

Testimony of Dan Whitney
Heavy Oil Development Manager
Shell Exploration and Production Company

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Chairman Lamborn, members of the Subcommittee on Energy and Minerals. I am pleased to have this opportunity to speak with you today on the topic of oil shale development.

I will focus on three points:

1. Growing world energy demand and our nation's need for secure supplies,
2. Shell's commitment to a cautious approach on oil shale, and
3. The importance of future regulatory stability in assuring new energy development.

Global energy demand is high and increasing constantly. So is international competition for limited energy resources and the investments needed to develop them.

Growing populations and economies in China, India, and elsewhere will at least double energy demand by 2050. Some analysts say it could triple.

One thing certain is we will need a lot more energy. The world will depend on fossil fuels for decades until technology and economics can deliver a larger contribution by alternative energy sources.

Today about 80% of the world's energy comes from coal, oil and natural gas. At most, nuclear and renewable energy sources might meet a third of the world's needs by mid-century -- fossil fuels will supply the rest. And, while the percentage will be a little lower, demand growth means the world will actually be burning more fossil fuel at mid-century than it does today

Most of that increase will have to come from sources undeveloped and even undiscovered today. We will need every available energy source -- renewable, alternative and conventional -- and greater efficiency too.

As you know, there are vast unconventional oil resources here in Colorado, in the form of oil shale -- some of the world's richest hydrocarbon deposits. Properly developed, they could be a major component of US energy security.

The U.S. Geological Survey (USGS) estimates recoverable reserves at more than 800 billion barrels, enough to supply the US for more than a century at current consumption rates.

The challenge of developing a commercial oil shale industry starts with its geologic state. The Green River Formation is a carbonate rock, generally marlstone that is very rich in kerogen. This source of oil has not had the natural forces of pressure and temperature over the millennia to convert it to oil and gas. So, unlike conventional oil and gas operations, oil shale cannot be pumped directly from the ground. Oil Shale must be processed either above ground or in place (in situ) to convert the kerogen into oil.

Shell is committed to a cautious approach in oil shale research and development. Shell has pursued the technical and commercial development of the In situ Conversion Process (ICP) for oil shale since the early 1980s as a means to produce from oil shale - in an environmentally responsible and socially sustainable manner. This has required considerable dedicated scientific application and significant financial investment – many tens of millions of dollars.

To date, through persistence and much effort, a logical progression of work has been completed from desk top studies, to laboratory scale testing, to prototype scale testing, and finally to field pilot testing in Colorado.

Shell's seven previous Colorado pilot projects have tested broad technology themes, including :

- (1) Demonstrating that the technology works,
- (2) Measuring energy balance and recovery efficiency necessary to estimate commercial project economics,
- (3) Producing and measuring the properties of ICP oil and gas,
- (4) Proving that the groundwater can be protected, and
- (5) Testing the effectiveness of a variety of heat delivery methods.

In the process, Shell has carried out extensive pre-operational environmental assessments. Shell has given careful attention to archaeologically sensitive areas by completely assessing and avoiding such areas, and has cooperated fully with agencies such as the State Historical Preservation Office and BLM to identify and avoid areas of critical environmental concern, including establishing conservation easements to provide permanent protection of certain areas.

Shell also funds research into environmental restoration and recently established a professorial chair in the subject at Colorado State University. Shell has also demonstrated, through its own research and field trials, that disturbed lands can be returned to beneficial uses that are equivalent to the pre-disturbance conditions, and was recognized by the BLM for these efforts.

The long cycle time of research and high up-front capital requirements of an oil shale project, need broad and consistent government support to establish a commercial industry. Supporting government policy and regulatory certainty are necessary for private industry to reasonably assess risks and

economics, and be confident in that assessment, so that the billions of dollars in required investment can be made.

Commercial scale technologies with economically attractive recovery efficiency and acceptable environmental impacts are prerequisite for success. The road to commercialization is likely to be measured in decades not years – a long time horizon is necessary to allow development to occur through the “bust and boom” oil and gas price cycles.

This extended time frame for supply growth and commercial viability is not unique to unconventional oil. Looking back through history, it consistently takes around 30 years for new forms of energy to achieve 1 percent market share after a commercial business is established. Biofuels are just now reaching 1 percent of the world oil market, or about 0.5 percent of total energy, after decades of development and government support. Wind may get to the 1 percent mark in the next few years, nearly three decades after the first large wind farms were built in Denmark and here in the United States.

Gaining experience and building industry capacity must occur before a new technology can contribute meaningfully to energy supply – and this requires billions of dollars in patient investment over decades in the hope of eventual growth. Regulatory stability is critical. This kind of commitment depends on predictable rules created in a well understood, legally established and exhaustive process.

Weakening regulatory certainty is a negative trend for US energy development.

A key case in point is the BLM’s re-opening of the 2008 PEIS covering Piceance Basin oil shale on the basis of “concerns” already fully covered by existing regulatory programs.

Potential ramifications of re-writing the existing regulations include:

- lower capital investment,
- lower domestic oil production,
- higher oil imports – (costing hundreds billions that might otherwise be invested within the US,)
- higher unemployment (a natural consequence of reduced investment,)
- lower tax revenues from royalties, federal and state corporate and individual incomes taxes, severance tax, and property and sales taxes, and
- lower overall economic growth.

The existing, fully vetted, comprehensive, 1800 page PEIS is less than three years old. No substantive new information has emerged that merits this revisit in such a short time.

The entire exercise ignores the comprehensive framework of regulatory checks and balances already in place in the form of environmental (and other) laws, including site specific NEPA review, that will apply to every future oil shale project under federal jurisdiction.

Remarkably, all five areas proposed for removal from development as identified in the Notice (i.e. those with wilderness characteristics, “very rare or uncommon” designation, sage grouse habitat, “areas of critical environmental concern”, and areas made off limits in the original PEIS) are already either

- (a) precluded from development by Federal or State statutes,
- (b) precluded from development under the original PEIS, or
- (c) may be precluded under the existing leasing authority assigned to BLM land managers.

Given that there are already adequate checks and balances provided in existing regulatory programs to accomplish the stated basis for this PEIS, Shell views the “fresh look” at the PEIS as an inefficient and unnecessary use of taxpayer money and as a significant deterrent to capital investment by Shell and others in the energy industry.

While questions and challenges remain regarding the future implementation of oil shale technology, Shell believes that commitment by the Federal Government to maintaining a regulatory environment that encourages investment in oil shale RD&D, as defined in the 2005 Energy Act and the subsequent regulations including the 2008 PEIS, is critical to long term success.

The lack of policy and regulatory consistency from one administration to another makes the investment climate even more risky and potentially untenable.

For Shell to make informed investment decisions, we must be able to predict the likely costs of future development. This includes royalties, bonds, reclamation requirements, lease duration, diligent development requirements, commercial lease conversion process and other aspects of permitting, lease administration, and commercial operation.

Given the substantial investments necessary for oil shale pilots, research and commercial facilities, regulatory uncertainty has significant adverse impact on Shell’s interests. To put it another way, the 2008 Oil Shale Rules and associated regulatory processes provide certainty and basis for investment decision. Reopening elements, of which the PEIS is one, and the prospect of future changes removes that certainty.

Shell firmly believes that if our technology and those being tested by other energy companies can be proven through RD&D testing, we can unlock a significant long term domestic energy source for the US. To do this, industry needs a regulatory environment that fosters innovation and results in production growth. This is accomplished by providing access to acreage with sufficient oil shale resources combined with long-term stable fiscal regimes and regulatory processes that provide industry the certainty and time needed to develop oil shale.

Our country is in competition with the world for energy resources. We need energy in every form, and we are sitting on the largest and most concentrated energy resource on the planet. And it will be needed, potentially sooner rather than later.

The benefits are huge. Consider this: an acre disturbed for corn production might generate the energy equivalent of 10 barrels of oil per year, and an acre of conventional oil and gas production might generate the equivalent of 10,000 barrels of oil, but an acre of oil shale in the Piceance Basin of Colorado has the potential to produce well over 1,000,000 barrels of oil. So the energy produced per acre disturbed is well over 100 times greater than any other known form of energy development. Colorado's oil shale is literally the richest and most concentrated hydrocarbon energy resource on the planet.

Shell has often said, we intend to develop oil shale in a manner that is economically viable, environmentally responsible and socially sustainable. If one only focuses on environmental concerns without also considering the socioeconomics, national energy needs, and the facts and realities of the situation, it becomes clear that a "no development" policy is unsustainable. As NEPA requires, the environmental and social impacts and benefits of any proposed action need to be considered. Our country needs energy in every form. There is clearly a path forward where our energy needs are supplemented with oil shale, while managing and mitigating impacts of development.

Thank you for considering my testimony.