

Facts about Oil Shale and Tar Sands Development in Utah and Other Western States



The Energy Policy Act of 2005 directed the BLM to analyze the environmental, economic, and social impacts of a new commercial leasing program for oil shale and tar sands resources in Colorado, Utah, and Wyoming. This environmental review will form the basis of a commercial leasing program that may occur as early as 2007.

Now, members of the public have the opportunity voice their concerns about oil shale and tar sands development to the BLM. A variety of media sources and citizens in Utah have articulated the importance of all Utahns actively participating in this process. While Colorado interest groups and concerned citizens have already vocally expressed reservations about oil shale development, it is important that all of the serious risks and unknown factors of developing oil shale and tar sands is also brought to the attention of the Utah BLM.

Environmental, economic, and social concerns killed oil shale and tar sands development twenty five years ago. If oil shale/tar sands development goes forward this time around, we need to know all of the facts.

Oil Shale /Tar Sands Development Would Affect Valuable Water Supplies

Oil shale and tar sands development consumes a tremendous amount of scarce water resources. The conventional method of mining and retorting oil shale takes up to five barrels of water to produce just one barrel of oil. Nobody but the Shell Oil Company knows how much water will be needed for its experimental *in-situ* method being developed at Mahogany, Colorado, though even Shell acknowledges that water supplies are likely to be a limiting factor. The BLM has estimates that oil shale development would lead to as much as an 8.2 percent reduction in the annual flow of northeastern Utah's White River.

Oil shale and tar sands development also leaves behind a huge mess. Spent oil shale results in highly-saline runoff that could degrade water quality in the Green, Colorado, and White Rivers and their tributaries or require costly treatment for the indefinite future. A million-barrel per day oil shale industry could increase salinity in the Lower Colorado River Basin by up to 2.4 percent. Shell still has determined whether it can control groundwater contamination when using its experimental *in-situ* method, leading to concerns about tainted drinking water supplies.

Clean water in the Upper Colorado River Basin is tightly regulated and in high demand (both for human consumption and to sustain native plants and animals). The BLM should determine how much water will be needed—and whether it's available—before giving the green light to any oil shale leasing.

Oil Shale /Tar Sands Development Would Dramatically Affect Communities around Vernal

During the short-lived oil shale boom of the 1980s, federal officials estimated that oil shale development in Colorado would result in an eight-fold population increase in Rio Blanco County and more than triple the population of Garfield County. A ten-fold population increase was projected for the towns of Rifle, Meeker, and Rangely. In the 1980s, the BLM set a carrying capacity threshold of 5-15% annual growth rate in such communities, meaning that a project that would result in growth exceeding this amount would not be leased or approved.

While impacts from new oil shale and tar sands industries are difficult to quantify without concrete plans for development, the potential for substantial socio-economic changes to the communities around Vernal is undeniable. With new industry comes significant numbers of people and increased demands on our government, our roads, our schools, and our hospitals. Large scale commercial oil shale and tar sands production would only add to the strain on eastern Utah communities already caused by a rapid increase in oil and gas development over the past decade.

The BLM must analyze how many people oil shale would bring into our communities and what effects this dramatic influx would have. The BLM should also strengthen the carrying capacity threshold to protect our communities.

Oil Shale/Tar Sands Development Would Require Huge Amounts of Energy

Turning rocks to oil also requires massive amounts of energy. Even a 100,000 barrel-per-day oil shale operation using Shell's *in-situ* conversion technology would require 1,200 megawatts of electricity—that would likely require a new power plant with the operating capacity to serve a city of 500,000. That power plant, at a cost of about \$3 billion, would consume five million tons of coal each year. To produce 1 million barrels of shale oil a day would require ten new power plants and five new coal mines to serve them.

The BLM needs to analyze where this energy would come from and what impacts its generation would have on the landscape, communities, and air quality.

Oil Shale/Tar Sands Development Would Cause Serious Air Pollution

All of the areas where oil shale and tar sands development is likely to occur enjoy high air quality due to their rural locations. This will change with the commencement of oil shale production since fossil fuels must be burned to produce the energy needed to create shale oil. The mining and processing of shale itself produces numerous toxic pollutants, such as sulfur dioxide, carbon monoxide, ozone, and particulates. The power plants required for in-situ development alone would release ten million tons of greenhouse gases. According to the *Denver Post*, the combination of more coal-fired power plants and oil shale production creates four times the amount of greenhouses gases as from conventional crude.

The BLM must determine the current air-quality baseline, and then determine exactly how much pollution will result from either traditional above-ground retorts or from in-situ processing before allowing any leasing.

Oil Shale/Tar Sands Development Would Threaten Wilderness-Quality Lands

Oil shale and tar sands resources in Utah lie within the greater Book Cliffs-Uinta Basin region, among some of our country's most spectacularly wild landscapes. The huge impacts to these lands from oil shale development—from both active production and the development of new industrial infrastructure—are simply incompatible with the area's wilderness characteristics. The development of oil shale and tar sands resources would threaten Wilderness Study Areas such as Winter Ridge and those in the eastern Book Cliffs. It would also endanger lands the BLM has identified as wilderness-quality or likely to be judged so, such as Desbrough Canyon, Wolf Point, Bitter Creek, and Lower Bitter Creek. Citizen-proposed wilderness areas are also at risk, including Sunday School Canyon, Seep Canyon, and Dragon Canyon.

Oil shale and tar sands development using mine-and-retort methods produces a huge amount of spent rock. A 100,000-barrel-per-day oil shale industry would require the disposal of up to 150,000 tons of waste rock each day, or 55 million tons annually. Crushing and retorting increases the volume of the spent shale by 15-25 percent, compounding disposal problems. Shell's *in-situ* method for oil shale extraction results in nearly 100% occupation of the land. It requires 15 to 25 heating holes per acre, plus wells for recovery of the produced oil and gas, as well as those to construct and maintain a freeze wall (see glossary below). The production zones would be stripped of vegetation and would take a decade or more to recover.

Regardless of the method of development, oil shale and tar sands would require significant new industrial infrastructure. Roads, power plants, power distribution systems, pipelines, water storage and supply facilities, and construction staging and storage areas would impose additional demands on the landscape.

The BLM must analyze how much oil shale development would change the landscape and preclude such development from wilderness-quality lands.

Oil Shale/Tar Sands Development Would Damage Valuable Wildlife Habitat

Elk, deer, and aquatic species including native fish could be seriously impacted by a full-scale oil shale and tar sands industry. The oil shale and tar sands resource area overlaps with several units that the BLM has designated or is considering designating as Areas of Critical Environmental Concern (ACECs), a status that recognizes the land's importance to wildlife habitat. These include proposed ACECs in Main Canyon, Bitter Creek/P.R. Spring, White River, Coyote Basin-Kennedy Wash, Coyote Basin-Snake John, and the Pariette Wetlands.

The BLM must analyze the effects an oil shale industry would have on wildlife and preclude such development from critical wildlife habitat.



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GLOSSARY OF OIL SHALE TERMS

OIL SHALE

A sedimentary marlstone containing kerogen which, when heated, can release petroleum-like liquids. The U.S. Geologic Survey estimates that 1/2 of the world's oil shale reserves -- about 1.3 trillion barrels of oil -- lies within 150 miles of Grand Junction, Colorado.

MINE AND RETORT DEVELOPMENT

In this method, oil shale is mined from the ground, trucked to a separate processing area, and then placed in a retort in which it is heated to about 900° F and enriched with hydrogen. The resulting oil is separated from the waste material and processed, and the waste rock is disposed of.

RETORT

A *retort* is a specialized furnace in which oil shale is heated to release petroleum products. The technology for surface retorting of shale has not been successfully applied at commercial levels, though experimental plants are operating in Estonia, Russia, Brazil, and China.

OPEN-PIT MINES

Because 80% of the Piceance Basin shale is covered by up to 500 feet of overburden and are often over 2,000 feet thick, reaching this resource would require enormous open-pit mines that would be 2,000 feet deep. Such mines would be comparable in size to the largest existing open-pit mines in the world.

IN-SITU DEVELOPMENT

In this experimental method, oil shale underground is heated in place, and oil is pumped from the ground and transported to a refining facility. At Shell's small-scale Mahogany Research Process in western Colorado, the shale is cooked underground for a period of 2-3 years at 700° F, with 15-25 heating holes per acre.

FREEZE WALL

To prevent hydrocarbons from leaving the production zone during heating, extraction, and post-extraction cooling, Shell proposes to construct a "freeze wall" around the perimeter by circulating refrigerated fluid through still more wells drilled around the active zone.

COMMERCIAL DEVELOPMENT

According to the RAND Corporation, the minimum size of a commercial oil shale industry is 50,000 barrels a day -- and more likely well over 100,000 barrels. There are currently no such commercial-size oil shale projects in the world.

TAR SANDS

Tar sands are a combination of clay, sand, water, and bitumen -- a heavy black viscous oil. Tar sands are mined using strip mining or open pit techniques and processed to generate oil. Oil from tar sands must be extracted, separated, then upgraded before it can be refined.

ENVIRONMENTAL IMPACT STATEMENT

The 2005 Energy Policy Act directed the Interior Department to prepare a programmatic "environmental impact statement" (EIS) under the National Environmental Policy Act (NEPA) examining the positive and negative environmental, economic, and social impacts of a commercial oil shale and tar sands leasing program.

SCOPE OF IMPACT STATEMENT

Under NEPA, the Interior Department must conduct detailed analysis of the direct and indirect impacts of a commercial oil shale and tar sands leasing program; the impacts of all foreseeable commercial development activities in Colorado, Utah, and Wyoming; all reasonable alternatives to the leasing program; all available mitigation measures to address impacts; and policies and Best Management Practices to be included in BLM Land Use Plans.

IMPACTS TO BE CONSIDERED IN IMPACT STATEMENT

Major issues to be addressed in the EIS include management of the oil shale and tar sands resources; impacts to surface and groundwater; impacts to air quality; impacts to wildlife and wildlife habitat; impacts to wilderness, riparian, and scenic values; impacts to cultural resources; impacts to threatened and endangered species and their habitat; transportation corridors; and socio-economic impacts on local communities.

TIMELINE FOR IMPACT STATEMENT

Under the Energy Policy Act, the Interior Department has only until February 2007 to complete this analysis. A Draft EIS will likely be available for review in Fall 2006.