Approved: March 13, 2002 Carl Dean Holmes
Date

MINUTES OF THE HOUSE COMMITTEE ON UTILITIES.

The meeting was called to order by Chairman Carl D. Holmes at 9:07 a.m. on January 29, 2002 in Room 526-S of the Capitol.

All members were present except: Representative Gene O'Brien

Committee staff present: Robert Chapman, Legislative Research
Dennis Hodgins, Legislative Research
Mary Torrence, Revisor of Statutes
Jo Cook, Administrative Assistant

Conferees appearing before the committee: Charles Benjamin, Sierra Club
Ken Peterson, Kansas Petroleum Council
Mike Loeffler, Northern Natural Gas
Jim Bartling, Greeley Gas Company
Chuck DeHart, The Williams Companies
Steve Johnson, Kansas Gas Service

Others attending: See Attached List

HCR 5038 - Urging the federal government to act quickly to approve and begin storage of radioactive waste at Yucca Mountain, Nevada

Chairman Holmes opened the hearing on **HCR 5038**.

Charles Benjamin, appearing on behalf of the Sierra Club, testified in opposition to **HCR 5038** (Attachment 1). Mr. Benjamin expressed concerns about transporting the waste through the state and who would bear the liability if an accident occurs. Mr. Benjamin responded to questions from the committee.

Representative McClure distributed copies of a US General Accounting Office report on Nuclear Waste - Technical, Schedule, and Cost Uncertainties of the Yucca Mountain Repository Project (Attachment 2).

Chairman Holmes closed the hearing on **HCR 5038.**

HCR 5040 - Resolution urging Congress to open the Arctic National Wildlife Refuge (ANWR) to oil and gas exploration and production

Chairman Holmes opened the hearing on **HCR 5040**.

The first conferee, Ken Peterson representing the Kansas Petroleum Council, spoke in support of HCR 5040 (Attachment 3). Mr. Peterson outlined the myths and facts regarding the Arctic National Wildlife Refuge. He shared details on well drilling and pipeline locating. Mr. Peterson also distributed a letter from James Daniels, Interstate Oil & Gas Compact Commission, that told of his trips to the Refuge (Attachment 4).

Written testimony in support of **HCR 5040** was provided by Terry Leatherman, Vice President - Legislative Affairs for the Kansas Chamber of Commerce and Industry (Attachment 5).

The hearing on **HCR 5040** was suspended.

The joint meeting of the House and Senate Utilities Committee convened at 9:30 with Senate Chairman Clark presiding. The purpose of the joint meeting was to continue the presentations on the status of the natural gas and oil industries.

Senator Clark shared the testimony provided by Robert Krehbiel, Executive Vice-President of the Kansas Independent Oil and Gas Association (Attachment 6). Mr. Krehbiel's testimony provided an update on the price of crude oil and natural gas along with information regarding price changes and active rotary rigs operating in Kansas.

MINUTES OF THE HOUSE COMMITTEE ON UTILITIES, Room 526-S Statehouse, at 9:07 a.m. on January 29, 2002.

Mike Loeffler, Manager of Governmental and Community Affairs for Northern Natural Gas, addressed the committee on three topics (Attachment 7). Those topics were: Northern Natural Gas's presence in the state, the transition of the company into a subsidiary of Dynegy, Inc. and areas of interest that the company has before the committee. Mr. Loeffler stated that they are committed to the tradition of service excellence provided to their customers and that their pipelines will continue to operate safely, efficiently and without interruption of service. Mr. Loeffler included a map of Northern's pipelines in the state (copy available from Legislative Research).

Jim Bartling, Public Affairs Manager for Greeley Gas Company, provided an update on the company's customer base and distribution area (Attachment 8). Mr. Bartling stated they serve approximately 117,000 customers in Kansas and are a local distribution company with operations regulated by the Kansas Corporation Commission.

Chuck DeHart, State Governmental Affairs Manager for The Williams Companies, appeared before the committee. Mr. DeHart stated that Williams is the largest natural gas transportation company, based on capital, and the second largest producer of ethanol. He said that the company's main issues were the One-Call System, underground storage, community safety and pipeline protection.

Steve Johnson, Executive Director of Corporate Relations for Kansas Gas Service, addressed the committee on the state of the natural gas industry in Kansas from both Kansas Gas Service's and ONEOK's points of view (Attachment 9). Mr. Johnson said they serve over 630,000 retail customers and 6,000 transportation customers in the eastern two-thirds of the state. Mr. Johnson explained that 2001 was a year in which they faced many challenges, including the highest prices for natural gas ever experienced and the coldest winter in recent memory.

Mr. Loeffler, Mr. Bartling, Mr. DeHart and Mr. Johnson responded to questions from members of the joint committee. Additionally, Ms. Diana Edmiston, Assistant General Counsel for the Kansas Corporation Commission, responded to questions regarding imbedded salt beds as a gas storage factility.

The joint meeting adjourned at 10:30, with House Utilities resuming their order of business.

HCR 5038 - Resolution urging the federal government to act quickly to approve and begin storage of radioactive waste at Yucca Mountain, Nevada

Chairman Holmes opened the debate on **HCR 5038**. Representative Kuether moved to amend the resolution to include asking for federal funds to provide training and equipment. Representative Long seconded the motion. The motion failed.

The debate on **HCR 5038** was suspended to return to the previous order of business.

HCR 5040 - Resolution urging Congress to open the Arctic National Wildlife Refuge (ANWR) to oil and gas exploration and production

The hearing on **HCR 5040** was resumed with Charles Benjamin, appearing on behalf of the Sierra Club, addressing the committee in opposition to the resolution (Attachment 10). Mr. Benjamin addressed the issues of security and reducing our dependence on oil.

Chairman Holmes closed the hearing on **HCR 5040**.

The meeting adjourned at 10:56 a.m.

The next meeting is scheduled for January 30, 2002.

JOINT MEETING
HOUSE AND SENATE UTILITIES COMMITTEES
GUEST LIST

DATE: January 29, 2002

NAME	REPRESENTING
Jack Glaves	Panhandle Eastern - Duke or Kinder Morgan
Ken Peterson	KS Petroleum Council
Mark Schreiber	Western Energy
Steve Johnson	Kansas Gas Service
Jim Bartling	Greeley Gas Co / Atmos Energy Corp
Tom Day	KCC
Larry Holloway	KCC
James G. Flaherty	Atmos
Bob Anderson	"
Joe Christian	Atmos Energy Corp / Greeley Gas Co
Tom Stephens	Atmos Energy Corporation
Chuck Dehart	Williams
Ron Gaches	GBBA
Charles Benjamin	Sierra Club - Kansas
Whitney Damron	KS Gas Service / ONEOK
Bruce Graham	ICEPG
Matt Bergmann	Pat Hubbell Assoc.
J C Long	UtiliCorp United

JOINT MEETING
HOUSE AND SENATE UTILITIES COMMITTEES
GUEST LIST

DATE: January 29, 2002

NAME	REPRESENTING
MIKE LOEFFLER	NORTHERN NATURAL GAS
Bud Burke	KCP&L
Cynthia Smith	KCPL

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Testimony Before the House Utilities Committee
In Opposition to House Concurrent Resolution No. 5038
On Behalf of the Kansas Chapter of the Sierra Club
January 29, 2002

Mr. Chairman, members of the Committee, thank you for the opportunity to testify before you this morning on behalf of the Kansas Chapter of the Sierra Club in opposition to HCR 5038. The Sierra Club is the largest grass roots environmental organization in the world with over 700,000 members including 4,000 in Kansas. The mission of the Sierra Club is:

To explore, enjoy, and protect the wild places of the earth;
To practice and promote the responsible use of the earth's ecosystems and resources;
To educate and enlist humanity to protect and restore the quality of the natural and human environment; and to use all lawful means to carry out these objectives.

More information about the Sierra Club can be found at the web site of the Kansas Chapter of the Sierra Club at www.kssierra.org and at the national Sierra Club web site at www.sierraclub.org.

As you are no doubt aware, no energy issue engenders more controversy than nuclear power. One of the thorniest issues is what to do with high-level radioactive waste, a by-product of the generation of electricity through fission. The choices appear to be either to bury the waste at central repositories or to leave the waste at the sites where they are generated. In general, the Sierra Club prefers the latter.

What I want to talk about this morning is another aspect of this issue that is not discussed in HCR 5038. That is the transportation of this waste and who bears the risk of accident. I want to illustrate this problem by telling you the story of my experience as a Harvey County Commissioner in 1981, shortly after I took office for the first of my four terms. In early 1981, twenty years ago, reports appeared in the Newton Kansan that high level nuclear waste from the San Onofre Nuclear Power plant in Southern California would travel through Harvey County on U.S. Highway 50 on its way to a General Electric storage site in Morris, Illinois. The U.S. Highway 50 at that time was not like it is today – a super two. In fact, in those days the Harvey County Commission was actively lobbying with other county commissions and municipalities along U.S. 50 between Newton and Emporia to ask the legislature to spend the money to improve U.S. 50. Shortly after these news reports surfaced the Harvey County emergency preparedness director and the Harvey County Sheriff expressed their concerns that should an accident occur during the transportation of these nuclear wastes the first responders along the route would be local law enforcement and emergency personnel. There were several concerns raised

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ATTACHMENT 1

by the EMS director and sheriff. One was that the first responders to an accident would be local law enforcement and EMS personnel. The sheriff and EMS director had enquired of state and federal agencies and asked what would happen should there be an accident involving this nuclear waste. They had been told that should the waste leak from the containers everyone within one mile of the spill would be dead. Depending upon the prevailing winds, everyone within six miles of the spill would be dead. The trucks carrying this waste would not have the usual placards warning of hazardous materials on board. Furthermore, the federal agencies would not give advance warning of these materials traveling through the county because of concerns that word would leak out to potential terrorists. The sheriff and county EMS director asked us to try to stop these shipments. We contacted out state legislator, Karen Griffiths, and asked her to do something. Her response was that the state could do nothing since shipments of nuclear waste was "interstate commerce" that could only be regulated by the federal government.

Now fast forward to the present and why this is relevant to Yucca Mountain as a depository of high-level nuclear waste. Some of you may have read news accounts in the last couple of years that high level nuclear waste destined for Yucca Mountain would travel along Interstate 70 – including through Kansas. Because of this fact I would respectfully urge that if you decide to pass this resolution that you add an amendment asking that if the Yucca Mountain Repository becomes active that the federal government provide training, equipment and funds to first responders all along the route used to transport these wastes. We know that the transporters of these wastes claim that the probability of an accident causing harm to anyone is very small. However, given the toxicity of these kinds of materials all it takes is one accident. As we all saw during the events of September 11 first responders – policemen, fireman and EMS personnel – put their lives at risk everyday. Let's give them the tools they need to protect us from the unthinkable.

Thanks for your time and attention.

Will Nuclear Waste Travel Through Your State?

The Congressional decision to single-out Yucca Mountain as the nation's proposed site for the disposal of irradiated fuel from commercial nuclear power plants and high-level nuclear wastes from defense and weapons facilities raises the question of how this highly radioactive waste would be transported to Nevada. The Agency for Nuclear Projects has received numerous requests for specific transportation information regarding Nevada and the many other affected states.

Since 1989, the Agency has sponsored studies of the highway and rail routes that likely would be used for shipping spent nuclear fuel and high-level radioactive waste to the proposed repository site at Yucca Mountain, about 80 miles northwest of Las Vegas. Potentially, more than 43 states could be affected by nuclear waste transportation. The following routing maps are an essential part of the State of Nevada's assessment of the transportation impacts and risks associated with locating a national high-level nuclear waste repository at Yucca Mountain.

U.S. Map of Probable Routes

State of Nevada
Nuclear Waste Project Office
Capitol Complex
Carson City, NV 89710
(702) 687-3744

*

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Nuclear Waste Transportation Routes

Highway and rail routes most likely to be used to transport high-level nuclear waste to Yucca Mountain, Nevada

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A Closer Look at the Individual States

Return to the Nuclear Waste Project Home Page

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State of Nevada
Nuclear Waste Project Office
Capitol Complex
Carson City, NV 89710
(702) 687-3744

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United States General Accounting Office

GAO

Report to Congressional Requesters

December 2001

NUCLEAR WASTE

Technical, Schedule, and Cost Uncertainties of the Yucca Mountain Repository Project

GAO-02-191

HOUSE UTILITIES

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ATTACHMENT 2

Contents

Abbreviations

DOE	Department of Energy
EPA	Environmental Protection Agency
GAO	General Accounting Office
NRC	Nuclear Regulatory Commission
OCRWM	Office of Civilian Radioactive Waste Management
USGS	U.S. Geological Survey

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GAO
Accountability * Integrity * Reliability
United States General Accounting Office
Washington, DC 20548

December 21, 2001

The Honorable Harry Reid
Chairman, Subcommittee on Transportation,
Infrastructure, and Nuclear Safety
Committee on Environment and Public Works
United States Senate

The Honorable Shelley Berkley
House of Representatives

As reflected in the administration's energy policy, there is renewed interest in expanding nuclear power as a source of electricity. At the same time, the nation currently does not have a facility to permanently dispose of the highly radioactive spent (used) fuel from existing commercial nuclear power plants. In lieu of such a facility, plant owners are currently holding about 40,000 metric tons of spent fuel in temporary storage at 72 plant sites in 36 states. In addition, the Department of Energy (DOE) estimates that it has over 100 million gallons of highly radioactive waste and 2,500 metric tons of spent fuel from the development of nuclear weapons and from research activities in temporary storage. Because these wastes contain radioactive elements that remain active for hundreds of thousands of years, the permanent isolation of the wastes is critical for safeguarding public health, cleaning up DOE's nuclear facilities, and providing a reasonable basis for increasing the number of nuclear power plants.

As required by the Nuclear Waste Policy Act of 1982, as amended in 1987, DOE has been studying one site at Yucca Mountain, Nevada, to determine its suitability for disposing of highly radioactive wastes in a mined geologic repository. If the Secretary of Energy decides to recommend this site to the President, the recommendation would begin a statutory process for the approval or disapproval of the site that will involve the President, the state of Nevada, and the Congress. In addition, a subsequent presidential site recommendation would trigger statutory time frames for action by the state, the Congress, DOE, and the Nuclear Regulatory Commission (NRC). If the site is recommended and approved, DOE must apply to NRC for a license to construct a repository. If the site is not recommended and approved for a license application, or if NRC denied a license to construct a repository, the administration and the Congress would have to consider other options for the long-term management of existing and future nuclear wastes.

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Site investigation activities at Yucca Mountain include studies of the physical characteristics of the mountain and potential waste containers. The investigation also includes the development and use of mathematical models to measure the probability that various combinations of natural and engineered (man-made) features of a repository could safely contain wastes for 10,000 years. The Environmental Protection Agency (EPA) has set health and safety standards for a repository at Yucca Mountain that require a high probability of safety for at least that period of time. DOE's criteria for determining if the site is suitable for a repository and the NRC's licensing regulations are consistent with these standards. DOE has designated the nuclear waste program, including the site investigation, as a "major" program that is subject to senior management's attention and to its agencywide guidelines for managing such programs and projects. The guidelines require the development of a cost and schedule baseline, a system for managing changes to the baseline, and independent cost and schedule reviews. DOE is using a management contractor to carry out the work on the program. DOE's management contractor develops and maintains the baseline, but senior DOE managers must approve significant changes to cost or schedule estimates. In February 2001, DOE hired Bechtel SAIC Company, LLC (Bechtel), to manage the program and required the contractor to reassess the remaining technical work and the estimated schedule and cost to complete this work.

In 1996, the U.S. Court of Appeals for the District of Columbia Circuit ruled that the Nuclear Waste Policy Act obligated DOE to start disposing of the spent fuel from commercial nuclear power plants no later than January 31, 1998. In 1998, because DOE could not meet this deadline, the U.S. Court of Appeals for the Federal Circuit held in another case that plant owners are entitled to damages. One of the major issues in the determination of damages is the schedule under which DOE will begin accepting the spent fuel. DOE does not expect to complete the sequence of site approval, licensing, and construction of enough of the repository facilities at Yucca Mountain to open it until at least 2010. Courts in these 2 cases and 16 cases brought by other utilities are currently assessing the amount of damages that DOE owes the plant owners for delaying the disposal of their wastes by the estimated 12-year delay. Estimates of the potential damages vary widely, from DOE's estimate of about $2 billion to the nuclear industry's estimate of $50 billion.

Given these circumstances and questions raised about DOE's investigation of the Yucca Mountain site, you asked us to determine the extent to which

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- DOE has completed the work necessary to support a site recommendation for the development of a repository at Yucca Mountain and
- DOE's goal of opening a repository at Yucca Mountain in 2010 is reasonable.

Results in Brief

Recommending to the President that the Yucca Mountain site is suitable for a repository is within the discretion of the Secretary of Energy but, for the reasons noted below, may be premature. Once the President considers the site qualified for a license application and recommends the site to the Congress, the Nuclear Waste Policy Act requires DOE to submit a license application to NRC within about 5 to 8 months.[1] On the basis of information we reviewed, DOE will not be able to submit an acceptable application to NRC[2] within the express statutory time frames for several years because it will take that long to resolve many technical issues. Specifically, DOE is currently gathering and analyzing technical information required to satisfy 293 agreements that it made with NRC. According to NRC, completing this ongoing technical work is essential for it to accept a license application from DOE. Some of these agreements, for example, provide for the additional study of how water would flow through the repository area to the underlying groundwater and the durability of waste containers to last for thousands of years. Many of the technical issues that were the subject of these agreements have also been of concern to the U.S. Nuclear Waste Technical Review Board, which was established by the Nuclear Waste Policy Act to review the technical and scientific validity of DOE's investigation of Yucca Mountain. Bechtel's September 2001 detailed reassessment of the work required to submit a license application, including the 293 agreements with NRC and assuming expected funding levels, concluded that DOE would be in a position to submit a license application to NRC in January 2006, or about 4 years from now. Under the Nuclear Waste Policy Act and DOE's siting guidelines,

[1] If the President makes a recommendation to the Congress, Nevada has 60 days to disapprove the site. If disapproved, the Congress has 90 days of continuous session to enact legislation overriding a disapproval. If the Congress overrides the state's disapproval, the Secretary is required to submit a license application to NRC within 90 days after the site recommendation is effective. These time frames provide about 150 to 240 days, or about 5 to 8 months, from the time the President recommends the site until DOE submits a license application.

[2] The acceptance of a license application is not the same as approving an application. A decision to approve or disapprove any application would be made by NRC following extensive review and testing.

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while a site recommendation and a license application are separate processes, DOE will need to use essentially the same data for both.

On the basis of the information we reviewed, DOE is unlikely to achieve its goal of opening a repository at Yucca Mountain by 2010 and currently does not have a reliable estimate of when, and at what cost, such a repository can be opened. Since DOE stopped using the cost and schedule baseline to manage the site investigation in 1997, the repository program's baseline has not reflected changes in the program. For example, when the program's fiscal year 2000 appropriation was $57.8 million less than requested, DOE deferred some planned technical work without adjusting the baseline to reflect this action. As a result, it was not clearly visible when, and at what cost, the site investigation would be completed and a license application submitted to NRC. Bechtel, in its September 2001 detailed reassessment, concluded, on the basis of expected program funding, that DOE could submit the application in January 2006 at a total cost of $5.5 billion. This date is approximately 4 years later, and the $5.5 billion figure is about $1.4 billion more than DOE's projection in 1997. Using Bechtel's estimate, sufficient time would not be available for DOE to obtain a license from NRC and construct enough of the repository to open it in 2010. Therefore, DOE is exploring alternative approaches to opening a repository in 2010, such as developing surface facilities for storing waste at the site until sufficient underground disposal facilities can be constructed.

We are recommending that the Secretary of Energy fully consider the timing of the statutory process before he decides when to make a site recommendation to the President. We are also making recommendations to DOE to better manage the nuclear waste program and to prepare estimates of the schedule and costs for opening a repository at Yucca Mountain that are tied to a new baseline for the program.

DOE disagreed that it may be premature for the Secretary of Energy to make a site recommendation to the President on the grounds that we did not understand the statutory and regulatory requirements for a site recommendation. (See app. II.) We agree that the Secretary has the discretion to make such a recommendation at this time; however, we question the prudence and practicality of making such a recommendation at this time, given the express statutory time frames for a license application and the significant amount of work remaining to be done for NRC to accept a license application from DOE. Our conclusion is based on the relationship between a site recommendation and DOE's readiness to submit an acceptable license application to NRC, as set out in law and

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DOE's siting guidelines. Although we have clarified our discussion of the statutory and regulatory requirements for site recommendation, approval, and licensing, we continue to believe that the Secretary of Energy should consider the timing of this statutory process as he decides when to make a site recommendation to the President. Therefore, while we have modified the language, we have not changed the intent of our recommendation on this matter. (See p. 24 for our evaluation of DOE's comments.)

Background

Recognizing the critical need to address the issue of nuclear waste disposal, the Congress enacted the Nuclear Waste Policy Act of 1982 to establish a comprehensive policy and program for the safe, permanent disposal of commercial spent fuel and other highly radioactive wastes in one or more mined geologic repositories. In the act, the Congress stated that federal efforts to devise a permanent solution for disposing of radioactive waste had been inadequate. The act charged DOE with (1) establishing criteria for the recommendation of sites for repositories; (2) "characterizing" (investigating) three sites to determine each site's suitability for a repository; (3) recommending one suitable site to the President who, if he considers the site is qualified for a license application, submits a recommendation of such site to the Congress; and (4) upon approval of a recommended site, seeking a license from NRC to construct and operate a repository at the approved site. The act created the Office of Civilian Radioactive Waste Management within DOE to manage its nuclear waste program. When the act was passed, it was expected that a repository could be operational in 1998. Amendments to the act in 1987 directed DOE to investigate only the Yucca Mountain site. These amendments also established the Nuclear Waste Technical Review Board (the Board). The Board's mission is to review the technical and scientific validity of DOE's activities associated with investigating the site and packaging and transporting wastes, and to report its findings and recommendations to the Congress and DOE at least twice each year. The act does not require DOE to implement the Board's recommendations.

The Nuclear Waste Policy Act also set out important and complementary roles for other federal agencies. It required EPA to establish health and safety standards for the disposal of these wastes in repositories. EPA issued the standards for the Yucca Mountain site in June 2001.[3] The act

[3] The Energy Policy Act of 1992 required EPA to establish specific health and safety standards for a repository at Yucca Mountain.

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also made NRC responsible for licensing and regulating repositories to ensure their compliance with EPA's standard. If the Yucca Mountain site is recommended to the President and approved, upon accepting a license application from DOE, NRC has, according to the act, 3 to 4 years to review the application and decide whether to issue a license to construct, and then to operate, a repository at the site. The act also required that, before the Secretary of Energy may recommend the site to the President, he or she must obtain NRC's preliminary comments on the sufficiency of DOE's site investigation for the purpose of a license application. NRC provided these comments in writing on November 13, 2001. From the beginning of the formal investigation of Yucca Mountain, therefore, NRC has been reviewing DOE's investigation activities, concentrating on the scientific and technical issues that need to be understood and clarified so that DOE will have adequate information for a license application. Finally, the Board's principal charge is to evaluate the technical and scientific validity of DOE's investigation of Yucca Mountain to ensure that the investigation is technically sound and scientifically credible. The Board must report to the Congress and the Secretary of Energy at least twice a year on issues surrounding the site investigation. Each of the Board's 11 members is appointed by the President from a list of candidates recommended by the National Academy of Sciences. Board members serve part-time and are assisted by a permanent staff.

In addition to the investigation of Yucca Mountain, the nuclear waste program includes preparations for eventually accepting and transporting spent fuel and other highly radioactive wastes from storage sites. Upon receipt of wastes at the site, DOE would put the wastes in metal containers and put the loaded containers in the repository. Both the natural features of the site and the design and materials of the waste containers and other engineered components of the repository system would contribute to restricting the release of radioactive materials from the repository over the 10,000-year period required by EPA's health and safety standards.

If DOE determines that the site is suitable for the development of a repository, according to the Nuclear Waste Policy Act, the Secretary may then recommend the site to the President at least 30 days after notifying the state of Nevada of the impending recommendation. However, before the Secretary may recommend the site to the President, the act requires that he hold local public hearings to inform the residents of the area and receive their comments on a possible site recommendation. DOE held the public hearings from May 2001 to December 2001. In addition, according to the Nuclear Waste Policy Act, the Secretary must prepare a

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comprehensive statement of the basis for the site's recommendation that includes, among other things, the following:

- NRC's preliminary comments on the sufficiency of the site investigation for a license application.
- Descriptions of the proposed repository and waste form or packaging and a discussion of the information obtained from the site investigation.
- An environmental impact statement prepared for the site along with the comments on the statement by the Department of the Interior, the Council for Environmental Quality, the EPA, and NRC.
- The views and comments of Nevada's governor and legislature and the Secretary's response to them.

If, after receiving a site recommendation from the Secretary of Energy, the President considers the Yucca Mountain site qualified for an application for construction authorization (a license) for a repository, then the President shall submit a recommendation of the site to the Congress. The Nuclear Waste Policy Act does not specify a time frame in which the President must act. However, the President's recommendation, if made, is automatically approved after 60 days unless Nevada's governor and legislature notify the Congress of their disapproval of the site. In that event, the site would not be approved unless the Congress enacted, within 90 days of continuous session, legislation overriding the state's disapproval. If the site is recommended and approved, the act requires the Secretary to submit a license application to NRC not later than 90 days after the effective date of the site's approval. NRC is required to issue or deny a license not later than 3 years after receiving a license application, unless it extends this period by not more than 1 year by reporting its reasons for doing so to the Secretary and the Congress.

It May Be Premature for DOE to Make a Site Recommendation

Although within his discretion, it may be premature for the Secretary of Energy to make a site recommendation in the near future because DOE is currently not prepared to submit an acceptable license application to NRC within the statutory limits that would take effect if the President recommended the site to the Congress within the next several years. DOE has entered into almost 300 agreements with NRC to gather and/or analyze additional technical information in preparation for a license application. DOE is also continuing to address technical issues raised by the Board. In September 2001, Bechtel completed a detailed reassessment of the plan for completing the necessary technical work for DOE and proposed January 2006 as the date when DOE would be ready to submit an acceptable license application to NRC. DOE has not accepted this estimate

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because, according to program officials, it would extend the license application date too far into the future. Instead, DOE is considering accepting only the planned work for fiscal year 2002 and asking the contractor to replan the work remaining to be completed after that fiscal year until the submission of a license application to NRC. Under the Nuclear Waste Policy Act and DOE's guidelines, while a site recommendation and a license application are separate processes, DOE will need to use essentially the same data for both.[4] Also, the act states that the recommendation that the President would make to the Congress is that he considers the site qualified for an application to NRC for a license. The President's recommendation also triggers an express statutory time frame that requires DOE to submit a license application to NRC within about 5 to 8 months. As a result, we believe that DOE should consider these factors in deciding when to make a site recommendation to the President. On the basis of the information we reviewed, DOE will not be able to submit an acceptable application to NRC within the express statutory time frames for several years because it will take that long to resolve many technical issues.

DOE Lacks Information for a License Application

Over the last 2 years, staff of DOE and NRC negotiated 293 agreements covering specific pieces of additional technical work that DOE agreed to perform as a part of preparing a license application that NRC would accept. Such agreements address areas of study within the program where NRC's staff determined that DOE needs to collect more scientific data and/or improve its technical assessment of the data. According to NRC's tracking system for the 293 agreements, as of November 30, 2001, NRC had received and is reviewing the information related to 47 of these agreements and DOE had completed work on another 15 of the agreements to NRC's satisfaction. Many of the technical issues that were the subject of the 293 agreements between DOE and NRC have also been of concern to the Board since it began reporting on the Yucca Mountain project in 1990. According to officials from NRC's waste management division, these issues generally relate to uncertainties about three aspects of the long-term performance of the proposed repository: (1) the expected lifetime of engineered barriers, particularly the waste containers; (2) the physical properties of the Yucca Mountain site; and (3) the supporting

[4] See *General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories; Yucca Mountain Site Suitability Guidelines* (preamble), 66 *Fed. Reg.* 57298, 57322 (Nov. 14, 2001).

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information for the mathematical models used to evaluate the performance of the planned repository at the site.

The uncertainties related to engineered barriers revolve largely around the longevity of the waste containers that would be used to isolate the wastes. DOE currently expects that these containers would be constructed with a nickel-chromium alloy that would isolate the wastes from the environment for more than 10,000 years. Minimizing uncertainties about the container materials and the predicted performance of the waste containers over this long time period is especially critical because DOE's estimates of the repository system's performance depend heavily on the waste containers, in addition to the natural features of the site, to meet NRC's licensing regulations and EPA's health and safety standards. As part of its agreements with NRC, DOE will continue its research on the expected rate of corrosion of the container material and the anticipated effects of corrosion on the performance of the repository system. In addition, DOE formed a peer review panel to address uncertainties about how materials for waste containers would be expected to perform over time in the repository.[5] A September 2001 interim report by the panel found no evidence thus far to rule out the use of the proposed container materials but noted that significant work is needed to substantiate the technical basis for predicting the stability of these materials. The report also stated that the uncertainty about the containers' long-term performance probably could be reduced substantially through further experiments and analysis.

The uncertainties related to the physical characteristics of the site involve a wide variety of issues. According to DOE officials, while some of these issues have been and are continuing to be studied by DOE, remaining uncertainties include

- the faulting and fracturing of the repository rock over time;
- the flow of water through the heated portion of the repository;
- the flow of water through the saturated and unsaturated zones of the repository under natural (prerepository) conditions;[6]
- the stability of the repository under natural conditions, heated conditions, and conditions involving seismic events;

[5] The peer review comprised recognized experts from industry and academia.

[6] The saturated zone is that area beneath the repository that is saturated with groundwater. The unsaturated zone is above the water table.

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- the movement of radioactive material through the repository in the event of a release of this material;
- the effect of volcanic activity on the repository; and
- the combined effects of heat, water, and chemical processes in and around the tunnels where the waste containers would be placed.

According to officials in DOE's repository project office, the amount of current scientific uncertainty within each of these areas varies. For example, the flow of water under natural conditions through the area where the repository would be located is relatively well understood. In contrast, there is much more current uncertainty about how the combination of heat, water, and chemical processes caused by the presence of nuclear waste in the repository would affect the flow of water through the repository.

The NRC staff's concerns over the supporting information for the mathematical models that DOE would use as its primary tool for assessing the performance of the repository revolved primarily around validating the models and verifying the information used in the models. Performance assessment is an analytical method that relies on computers to operate mathematical models to assess the performance of the repository against EPA's health and safety standards, NRC's licensing regulations, and DOE's guidelines for determining if the Yucca Mountain site is suitable for a repository. DOE uses the data collected during site characterization activities to model how a repository system, comprising both natural and engineered features, would perform at the Yucca Mountain site. Some of DOE's mathematical models describe the behavior of individual physical and chemical processes, such as how quickly water might travel from the surface to the repository. DOE then links the results of these individual models together into a computer model representing the performance of the overall repository system. DOE then uses this model, called a "performance assessment model," to estimate the release of radioactivity from a repository under a range of conditions and over thousands of years. The model also enables DOE to forecast the dose of radiation to hypothetical persons living in the vicinity of the repository and compare them with EPA's health and safety standards. DOE's agreements with NRC are centered on validating the models—presenting information to provide confidence that the models are valid for their intended use—and verifying the information that has been collected during the site investigation and used in these models.

In addition to the NRC staff's concerns about DOE's models, NRC's Advisory Committee on Nuclear Waste has raised concerns about the

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adequacy of the performance assessment model that DOE used to support the information discussed in the technical documents it has issued to support a site recommendation.[7] In a September 18, 2001, letter to the chairman of NRC, the committee concluded that the model did not provide a basis for estimating performance and did not inspire confidence in the modeling process. The committee's conclusions were based on its concern that the modeling

- is guided by an inconsistent set of assumptions, including a mixture of conservative and nonconservative bounding assumptions, that do not represent realistic conditions and
- relies on many assumption-based computations and analyses that do not support or link the assumptions with available evidence.

According to the director of DOE's repository project office, the additional work surrounding the 293 agreements with NRC's staff is an insignificant addition to the extensive amount of technical work already completed. Moreover, this official does not expect that completing the additional technical work will change DOE's current performance assessment of a repository at Yucca Mountain. Also, in commenting on a draft of our report, DOE stated that it has compiled an enormous body of scientific and technical work over the last 2 decades including some 600 papers cited in one of the recently published reports. The Department also cited a substantial body of analytic literature it has published in recent years.[8]

From NRC's perspective, however, the agreements provided the basis for it to give DOE, as required by the Nuclear Waste Policy Act, its preliminary comments on the sufficiency of DOE's investigation of the Yucca Mountain site for inclusion in a future license application. In a November 13, 2001, letter to the Under Secretary of Energy, the Chairman of the NRC commented that

"[a]lthough significant additional work is needed prior to the submission of a possible license application, we believe that agreements reached between DOE and NRC staff

[7] The committee, established by NRC to advise it on nuclear waste regulatory issues, comprises experts in several disciplines, including risk assessment.

[8] DOE mentioned its Viability Assessment (1998), Preliminary Site Suitability Evaluation (2001), Supplemental Science and Performance Analyses (2001), Draft Environmental Impact Statement (1999), and Supplement to the draft EIS (2001).

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regarding the collection of additional information provide the basis for concluding that development of an acceptable license application is achievable."

The NRC Chairman's letter also pointed out that NRC's Advisory Committee on Nuclear Waste noted, similar to the NRC staff, that substantial additional work by DOE is needed prior to its submission of a license application.

Since its first report to the Congress and Secretary of Energy in 1990, the Board has consistently raised issues and concerns over DOE's understanding of the expected lifetime of the waste containers, the significance of the uncertainties involved in the modeling of the scientific data, and the need for an evaluation and comparison of a repository design having a higher temperature with a design having a lower temperature. The Board continues to reiterate these concerns in correspondence to DOE's director of the nuclear waste program and in its reports to the Congress and the Secretary of Energy. For example, in an August 2000 letter to the Subcommittee on Energy and Power, House Committee on Commerce, the Board reported that the technical basis for DOE's long-term projections of repository performance had "critical weaknesses." The Board explained that some of the large uncertainties about the proposed repository's performance over thousands of years—including the estimated corrosion rates of waste containers and predicted behavior of the geologic system—were greater at the higher temperatures that would result from DOE's design of the repository. At a January 2001 public meeting with DOE, the Board told DOE that to determine whether the Yucca Mountain site is suitable for use as a repository, DOE must focus its attention on four priority issues: (1) quantifying the uncertainties in the models used to estimate the repository's performance; (2) gaining a further understanding of the processes related to the corrosion of waste containers; (3) evaluating and comparing a repository design having a higher temperature with a design that has a lower temperature; and (4) developing evidence other than performance assessment modeling to support the estimates of repository performance.

In October 2001, the Board reported that, despite DOE's progress in responding to the Board's concerns, gaps in data and analyses make evaluation of DOE's technical bases on whether to recommend the site more difficult. The Board provided several examples of these gaps. First, the Board noted that DOE has not yet completed a comparison, promised in a May 30, 2001, letter to the Board, between a high-temperature and a low-temperature repository design. The Board explained that a design with a lower temperature has the potential to reduce the level of

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uncertainty in DOE's modeling results. Second, DOE does not appear to have implemented the Board's suggestion, made in two previous letters to DOE, to examine more closely the contribution that each piece of natural and engineered barriers makes to the repository's overall performance. Third, the Board observed that DOE had not presented a clear and persuasive rationale for going forward with a site recommendation before resolving the important issue of the potential consequences to the repository from volcanic activity. Last, the Board asked that, if the analyses referred to in the letter would not be available before DOE's decision on whether to recommend the site to the President, DOE provide its rationale explaining why the analyses are not important for site recommendation as well as any plans for subsequently conducting the work if the site were recommended and approved for repository development.

Recent reports to DOE by the U.S. Geological Survey and an international peer review team provide further insights into DOE's site investigation. An October 2001 letter from the U.S. Geological Survey (USGS), which has long played an active role in the site investigation, stated that the scientific work performed to date supports a decision to recommend the site for development as a repository. However, USGS qualified its position by noting that it was commenting only within the scope of its earth science expertise and was neutral regarding other information the Secretary might consider. USGS also pointed out that additional studies need to be performed even after a site recommendation.

In November 2001 an international peer review panel released an executive summary of the results of its review of DOE's performance assessment modeling for a potential site recommendation. The panel, which performed the review at DOE's request, was organized by the Nuclear Energy Agency of the Organization for Economic Cooperation and Development and the International Atomic Energy Agency of the United Nations. The panel did not comment on the results of DOE's modeling efforts but found that DOE's methodology is soundly based and implemented in a competent manner. Overall, the panel stated, DOE's approach provides an adequate basis for supporting a statement on likely compliance within the regulatory period of 10,000 years and for a site recommendation decision. The panel also qualified its findings, however, by stating that the findings were based on a brief review and not an in-depth analysis. The panel also called for a number of improvements in DOE's approach to performance assessment, including demonstrating an understanding of the behavior of the overall repository system rather than

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focusing on the numerical results of the assessment, and identifying and treating all types of uncertainty in the modeling.

As recently as May 2001, DOE projected that it could submit a license application to NRC in 2003. It now appears, however, that DOE may not complete all of the additional technical work that it has agreed to do to prepare an acceptable license application until January 2006. In September 2001, Bechtel completed, at DOE's direction, a detailed reassessment in an effort to reestablish a cost and schedule baseline. Bechtel estimated that DOE could complete the outstanding technical work agreed to with NRC and submit a license application in January 2006. This estimate was based on guidance from DOE that, in part, directed the contractor to assume annual funding for the nuclear waste program of $410 million in fiscal year 2002, $455 million in fiscal year 2003, and $465 million in fiscal year 2004 and thereafter. DOE has not accepted this estimate because, according to program officials, the estimate would extend the date for submitting a license application too far into the future. Instead, DOE is now considering accepting only the fiscal year 2002 portion of Bechtel's detailed work plan and requesting Bechtel to prepare another work plan for fiscal year 2003 through submission of a license application.

Essentially the Same Information Is Needed for a Site Recommendation and a License Application

Under the Nuclear Waste Policy Act and DOE's site suitability guidelines, while the site recommendation and a license application are separate processes, DOE will need to use essentially the same data for both. Further, site recommendation and license application are connected by law with specific timeframes that require DOE to submit a license application to NRC within about 5 to 8 months once the President considers the site qualified for a license application and makes a site recommendation to the Congress.

Under the act, DOE's site characterization activities are to provide information necessary to evaluate the Yucca Mountain site's suitability for submitting a license application to NRC for placing a repository at the site. In implementing the act, DOE's guidelines provide that the site will be suitable as a waste repository if the site is likely to meet the radiation protection standards that NRC would use to reach a licensing decision on the proposed repository. Thus, as stated in the preamble (introduction) to DOE's guidelines, DOE expects to use essentially the same data for the site recommendation and the license application.

In addition, the act specifies that, having received a site recommendation from the Secretary, the President shall submit a recommendation of the

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site to the Congress if the President considers the site qualified for a license application. Under the process laid out in the Nuclear Waste Policy Act, once the Secretary makes a site recommendation, there is no time limit under which the President must act on the Secretary's recommendation. However, once the President makes a recommendation to the Congress that it approve the site, specific statutory time frames are triggered for the next steps in the process. Figure 1 shows the approximate statutory time needed between a site recommendation and submission of a license application and the additional time needed for DOE to meet the conditions for an acceptable license application. For illustrative purposes, figure 1 assumes that the Secretary recommends the site to the President on January 30, 2002 and the President recommends the site to the Congress 6 months later on July 30, 2002. The figure also assumes that Nevada disapproves the site but that the Congress overrides the state's disapproval. As shown in the figure, Nevada has 60 days to disapprove the site, and if disapproved, the Congress has 90 days (of continuous session) in which to enact legislation overriding the state's disapproval. If the Congress overrides the state's disapproval and the site designation takes effect, the next step is for the Secretary to submit a license application to NRC within 90 days after the site designation is effective. On the basis of Bechtel's latest program reassessment, DOE would be in a position to submit a license application to NRC in January 2006.

These statutory time frames provide about 150 to 240 days, or about 5 to 8 months, from the time the President makes a recommendation to DOE's submittal of a license application. DOE, however, will not be ready to file an acceptable application with NRC for several years.[9] (See fig. 1.) Therefore, the Secretary of Energy should consider the timing of this statutory process as he decides when to make a site recommendation to the President.

[9] In the congressional conference report on fiscal year 2002 appropriations for energy and water development, the conferees stated that they expect DOE to deliver the final site recommendation report and environmental impact statement to the Congress by Feb. 28, 2002. They recognized that certain scientific and engineering work is directly related to the site's recommendation and to resolving technical concerns of NRC and the Board, and that "such work should not automatically terminate upon submission of the site recommendation." H.R.Rep. No. 107-258, at 122 (2001).

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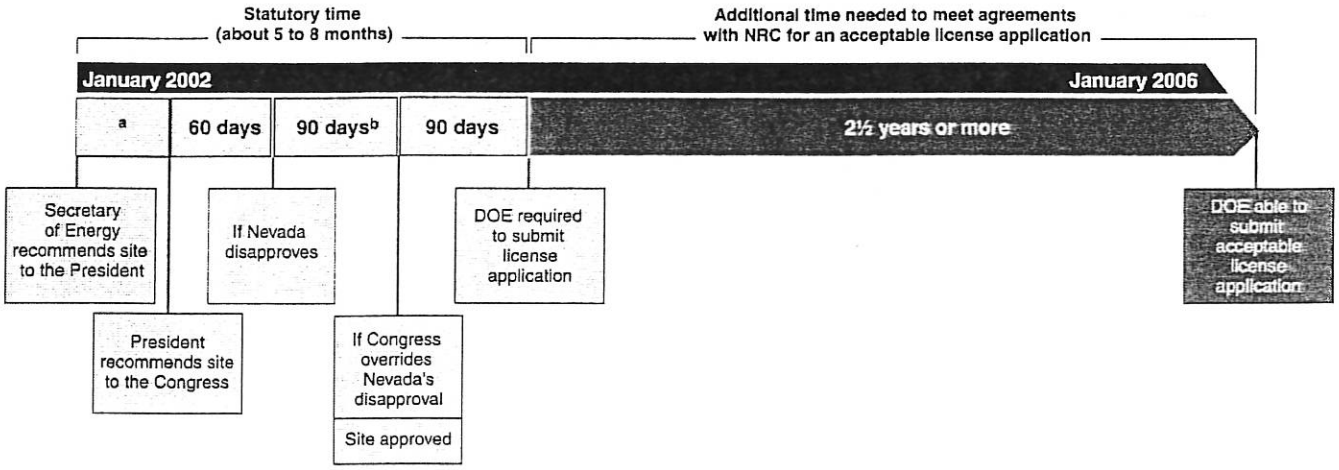
Figure 1: Comparison of Statutory Site Approval Process With DOE's Projected Schedule



[a] No prescribed statutory time frame.

[b] 90 calendar days of continuous session of the Congress.

DOE Is Unlikely to Open a Repository in 2010 as Planned

DOE, in a document that would support a potential site recommendation, states that it may be able to open a repository at Yucca Mountain in 2010. This expectation is predicated on the submission of a license application to NRC in 2003, receipt of the construction authorization in 2006, and construction of enough surface and underground facilities to begin putting wastes into the repository in 2010. However, according to Bechtel's September 2001 detailed reassessment of the nuclear waste program, in which it proposed to reestablish a baseline for the program, a more realistic date for submitting the license application may be January 2006. Reestablishing the program's baseline is necessary because DOE stopped using the baseline to manage the program in March 1997. Since then, program officials have used revised estimates for the license application date in various internal and external reports, but none of these changes were approved as required and the program's cost and schedule baseline has never been revised to reflect these changes. As a result, DOE does not have a baseline estimate of the program's schedule and cost that is based on all the work that it expects to complete through the submission of a license application. Because of uncertainty over when DOE may be able to open the repository, the Department is exploring alternatives that might still permit it to begin accepting commercial spent fuel in 2010.

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DOE's Current License Application Milestone Date Is Not Supported by the Program's Baseline

In its most recent report on the program's estimated cost, DOE states that it expects to submit the application to NRC in 2003.[10] This date reflects a delay in the license application milestone date last approved by DOE in March 1997 that targeted March 2002 for submitting a license application. The 2003 date was not formally approved by DOE's senior managers or incorporated into the program's cost and schedule baseline, as required by the management procedures that were in effect for the program. At least three extensions for the license application date have been proposed, but none of the three proposals have been approved as required.

DOE designates some of its programs and projects, such as the nuclear waste program, to receive special attention from senior DOE managers because of the complexity or estimated costs of the programs and projects. DOE's guidance for managing these designated programs and projects requires, among other things, that senior managers establish a baseline for managing the program or project. The baseline describes the program's mission—in this case, the safe disposal of highly radioactive waste in a geologic repository—and the expected technical requirements, schedule, and cost to complete the program. Procedures for controlling changes to an approved baseline are designed to ensure that program managers consider the expected effects of adding, deleting, or modifying technical work, as well as the effects of unanticipated events, such as funding shortfalls, on the project's mission and baseline. In this way, alternative courses of action can be assessed on the basis of each action's potential effect on the baseline. DOE's procedures for managing the nuclear waste program require that program managers revise the baseline, as appropriate, to reflect any significant changes to the program.

After March 1997, according to DOE officials, they did not always follow these control procedures to account for proposed changes to the program's baseline, including the changes proposed to extend the date for license application. According to these same officials, they stopped following the control procedures because the Secretary of Energy did not approve proposed extensions to the license application milestone. As a result, the official baseline did not accurately reflect the program's cost and schedule to complete the remaining work necessary to submit a license application.

[10] See *Analysis of the Total System Life Cycle Cost of the Civilian Radioactive Waste Management Program* (DOE/RW-0533, May 2001).

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In November 1999, the Yucca Mountain site investigation office proposed extending the license application milestone date by 10 months, from March to December 2002, to compensate for a $57.8 million drop in funding for fiscal year 2000. According to the specific management procedures that DOE adopted for the nuclear waste program, a proposed extension in the license application milestone required the approval of both the Director of the nuclear waste program and the Secretary of Energy. Neither of these officials approved this proposed change nor was the baseline revised to reflect this change even though the Director subsequently began reporting the December 2002 date in quarterly performance reports to the Deputy Secretary of Energy.

Less than a year later, in September 2000, the site investigation office once again proposed an extension to the license application milestone to July 2003 because of reduced funding and added technical work. Then, in February 2001, the site investigation office proposed another extension in the milestone, to December 2003. As with the November 1999 extension request, neither the Director of the nuclear waste program nor the Secretary of Energy approved either of the latter two requests, nor was either extension date for the license application milestone incorporated into the baseline for the program. Furthermore, as with the November 1999 proposed change, DOE began to use the unapproved milestone dates in both internal and external reports and communications. For example, the Director used the unapproved 2003 date for submitting a license application twice in congressional testimony in May 2001. Later, in a September 2001 memorandum to the DOE Under Secretary discussing the goals of the nuclear waste program through January 2005, the Director established 2004 as his goal for submitting a license application.

Because senior managers did not approve these proposed changes for incorporation into the baseline for the program, program managers did not adjust the program's cost and schedule baseline. By not accounting for these and other changes to the program's technical work, milestone dates, and estimated costs in the program's baseline since March 1997, DOE has not had baseline estimates of all of the technical work that it expected to

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complete through submission of a license application and the estimated schedule and cost to complete this work.[11]

When Bechtel was contracted to manage the nuclear waste program, one of its first assignments was to document the remaining technical work that had to be completed to support the submission of a license application and to estimate the time and cost to complete this work. The contractor's revised, unofficial baseline for the program shows that it will take until January 2006 to complete essential technical work and submit an acceptable license application. DOE also estimated that completing the remaining technical work would add about $1.4 billion to the cumulative cost of the program, bringing the total cost of the Yucca Mountain project's portion of the nuclear waste program to $5.5 billion.[12] As noted above, DOE has not accepted Bechtel's proposed new baseline extending out until January 2006. Instead, DOE is considering accepting, at present, only that portion of the baseline that Bechtel proposed to complete in fiscal year 2002.

Extension of License Application Date Will Likely Postpone 2010 Repository Goal

An extension of the license application date to 2006 would almost certainly preclude DOE from achieving its long-standing goal of opening a repository in 2010. According to DOE's May 2001 report on the program's estimated cost, after submitting a license application in 2003, DOE estimates that it could receive an authorization to construct the repository in 2006 and complete the construction of enough surface and underground facilities to open the repository in 2010, or 7 years after submitting the license application. This 7-year estimate from submittal of the license application to the initial construction and operation of the repository assumes that NRC would grant an authorization to construct the facility in 3 years, followed by 4 years of construction. Assuming these same estimates of time, submitting a license application in January 2006 would extend the opening date for the repository until about 2013.

[11] In 1998 and 2000, independent cost and schedule reviews of the program were performed by DOE contractors. On the latter review, the contractor concluded that DOE's schedule for licensing, constructing, and opening the repository by 2010 was optimistic by about 2 years and that DOE's estimate of the total cost of the program over its 100-plus-year lifetime—$58 billion (2000 dollars)—was understated by about $3 billion.

[12] DOE estimated that the program cost $4.1 billion, on the basis of year-of-expenditure dollars from the program's inception in 1983 through March 2002. The $5.5 billion estimate for the license application is based on year-of-expenditure dollars from 1983 through January 2006.

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Furthermore, opening the repository in 2013 may be questionable for several reasons. First, a repository at Yucca Mountain would be a first-of-a-kind facility, meaning that any schedule projections may be optimistic. DOE has deferred its original target date for opening a repository from 1998 to 2003 to 2010. Second, although the Nuclear Waste Policy Act states that NRC has 3 years to decide on a construction license, a fourth year may be added if NRC certifies that it is necessary. Third, the 4-year time period for construction that DOE's current schedule allows from the issuance of a construction authorization to the opening of the repository may be too short. For example, a contractor hired by DOE to independently review the estimated costs and schedule for the nuclear waste program reported that the 4-year construction period was too optimistic and recommended that the construction phase be extended by a year-and-a-half.[13] Bechtel anticipates a 5-year period of construction between the receipt of a construction authorization from NRC to the opening of the repository. Thus, on the bases of a 4-year licensing period and a 5-year period for initial construction, the repository might not be ready to open until about 2015 if DOE does not apply for a license until January 2006.

Finally, these simple projections do not account for any other factors that could adversely affect this 7- to 9-year schedule for licensing, constructing, and opening the repository. Annual appropriations for the program in recent years have been less than $400 million. In contrast, according to DOE, it needs between $750 million to $1.5 billion in annual appropriations during most of the 7- to 9-year licensing and construction period in order to open the repository on that schedule. In its August 2001 report on alternative means for financing and managing the program, DOE stated that unless the program's funding is increased, the budget might become the "determining factor" whether DOE will be able to accept wastes in 2010.[14]

[13] See *Independent Cost Estimate Review of the Civilian Radioactive Waste Management Program, 2001 Total System Life Cycle Cost* (Jan. 2001).

[14] See *Alternative Means of Financing and Managing the Civilian Radioactive Waste Management Program* (DOE/RW-0546, Aug. 2001).

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DOE Is Reviewing Alternative Ways to Accept Wastes in 2010

Because of the uncertainty of achieving the 2010 goal for opening the Yucca Mountain repository, DOE is examining alternative approaches that would permit it to meet the goal. In May 2001, DOE released a report on potential options for constructing and operating the repository.[15] It is also sponsoring a National Research Council study on possible approaches to developing a repository in stages over a longer duration.

DOE's May report evaluates a range of approaches to developing and operating the repository system and strategies for implementing these approaches. For example, to reduce the uncertainties of receiving substantially higher appropriations needed to open the repository as planned, DOE examined approaches that might permit it to begin accepting wastes at the repository site in 2010 while spreading out the construction of repository facilities over a longer time period. The study recommended developing the repository on a modular basis, separating the rate of accepting wastes at the repository site from the rate of waste emplacement in the underground disposal areas by relying on the surface storage of received wastes until the capacity to move wastes into the repository has been increased. For example, relatively modest-sized surface facilities to handle wastes could be expanded later to handle larger volumes of waste. Such a modular approach, according to the study results, would permit partial construction and limited waste emplacement in the repository, at lower than earlier estimated annual costs, in advance of the more costly construction of the facility as originally planned. Also, by implementing a modular approach, DOE would be capable of accepting wastes at the repository earlier than if it constructed the repository described in documents, such as the Science and Engineering Report that the Secretary would use to support a site recommendation.

In addition, DOE has contracted with the National Research Council to provide recommendations on design and operating strategies for developing a geologic repository in stages, which is to include reviewing DOE's modular approach. The Council is addressing such issues as the

- technical, policy, and societal objectives and risks for developing a staged repository;

[15] See *CRWMS Modular Design/Construction and Operation Options Report* (DOE/OCRWM, TDR-CRW-MD-000002, Rev. 03, May 2001).

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- effects of developing a staged repository on the safety and security of the facility and the effects on the cost and public acceptance of such a facility; and
- strategies for developing a staged system including the design, construction, operation, and closing of such a facility.

The Council expects to publish interim and final reports on the study in about March 2002 and December 2002, respectively.

In part, DOE's desire to meet the 2010 goal is linked to the court decisions that the Nuclear Waste Policy Act, as implemented by DOE's contracts with owners of commercial spent fuel, obligated DOE to begin accepting spent fuel from contract holders not later than January 31, 1998, or be held liable for damages. Courts are currently assessing the amount of damages that DOE must pay to holders of spent fuel disposal contracts. Estimates of potential damages for the estimated 12-year delay from 1998 to 2010 range widely from the Department's estimate of $2 billion to $3 billion to the nuclear industry's estimate of at least $50 billion. The damage estimates are based in part on the expectation that DOE would begin accepting spent fuel from contract holders in 2010. The actual damages could be higher or lower, depending on when DOE begins accepting spent fuel.

Conclusions

In addition to studying the Yucca Mountain site, DOE is taking the other steps, such as public hearings and obtaining NRC's sufficiency comments, that are required for the Secretary to make a site recommendation in the near future. Making a site recommendation at this time, however, may be premature. Under the Nuclear Waste Policy Act and DOE's siting guidelines, a site recommendation and a license application will need to be based on essentially the same data. Furthermore, the act lays out a process with specific time frames that requires DOE to submit a license application to NRC within about 5 to 8 months after the President makes a site recommendation to the Congress. DOE's contractor estimates that it will not have all of the additional information that NRC has said will be needed for an acceptable license application for another 4 years. Waiting until DOE is closer to submitting a license application for the additional information would put DOE in a position to be able to submit a license application that is acceptable to NRC within the time frames set out in the law, and to be able to better respond to questions and challenges that may emanate from the statutory review process subsequent to the President's recommendation.

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Another benefit of waiting for the additional technical information is that the repository's design and development schedule described in the documents that support a site recommendation may not describe the facilities that DOE would actually develop. These documents generally describe surface and underground facilities that DOE would design and build on a schedule permitting it to open the repository in 2010. This schedule, however, is unrealistic if one assumes that DOE's existing prelicensing and construction time frames continue to be valid. This uncertainty is compounded by questions about whether DOE can obtain the increases in annual funding required to meet its schedule. On the other hand, a compelling incentive exists to open the repository in 2010 because DOE is liable for damages, in amounts not yet determined by the courts, for not beginning to accept utilities' spent fuel by 1998. The damage amounts will in part be based on when DOE can begin to accept and deliver spent fuel to the repository. For these reasons, DOE is exploring alternative approaches to developing a repository, such as initially storing spent fuel at the repository site before constructing underground disposal facilities that could still enable it to accept spent fuel by 2010. Thus, deferring a site recommendation until DOE has substantially completed the remaining technical work needed for an acceptable license application would also enable DOE to complete its consideration of alternative approaches to developing a repository at Yucca Mountain. DOE could then ensure that the site recommendation is based on the approach that the Department intends to follow. This would enable DOE to develop the estimated schedule to design and build the preferred approach and estimate its cost, including the annual funding requirements, as part of the information on which to make a site recommendation.

DOE needs to reestablish a baseline for the nuclear waste program that accounts for all of the outstanding technical work needed to prepare an acceptable license application and the estimated schedule and cost to achieve this milestone. In conjunction with reestablishing a baseline for the program, DOE needs to resume using the baseline as a tool for managing the program, in accordance with the Department's policies and procedures for managing major projects.

Recommendations for Executive Action

To ensure that DOE will be prepared to submit an acceptable license application within the timeframes set out in the Nuclear Waste Policy Act, the Secretary of Energy should consider (1) deferring a site recommendation until it can meet the express statutory time frames that are triggered by a site recommendation by the President to the Congress and (2) including the results of DOE's ongoing technical work for NRC and

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the results of analyses of alternative approaches to the proposed repository in the Secretary's comprehensive statement of the basis for a site recommendation.

To improve the management of the nuclear waste program and to provide the Congress and the public with accurate information on the repository program, we further recommend that the Secretary of Energy

- reestablish the baseline for the nuclear waste program through the submission of a license application, including incorporating the remaining technical work required to submit the application and the estimated cost and schedule to complete this work, and
- follow the Department's requirements for managing major programs and projects, including a formal change control procedure.

Agency Comments and Our Evaluation

We provided DOE with a draft of this report for review and comment. DOE disagreed with our report, contending that we did not understand the relevant statutory and regulatory requirements related to a site recommendation. Bechtel, DOE's management contractor, also provided us with a letter asserting unspecified factual and legal inaccuracies in our draft report; however, the company added that it would provide specific comments through DOE. While it was not clear from DOE's comments which ones had come from Bechtel, we are responding to all comments received on the following pages. According to DOE, our misunderstanding of the requirements resulted in a contention in the draft report that it is premature for DOE to make a site recommendation because all the technical work for license application is not complete. (DOE's comments are in app. II.) We agree that the Secretary has the discretion to make such a recommendation at this time; however, we question the prudence and practicality of making such a recommendation at this time, given the express statutory time frames for license application and the significant amount of work remaining to be done for NRC to accept a license application from DOE. Our conclusion is based on the relationship between a site recommendation and DOE's readiness to submit an acceptable license application to NRC, as set out in DOE's siting guidelines and the Nuclear Waste Policy Act. The preamble to DOE's siting guidelines states that DOE expects to use essentially the same data for a site recommendation and a license application. Also, the Nuclear Waste Policy Act states that a presidential site recommendation is to be made if the President considers the site qualified for a license application and sets out a time frame that could be as short as 5 to 8 months from a presidential site recommendation to a license application. This includes

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the requirement that the Secretary of Energy submit a license application not later than 90 days following congressional approval of the site. Thus, the statutory time frame is decidedly shorter than the 4-year estimate between site recommendation and license application that was recently proposed by DOE's management contractor.

DOE also pointed out the difference between the decision at hand—determining whether a potential site is licensable—and the licensing by NRC of a repository facility at the site. The latter decision would come at the end of a 3- to 4-year licensing proceeding. In contrast, our report addresses the relationship between a site recommendation and the submission of the license application.

DOE said that our draft report incorrectly states that DOE's siting guidelines require the Secretary, in making a site recommendation, to determine if the site currently complies with NRC's licensing requirements rather than determining if the site is "likely" to meet NRC's radiation protection standards. We agree that the standard in DOE's guidelines is "likely" and have added this language to the report. The report accurately states the relationship between a site recommendation and a license application under the Nuclear Waste Policy Act and the siting guidelines.

In addition, DOE stated that the Nuclear Waste Policy Act charges the Secretary with establishing criteria for determining the suitability of a site for a repository and that the Department's standards (siting guidelines) are the most important legally relevant guidance on the question of whether the Department is ready to make a site recommendation. Our report, DOE said, ignores these standards and instead asserts a standard of our own devising. Contrary to DOE's assertion, we did not evaluate DOE's performance against a standard we devised. We used the Nuclear Waste Policy Act and DOE's standards—that the site is likely to meet NRC's radiation protection standards—for a site suitability recommendation. Moreover, a presidential site recommendation triggers statutory time frames that require DOE to submit a license application to NRC within about 5 to 8 months. Thus, our conclusion regarding whether DOE should make a site recommendation relies on both the relationship between the standards for site recommendation and license application and the statutory time frames. While recommending to the President that the Yucca Mountain site is suitable for a repository is within the discretion of the Secretary of Energy, such a recommendation may be premature because of the large number of technical issues remaining to be resolved before an acceptable license application can be filed with NRC.

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DOE also stated that NRC's licensing process is an iterative and continuous process; even the license application is not expected to be "set in concrete." We agree with DOE's statement. The important point, however, is that DOE and NRC have made 293 specific agreements on technical work that DOE will need to complete and incorporate into a license application that would be acceptable to NRC. This also assumes that no new issues surface that would need to be addressed.

DOE said that our draft report emphasized the inventory of issues between DOE and NRC but completely ignored the technical work that has been done over the past 2 decades and the technical groups who have said that DOE's data are sufficient for a site recommendation. We have added information to the report recognizing the body of work that DOE has completed to date and the views of other technical parties mentioned by DOE. As discussed above, however, the central issue is not whether technical parties are of the opinion that DOE has enough information for a site recommendation but the relationship, in statute and regulation, between the site recommendation and the submission of an acceptable license application.

DOE also said our report gives short shrift to NRC's recent "sufficiency letter" that, according to DOE, memorializes NRC's conclusion that the data and analyses existing and under way likely will be sufficient for a license application. Instead, DOE added, our report over-relies on the views of an NRC advisory committee. Our characterization of NRC's sufficiency comments is accurate. NRC did state that the agreements between DOE's and NRC's staffs regarding the collection of additional information provide the basis for concluding that the development of an acceptable license application is achievable; however, NRC conditioned this comment on DOE's successful completion of "significant" additional work prior to a license application. Also, the Nuclear Waste Policy Act does not refer to work "underway," but uses the phrase "seem to be sufficient." Finally, we included the views of NRC's advisory committee because NRC's letter included these views.

In addition, DOE stated that our report prominently emphasizes the views of the Board as requiring the Department to accommodate them before a site determination is made. DOE added that the report does not emphasize that the substance of the Board's criticisms is directed to licensing—not site recommendation. Contrary to DOE's assertion, we did not assert that DOE is "required" to accommodate the Board. We discussed the Board's continuing concerns as outlined in its October 2001 letter to DOE. In that letter, the Board noted that gaps in data and

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analyses make the evaluation of DOE's technical bases on whether to recommend the site—not apply for a license—more difficult. Also, we gave the Board's current concerns about DOE's site characterization work, as summarized in its October letter, prominent mention in our report because of the Board's statutory mission to independently evaluate the technical and scientific validity of DOE's investigation of Yucca Mountain.

Finally, DOE said that our statement that delaying a site recommendation decision will have no effect on the timing of the ultimate opening of a repository is contrary to all common sense and experience. We have removed that statement from the report. However, we note that the key factors that bear on opening a repository currently lie in the licensing arena. One such factor is the 4 more years of licensing-related work that Bechtel, in its September 2001 detailed reassessment that proposed a new cost and schedule baseline, estimates would be needed to submit a license application that is acceptable to NRC. In addition, other licensing-related conditions could continue to affect the timetable for developing a repository. For example, Bechtel characterized its reassessment leading to the submission of a license application in January 2006 as a high-risk schedule that does not include any contingency or reserve—in effect, an optimistic schedule. Also, NRC, in its preliminary comments on the sufficiency of site characterization, stated that if DOE adopts a low-temperature repository operating approach, such as described in a recent technical document, then additional information would be needed for a potential license application.

Although we have clarified our discussion of the statutory and regulatory requirements for site recommendation, approval, and licensing, we continue to believe that the Secretary of Energy should consider the timing of this statutory process as he decides when to make a site recommendation to the President. Therefore, while we have modified the language, we have not changed the intent of our recommendation on this matter. DOE did not comment on our findings, conclusions, and recommendations about (1) potential delays on, and alternatives to, its proposed repository design and (2) its management of the nuclear waste program.

Scope and Methodology

We performed our review at DOE's headquarters in Washington, D.C., and its project office in Las Vegas, Nevada. We also met with officials of NRC in Rockville, Maryland; the Nuclear Waste Technical Review Board in Clarendon, Virginia; and the state of Nevada's Agency for Nuclear Projects in Carson City, Nevada. We conducted our review from April through

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December 2001 in accordance with generally accepted government auditing standards. (See app. I for details of our scope and methodology.)

We will send copies of this report to the Secretary of Energy; the Director, Office of Management and Budget; and other interested parties. We will make copies available upon request. If you or you staff have any questions about this report, please call me at (202) 512-3841. Key contributors to this report are listed in appendix III.

Gary L Jones

(Ms.) Gary L. Jones
Director, Natural Resources
and Environment

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Appendix I: Objectives, Scope, and Methodology

Our objectives for this report were to determine whether (1) the Department of Energy (DOE) has completed the work necessary to support a site recommendation for the development of a repository at Yucca Mountain, and (2) DOE's goal of opening a repository at Yucca Mountain in 2010 is reasonable.

To determine whether DOE, through its Office of Civilian Radioactive Waste Management (OCRWM), has completed the work necessary to support a site recommendation, we discussed with DOE officials the nature and extent of such work and their relationship to the two processes. We also discussed technical issues still outstanding with staff of the Nuclear Waste Technical Review Board, the Board's Chairman, and the staff of the Nuclear Regulatory Commission's (NRC) Office of Nuclear Materials Safety and Safeguards. We analyzed the Board's annual reports and other correspondence to DOE, and summarized issues of concern affecting a site recommendation raised by the Board to DOE. We also reviewed documents obtained from NRC to identify key technical issues affecting readiness to submit an acceptable license application. We visited DOE's Yucca Mountain Site Characterization Office in Las Vegas, Nevada, and interviewed officials in that office on the Department's response to the issues raised by the Board and NRC. We also reviewed project management documents at OCRWM's headquarters and at the project office to identify and characterize how OCRWM's response to the issues raised had been incorporated into the project's work plans and guidance to the office's management contractor for the nuclear waste program. We interviewed officials of Bechtel SAIC Company, LLC, DOE's management contractor, and obtained and analyzed documents prepared by the contractor—such as its September 2001 detailed reassessment of the nuclear waste program—to determine how ongoing and future project work would address these issues, and the subsequent effects on the project schedule and milestones.

To determine whether DOE's goal of opening a repository at Yucca Mountain in 2010 was reasonable, we analyzed OCRWM's reports and project documents. We interviewed officials in OCRWM's headquarters and the project office to determine how total project and program costs had been captured, estimated, and reported to the Congress and the public. We summarized the estimated program costs and associated reasons for the milestones and changes over time. We also determined the procedures used by DOE to revise its cost and schedule estimates for site recommendation and license application, and assessed its use of those procedures.

Our work was conducted from April through December 2001, in accordance with generally accepted government auditing standards.

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Appendix II: Comments From the Department of Energy

The Under Secretary of Energy
Washington, DC 20585

December 5, 2001

The Honorable David M. Walker
Comptroller General
U.S. General Accounting Office
441 G Street, N.W.
Washington, D.C. 20548

Dear Mr. Comptroller General:

The Department has received, by November 28 letter, the General Accounting Office's proposed report, "Nuclear Waste: Technical, Schedule, and Cost Uncertainties on the Yucca Mountain Repository Project." The proposed report addresses the question whether the Department of Energy is ready to make a recommendation to the President regarding whether Yucca Mountain is a suitable site for a potential repository -- a recommendation the Secretary of Energy is called upon to make by the Nuclear Waste Policy Act of 1982.

Let me emphasize at the outset that, press reports to the contrary, the Secretary has not decided on a firm time frame for determining whether or not to recommend Yucca Mountain for this purpose, let alone having decided what the content of such a recommendation might be. That being said, the Department believes the approach the proposed report takes to these issues is profoundly flawed for reasons we explain below.

The proposed report asks, in effect, "why now?" about making a site determination regarding the Yucca Mountain project. What it realistically leaves unanswered is "then when?" should the results of years of scientific inquiry reveal that the Secretary of Energy and the President have enough information to make their determinations on the merits. The Nuclear Waste Policy Act instructs that the Secretary's recommendation is to be made under Department siting guidelines that use the standard that a facility at the site is likely to meet NRC radiation protection standards, and after receiving the conclusion of the NRC whether the information developed and underway will be sufficient for a license application. The NRC recently rendered the sufficiency advice called for by the Act.

Avoidance of a timely decision -- should it be otherwise called for on its merits -- would be a dereliction of duty owed to current and future generations of Americans to pursue with thoughtful expedition the task of making safe all high

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level nuclear waste. Because the proposed report is a "Brandeis brief" for delay, we must in these comments critically evaluate its major points.

The central contention of the proposed report is that it is premature for the Department to make a site recommendation for Yucca Mountain because the Department has yet to complete all the remaining technical work needed for a license application. This contention reflects a profound lack of understanding of the statutory and regulatory requirements based on an inaccurate depiction of their context.

First, the decision at hand involves determining a potential site, not the licensing of a facility. The construction and operation of a facility – here the repository – would be licensed by the Nuclear Regulatory Commission after site determination. The site itself is not licensed; instead its features may affect design of the facility which is licensed. Thus determining a site must occur before beginning the licensing procedure.

That is why the Nuclear Waste Policy Act specifically envisions two distinct decisions: one by the President, on the advice of the Secretary of Energy, as to whether a hypothetical repository at Yucca Mountain is potentially licensable by the NRC; then one by the NRC as to whether a proposed repository, complete with design specifications, should be allowed to be built and ultimately operate there.

Second, the proposed report misstates, in its brief treatment of them, the Department's siting guidelines as requiring the judgment that the site currently complies with NRC licensing requirements. Not only is this not what the Department's guidelines require, but during the notice and comment rulemaking held on them over a period many years, not a single commenter suggested that the Department adopt such a standard. Rather, consistent with the structure outlined above, the Department's guidelines call for the judgment that a facility at the site is likely to meet NRC radiation protection standards – a predictive judgment that inherently embraces the existence of incompletely resolved potential licensing issues.

Third, because the NWPA charges the Secretary with establishing "criteria to be used to determine the suitability of [a] site for the location of a repository," the Department's standards – in which the NRC has concurred, as the NWPA also requires – provide the most important legally relevant guidance on the question whether the Department is ready to make a site recommendation. Yet the proposed report, despite purporting to answer that question, ignores these standards altogether and instead evaluates the Department's readiness against a standard of its own devising.

Fourth, the NRC licensing process is one that the NRC has described as "iterative" and an "integrated and continuous process." That means that even the license application envisioned by the NWPA was not expected to be set in concrete on its submission but was instead expected to experience refinement and amendment during the licensing process, as was indicated in the NRC regulations in effect when the Nuclear Waste Policy Act was adopted by Congress in 1982.

Fifth, the proposed report affords heavy and central emphasis to the existence of an inventory of issues as to which the Department has agreed with the NRC further to develop for licensing purposes. At the same time it completely ignores the enormous body of scientific and technical work completed regarding the site over the last two decades, including the inventory of some 600 papers cited in the Department's May, 2001 Science and Engineering Report on Yucca Mountain. Nor does the proposed report touch upon – or even acknowledge the existence of – the substantial body of recent, directly relevant analytic literature published by the Department, including the 1998 Viability Assessment, the 2001 Preliminary Site Suitability Evaluation, the 2001 Supplemental Science and Performance Analyses, the 1999 Draft Environmental Impact Statement, and the 2001 Supplement to the Draft EIS.

Much less does the proposed report attempt to evaluate the significance of the unresolved issues as compared with those that have been addressed and resolved in assessing the appropriate timing for a site recommendation. Nor does it address the recent formal conclusions of independent, technically-literate bodies like the U.S. Geological Survey, the International Peer Review Team of the International Atomic Energy Agency and the Organization of Economic Cooperation and Development's Nuclear Energy Agency, and the Energy Committee of the Council on Engineering of the American Society of Mechanical Engineers. In substance each of these has advised the Department that, from the standpoint of the disciplines within its institutional expertise, the information adduced to date is sufficient for a site recommendation.

Sixth, the proposed report gives short shrift to the NRC's recent "sufficiency letter," that memorializes a site determination judgment called for specifically by the Nuclear Waste Policy Act to the effect that the NRC has concluded that the data and analyses existing and underway likely will be sufficient for a license application. Instead the proposed report centers its attention on views attributed to an advisory committee to the NRC, ignoring that it is the NRC, rather than any of its individual or collective advisors, that is responsible under the Nuclear Waste Policy Act (as in all else) for the conduct of its statutory functions.

Seventh, and in a similar vein, the proposed report prominently emphasizes the views of the Nuclear Waste Technical Review Board as requiring the Department to accommodate them before a site determination is to be made. The Department regards the Board's advice as extremely valuable and anticipates continuing to

receive that advice throughout the entirety of the program. Nonetheless, beyond this advisory function, Congress gave the Board no formal role in the siting process when it established this body. And in any event what is not emphasized in the proposed report is that the substance of the Board's criticisms is directed to factors that bear on licensing the facility, not the identity of the site.

Finally, the proposed report asserts that delaying a site recommendation decision will have no effect on the timing of the ultimate opening of a repository. That is contrary to all common sense and experience. Yet this assertion plays a critical role in the structure of the report. Had the report made the only realistic assumption on this question – that delay on site recommendation will indeed lead to delay in opening a repository – it would have had to come to grips with the costs as well as the benefits of delay. For example: high level radioactive waste is currently stored in surface facilities at 129 sites in 39 States around the country, with attendant vulnerabilities. Yet the report gives no weight to the interests of the communities where this waste in located in having a decision on a site for a repository made promptly one way or the other as soon as it can be made responsibly.

We look forward to working with the GAO on this important issue.

Sincerely,

Robert G. Card/ejf

Robert G. Card

Appendix III: GAO Contact and Staff Acknowledgments

GAO Contact

Dwayne E. Weigel (202) 512-6876

Acknowledgments

In addition, Daniel J. Feehan, Robert E. Sanchez, John C. Furutani, Jonathan S. McMurray, Lindy Coe, Doreen S. Feldman, and Susan W. Irwin made key contributions to this report.

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U.S. General Accounting Office, 441 G. Street NW, Room 7149,
Washington, D.C. 20548

Kansas
Petroleum
Council

Comments Submitted to the House Utilities Committee
By Ken Peterson, Kansas Petroleum Council

In Support of HCR 5040
Urging Congress to Allow Oil and Gas Exploration
On the Coastal Plain of the Arctic National Wildlife Refuge
January 29, 2002

Mr. Chairman and members of the Committee, thank you for allowing me the opportunity to offer these comments on House Concurrent Resolution 5040. I appreciate the efforts of Representative Myers to bring this issue up for discussion and rise in support of this resolution.

Drilling in the Arctic National Wildlife Refuge is actually a misnomer. Exploration and production would take place on the Coastal Plain, an inhospitable area where the winter lasts for nine months and the wind chill can reach minus 110 degrees F. It is located more than 200 miles north of the Arctic Circle. In midwinter, it is continuously dark for 56 days. This is not a place where one can go for a pleasant picnic in the park.

Myths and outright fabrications about ANWR have sprung up over the years to the point where they are accepted as fact. These distortions and untruths should be shattered. I have included with these remarks a couple of myth-debunkers that I hope the committee will find informative as it considers this Resolution.

The materials were prepared by a group called Arctic Power, an organization composed largely of local citizens, including the Eskimo people who live and work exclusively in the Coastal Plain. They support production because it provides a tax base for local government. Development provides jobs, funding for water and sewer systems and for schools.

Environmental concerns are the obvious driving force behind the ANWR and Coastal Plain controversy. We all want to protect Alaska's wilderness. At the same time, oil and natural gas reserves in Alaska are vital to guaranteeing a steady supply of affordable energy to our nation. The oil and gas industry has made tremendous advances in technology that preserve important environments like the North Slope of Alaska.

Protecting the environment and providing the nation's energy needs is not an either/or proposition.

Mr. Jim Daniels of Murfin Drilling in Wichita has submitted a letter addressing the environmental practices in effect at Prudhoe Bay. Mr. Daniels is one of two associate Kansas representatives to the Interstate Oil and Gas Compact Commission. He has visited the North Slope, a remote area that few of us will ever see.

HOUSE UTILITIES
DATE: 1-29-02
ATTACHMENT 3

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Kansas
Petroleum
Council

The industry's technological advances make exploration and production on the North Slope the cleanest and most advanced – and most heavily regulated – practices in the world.

An example includes ice roads, described by Mr. Daniels, that melt away with the spring thaw. Modern drills can change direction under the surface, so dozens of wells can be clustered in an area with a "footprint" of only six acres. That leaves more open land and habitats untouched.

Wells can reach out to a distance of 5 miles from the surface location and hit a target the size of a refrigerator located at a depth of 10,000 feet. Pipelines are elevated to allow wildlife, such as migrating caribou, to pass safely underneath. The elevated pipelines have elbows that provide an added measure of protection in the event of an accidental release. At most, only the oil in the pipeline between a given pair of elbows could be spilled.

Finally, one of the arguments against development on the Coastal Plain has been that the estimated 10.8 billion barrels of reserves is only a 200-day supply of oil. Production in this area is not a spigot that can be turned on and off with fuel magically appearing in the lower 48. Even if the Coastal Plain were opened up today, it would take seven to 10 years and possibly longer before the first oil reached American consumers.

Pipelines have only so much capacity, and production from the Coastal Plain would be added to existing domestic sources over time. Supplies from this new production would last, according to conservative estimates, for 25 years.

To localize the issue a little bit, Mr. Daniels said yesterday that several independent oil and gas producers in Wichita are working to secure leases on the North Slope, so Kansas is directly involved in the future of Alaska production. Several oil and gas service companies and suppliers are vendors in Alaska operations.

This debate is now part of a national energy bill under consideration in Washington. The House voted 206-223 in August against an amendment to remove ANWR from the bill, and attention has shifted to the Senate where the issue's fate is uncertain.

Thank you for allowing the submission of these comments. We encourage your support of HCR 5040

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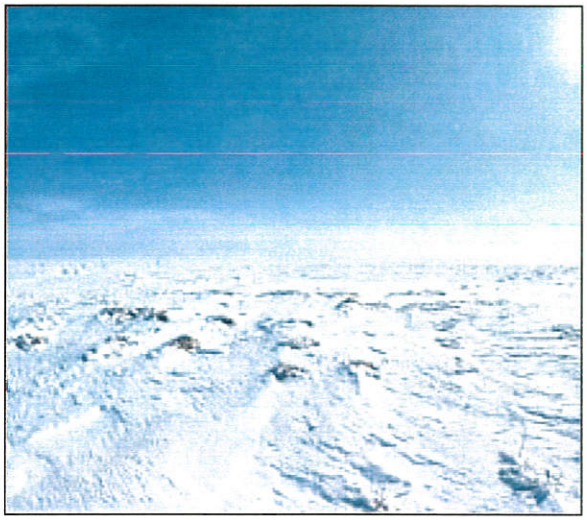
WHICH ONE IS THE REAL ANWR?



AOGA

Danny Lehman

The one on the *right*, right? Majestic mountains. Sweeping panoramas. The Serengeti of the North. The last remaining Arctic ecosystem. Pristine. Untouched. Home to millions of animals. Caribou, bears, wolves, muskox.

Well, you're mostly correct. 8 million acres of The Arctic National Wildlife Refuge (ANWR) looks just like that picture. But that land is already designated as Wilderness. And over 9 million more acres are classified as a National Wildlife Refuge. No one can touch that land, ever. That 17 million acres is off limits to any kind of development. In fact, combined with the rest of the land designated as Wilderness in Alaska, we're talking about an area the size of four or five States in the lower 48. Alaska alone has over 60 % of all federally-designated Wilderness lands.

Look again at the picture on the left. And listen to some facts.

These facts aren't as pretty or as emotionally appealing. But they are important for anyone involved in the ANWR debate. On the coastal plain, the Arctic winter lasts for 9 months. It is dark continuously for 56 days in midwinter. Temperatures with the wind chill can reach -110 degrees F. It's not pristine. There are villages, roads, houses, schools, and military installations. It's not a unique Arctic ecosystem. The coastal plain is only a small fraction of the 88,000 square miles that make up the North Slope. The same tundra environment and wildlife can be found throughout the circumpolar Arctic regions. The 1002 Area is flat. That's why they call it a plain.

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ANWR
INFORMATION BRIEF

Myths of ANWR:

In 1980, the 1.5 million acre Coastal Plain of the Arctic National Wildlife Refuge was specially designated by Congress for further study of its oil and gas potential. Much of the rest of ANWR's 19 million acres is already designated as Wilderness.

Groups seeking to stop oil exploration in Alaska want to designate the Coastal Plain as Wilderness (half of ANWR is formally designated Wilderness now), and present several misleading arguments:

Here are the "myths" being told about ANWR, and the truth:

***Myth:** *All of Alaska's Arctic coast is open to oil and gas development.*

Reality: With the exception of the area between the Colville and Canning Rivers (which is owned by the state of Alaska) none of the more than 1000 miles of Arctic Alaska coastline is open to oil and gas leasing, not one mile of it.

***Myth:** *The state of Alaska will get 90 percent of any royalties from oil production in ANWR's Coastal Plain.*

Reality: The federal government won litigation in the Supreme Court of the United States which allows congress to determine the share of revenues with the State of Alaska. Congress wants 50/50.

***Myth:** *Alaska's indigenous people are against oil exploration in the Coastal Plain.*

Reality: Alaska's Inupiat Eskimo people, who live on the North Slope (one village, Kaktovik, is the only community within ANWR) strongly support onshore oil and gas exploration in the Coastal Plain, and elsewhere on the North Slope. Some of the Gwichins, who live 150 miles south of the Coastal Plain, are opposed to development. The Gwichins leased their own lands for oil exploration, but no oil was found. Now they oppose the Inupiats having the same rights to explore.

"Grizzly bears in the Arctic National Wildlife Refuge want the straight scoop."

***Myth:** *We need to save ANWR's oil for our grandchildren.*

Reality: It will supply our children and grandchildren. If the Coastal Plain was opened today it would be 7 to 10 years, and possibly longer, before the first oil reached American consumers. Oil from the Coastal Plain will supply America in a time when oil from foreign sources will certainly be more expensive and in shorter supply than today.

***Myth:** *The Coastal Plain may have only a 200 day supply of oil. That is not worth developing.*

Reality: A 200 day supply is almost 4 billion barrels. The Coastal Plain probably contains much more oil, but it can be produced at a maximum rate of 2 million barrels per day (capacity of the trans-Alaska oil pipeline).

Therefore, it could last for 25 years, and probably much longer.

CONTINUED ON BACK

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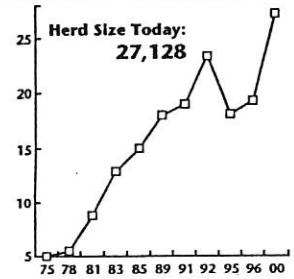
Do the caribou really care?

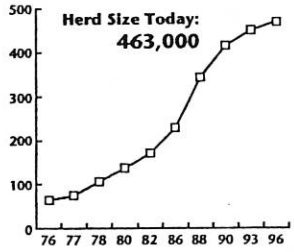
Are caribou adversely affected by oil development on the North Slope? The answer is no, based on thirty years of scientific observations. The Central Arctic Herd, which uses the area around Prudhoe Bay, has increased five fold in population since oil development started in the early 1970s. There are four major caribou herds in northern Alaska. Besides the Porcupine and Central Arctic Herds, there is the Western Arctic Herd, which is more than twice the size of the Porcupine Herd, and the smaller Teshekpuk Lake Herd. Populations of these herds rise and fall by natural cycles. Three decades of oil and gas activity in the central North Slope has had no negative impact.

Central Arctic Herd:

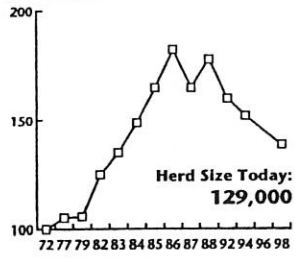
Number of caribou times 1,000

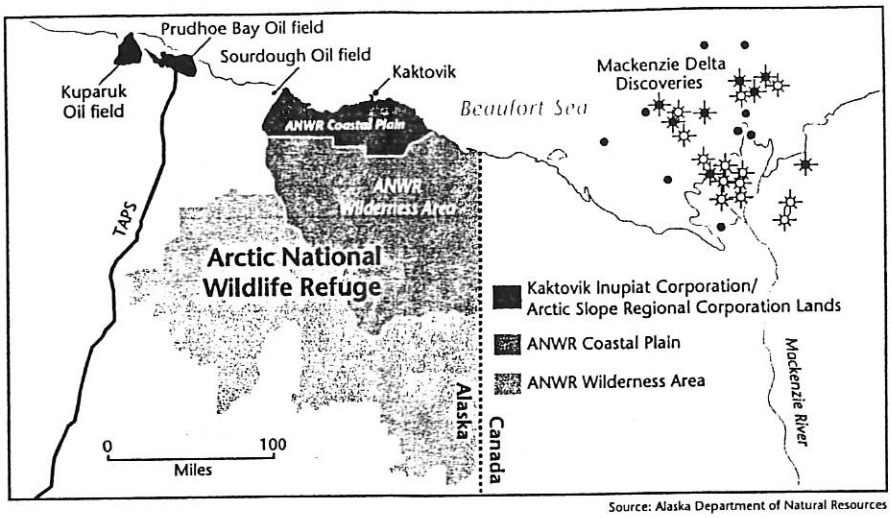


Western Arctic Herd:



Porcupine Herd:





Source: Alaska Department of Natural Resources

Myths of ANWR: Don't be misled

FROM FRONT SIDE

***Myth:** Development of the Coastal Plain will destroy the caribou.*

Reality: The same claim was made about the trans-Alaska pipeline more than 2 decades ago, but today North Slope caribou herds along the pipeline and near the North Slope oil fields are thriving.

***Myth:** ANWR's oil will be exported, and will not reduce our dependency on foreign oil.*

Reality: Since May 2000 no oil from the North Slope has been exported. Exports can be stopped by a Presidential order. The U.S. exports advanced technologies, much more valuable and unique than oil. Few object to that.

***Myth:** Alaskan oil development is environmentally damaging.*

Reality: The North Slope's petroleum industry is the cleanest, most technologically advanced and most heavily regulated in the world. Facilities are designed for minimal environmental impact.

***Myth:** The Coastal Plain is unspoiled wilderness, an Arctic Serengeti.*

Reality: This is no Serengeti. The Coastal Plain is a frozen, barren land for 9 months of the year. The Inupiat people have lived and hunted there for centuries; 19th century whalers hunted extensively for food; military and defense contractors built DEWline radar sites; recreation groups use it for rafting and hiking. Other areas of the North Slope are more biologically sensitive than the Coastal Plain.

ANWR Facts:

- Refuge totals 19.6 million acres.
- 8 million acres designated Wilderness;
- Coastal Plain, 1.5 million acres, set aside by Congress for study of oil potential;
- Only a small percentage of Coastal Plain, about 2,000 acres, would be impacted by oil development;

The Coastal Plain is not a pristine wilderness:

- A community, Kaktovik, exists in the Coastal Plain; Military installations operate in the plain now and in the past.

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See our web site at: www.anwr.org

February 2001

MURFIN DRILLING CO., INC.

CONTRACTORS AND PRODUCERS

North Slope Operations

I made two trips to visit the North Slope Operations. The first, on Saturday, May 12, 2001, was with the IOGCC group, which was comprised of official representatives, and others who attended the meeting and were there on Saturday. Among those attending were Cynthia Claus, Kansas Official Representative and myself, one of two Kansas Associate Representative

The day was clear with temperatures between 12 – 14° F for lows and 24 – 26° for highs. We were transported by a chartered 737 Alaska Air plane and crew. The trip was sponsored by BP Amoco – Phillips. We flew to Prudoe Bay – Dead Horse Airport, departed and toured the Prudoe and Endicott facilities. Prudoe was the first major development and is the beginning of the Trans Alaska Pipeline and the end of the only road from lower Alaska, which starts at Fairbanks. The pipeline is 800± miles long and ends at Valdez on Prince William Sound in the Gulf of Alaska. Prudoe wellheads are located 100 feet apart with the complete facility covering a fairly large area (several hundred acres).

Endicott is a manmade artificial island with a manmade gravel causeway over the Bearing Sea. The wellheads are located 10 feet apart. There are no air facilities. The all weather road over the Bearing Sea, is used for supplies. It is self-contained and has processing facilities, living quarters, and a pipeline connection to the Alaskan Pipeline at Prudoe. The close wellhead density was a prototype for Alpine and is probably what will be used in future facilities. Thus, we viewed a contrast of the oldest onshore facility, which is base camp in many respects for the entire North Slope oil operation, as pipeline and road to lower Alaska originate at Prudoe and Endicott, a newer offshore operation.

The second trip was to Alpine, the newest producing facility at the invitation of Phillips, since I am Chairman of the Interstate Oil and Gas Compact Commission Stewardship Awards Committee. Phillips had received the Major Company Stewardship Award eight days earlier at the mid year IOGCC meeting.

HOUSE UTILITIES

DATE: 1-29-02

ATTACHMENT 4

The day, Tuesday, May 22, 2001, was cloudy with temperatures from 10 – 15° F for the low to 22 – 25° for high. Flew in a regularly scheduled Alaska Airlines (Boeing 737) plane to Kuparek Airfield. From here, flew west 70± miles in a twin prop plane to Alpine, which has an airfield capable of taking up to four motor DC-6 cargo planes

Alpine is the last development to get a pipeline to market oil. It flows to Prudoe and the Alaskan Pipeline. It had started producing within the last year (late 2000). Development drilling was still being conducted. The wellheads are 10 feet apart. It has developed approximately 44,000 acres of underground reservoir, from a 90 – 95 acre surface facility, which includes airstrip, complete living quarters, processing facilities and storage for extra supplies. Supplied in summer by air only and in winter by ice roads from Prudoe. Ice roads are only useable four to six months for lighter equipment, four months ± for heavy equipment. A man made gravel pad is utilized for the facilities and airstrip.

Exploratory drilling is only done during the winter, from late December - early January to usually late April (4 months ±). Drilling is conducted on ice pads and supplied by ice roads. All equipment is moved off, except wellhead, if productive, when drilling is stopped at the end of season or well plugged. If oil/gas is discover and sufficient reserves are indicated, permanent gravel pads can be built and a permanent road installed. Could, like Alpine, use ice roads to Prudoe or closest point in winter with airfield year around.

ANWR can be developed utilizing Alpine as a format. A 90± acre surface facility can develop a 40,000+ acre reservoir. All ANWR potential is on the coastal plane or off shore, like Prudoe, Alpine, Kuparek and Endicott. There are huge potential reserves, estimated at 10+ billion barrels. Exploration wells can be drilled using ice pads and ice roads. The pipeline for production from Prudoe is now about one half full, or has capacity for an additional one million barrels oil per day.

In addition, there is potential for natural gas reserves, as with Prudoe, Kuparek, Endicott, and Alpine, where gas now is being recycled. Gas pipeline will be built within the next few years. The right of way is being worked on now.

MURFIN DRILLING COMPANY

Industry is very environmentally conscious as can be demonstrated with present facilities. Caribou herds are much larger now than before operations and care is taken to protect all animals and plants. Oil and gas development @ ANWR will not be in the tree or mountainous area but on coastal plane and out in the ocean.

Unlike Yellowstone, very few people can visit ANWR. There are no roads, access is over frozen ground in winter, when it is virtually all dark and bitterly cold, by air in winter or summer, or by water for 1 – 2 months in summer. It is not an area many people will ever want or be able to see. It is remote, cold, harsh, with a long period of short daylight hours in the winter and but a brief period of mild weather in the summer.

I have a Phillips video on Alpine and have personal pictures as reference.

Submitted,

James R. Daniels
Kansas Associate Representative
Interstate Oil & Gas Compact Commission

JRD/bh

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LEGISLATIVE TESTIMONY

the Kansas Chamber of Commerce and Industry
The Unified Voice of Business

835 SW Topeka Blvd. • Topeka, KS 66612-1671 • 785-357-6321 • Fax: 785-357-4732 • E-mail: kcci@kansaschamber.org • www.kansaschamber.org

HCR 5040

January 29, 2002

KANSAS CHAMBER OF COMMERCE AND INDUSTRY

Testimony Before the

House Committee on Utilities

by

Terry Leatherman
Vice President – Legislative Affairs
Kansas Chamber of Commerce and Industry

Mr. Chairman and members of the Committee:

I am Terry Leatherman. I am the Vice President of Legislative Affairs for the Kansas Chamber of Commerce and Industry. Thank you for the opportunity to express the Kansas Chamber's support for HCR 5040.

KCCI supports the development of a comprehensive energy policy that includes promoting the development of domestic energy sources. U.S. reliance on foreign oil imports now exceeds 50% and is growing. America's best opportunity to increase oil production appears to be through development

The Kansas Chamber of Commerce and Industry (KCCI) is a statewide organization dedicated to the promotion of economic growth and job creation within Kansas, and to the protection and support of the private competitive enterprise system.

KCCI is comprised of more than 2,000 businesses which includes 200 local and regional chambers of commerce and trade organizations which represent over 161,000 business men and women. The organization represents both large and small employers in Kansas, with 48% of KCCI's members having less than 25 employees, and 78% having less than 100 employees. KCCI receives no government funding.

The KCCI Board of Directors establishes policies through the work of h[illegible] members who make up its various committees. These policies are the [illegible] organization and translate into views such as those expressed here.

HOUSE UTILITIES
DATE: 1-29-02
ATTACHMENT 5

of the coastal plain of Alaska. According to the Department of the Interior, there is a 46% probability that 9.2 billion barrels of oil might be recovered from this region of the Alaska National Wildlife Refuge.

Development of the coastal plain of Alaska would also be accomplished without conflict to conservation of natural resources. Oil exploration can be done in concert with the region's wildlife and environmental protection.

As a result, KCCI would urge this Committee recommend HCR 5040, sending the message to Congress on this important public policy matter. Thank you for considering KCCI's position on this issue. I would be happy to respond to any questions.

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LEGISLATURE OF THE STATE OF KANSAS
JOINT MEETING OF THE
KANSAS HOUSE AND SENATE
UTILITIES COMMITTEES

Hearing
January 28 and 29, 2002
Update on the Status of the Oil and Gas Industry

Testimony of
Robert E. Krehbiel, Exec V.P.
Kansas Independent Oil & Gas Association

HOUSE UTILITIES
DATE: 1-29-02
ATTACHMENT 6

Chairman Clark, Chairman Holmes and members of the House and Senate Utilities Committee:

My name is Robert E. Krehbiel, Executive Vice-President of the Kansas Independent Oil & Gas Association.

My testimony today is simply to provide an update on the price of crude oil and natural gas. Attachments 1, 2 and 3 reflect the change in price from one year ago and are self explanatory.

Attachment 4 is a comparison of the number of active rotary rigs operating in Kansas and reflects the impact of declining prices on the producing segment of the oil and gas industry.

The exploration and production of oil and gas is price and cost sensitive. From 1980 to 1985 the price of crude oil in Kansas averaged more than $30 per barrel and the active rig count ranged from 150 to 200. Today the price of crude oil is $15 per barrel and the active rig count is 19.

From 1980 to 1985 there were people on the streets in downtown Wichita. Today large office buildings sit vacant and people are few and far between.

Thank you for this opportunity to testify.

ATTACHMENTS

1. Crude Oil Prices. A comparison of NYMEX prices for January, 2001 v. January, 2002, and a graph depicting the daily price for the previous 12 month period .

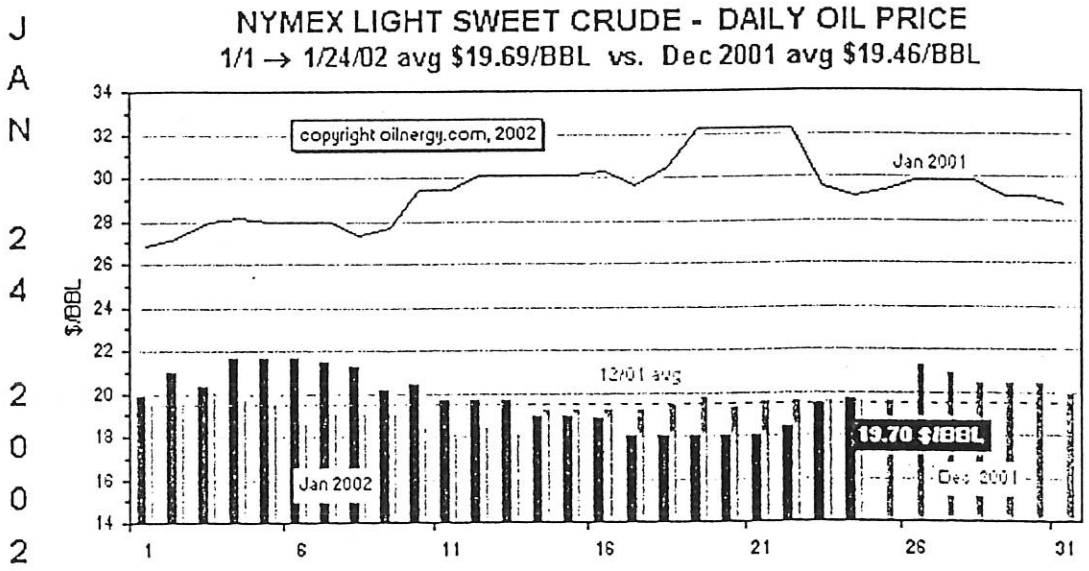
2. Crude Oil Price Bulletin. Current Kansas price posted by the National Cooperative Refinery Association, McPherson, Kansas.

3. Natural Gas Prices. A comparison of NYMEX prices for January, 2001 v. January, 2002, and a graph depicting the daily price for the previous 12 month period.

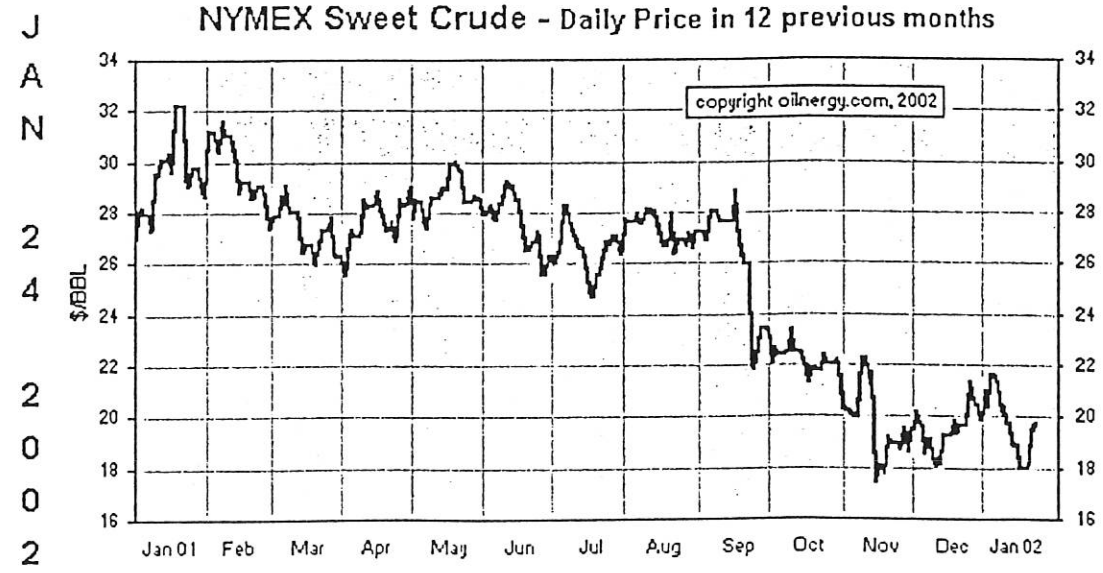
4. Redtop Rotary Rig Report. A comparison of the Active Rotary Rig Count in Kansas comparing the rig count in January 2001 v. January, 2002.

CRUDE OIL PRICES

January 2001 vs. January 2002



The Previous 12 Months



6-4

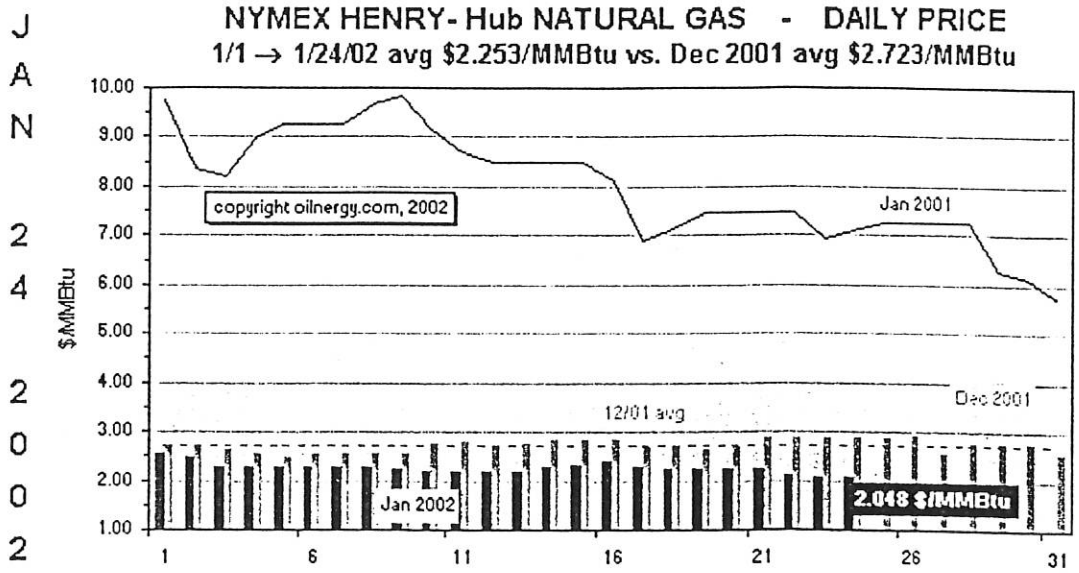
CRUDE OIL PRICE BULLETIN
P.O. BOX 1404, MCPHERSON, KANSAS 67460

Effective at 7:00 A.M. on the date shown below, subject to change without notice and subject to applicable law and regulations and to it's Division Orders and other contracts, National Cooperative Refinery Association (NCRA) will pay the price per barrel set out below after application of all adjustments to base price, including adjustments for gravity and transportation where applicable.

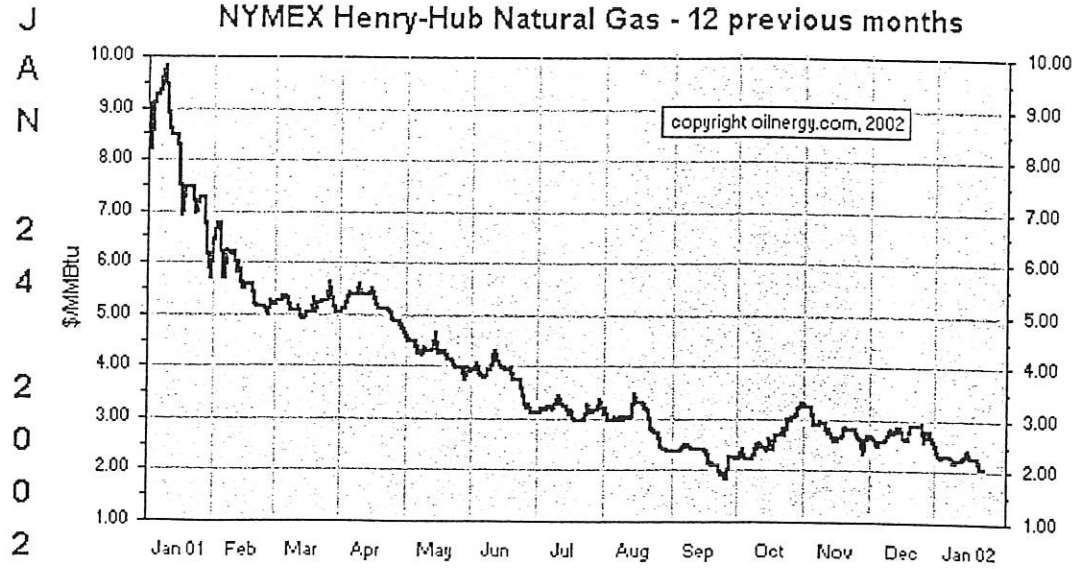
Bulletin #	212	1	2	3	4	5	6	
Effective Date	12/31/01	1/2/02	1/3/02	1/4/02	1/7/02	1/8/02	1/9/02	
	Price	Price	Price	Price	Price	Price	Price	Gravity
State/Area	$/BBL	$/BBL	$/BBL	$/BBL	$/BBL	$/BBL	$/BBL	Adj Col
Kansas								
Kansas Common	15.25	16.50	16.00	17.25	17.00	16.75	15.75	B
Kansas GS	15.75	17.00	16.50	17.75	17.50	17.25	16.25	B
Nebraska								
Intermediate	14.50	15.75	15.25	16.50	16.25	16.00	15.00	B
Oklahoma								
Sweet	16.00	17.25	16.75	18.00	17.75	17.50	16.50	A
Western Okla Sweet	15.50	16.75	16.25	17.50	17.25	17.00	16.00	A
Texas								
West Texas Int.	16.00	17.25	16.75	18.00	17.75	17.50	16.50	C
West Texas Sour	11.50	12.75	12.25	13.50	13.25	13.00	12.00	D
Bulletin #	7	8	9	10	11	12	13	
Effective Date	1/10/02	1/11/02	1/14/02	1/16/02	1/17/02	1/22/02	1/23/02	
	Price	Price	Price	Price	Price	Price	Price	Gravity
State/Area	$/BBL	$/BBL	$/BBL	$/BBL	$/BBL	$/BBL	$/BBL	Adj Col
Kansas								
Kansas Common	16.00	15.25	14.50	14.25	13.50	13.75	15.00	B
Kansas GS	16.50	15.75	15.00	14.75	14.00	14.25	15.50	B
Nebraska								
Intermediate	15.25	14.50	13.75	13.50	12.75	13.00	14.25	B
Oklahoma								
Sweet	16.75	16.00	15.25	15.00	14.25	14.50	15.75	A
Western Okla Sweet	16.25	15.50	14.75	14.50	13.75	14.00	15.25	A
Texas								
West Texas Int.	16.75	16.00	15.25	15.00	14.25	14.50	15.75	C
West Texas Sour	12.25	11.50	10.75	10.50	9.75	10.00	11.25	D
Bulletin #	14							
Effective Date	1/24/02							
	Price	Price	Price	Price	Price	Price	Monthly	Gravity
State/Area	$/BBL	$/BBL	$/BBL	$/BBL	$/BBL	$/BBL	Average	Adj Col
Kansas								
Kansas Common	15.25						15.229	B
Kansas GS	15.75						15.729	B
Nebraska								
Intermediate	14.50						14.479	B
Oklahoma								
Sweet	16.00						15.979	A
Western Okla Sweet	15.50						15.479	A
Texas								
West Texas Int.	16.00						15.979	C
West Texas Sour	11.50						11.479	D

NATURAL GAS PRICES

January 2001 vs. January 2002



The Previous 12 Months



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REDTOP ROTARY RIG REPORT

January 25, 2002 Page 1

WESTERN KANSAS

Contractor	Rig	Type	Rated	Loc	Status	County	Sec-Twp-Rg	Operator	Lease
A & A Production	1	M	4,500	Kans	Moving	Sheridan	4-9S-28W	A & A Production	#2 Caldwell
Abercrombie RTD	2	M	10,000	Okla	Drlg	Texas	23-5N-14ECM	EOG Resources	#23-1 Stephens
	4	M	6,500	Kans	Drlg	Stevens	20-34S-35W	OXY USA	#1 Illincis A
	5	M	10,000	Okla	Drlg	Texas	14-1N-11ECM	EOG Resources	#14-1 Christien
	8	M	6,500	Kans	WO Loc	-	-	-	-
Allen Drilling	1	M	8,500	Kans	Drlg	Barber	22-34S-15W	M & M Exploration	#3-22 Davis Ranch OWWO
	3	M	8,000	Okla	Drlg	Woodward	8-25N-18W	Chesapeake Operating	#1-8 Rennebohm
	4	M	8,000	Kans	Drlg	Rush	34-19S-16W	Special Energy Corp.	#1 Blanche
	5	M	8,000	Okla	Drlg	Beaver	24-6N-21ECM	Chesapeake Operating	#1-24 Bonnie
	6	M	8,500	Okla	Moving	Beaver	19-5N-24ECM	Apache Corp.	#6-19 Moreau
BH & K Drilling	1	M	6,000	Kans	WO Loc	-	-	-	-
Big A Drilling	1	M	8,000	Kans	Drlg	Clark	21-33S-22W	Horseshoe Operating	#1 Degnan
	2	M	10,000	Kans	WO Loc	-	-	-	-
	4	M	8,000	Kans	WO Loc	-	-	-	-
Cheyenne Drilling	1	M	7,500	Texas	WO Loc	-	-	-	-
	2	M	7,500	Okla	WO Loc	-	-	-	-
	3	M	7,500	Kans	WO Loc	-	-	-	-
	4	M	7,500	Okla	Drlg	Roger Mills	6-16N-21W	Mustang Fuels	#2-6 Swisher
	5	M	6,500	Kans	WO Loc	-	-	-	-
	6	M	9,000	Texas	Drlg	Wise	-	Threshold	#1 Joe Larue-Todd
	7	M	7,500	Texas	WO Loc	-	-	-	-
	8	M	4,000	Okla	WO Loc	-	-	-	-
	9	M	12,500	Okla	Drlg	Ellis	9-19N-21W	Samson Resources	#2-9 Hixson
	10	M	9,500	Okla	Idle	-	-	-	-
	11	M	10,000	Kans	Drlg	Meade	23-34S-29W	Great Plains Petroleum	#3 Adams F
	12	M	10,000	Kans	Moving	-	-	-	-
	13	M	10,000	Texas	Drlg	Stephens	-	Zinke & Trumbo	#1-1058 Dollar
	14	M	10,000	Okla	Drlg	Dewey	2-17N-15W	Brighton Energy	#2-1 Chain Ranch
Discovery Drilling	1	M	6,000	Kans	Drlg	Ness	10-16S-25W	Palomino Petroleum	#1 McNinch
	2	M	6,500	Kans	Drlg	Barton	11-20S-11W	Popp Operating	#3 Panning
Duke Drilling	1	M	7,000	Okla	Drlg	Woods	28-29N-16W	Jack Exploration	#2-28 Williams
	2	M	7,000	Kans	Drlg	Barber	2-33S-10W	Molz Oil Co.	#1 Ruby OWWO
	4	M	6,000	Kans	Drlg	Comanche	12-33S-18W	Corsair Energy, LC	#1-12 Roberta Todd
	5	M	7,000	Kans	WO Loc	-	-	-	-
	6	M	10,000	Okla	Drlg	Beaver	21-4N-21E	Anadarko Petroleum Corp.	#L-3 Brownell
	7	M	7,500	Kans	Drlg	Comanche	3-35S-16W	American Warrior	#3 Murdock
	8	M	6,000	Kans	WO Loc	-	-	-	-
H-40 Drilling	3	M	9,000	Okla	Drlg	Blaine	-	-	-
L.D. Drilling	1	M	5,000	Kans	WO Loc	-	-	-	-
Mallard JV	1	M	5,600	Kans	WO Loc	-	-	-	-
Mendenhall Drilling	3	M	6,500	Kans	Drlg	Sumner	29-32S-3W	Glacier Petroleum Co. Okla.	#1 Andrae
Murfin Drilling	3	M	6,000	Kans	WO Loc	-	-	-	-
	8	M	6,000	Kans	WO Loc	-	-	-	-
	14	M	8,500	Kans	WO Loc	-	-	-	-
	16	M	5,000	Kans	WO Loc	-	-	-	-
	20	M	7,500	Kans	WO Loc	-	-	-	-
	22	M	7,500	Kans	WO Loc	-	-	-	-
	24	M	6,500	Kans	WO Loc	-	-	-	-
	25	M	8,000	Kans	Drlg	Morton	19-34S-39W	Anadarko Petroleum Corp.	#3 Littel B
Norseman Drilling	1	M	7,500	Okla	Idle	-	-	-	-
	2	M	6,500	Okla	Idle	-	-	-	-
	3	M	7,500	Kans	Idle	-	-	-	-
	4	M	7,500	Okla	Idle	-	-	-	-
Pickrell Drilling	1	M	6,500	Kans	Drlg	Comanche	32-31S-19W	Pickrell Drilling Co.	#1 Bird N
Shields Drilling	1	M	5,500	Kans	Drlg	Gove	20-14S-30W	Shields Oil Producers	#3 Sharp A
Sterling Drilling	1	M	4,200	Kans	Moving	Stafford	16-25S-12W	Rama Operating Co.	#1 Deselms OWWO
	4	M	5,500	Kans	Drlg	Kingman	25-28S-8W	Messenger Petroleum	#A-1 Gillen

(continued)

REDTOP ROTARY RIG REPORT

January 25, 2002 Page 2

WESTERN KANSAS (continued)

Contractor	Rig	Type	Rated	Loc	Status	County	Sec-Twp-Rg	Operator	Lease
Val Energy	1	M	6,000	Kans	WO Loc	-	-	-	-
	2	M	8,000	Okla	Drlg	Woods	9-25N-15W	Comanche Resources	#9-1 Edna
Vonfeldt Drilling	1	M	5,500	Kans	WO Loc	-	-	-	-
Zenith Drilling	1	M	10,000	Okla	Drlg	Beaver	7-3N-23ECM	Natural Gas Anadarko	#1 Kile 2-7
	6	M	10,000	Texas	Moving	Sherman	129-Blk1C CHHS	Phillips Petroleum Co.	#4 Pugh

EASTERN KANSAS

Berentz Drilling	5	M	4,800	Kans	WO Loc	-	-	-	-
Black Diamond Drlg	1	M	1,000	Kans	Idle	-	-	-	-
C & G Drilling Co.	1	M	3,000	Kans	WO Loc	-	-	-	-
C & S Oil Co.	1	M	1,200	Kans	WO Loc	-	-	-	-
Cleaver, Loraine	1	M	1,500	Kans	WO Loc	-	-	-	-
Dixon Drlg, Jim	1	M	3,800	Kans	Idle	-	-	-	-
DL, Inc.	1	A	2,000	Kans	WO Loc	-	-	-	-
Double 7 Oil & Gas	1	M	1,000	Kans	WO Loc	-	-	-	-
Ensminger Drilling	1	A,M	1,200	Kans	WO Loc	-	-	-	-
Erbe, Dwayne E.	1	M	1200	Kans	WO Loc	-	-	-	-
Farthing, Don	1	M	1,500	Kans	Idle	-	-	-	-
Finney Drilling	1	M	2,000	Kans	Idle	-	-	-	-
Glaze Drilling	G-1	A	2,000	Kans	WO Loc	-	-	-	-
	R-1	A,M	1,500	Kans	Idle	-	-	-	-
Hughes Drilling	1	M	1,200	Kans	Idle	-	-	-	-
J & J Oil	1	M	1,200	Kans	Idle	-	-	-	-
Kan - Drill	1	M	2,000	Kans	Idle	-	-	-	-
Kelly Down Drlg	1	M	2,200	Kans	Idle	-	-	-	-
L & S Well Svc.	1	A	1,200	Kans	WO Loc	-	-	-	-
Lincoln 77	1	M	1,200	Kans	Idle	-	-	-	-
McGown Drilling	1	M	2,500	Kans	Moving	Osage	-	-	-
	2	A,M	1000	Kans	WO Loc	-	-	-	-
McPherson, Billy	1	A,M	2,000	Kans	WO Loc	Allen	-	-	-
	2	M	1200	Kans	WO Loc	-	-	-	-
McPherson, Ron	1	A	2,000	Kans	WO Loc	-	-	-	-
	2	A	1,750	Kans	WO LOc	-	-	-	-
	3	A	1,750	Kans	S.D. Svc	-	-	-	-
MOKAT Drilling	1	A	2,000	Kans	WO Loc	-	-	-	-
Ranger Oil & Gas	1	A,M	1,600	Kans	Idle	-	-	-	-
Rig 6 Drilling	7	M	4,000	Kans	WO Loc	-	-	-	-
RJ Enterprises	1	M	1,500	Kans	WO Loc	-	-	-	-
Summit Drilling	1	M	4,000	Kans	Idle	-	-	-	-
The Xenia Corp.	1	M	1,500	Kans	WO Loc	-	-	-	-
Thornton Drilling	1	A	1,500	Kans	WO Loc	-	-	-	-
Town Oil Co.	1	A	1,200	Kans	WO Loc	-	-	-	-
W & W Production	1	M	1,200	Kans	WO Loc	-	-	-	-
Wax, William T.	1	A	1,200	Kans	WO Loc	-	-	-	-
Way Drilling	1	M	1,200	Kans	Idle	-	-	-	-
Well Refined Drlg	1	A	1,200	Kans	WO Loc	-	-	-	-

Sab down 57.8% from last yr

Active Rotary Rig Count In Kansas

Total Available Rigs: East KS- 39/West KS - 62

Active Kansas Rigs:	East	West	Total	
Rigs Moving	1	3	4	
Rigs Making Hole	0	15	15	
Totals	1	18	19	
Week Ago (1/18/02)	11	23	34	- 44.1 %
Month Ago (12/28/01)	9	18	27	- 29.6 %
Year Ago (1/26/01)	11	34	45	- 57.8 %

	1/25/02	Yr Ago
Active Rigs in Kansas	19	45
Rigs W.O. Loc Assignment	43	9
Rigs Idle (not stacked)	15	17
Kansas Rigs in: Oklahoma	19	26
Colorado	0	1
Texas	5	2
Nebr	0	0
Total Kansas-based Rigs	101	100

Presentation Before the Kansas Senate and House Utilities Committees
January 29, 2002
Testimony of Michael Loeffler
Northern Natural Gas

Introduction

Good morning. It is a pleasure to appear for the first time before the Kansas Senate Utilities Committee. My name is Mike Loeffler and I am the manager of Governmental and Community Affairs for Northern Natural Gas, as of today a subsidiary of Enron Transportation Services (ETS). I have been employed by Northern since May 2001. My responsibilities include regulatory and legislative affairs for the states of Kansas, Nebraska, Illinois, and Oklahoma. I also work in community affairs for the state of Nebraska. Enron Transportation Services has a regional office in Omaha, Nebraska where approximately 275 employees from Enron and Northern Border, a division of Enron, are employed.

Purpose of Presentation

The purpose of my brief presentation before this Committee does not include any new information or insights into the financial or political difficulties faced by Enron Corporation. We have people in Houston who are the spokespersons for Enron.

Instead, my focus is will be three-fold. First, I will describe the presence of Northern Natural Gas here in the state of Kansas. Second, I will provide a brief overview and update on the transition of Northern Natural Gas into a subsidiary of Dynegy, Inc. Third, I will touch on a few areas of interest that we continue to have before this body. Finally, to the extent that I am able, I will answer any of your questions.

Presence in the State

Enron Corp. has two major operations in the state – Northern Natural Gas and a subsidiary of Enron known as EOTT. Northern Natural Gas operates 16,000 miles of pipeline originating in West Texas and extending to the upper Midwest delivering natural gas to purchasers throughout the United States. Approximately 2100 miles of this pipeline lies within the state of Kansas. EOTT transports liquid petroleum products through its pipelines. I will concentrate my testimony on the Northern Natural Gas system.

The Northern Natural Gas pipeline extends from the southwest corner of Kansas to the north-central part of the state. Along the pipeline are compressor stations that boost the pressure of the natural gas to ensure its transport along the pipeline. There are about a dozen and a half compressor stations. In addition to these facilities,

HOUSE UTILITIES
DATE: 1-29-02
ATTACHMENT 7

Northern operates two porosity storage fields – one in Lyons and the other at Cunningham. Pipelines connect these storage fields to the main transport pipes.

Although the pipelines are increasingly automated, the company still employs over 230 field operations persons in the state of Kansas. EOTT employs an additional 22 persons.

Transition to Dynegy

Late last year, Enron entered into a merger agreement with Dynegy, Inc. Dynegy is a provider of energy and communications services to customers around the globe. Their industries include power generation, wholesale and retail marketing and trading of power, natural gas, coal, emission allowances, weather derivatives, broadband, gas gathering and natural gas processing. Dynegy has its corporate headquarters in Houston with other offices located throughout North America and Europe. As part of the agreement for the merger, Dynegy infused $1.5 billion in capital into Enron secured by the right to purchase Northern Natural Gas by assuming an additional $1 billion in debt conditional upon the termination of the merger agreement.

The merger has since terminated. There is an ongoing legal dispute as to the terms and liabilities of the termination. Pending the outcome of that dispute, Dynegy and Enron announced an agreement whereby Dynegy will take full ownership and operation of Northern Natural Gas. Under this agreement, Enron has the right to repurchase Northern Natural Gas on or before June 30, 2002.

Effective February 1, about one hundred current Northern Natural Gas employees will transfer and become employees of Dynegy. Other employees, including the field personnel in Kansas, will remain employees of Enron and operate the pipelines during the transition period until June 30, 2002, pursuant to a services agreement between Dynegy and Enron. That agreement is close to being finalized.

Although Dyengy has not owned a major interstate natural gas pipeline, it has been a substantial and respected participant in numerous aspects of the global energy markets for many years. Northern Natural Gas' management will remain in place and we do not expect that any of the customers of Northern Natural Gas will experience any negative impact as a result of the change in ownership.

Areas of Interest

Northern Natural Gas has been an active participant in the ongoing discussions with the Kansas Department of Health and Environment and the Kansas Corporation Commission in the development of storage regulations being promulgated under the directive of House Bill 2200 passed by this Legislature last year.

As you know, the KDHE has been working on rules and regulations for the storage of natural gas in imbedded salt and the KCC has been working on regulations

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for porosity storage of natural gas. We expect that preliminary drafts of these regulations will reach the formal rule promulgation stage in a short time.

While concerns remain and issues must still be resolved, we are committed to rules that adequately protect the health of this state's residents and environment.

Conclusion

Northern Natural Gas and Dynegy are committed to the same tradition of service excellence that Northern Natural Gas has provided to its customers in the past. I want to assure the members of this Committee that the natural gas pipelines operated by Northern will continue to operate safely, efficiently and without interruption of service.

I will answer, as I can, any questions of the Committee.

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COMMENTS OF
JAMES W. BARTLING, MANAGER PUBLIC AFFAIRS
GREELEY GAS COMPANY
BEFORE THE JOINT MEETING OF THE
SENATE UTILITIES COMMITTEE
AND
HOUSE UTILITIES COMMITTEE
JANUARY 29, 2002

Chairman Clark, Chairman Holmes, Vice-Chairman Emler, Vice-Chairman Sloan, and Members of both the Senate and House Utilities Committees:

I appreciate the opportunity to speak before the Joint Senate / House Utilities Committees to provide you with an "Update on the Natural Gas Industry", specifically what is happening with Greeley Gas Company.

My name is Jim Bartling and I am Manager of Public Affairs for Greeley Gas Company, a business unit of Atmos Energy Corporation. Greeley serves approximately 117,000 customers in 114 communities within 31 counties in the State of Kansas, whereas the five business units of Atmos Energy Corporation serve approximately 1.4 million customers in 10 states. We are a local distribution company with operations regulated by the Kansas Corporation Commission (KCC).

A recent article in the Kansas City Star (Wednesday, January 23, 2002 by Steve Everly) reflected proposed rates effective February 1, 2002 for Greeley Gas Company customers in the United Cities Region (approximately 70,000 customers in Johnson County and Wyandotte County) to be $1.00 to $2.00 per Mcf (thousand cubic feet) below the rates charged by the other gas utilities serving the greater Kansas City area. This was accomplished in part by our ability to purchase gas at favorable rates and to store gas in our storage facilities when gas prices were at favorable rates. Our November and December 2001 gas rates were $1.50 to $2.00 per Mcf less than the rates for the same months in 2000, and the January and February 2002 rates are $5.00 to almost $7.00 per Mcf less than the rates for the same months in 2001.

We at Greeley Gas Company recognize that last winter's prices were some of the highest that we had ever seen. To help insure that this situation did not occur again we

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filed with the KCC a gas hedge program that would allow us to establish a price cap on approximately 60% of the non-storage flowing gas volumes for December 2001 and January 2002. The cost of the program was not to exceed $1.4 million with the cost to each firm customer to be approximately $12.00. Because gas prices stayed low we were actually able to purchase straight call options for 22% of the November, 50% of the December, 51% of the January, and 24% of the February net purchases at a total cost of just barely over $1 million. If the market prices for natural gas had approached the prices of last winter our call options would have allowed us to keep our gas prices to our customers at a more acceptable level.

Greeley supported the Kansas Senate's and House's recommendations to use the ad valorem tax refund for low-income energy assistance during the hearings before the KCC. Following the KCC's ruling we established the Greeley Energy Assistance Program (GEAP), and with the assistance of the Topeka based Kansas Capital Area Chapter of the American Red Cross, proceeded to refund $2.1 million that we had received from the first Williams settlement. We were able to provide bill credits up to $350.00 for 6,082 customers or a total of $2,127,146 in bill credits. Additionally, the Red Cross has approved another 2,457 of our customers that will receive bill credits up to $350.00 once the final appeals have been exhausted by the industrial groups that appealed the KCC order or the FERC order.

Greeley, as well as other utilities in the state of Kansas, experienced an exceptionally high level of uncollectible customer accounts following the winter of 2000–2001 and filed with the KCC to recover these extraordinary bad debt costs through the PGA (purchased gas adjustment) mechanism. As you know, the KCC denied this relief but did preserve these costs through an accounting order. I testified last Thursday before the House Utilities Committee in support of HB 2644 and will continue to work with the Committees and the KCC in support of a bill that will work for all concerned.

Similarly, Greeley Gas Company has been an active participant in the meetings that the KCC has conducted to address revisions to the Cold Weather Rule (CWR), and we will continue to do so. Should a bill come out of these Committees addressing the CWR, Greeley Gas Company can be expected to be an active participant. We strongly

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support the basic premise of the CWR but feel that there are portions of it needing modification.

Of direct interest to several Committee members is Greeley's ongoing involvement with the farmers in southwest Kansas to help these farmers resolve the declining wellhead pressure problems being experienced in and around the Hugoton field. Last year, through our Vastar project, we were able to connect over 50 irrigation customers in Grant County and provide them with pipeline quality gas for their irrigation wells. Currently we are working on the Pioneer project, which in Phase I will provide pipeline quality gas to over 100 farmers in this region for their irrigation needs.

Internally we have made numerous enhancements to our billing system and customer support center so that our customers can more easily access us and obtain the information or services that they seek. One problem that most utilities experienced during the winter of 2000–2001 was complaints of exceptionally long hold-times as they waited for a customer service representative to take their calls. We have added additional staff and phone lines as well as adding a feature called, "Virtual Hold," that allows the customer to simply leave their name, telephone number and the time that they would like their call returned. Once that time arrives the computer automatically calls the customer and connects them to the next available customer service representative, thereby completely eliminating the need to wait on the line.

This is only one of the new customer service enhancements that our customers will see as we begin a new initiative directed at customer service. Atmos Energy Corporation is committed to providing its customers with exceptional customer service. We strongly believe that our customers are the reason that we're in business and we are accountable for, and take ownership of, their issues and concerns.

One thing that you can expect to see happening at Greeley Gas Company during this calendar year is a name change. All of the Atmos Energy Corporation business units, Energas Company, Western Kentucky Gas Company, Trans Louisiana Gas Company, United Cities Gas Company, and Greeley Gas Company will be dropping their regional names and becoming "Atmos Energy Corporation."

This concludes my comments before this joint Committee. I will be happy to take questions at the appropriate time.

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KANSAS GAS SERVICE
A DIVISION OF ONEOK

Before the Senate and House Joint Utilities Committee
Testimony of Steve Johnson
Executive Director, Corporate Relations
Kansas Gas Service
January 29, 2002

Chairman Clark, Chairman Holmes and Members of the Committee,

Thank you for the opportunity to address your joint committees this morning about the State of the Natural Gas Industry in Kansas from the Kansas Gas Service and ONEOK point of view.

As you are aware, Kansas Gas Service (KGS) is the largest natural gas distribution company in the state, with our division headquarters in Overland Park. We are a division of ONEOK, Inc. a diversified energy company based in Tulsa, Oklahoma. ONEOK has business segments in production (5% of revenue), gathering and processing (33%), transportation and storage (19%), marketing and trading (15%), and distribution of natural gas (29%) throughout the Midwest. A sister company to KGS is Oklahoma Natural Gas serving almost 800,000 customers in Oklahoma. ONEOK also generates electricity at a 300 MW plant near Edmond, Oklahoma, using gas as a fuel, located over a large porosity storage field north of Oklahoma City. ONEOK had revenues over $6.6 Billion in 2000 and is traded on the New York Stock Exchange under the symbol, OKE.

Kansas Gas Service serves over 630,000 customers at retail and has 6,000 transportation customers situated in the eastern two-thirds of Kansas. Wichita, Kansas City, Overland Park, Topeka, Pittsburg, Salina, Hutchinson, Manhattan and Emporia are some of the largest cities served of the 341 communities served in the state. We have 1,359 employees working for KGS or ONEOK in Kansas with a payroll of almost $51,000,000. KGS purchases most of its gas supply from several companies in Kansas, such as Amoco, Anadarko, Oxy, Pioneer and many smaller producers in south-central and southwest Kansas. We also purchase system supply through such marketers such as Tenaska, Williams Marketing and Trading and ONEOK Marketing and Trading. The majority of the gas (67%) is purchased on long term contract, another block is purchased on short term (16%) and the balance is purchased "seasonally" (about 17%). As of the 12 months ended November 30, 2001, we purchased 77.8 Bcf of gas for our customers and Williams transports most of the gas. Additionally, we pay taxes in the state of $10.3 million, the majority of which is Ad Valorem taxes. During the past year we have invested $64,600,000 in new or upgraded facilities for Kansas Gas operations and another $9,950,000 in capital expenditures on pipeline and facilities related to our ONEOK

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operations which consist of the Mid Continent Market Center and other transportation, gathering and processing assets owned by other subsidiaries of ONEOK in Kansas.

The Kansas Corporation Commission (KCC) regulates Kansas Gas Service and the Mid Continent Market Center and much of our business comes under the scrutiny of this agency. At this time we have several cases pending before the KCC, some of which have been heard before this committee such as the Cold Weather Rule changes we have discussed, the recovery of extraordinary bad debts through a surcharge on the cost of gas or through an accounting order in the next rate case, the continuation of our hedge program to reduce the volatility of gas price swings, the renewal of the Weatherproof Bill option for our customers and the distribution of Ad Valorem refunds to the most needy of our customer base. Additionally, we have filed to move the majority of the Mid Continent Market Center assets onto the books of KGS and the remaining assets folded into ONEOK. Essentially, the pipeline, measurement and regulation equipment and several compressor stations will become a part of KGS and the Yaggy and Brehm storage facilities will remain with one of the ONEOK subsidiaries.

Throughout 2001 Kansas Gas Service faced many challenges such as the highest prices for natural gas ever experienced, the coldest winter in recent memory, the highest bad debts ever incurred and the Hutchinson incident. However, our operations continued to serve our customers with distinction. We work very closely with Westar Energy in answering customer calls, billing, meter reading and service calls through shared service agreements. Our phone centers in Topeka and Wichita experienced the highest levels of calls last winter and continue to serve our customer with higher levels of technology. We have installed laptop PC's in all service trucks to work more efficiently and be able to respond more quickly. We have installed over 150,000 automated meter reading devices in our Wyandotte and Johnson County service territories for more accurate and on time meter reads and we continually train our employees with their safety in mind and within prescribed operator standards as established by the KCC and DOT. We have also been heavily involved with the many cities and counties we serve to standardize our maps using the GPS system to make our mapping very accurate and accessible. In response to the events of September 11 we have reviewed our security measures and have begun to address changes that should be made to make sure our employees, customers and the public is as safe as humanly possible from intervention by those with different agendas.

On a very positive and upbeat note we are now experiencing a very mild winter with gas costs at their lowest levels. November 2001 was 31% warmer than normal and December was 17% warmer than normal. This and lower gas costs have allowed the customer the opportunity to "catch up" on their gas bills if needed and or spend their income in other ways. An average customer paid $14.03 less in November and $95.32 less in December and it looks like their January bills will be equally affordable.

Thank you again for this opportunity and I will be available for questions at your convenience.

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Testimony Before the House Utilities Committee
In Opposition to House Concurrent Resolution No. 5040
On Behalf of the Kansas Chapter of the Sierra Club
January 29, 2002

Mr. Chairman, members of the Committee, thank you for the opportunity to testify this morning in opposition to HCR No. 5040 urging the Congress of the United States to open certain areas of the Artic National Wildlife Refuge (ANWR) to oil and gas production.

I am appearing today on behalf of the Kansas Chapter of the Sierra Club. The Sierra Club is the largest grass roots environmental organization in the world with over 700,000 members including 4,000 in Kansas. The mission of the Sierra Club is:

To explore, enjoy, and protect the wild places of the earth;
To practice and promote the responsible use of the earth's ecosystems and resources;
To educate and enlist humanity to protect and restore the quality of the natural and human environment; and to use all lawful means to carry out these objectives.

The public policies that the Sierra Club supports can be found at the web site for the national Sierra Club at www.sierraclub.org and the web site of the Kansas Chapter at www.kssierra.org.

I have included for your information copies of a publication of Sierra Club called "The Artic National Wildlife Refuge: America's Natural Resource in Peril." This publication is not meant to be a detailed technical critique of the proposal to drill for oil in ANWR. Instead, it is meant as a critique that lays out the arguments of the Sierra Club for the general public.

I would like to just take a little of your time here to critique this resolution. I would like to specifically agree with the fourth paragraph of this resolution that states: "The security of the United States requires less dependence on foreign oil, the importance of which is underscored by the events of September 11, 2001". All of us would agree with this statement. Where we disagree is the conclusion in the next paragraph that "development of the oil and gas resources of the Arctic Coastal Plain area of ANWR would substantially reduce that dependence." The long term solution to U.S. dependence on "foreign oil" is to reduce our dependence on oil. Furthermore, we simply don't want to take the risk that the Arctic Coastal Plain can be opened to oil and gas production without "significant adverse environmental impact[s]" as stated in the resolution.

We therefore respectfully urge you not to pass this resolution. Thank you for your time and attention.

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wildlands

Arctic National Wildlife Refuge

The Arctic National Wildlife Refuge is one of America's greatest natural treasures. The 19 million-acre Refuge in remote northeast Alaska harbors an unparalleled diversity of wildlife in untamed wilderness.

Unfortunately, the area has also been targeted for drilling and industrial development by the oil industry and its allies in Congress. This effort not only ignores clean, energy-efficient solutions in favor of more dirty and dangerous oil, coal and nuclear production -- it also would open the pristine Arctic Refuge to oil and gas development. Read more about the Arctic Refuge in Peril and what's happening now in Congress.

find out more

- Background on the Arctic
- Arctic Refuge in Peril
- How You Can Help
- Oil Factsheet
- Jobs and the Arctic
- Bush Energy Plan
- VoteWatch
- 2000 Acre Hoax

tour the arctic

- Arctic Slideshow

Photo courtesy Daniel J. Cox/naturalexposures.com

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wildlands

Arctic National Wildlife Refuge

Drilling For Oil in the Arctic National Wildlife Refuge Won't Address National Security or Consumer Needs

For decades, the oil industry and its allies in Congress have targeted the sensitive coastal plain of the Arctic National Wildlife Refuge for oil and gas development. Now they're using the nation's current crisis to forward their efforts, under the guise of national security. The truth is, the speculative amount of oil that could be had from the coastal plain would not put a dent in our dependence on foreign oil, would do nothing to strengthen our national security, and would not save consumers a dime.

How Much Oil Might the Coastal Plain Really Supply?

Proponents of drilling in the Arctic Refuge claim that massive amounts of oil are to be found underneath the Refuge's fragile coastal plain. They often quote an inflated figure of "technically recoverable oil" that might lie beneath the coastal plain. This is the amount of oil that could be recovered *without any regard to cost*. This figure does not take into account the actual cost of bringing the oil to domestic markets. When economic factors are considered, the mean amount of economically recoverable oil drops to just 3.2 billion barrels. The cost of drilling in the Arctic Refuge is so high, in fact, that the U.S. Geological Service (USGS) says if the price of oil fell to $16 a barrel, there would actually be NO economically recoverable oil in the coastal plain.[1]

Arctic Oil Will Not Strengthen Our National Security...

What do 3.2 billion barrels of oil mean to Americans who are concerned about our dependence on foreign oil, particularly from the Middle East? Consider this: Each day, the United States consumes about 19.5 million barrels of oil, an annual total of about 7 billion barrels each year [2]. Given this rate of consumption, if Arctic oil was our nation's only source, it would fuel America's demand for less than 6 months.

The United States sits on only two percent of the world's total crude oil reserves,[3] and currently produces nine percent of the

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world's total oil supply (2.1 billion barrels a year in 1999)[4]. Our consumption of oil grossly outweighs what we produce domestically or are capable of producing in the future. With only five percent of the world's population, the U.S. consumes 26 percent of the world's oil -- seven billion barrels a year [5]. Even if we drained all the economically recoverable oil from the Arctic Refuge all at once (3.2 billion barrels) and combined it with the amount we produce annually from all other U.S. sources (2.1 billion barrels), we still would not meet one year's U.S.demand for oil (7.1 billion barrels).

At its peak of production, Arctic Refuge oil could supply perhaps one percent of America's energy needs at any given time -- not enough to put a dent in our dependence on foreign oil.

In addition, our critical energy infrastructure -- power plants, pipelines, transmission lines and other facilities that provide us with electricity and gasoline -- are vulnerable. For instance, a local Alaskan man recently fired a gunshot into the Trans-Alaska Pipeline and caused it to leak 300,000 gallons of crude oil into a spruce forest. The 103 nuclear power plants across the country are not built to withstand impact by a commercial jetliner; an explosion at a nuclear plant could spread highly radioactive material -- that remains dangerous for tens of thousands of years -- over a large geographic area.

Drilling in the Arctic Refuge will not move us toward energy dependence, nor will it make us less vulnerable to terrorist attacks. Instead, we need to make make wise policy choices that truly eliminate vulnerabilities and ensure that our energy infrastructure and delivery systems are safe and secure.

...Nor Will it Reduce the Price of Oil -- by the Barrel or at the Pump

Regardless of whether oil from the coastal plain would reduce our dependence on foreign oil, total independence from foreign oil would still not affect the price we pay for oil. Even the conservative Cato Institute agrees:

> "Even if all the oil we consumed in this country came from Texas and Alaska, every drop of it, assume we didn't import any oil from the Persian Gulf, prices would still be just as high today. And the main reason is that domestic prices will rise to the world price."
>
> -Jerry Taylor, Cato Institute, interview with National Public Radio October 5, 2000

OPEC nations control over 75 percent of the world's oil

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reserves and produce 42 percent of the oil currently consumed throughout the world 6. OPEC meets several times a year to agree on production levels. This collusion of oil powers sets the worldwide price for all oil, based on simple supply and demand principles. They have the majority of the supply and we have the majority of demand. Thus the U.S., because of its minimal oil reserves and small contribution to the world market, cannot affect the world price of oil through domestic production alone.

Even if drilling our way to energy independence were the answer, Americans who are concerned about reducing their prices at the gas pump would have a long wait if they're looking to Arctic oil. The oil and gas industry itself estimates that oil from the Arctic Refuge would not be available for at least seven to ten years, due to the complicated nature of leasing, exploration and infrastructure construction.

How Can We Address America's Growing Energy Needs?

Since we cannot meet our own demand for oil with domestic supplies, we must find ways to curb demand. And this doesn't mean austere conservation measures or expensive new technology for the average American. Fully two-thirds of America's demand for oil is generated by transportation (cars, sport utility vehicles, heavy trucks, jets, etc.). Therefore, the biggest single step we can take to reduce our dependence on oil is to make cars and trucks go farther on a gallon of gas.

As a first step, we can require SUVs to meet the same miles per gallon standard as cars. Currently, federal regulations require that cars be manufactured so as to go at least 27.5 miles per gallon of gasoline, while ultra-popular SUVs only have to go 20.7. According to the Union of Concerned Scientists, raising the standard for SUVs would save one million barrels of oil a day. In a 10-year period -- the same amount of time it would take to bring Arctic Refuge oil to the lower 48 States -- we could save 3.65 billion barrels of oil. That is more than the most likely total amount of economically recoverable oil in the coastal plain. Plus, these reductions in demand would last far longer than ten years, and would save consumers a bundle at the gas pump -- $45 billion a year!

The Bottom Line

America must find simple ways to cut our dependence on oil -- whether foreign or domestic. Our nation needs a comprehensive energy policy based on conservation, alternative energy sources, and improved efficiency standards -- such as making our cars go farther on a gallon of gas. Such a strategy will decrease our dependence on oil, reduce pollution, and spare natural treasures like the Arctic National Wildlife Refuge for future generations to enjoy.

We need an honest, balanced energy plan that gives us cleaner, cheaper and safer energy solutions. We can have clean energy and a healthy environment for our families, for our future.

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- **Quicker** - Increasing energy efficiency technology and fuel efficiency will decrease our energy use. Research to develop efficient cars and investment in mass transportation, combined with cycle natural gas plants can begin saving energy and reducing pollution from old, dirty and inefficient plants by next year.

- **Cleaner** - By choosing energy options such as solar, wind and energy-efficient technologies, we can protect our clean air, clean water and climate.

- **Cheaper** - Not only do we save energy by using more efficient appliances and technologies, such as compact fluorescent light bulbs, but raising fuel economy standards for cars, SUVs and other light trucks will save consumers $45 billion a year at the gas pump.

- **Safer** - An energy plan that provides a strong balance of efficiency, renewable energy and cleaner natural gas production is safer for our public health and environment.

read more

Crude Behavior: A Sierra Club Report on the Oil Industry's Influence Over America's Energy Policy.

Endnotes:
1 USGS 1002 Area Petroleum Assessment, 1998
2 Annual Energy Review 1999, Table 5.1, Energy Information Administration, U.S. Department of Energy
3 Energy Information Administration, "International Energy Annual 1999," Table 8.1
4 Department of Energy, EIA's Annual Energy Review 1999, Table 11.4
5 Department of Energy, EIA, Annual Energy Review 1999, Table 11.9
6 Dept. of Energy, EIA

Photo (top) courtesy Daniel J. Cox/naturalexposures.com

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