

Colorado Oil Shale Initiatives for the '90s*

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I appreciate the opportunity to participate in the Twenty-Third Oil Shale Symposium. With 80% of the nation's recoverable reserves of oil shale located in the West, it is appropriate that the Colorado School of Mines continues to be the technical focus of the oil shale industry.

I also bring greetings from Governor Roy Romer. As many of you know, he has been active in a variety of oil shale efforts over the past three years, advocating a fair settlement of unpatented oil shale claims in northwest Colorado and soliciting political and financial support for a demonstration oil shale test facility. He has requested congressional funding and support from other governors for the Western Oil Shale Enhancement Program. He will continue to lend his support to those initiatives, which are cost-efficient and environmentally responsible.

Colorado has been involved with a variety of oil shale efforts over the past three years—ranging from settlement of oil shale claims in northwest Colorado, to installation of oil shale-asphalt test strips, joint ventures for improved oil shale mining and processing technologies, and design of a modified in situ demonstration facility. In addition, we have played a viable role in Washington, where the future of oil shale as a national resource has been debated.

Over the past 15 years, the state has helped define the role of oil shale as a strategic resource. Yet, we have been absent from proceedings such as these where contributions to the advancement of oil shale have been discussed. Your invitation today is an acknowledgment of the role that the state and local government have played in development of the oil shale industry.

OVERVIEW

Colorado is dedicated to a viable energy and minerals industry. It is an important component of Colorado's economy, providing jobs for our citizens and revenues to state and local governments. The Romer administration has worked to establish a cooperative political environment and to help foster an appropriate market niche for all our fuels and minerals.

At the state level, our approach has been to promote our mineral resources and streamline the regulatory process,

while ensuring that individual projects are economically healthy and environmentally sound. At the federal level, we have advocated state primacy in national environmental regulations to avoid duplication and preemption of state and local laws. We have promoted reform in the way federal royalties are set, federal lands are leased, and public lands are managed. Underlying these initiatives is a firm belief that we can do both—protect the environment and public health while ensuring that environmental regulations are efficient and reasonable.

Those of you who work in the industry on a daily basis know that the integration of economic and environmental concerns is difficult, time consuming, and costly. We cannot easily change or ignore federal laws, but we must be responsive to local government needs and citizens' concerns. We must be responsible stewards of Colorado's natural resources. We must protect the public health and safety in project designs. And, we must do so without over-regulating the industry. But it can be done—it simply takes work and common sense to integrate all these objectives. Our first-class energy resources and our world-class beauty both can be integral parts of our economic future.

We can reduce the financial, technical, and emotional uncertainties in particular projects through education, information, technical assistance, and communication. Miners, politicians, regulators, environmentalists, and the public must all be part of the team as individual projects are designed, reviewed, constructed, and operated.

The energy and minerals industries are an important part of our economic development activities. We are involved in many very specific issues that affect their overall economics and competitiveness. In 1988 Governor Romer outlined a nine-point plan to assist in the recovery of the state's mining industry. Last year, he proposed an eight-point plan designed to expand the market for our oil and gas resources. In those plans we are asking all affected parties—producers, transporters, the federal government, state and local governments, and consumers—to assist in making these industries more competitive.

The good news is that the partnership is working. The value of minerals produced in the state increased 22% in 1989. Two weeks ago we announced the largest coal export contract in the history of the state. We are signing new customers for Colorado gas on the West Coast. And we

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have received over \$22 million in federal assistance for the development of new underground hardrock mining technologies, clean-coal technologies, and oil shale mining and processing technologies. We have set a national standard for public/private partnerships and ventures in the energy field.

THE PHILOSOPHY OF OIL SHALE DEVELOPMENT

The expectation of oil shale development has been on the horizon in Colorado for more than 100 years, going back to the first Mormon retorts in western Colorado in the 1870s.

The oil crisis of the 1970s resulted in the search for alternate sources of oil, including oil shale and tar sands in the West. By the late 1970s, a crash program was under way by industry and the federal government to develop oil shale. With 80% of the nation's recoverable reserves, Colorado was the focus for this development. Many unanswered questions arose about proper technology for oil shale processing, fiscal implications to local governments from multiple projects in a specific region, and environmental impacts from projects of this magnitude.

For this reason, Colorado supported a phased approach to oil shale development and modular components, which could allow projects to expand incrementally. This would allow technical, environmental, and economic questions to be answered in a systematic fashion. Oil shale has the potential to be an available strategic fuel in the future, but we must find ways to produce the shale economically and in an environmentally responsible way.

As the first projects were proposed in the early 1980s, it was clear that the uncertainties were great enough, and the benefits sizeable enough, that the risk should be shared between the public and private sectors. For that reason, the state supported two proposals to the Synthetic Fuels Corporation—Union Oil's proposal for surface retorting, and Occidental Oil's proposal for modified in situ retorting. In addition, Colorado worked with Exxon, Chevron, and the Rio Blanco Oil Shale Company on their privately financed project.

Unfortunately, the market and price structure collapsed before the private ventures became operational, and the Synthetic Fuels Corporation was abolished before the Occidental project was funded.

When the world for Colorado oil shale changed, or in some cases ended, in 1982, I wrote an article in *Mines Magazine* entitled, *Oil Shale—A Bust of Expectations*. In that article, I stated,

"Colorado will continue to support an oil shale industry that is (1) consistent with well-considered national and regional energy goals; (2) based on sound technologies and economic sense; (3) paced to permit development with good management of socioeconomic impacts; and (4) envi-

ronmentally sound to avoid unnecessary degradation of the air, water and other natural resources."

I also stated that "federal subsidies should not replace the prudent economic decisions of oil company executives who are allocating corporate funds for additional oil supplies." In a constantly changing world, these principles still guide our oil shale activities in 1990.

OIL SHALE ISSUES AND ACTIVITIES

The State of Colorado, in cooperation with the states of Wyoming and Utah, have pursued a variety of oil shale issues and activities in recent years. Let me summarize them for you.

Unpatented Oil Shale Claims

Congress continues to be involved in negotiations to settle unpatented oil shale claims in Colorado, Utah, and Wyoming. Based on our discussions with local governments, claimants, and environmentalists through the Oil Shale Lands Committee of the Associated Governments of Northwest Colorado, the state has forwarded to our congressional delegation a proposal with the following provisions—issuance of patents limited to oil shale and associated minerals; retention of surface rights and other minerals and fuels by the federal government; a limited period to file patent applications after enactment of the legislation; a revised patent fee structure based on the costs to process such applications (\$15 to \$20/acre); and public review and comment on the validity criteria the Secretary of the Interior intends to use to evaluate the claims.

Colorado supports the patenting of valid oil shale claims. It is our intent, however, to limit speculation on this resource and to assure Colorado's involvement in surface management decisions. This has been the basis of our legal and policy actions over the past four years. Following the patenting of claims in 1986, allegations were made that several claims patented in 1986 were invalid. Such oversights, if valid, should not occur if patenting resumes.

In 1986 the Department of the Interior patented 525 oil shale claims in Colorado, Utah, and Wyoming, covering 82,000 acres of land. Colorado, which had various surface management responsibilities on those lands, was not a participant in the patent process or in the related agreements between Interior and the claimants. This violated the federal government's trust responsibilities to the state.

In 1986 and 1987 we took legal action to protect our interest in management of the surface. The basis of this intervention was twofold. First, it is our belief that a special agreement of this type, which goes beyond the normal federal patent process, is subject to provisions of the Federal Land Policy and Management Act (FLPMA) of 1976. This law requires public participation, a 60-day gubernatorial

review period before any agreement is finalized, and congressional authorization of land transfers of over 2,500 acres.

Second, it is our belief that land transfer of this magnitude is subject to the provisions of the National Environmental Policy Act, which requires either an environmental impact statement or refinement of existing statements and management plans currently in place to apply specifically to the 82,000 acres.

As settlement to these legal actions, the Romer administration began negotiations with the principal claimants in February 1987 to prepare voluntary surface management agreements that would guide the surface use of the patented lands until such time as oil shale development commenced. These agreements are restrictive covenants that go with the land and are recorded as documents affecting title. They serve as a matter of record describing the unique features of the tracts that will be useful at the time environmental impact statements are prepared prior to the development of the resource. They address public access for certain activities, consultation with state and local governments for land management actions, and identification of areas and species of significance for protection or preservation. We have agreements with Unocal, Shell, Ertl Trust, and TOSCO. Agreements are pending with Exxon and Weber Oil.

Within the past several weeks, the Senate reached a compromise on the patenting of remaining oil shale claims, which is now being sent to Conference Committee. While we are pleased with recent developments to resolve this issue, several issues we outlined in our proposed compromise are not addressed in the Senate's version. We hope that those issues will be addressed in the Conference Committee.

Western Oil Shale Enhancement Program

Oil shale has significant by-product potential that can aid in financing its development as a strategic fuel. In 1986 a group of interested individuals representing the public and private sectors from Colorado, Utah, and Wyoming formed the Oil Shale Action Committee. This group outlined two objectives—(1) to assess the feasibility of a demonstration oil shale test facility; and (2) to develop a plan of action for enhancement of western shale.

Senator Tim Wirth and Representatives Ben Campbell and Hank Brown have been instrumental in securing nearly \$1 million to test new mining methods and by-product uses and to improve retort technologies for western oil shale. We believe that it is important that the technological aspects of oil shale development be pursued at a time when the product is not needed as a strategic fuel. This is consistent with our philosophy of phased development of Colorado's oil shale resources.

A number of significant accomplishments have been achieved in the western states oil shale initiative. Studies that have been completed include:

- Assessment of products obtainable from oil shale for which a viable market may be available under present economic conditions (J.E. Sinor Consultants).
- Investigation of oil shale mining costs for different extraction and processing conditions, spent-shale disposal costs, and potential unconventional uses for oil shale (Synfuels Engineering and Development).
- Process engineering study, including capital and operating costs for a 2,000-bbl/day production facility (Ford, Bacon and Davis).
- Economic evaluation of a small-scale shale oil plant serving a niche market, based on the above studies, and review of environmental permitting and monitoring requirements and costs (Western Research Institute).
- Economics of large-scale commercial production of shale oil, combining underground and surface processing (Occidental Oil Shale Inc.).
- Videotape program describing western oil shale resources and their potential to meet future national energy needs (Associated Governments of Northwest Colorado).

On-going studies include:

- Field investigation of methods to improve in situ fracturing of oil shale using propellants (Geokinetics).
- Proof-of-concept study for a novel shale oil refining process (University of Utah).
- Investigation of innovative methods for mining oil shale (Colorado School of Mines).
- Support is being provided to a field demonstration study, being conducted by the Colorado Mining Association, of water-jet-assisted mining techniques.
- A brochure on western oil shale resources and their potential for satisfying future energy needs of the country (Utah Energy Office).

Two by-products of oil shale are of interest particularly to the state of Colorado. First, laboratory tests indicate that as an asphalt additive, oil shale can extend road life twofold and threefold, thus reducing the cost to the public for road maintenance and replacement. The state has contracted with the New Paraho Corporation for six test strips for evaluation.

Second, oil shale has the qualities of a dry sorbent when used in fluidized-bed coal-fired power plants. We continue to pursue the possibility of a test of the NO_x and SO_x reduction potential at Colorado-Ute's Nucla facility. If successful, this could be a Colorado alternative to imported calcium or limestone from neighboring states. Such a test could be part of a Department of Energy Clean Coal Technology Program project.

Demonstration Projects

We continue to support Unocal's efforts to make its surface retorting technology more cost efficient. To that end, we have indicated to our Congressional delegation our support for modifications to credits for producing fuels from nonconventional sources, contained in the Windfall Profits Tax.

We also support development of alternate technologies. A team consisting of the state, Occidental Oil, the Department of Energy (DOE), and local governments are examining the economic and environmental feasibility of a \$200 million, ten-year demonstration project to test modified in situ oil shale processing. The project would employ 200 people at the C-b Oil Shale Tract in Rio Blanco County. In addition, we are encouraging Lawrence Livermore Laboratory in California to move the next phase of its surface-retorting project to that site.

This year (1990) about \$2.5 million is being invested in this effort—\$1 million from DOE, \$1.15 million from Occidental, and \$400,000 from the State and local governments in northwest Colorado. These funds will complete preliminary engineering designs and begin updating of federal, state, and local permits. Related to this project, the state also supports extension of the Nonconventional Fuels Tax Credit.

Other Issues Related to Colorado's Oil Shale Industry

I would like briefly to discuss three additional issues related to Colorado's oil shale industry.

First, given the economic value of mining to local communities, the industry must develop a friendly, supportive working relationship with local governments and gain public acceptance for development activities. As a result of concerns raised by local governments and citizens groups in areas of rapid industry expansion, Governor Romer has asked relevant executive agencies and local governmental associations to evaluate the needs of local governments to respond to energy development proposals. Education of local officials on the technical aspects of proposed projects, together with the ability of these governments to analyze the impacts of these projects, is critical to their success.

In addition, we suggest that new projects use the Colorado Joint Review Process. All too often state government is asked to fix a problem after the project is too far into the regulatory process. The Joint Review Process could play an ombudsman role for small projects and a permit coordination role on larger ones. This would allow increased local government and citizen involvement earlier in the process.

Second, probably the biggest economic and strategic threat to the nation is our growing dependence on foreign oil. Earlier in 1990, 54% of our oil supply was imported. As a result of the gasoline crisis a decade ago, much of the "fat" in our oil-consuming habits has been reduced at relatively little economic cost to society. The next supply interruption could have severe economic and lifestyle implications.

To address this situation, we support the establishment of regional reserves of crude oil and refined petroleum products and updating of the databases, monitoring systems, and management programs developed in the 1970s. We also are encouraging Secretary Watkins to incorporate oil shale and other synthetic fuels into DOE's National Energy Strategy. Clearly, such fuels have long-term strategic value as well as short-term regional supply potential. We are encouraged by a recent National Research Council report that stresses the need for increased federal emphasis on oil shale technology development and the need for a field pilot facility. Such national emphasis will help focus limited private dollars for cooperative ventures in the development of improved oil shale technologies.

Finally, as part of our effort to promote Colorado's energy resources and related businesses, we are participating in the formation of the Colorado GEM Organization. GEM stands for Geotechnology, Energy, Environment, Materials and Minerals. Its mission is twofold—first, to promote national and international awareness of Colorado as a center for geotechnology, energy, and materials-related activities in business, education, and research; and second, to increase our effectiveness and enhance our competitiveness by creating networks for information exchange, technology transfer, and business promotion. The organization currently involves more than 250 individuals from all industries connected to these businesses. It is headquartered at the Colorado School of Mines during this developmental year.

The Oil Shale Symposium represents not only the principal oil shale development players, but a large cross section of support businesses and organizations—both public and private—dedicated to cost-efficient and environmentally responsible development of this strategic fuel. We urge the companies and individuals represented here today to become part of Colorado GEM's efforts to promote our energy resources and services.

CONCLUSION

In conclusion, no single action will promote or expand the oil shale industry or create new processing technologies. However, the cumulative impact of many positive actions by government and industry will develop the mining, processing, and transporting technologies necessary to make competitive oil shale a reality while contributing to our national energy supply.

Any action designed to improve the outlook for oil shale production in the West should reflect the increasing environmental awareness of society, serve to encourage rather than discourage new projects, and foster the establishment of by-product market niches. To do this, state regulations must be reasonable and flexible. Local government needs the authority to determine if a project is a "good deal" for their local economy. The public must have a greater understanding of the value added by your industry to their daily lives. Federal regulations must realistically reflect the manner in which the industry conducts its business. And industry must improve its outreach to the community.

I would like to leave you with two quotes that characterize the spirit of the oil shale industry.

"The day that some company undertaking the production of oil through the distillation of oil shale in this country proves, through actual practice, that oil may be produced

successfully and continuously on a commercial scale at its plant, a new page will be turned in the industrial history of the United States. The significance of the first genuine production at a profit is hardly likely to be overestimated." And,

"The State of Colorado, among its resources of potential importance, considers its vast oil shale deposits of particular value and the basis of a future great industry that ultimately will place Colorado in the front rank of the oil-producing states of the Union."

These may sound like statements by Armand Hammer and Roy Romer. Surprisingly, they were made by George Otis, Director of the U.S. Geological Survey, in 1918, and by Colorado Governor Shoup in 1922.

The dream is still alive. Only the names and budgets have changed. We look forward to a partnership with you that will make the dream a reality.