 years spread across the southern tier of Montana. Picture the effect of pumping enough water from the aquifers to fill 3 billion oil field barrels, enough to cover 56 townships three inches deep. That's 1,290,000 acres 3 inches deep of sour vegetation and soil-killing water. As a biologist, I cannot and do not want to picture the magnitude of these potential surface impacts, much less the impacts to the surface and ground waters of Montana.

Economy and growth are the buzzwords this year, and the message is being urgently sent to industry that Montana is open for business. Again, the words being used are we need streamline, minimize the schedule, maximize efficiency. I have seen no suggestion anywhere to date that this industry will have the enormous negative effects that it most certainly will. I have seen only the positive benefits mentioned.

To quote a draft DEQ economic issue statement from February of this year, past CBM studies, including at least two EISs, have

tended to focus on economic benefits only, without acknowledging that significant economic costs may also exist from the methane extraction process. In these cases, CBM always passes the economic test without a consideration of costs.

The same paper goes on to say CBM development over its lifetime will likely result in costs that potentially include environmental degradation, social division, and the typical economic consequences from short-term, boom-and-bust extraction development.

What will it cost Montana to lose thousands of acres of irrigated cropland forever because the soil is soured by higher SAR water? What will it cost a farmer or a rancher in Montana to lose ground water for domestic and livestock use? What will it cost Montana to sacrifice one of our only sustainable industries for short-term gain, one that has been here for over 120 years and could be here for as long as Montana is on the map?

What will it cost to reclaim the tens of thousands of acres of surface disturbed by CBM development? How much will it cost to eliminate or even control noxious weeds in areas that presently have minimal weed problems? What will the cost to Montanans be in terms of lost fisheries and wildlife resources? Have we forgotten the costs in perpetuity to Montana from Butte miners, from Pegasus Gold at Zortmen-Landusky? Who pays for this? Montanans, of course.

How will this EIS address these issues if it is on a time line to be in draft form by September? It will not. It will be meaningless sham, essentially putting spurs to the CBM horse.

If the CBM industry plans to be a stakeholder in more than short-term gain, if Montana wants to guarantee that short-term gain does not mean lack of foresight and understanding of long-term impacts, then show us by demonstrating a sincere interest in future generations of Montanans. Do this by taking this important planning tool off the fast track, slow the NEPA process down, and gather the data and make informed decisions and do it right.

Coalbed methane has been in the ground for millions of years. It is estimated there is only enough CBM in Montana's coal seams to provide the needs of the United States for about 20 months. We do not need to risk the future of millions of acres of Montana in a rush to get it out of the ground now.

PREPARED STATEMENT

Please do not just tell us not to worry, that you are making sure that CBM development will be done without damaging precious resources that will sustain us for generations. Show us you mean this. Slow the process. Gather the baseline data. Analyze it carefully. Provide us with all—all with intelligent, informed, up-to-date information that will allow this industry to be responsible to Montanans and our long-term needs.

The Northern Plains Resource Council thanks your for this opportunity to comment.

[The statement follows:]

PREPARED STATEMENT OF STEVE GILBERT

Good morning. I'm Steve Gilbert, a consulting biologist from Helena. I'm a Board member and coal bed methane committee member of Northern Plains Resource

Council. I am not a farmer or rancher, but other members of the committee are in the middle of calving and asked me to represent their interests.

WHO, OR WHAT IS NPRC?

The roughly 3,000 members (about half of whom are farmers or ranchers) are protective stewards of thousands of acres of Montana's rich prairies, river bottoms and the social and cultural fabrics that tie Montanans to the land. The Council states that its mission is "committed to land stewardship and social justice principles that ensure future generations a healthy, quality homeland." It also believes that rural, urban and tribal communities in the region can prosper without destroying the land.

WHAT IS NPRC'S GOAL RELATIVE TO CBM DEVELOPMENT?

Our goal is to ensure that Montana's CBM resource is developed in a prudent, orderly manner; that the existing agricultural economy, water quality, air quality, fisheries, wildlife, soils, hydrologic regimes, cultural and historic resources and local communities are maintained in a condition as good or better than prior to development; that such development complies with all applicable state and federal regulations and that a meaningful EIS is prepared before any additional development occurs.

An EIS is being prepared, so why should we continue to have very grave concerns that the process is not quite right? Here are some of the things that concern us right now.

To quote the BLM's Work Plan on the EIS, "the total planning area exceeds 3 million square miles." "The plan for preparing the EIS/RMP Amendment is based on the need to minimize the schedule, maximize efficiency of production and review, and produce a document that is consistent in its style and easily understood by the public." I applaud the final statement about making the document easily understood. To inform the public is clearly one of the specific tasks of NEPA. I am, however, deeply concerned by the industry-sounding language that says the NEPA process is on the very fast track.

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Picture 9,500 wells over the next 10 years spread across the southern tier of Montana. Picture the effect of pumping enough water from the aquifers to fill 3 billion oil field barrels, enough to cover 56 townships 3 inches deep. That's 1 million, 290 thousand acres 3″ deep with sour, vegetation and soil-killing water. As a biologist, I can't and don't want to picture the magnitude of these potential surface impacts, much less the impacts to the surface and ground waters of Montana.

Economy and growth are the buzz words this year and the message is being urgently sent to industry that Montana is open for business. Again, the words being used are we need to streamline, "minimize the schedule, maximize efficiency." I've seen no suggestion anywhere to date that this industry will have the enormous negative effects that it most certainly will. I've seen only the positive benefits mentioned. But to quote a draft DEQ economic issue statement from February of this

year, "Past CBM studies (including at least two EISs) have tended to focus on economic benefits only without acknowledging that significant economic costs may also exist from the methane extraction process. In these cases, CBM always passes the economic test without a consideration of costs." The same paper goes on to say "CBM development over its lifetime will likely result in costs that potentially include environmental degradation, social division and the typical economic consequences from short-term, boom and bust extraction development."

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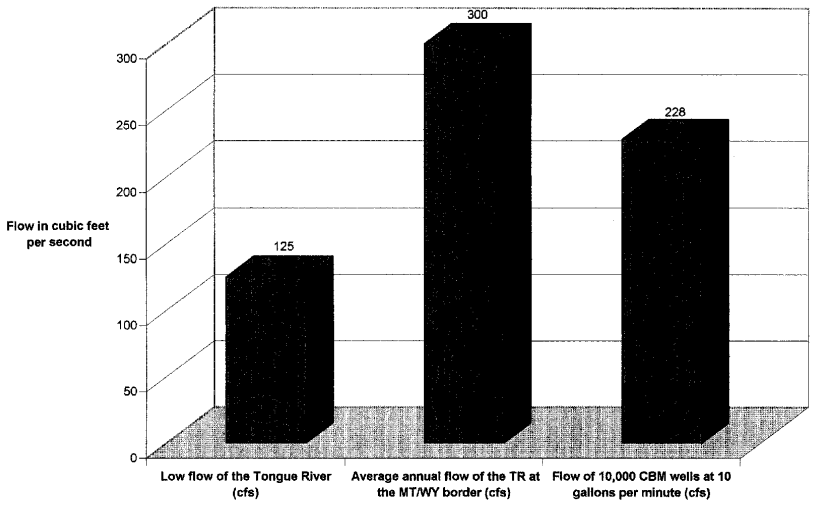
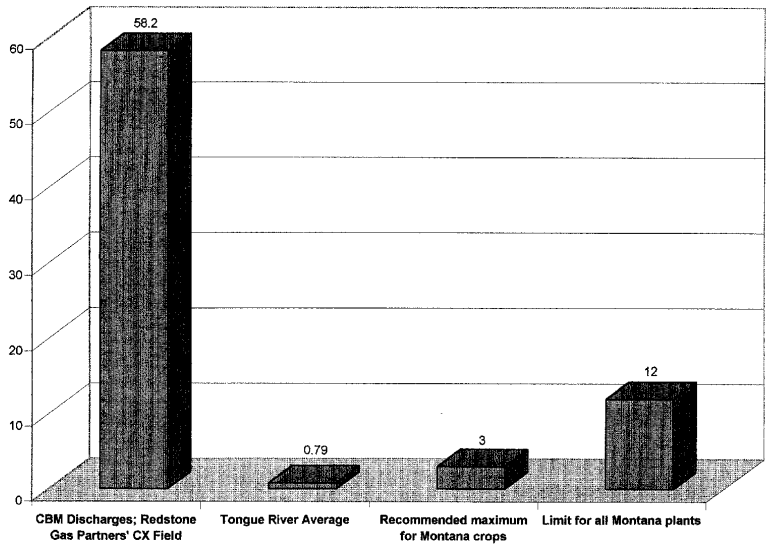
Northern Plains Resource Council thanks you for this opportunity to comment.

Estimated flows from CBM development compared to flow of the Tongue River



*Values do not reflect increased flows from CBM discharges in Wyoming

Sodium Absorption Ratio (SAR)



SAR is the measure of the degree to which sodium will accumulate in soil irrigated with the water. No local plant species can survive an SAR above 12, and generally soil productivity decreases when SAR levels exceed 3.

Senator BURNS. Thank you. I appreciate that.

David Heinz, district manager, CMS Oil and Gas. Thank you for coming today.

STATEMENT OF DAVID R. HEINZ, MANAGER OF BUSINESS DEVELOPMENT, CMS OIL AND GAS CO.

Mr. HEINZ. Thank you, Senator.

I am here today to discuss the nation's need for natural gas, how CBM development in Montana, and in particular the Powder River Basin of southeastern Montana, can play a role in supplying natural gas and what the economic benefit could be to the citizens of Montana.

Natural gas currently supplies 24 percent of the nation's total energy needs. We as a nation consume approximately 22 trillion cubic feet of natural gas per year. Our yearly consumption on natural gas is projected to increase to 30 trillion cubic feet by the year 2020. The majority of this increased consumption will go toward the generation of electricity.

The nation has very little excess electric generation capacity. Over 90 percent of the new generation currently under construction or under consideration will utilize natural gas. This is due to a number of factors: our need to reduce carbon dioxide and nitrogen oxide emissions, ease of permitting natural gas versus coal and nuclear and the size of the plants and the ease of placing them closer to the market.

The nation's ability to meet this growing natural gas demand depends on numerous factors: advances in technology, development of the deep water Gulf of Mexico, access to Federal lands, the development of so-called unconventional resources. Coalbed methane falls into the category of an unconventional gas.

The development of coalbed methane is not new. For years the coal mines would de-gas coal seams prior to mining for reasons of mine safety. It has only been within the last 20 years that we have tried to capture this resource and extend its development out away from the mined areas. Coalbed methane development is taking place in Alabama, Virginia, New Mexico, Colorado, Utah, and, of course, here in the Powder River Basin of Wyoming and Montana.

CMS Oil and Gas and its partner, Marathon Oil, control approximately 200,000 gross acres within the Powder River Basin of Montana. Therefore, we are very interested in seeing the development of this resource. During the course of several meetings with the coalbed methane coordination group held last summer it became very apparent that CBM development was coming to Montana and that numerous issues needed to be addressed.

For example, the State of Montana is required to update it programmatic EIS, and the Bureau of Land Management preferred a basinwide EIS as opposed to smaller, site-specific environmental assessments. It was also apparent that the general public's perception about the magnitude of development was much larger than the natural gas industry was predicting.

The area or extent of southern Montana's portion of the Powder River Basin encompasses over 10,000 square miles. However, only one quarter of this area is prospected for coalbed methane development. And it is believed that only three areas in this region of

Montana—Colstrip, Ashland, and Decker coalfields—will see any substantial development. CMS polled the active oil and gas companies in these areas, asking them what their development plans would be given perfect development conditions.

For example, a proven resource—favorable economics, no permitting or land access problems, et cetera—the industry came back with approximately 10,000 coalbed methane wells. Over 50 percent of these are projected to be drilled on Federal mineral acreage. Based on CMS's experience in northern Wyoming, we estimated the economic productive life for these wells could be on the order of 20 years. Given technological advancement, the gas industry's experience in the past, the productive life of these could be much greater.

Also based on our production history, we attempted to project what the economic benefit to the State of Montana and the United States could be from royalty and production tax payments. Given a typical CBM well, the number of wells planned by industry, and the natural gas price of $3.50 over the life of this project, it is estimated that the State of Montana would receive royalty payments of $450 million. In addition, the State could see production tax payments of $440 million, and the Federal Government could receive royalty payments on the order of $190 million from those wells drilled on Federal minerals.

None of these take into account the capital expenditures that would be necessary to drill, complete, and produce these wells. I estimate it could take about $1.6 billion to develop and produce this resource into the market.

PREPARED STATEMENT

In conclusion, CMS believes that there are very legitimate concerns that need to be addressed before any large-scale development of coalbed methane can take place in Montana. The environmental impact statement under discussion here today will address those concerns. Furthermore, we support and encourage the public comment. And I thank you.

[The statement follows:]

PREPARED STATEMENT OF DAVID R. HEINZ

My name is David R. Heinz; I'm Manager of Business Development for CMS Oil and Gas Company. CMS Oil & Gas is actively engaged in the development of Coalbed Methane (CBM) in Wyoming. I'm here today to discuss the nations need for natural gas. How CBM development in Montana and in particular within the Powder River basin of southeastern Montana can play a role in supplying natural gas. And what the economic benefit could be to the citizens of Montana.

Natural gas currently supplies twenty four percent (24 percent) of the nations total energy needs. We as a nation current consume approximately 22 trillion cubic feet of natural gas per year. Our yearly consumption of natural gas is projected to increase to 30 TCF by the year 2020. The majority of this increased consumption will go toward the generation of electricity. As we have all become aware over the last several months with the electric crisis in California the nation has very little excess electricity generation capacity. Over 90 percent of the new electrical generation currently under construction or under consideration will utilize natural gas. This is due to a number of factors: the nations need to reduce carbon dioxide (CO_2) and nitrous oxide (NO) emissions, ease of permitting natural gas fire plants versus coal fired and nuclear powered, the size of the plants and ease of placing them closer to the market.

The nations ability to meet this growing natural gas demand depends of numerous factors:

(1) Advances in technology;
(2) Development of the deep water Gulf of Mexico;
(3) Access to Federal lands; and
(4) Development of so called "unconventional resources."

Coal bed methane falls into the category of "unconventional gas."

The development of coal bed methane is not new. For years coalmines have degassed coal seams prior to mining for reasons of mine safety. It has only been within the last twenty years that we have tried to capture this resource and extend its development out away from the coal mine areas. CBM developed is taking place in Alabama, Virginia, New Mexico, Colorado, Utah and of course here in the Powder River basin of Wyoming and Montana.

CMS Oil and Gas Company and its partner Marathon Oil control approximately 200,000 gross acres within the Powder River basin of Montana. Therefore we are very interested in seeing the development of this resource. During the course of several meetings of "The Coalbed Methane Coordination Group" held last summer, it become very apparent that CBM development was coming to Montana and that numerous issues needed to be addressed. For example, the State of Montana is required by statue to update its programmatic EIS and that the Bureau of Land Management (BLM) preferred a basinwide EIS as opposed to smaller site specific "Environmental Assessments" (EA's). And that the general public's perception about the magnitude of development was much larger then the natural gas industry was predicting.

The aerial extent of southern Montana's portion of the Powder River basin encompasses over 10,000 square miles, however, only one quarter of this area is prospective for CBM development. And it is believed that only three areas in this region of Montana, the Colstrip, Ashland, and Decker Coalfields will see any substantial development.

CMS Oil and Gas polled active oil and gas companies is these areas, asking them what their development plans would be given perfect development conditions. For example, proven resource potential, favorable economics, no permitting or land access problems, etc.

Industry came back with approximately 10,000 CBM wells. Over fifty percent (50 percent) of these are projected to be drilled on federal mineral acreage.

Based on CMS's experience in northern Wyoming we estimated that the economic productive life of these wells could be on the order of twenty years. Given technological advancements, and the gas industries experience in the past, the productive life of these was could be much greater.

Also based on our production history we attempted to project what the economic benefit to the State of Montana and United States could be form royalty and production tax payments.

Given a typical CBM well, the number of wells planned by industry and a gas price of $3.50/MCF over the life of the project, it is estimated that the State of Montana could see royalty payments of $450,000,000 over the course of a twenty-year period. In addition the State could see production tax payments of $440,000,000. The Federal government could see royalty payments of $190,000,000 from wells drilled on federal mineral acreage.

None of these estimates take into account the capital expenditures that will be necessary to drill, complete and produce these wells. I would estimated that it will take one billion six hundred million dollars ($1,600,000,000) to develop and produce this resource into the market.

In conclusion CMS understands that there are very legitimate concerns that need to be addressed before any large-scale development on CBM can take place in Montana. The Environment Impact Statement under discussion here today will address these concerns. We support and encourage public comment.

Senator BURNS. Mr. Heinz, let us just pick up on your testimony. You say the estimates have been. Do you think the estimates, to your knowledge—and we have got only you folks that are in the business to rely on. Do you think those estimates are in the—align themselves with the expectations?

Mr. HEINZ. I think so, yes, sir.

Senator BURNS. Do you think that there is that much?

Mr. HEINZ. I do, otherwise we would not be here. We have invested an awful lot of money in this State, as far as acreage acquisitions and stuff, and we believe the resource is there. Yes, sir.

Senator BURNS. Mr. Nicklin, you based most of your testimony on water and water discharge and the amount of water. You have taken a look at Omega and Mr. Kelley and his testimony on dealing with that and new technologies dealing with that water. Do you think that this is feasible?

Mr. NICKLIN. I think that water management is very feasible. We will have to keep in mind there is lots of options we should—we should work with. That is my answer.

Senator BURNS. Mr. Gilbert, in short-water years, not only do we try to take a resource, participate in the—in solving some of the problems that the nation has energywise, and if we can manage our water and make it suitable—in other words, removing some of the sodium—and making it potable and usable on our streams, why is that not—why should we not be taking advantage of that resource?

Mr. GILBERT. Senator Burns, I agree that this resource is probably one that we should take advantage of for all the reasons that have been mentioned. Our concerns relative to water are twofold. One, we do not want to see long-term agricultural operations compromised by maybe lack of foresight and proper use of water—you know, reinjection, whatever it is. To date, there are not enough answers, and there are still more questions.

We are concerned about loss of springs and seeps to wildlife and stock-watering opportunities. We are concerned about quality of irrigation water. We do not have enough answers yet.

Senator BURNS. You are the only—the only solution that you have really—that you recommend is reinjection; is that correct?

Mr. GILBERT. We do not have enough information, you know, right now on reinjection. We are concerned that we reinject in such a way that it is accessible to those landowners who need the water. We are concerned about its water quality. To date, there are no answers there. Northern Plains has, however, hired an expert on reinjection, and we are looking into that.

Senator BURNS. Listening—and I do not know whether you have had access to the information from the Omega Oil Company and their suggestion on the technology to deal with that water. Would that live up to your expectations if they could do everything that they did say here?

Mr. GILBERT. Senator Burns, I believe that was a big "if."

Senator BURNS. That is all we deal in around here is "ifs."

Mr. GILBERT. I appreciate the proposal that Mr. Kelley made. I think that it is a valuable one and that it is one of the many options that we need to look at. I think it has a lot of potential. I have, as a biologist, been involved with some processes to take acid mine drainage from coal fields and run them through wetlands to extract the egregious acid-bearing materials.

It has not proven to be something that can be used everywhere and also leaves you with—you know, there was one little thing that Mr. Kelley mentioned, which was disposal of the vegetative material. I do not believe that if this filled up with salts we are going to be able to feed this to livestock. This material does not disappear. It is taken up by the vegetation. There are some other good options that we need to look at, though.

Senator BURNS. Senator Baucus.

Senator BAUCUS. Thank you, Conrad.

You know, as I listen to all of this it seems to me that basically people are coming together, and it is just a matter of a lot of work ahead of us to figure out how to do this the right way.

I commend you, Mr. Gilbert, for saying that you believe we should take advantage of this resource. I believe you said that, but you also said to make sure we do it right. And Mr. Caskey of Redstone has said basically the same thing, that they want to do it right, they want to do it the right way. And we have a process, the EIS process, which I think, if done right, I think will help us come together and figure out the way to get this done in a way that is balanced.

Now, I think it is important for us to remember that the EIS also has to be done right. I can think of a lot of times when the EISs were not done right and there was a lawsuit. And the lawsuits prevail, and the agency had to go back to the drawing board and do it all over again. You know, the law is the law. And if a judge says that the EIS is not done appropriately, well, then, that is pretty much where it is.

So I think it is incumbent upon all of us, particularly people from the business prospective, as well as those in the environmental prospective, to make sure that this is done right the first time, because if it is done right the first time, then we are going to be able to develop this resource earlier rather than later, avoid a lawsuit. And we are also going to be assured, as well as we possibly can, that the potential adverse environmental impacts are essentially addressed.

It is my sense that we—that this is such a big deal that people are going to work pretty hard, maybe harder than usual, to try to figure how to do all of that. And I see the BLM guys sitting in the front row here, and I am looking at them when I say to all of us that we make sure we get this done the right way to avoid a lawsuit that is going to slow things down. It is going to make it even more delayed than might otherwise meet the eye.

A second point that really has not been addressed much yet, and this is this sodium absorption rate. I am not going to get into that in great detail now, but that is—it just looks to me that that is something we are going to have to look at pretty closely. We have got a lot of ideas here in how to do all of this. Clearly, we want to develop this resource. It is there. It is needed. It is going to help in a lot of ways.

But clearly, we want to make sure that we do it in an appropriate way because now—it has not been developed. And now that we are focusing on it, we have a much better chance to develop it the correct way and not with the consequences of, you know, other resource developments where the cost has been passed on to taxpayers and Montanans after the benefits have left and gone somewhere else. We have an opportunity here to make sure this is done the right way.

And I just urge all of us to do that. Because if we do not, we are going to pay the price in lots of ways. One is going to be delay. One is going to be less development, and another consequence will be environmental degradation potentially. It is kind of exciting actually. And it is my thought that we should—Mr. Chairman, we

should have follow-up hearings on this subject just to kind of see how it is going along, see what new technology is involved, new ideas involved and so forth. So this is just a good, solid way.

Senator BURNS. Well, there will be another hearing. It might be in Washington, D.C., when we start down this road of appropriating money.

Senator BAUCUS. Would not be a bad idea to have one here, too, I think, in some capacity, in some way, because I think that will be helpful.

Senator BURNS. We will look into that. We will see if we got money to do it. The chief deputy says we have to cut back.

That is just about all the questions. I want to invite the press that has been here today to—they can visit with the individuals. And there will be some more questions, and I will guarantee you, from the rest of the committee. And they will probably come in the mail. If you would respond to both me and the committee members, why, we will make sure that this—this testimony will be made part of the committee record and as we move forward.

But I will tell you that I was struck in Las Vegas about a month ago—I was there when I spoke to the consumer electronics folks. I picked up a Los Angeles Times and a headline on the front page on Sunday morning out of the Los Angeles Times says Californians do not believe that we have an energy shortage. And I just thought—I just thought somebody has got a credibility problem. And we know that the crisis is real, and yet we have those folks who want to keep on limiting our methods of producing energy.

We still have people who are—who want to breach dams. We have people who want to continue to block our way to process high-level nuclear waste so that we can get on with powering our ships and our national defense and, yes, our—in some cases, our nuclear situation in producing power.

As you know, California—you may not know this. California has one—I think it is a 1,200 megawatt plant that has never cranked out one spark of electricity and was shut down by the vote of the people, by referendum. And yet, they come to us and say, well, we want to use your power out of the Northwest because we are running out of power in California.

So the crisis is real. There is a shortage. And we must use every resource we have, which includes solar and wind. And there can be nothing left out of the energy mix to produce the amount of energy it takes to power what I believe is an empowering economy.

So thank you for—we want to thank all of the witnesses for coming today. I want to thank Senator Baucus for stopping by and adding his insight to this, as his committees and especially EPW. He sits on that committee also. It will be very, very important under other forms of industry.

So this has been a good hearing. And I appreciate everybody making the effort to get here.

ADDITIONAL COMMITTEE QUESTIONS

Thank you very much. There will be some additional questions which will be submitted for your response in the record.

[The following questions were not asked at the hearing, but were submitted to the Department of Energy for response subsequent to the hearing:]

QUESTIONS SUBMITTED BY SENATOR CONRAD BURNS

MINIMIZING ENVIRONMENT IMPACT FROM COALBED METHANE

Question. Mr. Hochheiser, thank you for joining us today to learn more about the potential for development in the Power River Region and some of the challenges we face. Can you assure me that the Department of Energy will be willing to help us look for ways to minimize the environmental impacts from coalbed methane development?

Answer. Yes, the Department of Energy (DOE) is willing to help with research and analysis within the constraints of the program budget. DOE's office of Fossil Energy is already working in this area. We have recently awarded a contract to Arthur Langhus Lane to examine current environmental concerns and coalbed methane (CBM) production practices in the Montana portion of the Powder River Basin, and to investigate how recent advances in geographic information systems technology can be applied as mitigation aids. As part of this project, they will define best management practices and mitigation strategies for specific state regions and environmental settings. DOE is also funding two CBM ground water monitoring projects with the Bureau of Land Management in Colorado and Wyoming. In addition, our research on a variety of produced water treatment and disposal technologies may be useful in minimizing the environmental impacts of CBM development.

TECHNOLOGY INVESTMENTS

Question. From your position in the Department of Energy, you have a clear understanding of natural gas needs in this country. Currently, gas prices are at an record high in much of the country, but it is expected they will rest at a more reasonable level. What words of caution might you be able to offer regarding investing too heavily in new technology during boom periods? Should we be concerned with industry investing too much on some technologies, water filtration for example, that may not pay off when gas prices stabilize?

Answer. Industry should be able to invest in the necessary technologies and still make a profit once gas prices stabilize at levels currently projected by the Energy Information Administration and others. Industry participants can also avail themselves of financial instruments to hedge their exposure to price changes, and thus reduce their risk. Industry will have to comply with Federal and state regulatory requirements in disposing of their waste streams. Companies will have to make the necessary investment, but they have a variety of treatment and disposal options. DOE can help. DOE's Oil and Gas Environmental Research Program helps develop compliance technologies that are more cost-effective while improving environmental performance. The program can also help analyze options to find the lowest-cost compliance method for a given situation. The Arthur Langhus Lane project will provide data and tools for this kind of analysis.

CONCLUSION OF HEARING

Senator BURNS. Thank you all very much for being here, that concludes our hearing. The subcommittee will stand in recess subject to the call of the Chair.

[Whereupon, at 12:18 p.m., Saturday, March 10, the hearing was concluded, and the subcommittee was recessed, to reconvene subject to the call of the Chair.]

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