

New oil-shale push revives reservoir plans

By Nancy Lofholm
Denver Post Staff Writer

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113

Governments in Colorado and Utah are dusting off plans for major reservoirs to feed development anticipated from the latest push to tap the region's oil-shale deposits.

The town of Rangely, in northwest Colorado, and Uintah County, just across the state line in Utah, are reviving interest in water-storage projects that were on the drawing

> See **WATER** on 3B



Hyoung Chang | The Denver Post

WALKING THE LINE | Andrew Hoiberg stripes Invesco Field at Mile High on Wednesday in preparation for Saturday's NFL playoff game between the Broncos and Patriots.

WATER: Reservoir plans both involve White River

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boards more than two decades ago during the last oil-shale boom.

The reservoir proposals are both on the White River — one halfway between Meeker and Rangely and the other about 25 miles south of Vernal.

"Water development needs to precede any energy development on a large scale," said Rangely Town Manager Lance Stewart.

Rangely is using an environmental study done during the late 1970s as a starting point to float the idea of building a 200,000-acre-foot reservoir — a shade smaller than Lake Dillon. That study determined about 500,000 acre-feet of White River water would be available for capture and reuse.

Stewart said a reservoir likely would draw other industrial development to the area as well as a concessionaire business for the reservoir, which would be large enough for houseboats. It would also free more water to meet the drinking-water needs of a community that would grow with any large oil-shale development.

"An incredible amount of ground-work still needs to be conducted, but we have had basic meetings with industry representatives and they agree that this plan could dovetail with their plans," Stewart said.

Jill Davis, a spokeswoman for Shell Oil, the energy giant that has been testing a new method of extracting oil from shale in the Mahogany Ridge area between Rangely and Meeker, said water storage likely will be a necessity if the company decides to move its project into development.

"Water storage is going to be important for us and probably for others," Davis said. "If there was some sort of storage in the area it would be nice for us."

Davis said if Shell's method proves to be economically and environmentally feasible, it will not use as much

water as the oil-shale-boom method of mining shale rock and cooking it in above-ground retorts.

During failed oil-shale development efforts in the late 1970s and early 1980s, estimates ranged from one to three barrels of water needed for every barrel of oil produced.

"We are still kind of crunching the numbers, but we know it would be better than in the past," Davis said.

Shale development failed previously because it was too expensive. But efforts to unlock that oil have continued in the 16,000-square-mile Green River Formation, which holds an estimated 2 trillion barrels of oil under north-west Colorado and into eastern Utah and southern Wyoming.

Development of that oil shale using new techniques received a boost last year through the 2005 Energy Bill, which mandates a new commercial shale-leasing program.

But water is still cited as a major hurdle to shale development.

"Water requirements for the infrastructure and socioeconomic demands could place a burden on the neighboring communities, which could see tremendous growth as a result of new oil shale industry in the region," a 2005 Department of Energy report said.

Steve Smith with the Wilderness Society said he worries that creating water for shale development means taking water from other users. He also is worried about using up a precious resource for an unproven effort to get at oil shale.

"We need to find a technology that doesn't use water in this arid region," Smith said. "Nobody should be in a hurry to build new reservoirs when we don't even know if oil shale is going to work."

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Oil-shale lease plans draw public scrutiny

By Nancy Lofholm
Denver Post Staff Writer

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Rifle — The federal government's latest attempt to spur the wresting of oil from rock in western Colorado was greeted with skepticism Wednesday at the first meeting in the state seeking public comment on oil-shale leasing.

About 100 people — from former oil-shale industry workers to environmentalists — turned out to question and comment on an environmental study being done by the Bureau of Land Management prior to leasing lands in northwest Colorado for research and development and eventual commercial production of

> See **SHALE** on 4B

SHALE: BLM conducting study prior to leasing lands in Colo.

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the world's richest oil-shale resource.

"I have intense skepticism. This is a resource that has promised so much and delivered so little," said Randy Udall, director of the Community Office for Resource Efficiency in Aspen. "If it's economically and technically feasible, the good news is this nation will have a new energy source. The bad news is that it would absolutely devastate everything people love about western Colorado."

The BLM is under the congressional gun to quickly complete an environmental impact statement, or EIS, on oil-shale lands in the Piceance and Washakie basins in Colorado, the Green River and Washakie basins in Wyoming and on tar sand lands in the Uintah Basin of Utah.

"Congress tightened our time frames," said Jim Edwards, a BLM branch chief for solid minerals.

Edwards admitted the agency would like to have more time, but said the immensity of the resource is driving the federal push to get at it and relieve some of the reliance on foreign oil.

"We're talking big numbers here. This is a lot of oil and we're going to take another crack at getting it out," he said.

The meeting Wednesday — held in a town that has half the world's oil shale resources within 100 miles — felt like déjà vu to some who weathered the boom and bust of oil shale in the 1970s and '80s. Many of them urged the BLM to proceed with caution.

"I think we need to build up gradually to where we're ready to expand into commercial. Stage development is going to be crucial," said Gary Aho, who has worked in oil-shale development for 35 years.

The attempt to release some of the estimated two trillion barrels of oil locked in shale rock foundered in 1982 when the costs of trying to mine and process the oil was too expensive.

As the BLM prepares to make 160-acre parcels available for research and development and to add 4,920 acres for commercial development, energy companies are coming forward with new technologies to try to get to the oil in shale.

The research on those methods won't be complete in time for the EIS the BLM is preparing. That rankles Matt Sura of the Western Colorado Congress.

"This EIS is unfortunately going to be irrelevant on arrival," Sura said.

The BLM will hold hearings today at 1 and 7 p.m. at the Marriott Denver West, 1717 Denver West Boulevard, before wrapping up the public-comment scoping period Jan. 31.

PERA outlines plan for reform

Any fix for the \$11 billion shortfall in the retirement fund will be tough to pass, a senator says.

By Aldo Svaldi
Denver Post Staff Writer

Reforms are needed to overcome an \$11 billion funding shortfall at the state's largest public pension plan, but any legislative

Oil-shale plan hammered at forum

Environmentalists and others who remember the previous boom and bust see little call for optimism.

By Greg Griffin
Denver Post Staff Writer

Environmentalists and other Coloradans with long memories criticized a government effort to revive oil-shale production on the Western Slope during a meeting in the Denver area Thursday, as industry representatives generally stayed quiet.

"There's no indication today that oil shale is any more economically viable than it was on Sunday, May 2, 1982," when Exxon closed its oil-shale project near Parachute, laying off 2,200 workers, said

Kevin Markey, who lives near Lyons.

Markey and others warned that the oil-shale industry took a heavy toll on Colorado's environment and economy, and said they see little reason to believe a new round of exploration will be different.

"Even the staunchest advocates of oil-shale development ... acknowledge that the development of a strategic-scale oil-shale industry will have dramatic impacts on the human environment," said Joseph Santarella, an attorney for the Rocky Mountain Environmental Labor Coalition.

The U.S. Bureau of Land Management is soliciting public comments until Jan. 31 on its effort to open to commercial extraction oil-shale deposits in Colorado, Utah and Wyoming within two years. Two meetings in Golden on Thursday followed meetings in Rifle on Wednes-

day. The BLM is rushing to complete its environmental-impact statement by summer 2007.

About 70 people attended the afternoon meeting in Golden, including a few from the oil industry.

"We're just gathering information," an energy-company representative said after the meeting. He declined to identify himself or his employer. Of the issues raised at the meeting, he said, "There is a lot of concern, and a lot of opportunity."

With gasoline prices rising, extracting oil from sedimentary deposits, a process that ultimately proved too complex and expensive in the shale boom and bust of the 1970s and early 1980s, is again attractive for energy producers.

Estimates of recoverable oil in Colorado's Piceance Basin near Rifle alone total 1.2 trillion barrels, of a total of 2 tril-

lion barrels of reserves in the state, said BLM solid-minerals specialist Jim Edwards.

"Colorado has the thickest, richest and most barrels of shale oil," Edwards said.

But those who experienced the boom and bust remained skeptical at Thursday's meeting. John Rold of Lakewood, a former federal geologist, said the economics and politics of oil shale remain a bit of a mystery for oil companies and the government, and that Edwards' reserve estimates are too high.

"I've often said that oil shale is at least five years around the corner," he said, "and I've been proven right for the last 40 years."

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WSS
15 Sep 05
C1

A Black-Gold Rush in Alberta

With Price of Crude Staying High, Tapping Into Canadian Oil Sands Looks Increasingly Profitable

By TAMSIN CARLISLE

Calgary, Alberta

BY BRIEFLY BLASTING oil prices above \$70 a barrel, Hurricane Katrina may have blown away any lingering doubts among oil producers about the long-term profitability of multibillion-dollar projects in the vast oil sands of this western Canadian province.

The supply disruptions caused by the hurricane also may stoke further U.S. interest in the oil sands as a stable, long-term supply source.

The U.S. Department of Energy estimates that Canada's oil sands contain 174 billion barrels of recoverable reserves—the world's second-largest oil resource behind Saudi Arabia. But soaring construction costs and high prices for natural gas, which is used in producing petroleum from the sticky sands, are driving up the break-even point for new developments under way or planned for the northern Alberta region.

Until recently, analysts estimated that such projects would be profitable as long as the price of crude was at least \$25 a barrel.

Still, it is hard to imagine a scenario in which an oil-sands project wouldn't return a profit with crude at \$40 a barrel, says FirstEnergy Capital Corp. analyst Steven Paget, an oil-sands specialist. The price of the benchmark light, sweet crude-oil futures contract rose \$1.98 to \$65.09 yesterday on the New York Mercantile Exchange, breaking a three-session streak of declines.

With \$80 billion of projects under way or in the planning stages, industry participants forecast that production from the oil-sands region will nearly triple to 2.7 million barrels a day by 2015 from one million barrels a day last year. The U.S. consumes about 21 million barrels of oil a day.

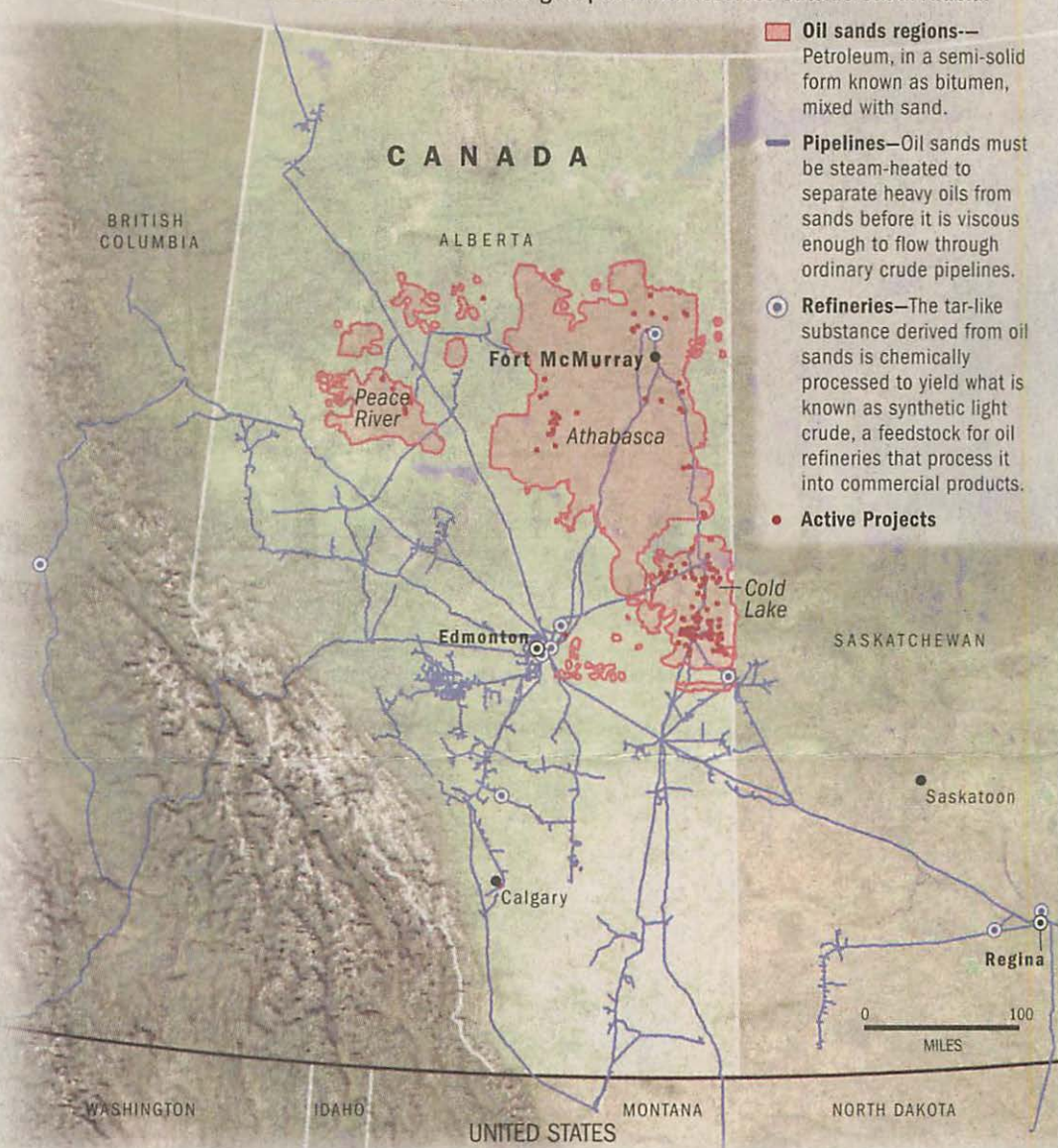
Oil sands are a mixture of grit and a tar-like grade of crude oil known as bitumen. The deposits are either mined in massive open pits, or, if too deeply buried for surface-mining, are injected with steam to coax the viscous bitumen to flow into wells. The bitumen, in turn, is chemically processed to yield an oil grade known as synthetic light crude, a preferred oil-refinery feedstock that trades at a premium to most benchmarks, such as West Texas Intermediate or the Nymex futures.

Prices for natural gas—the fuel most widely used to produce steam—are about 45% higher in Alberta than a year ago.

Construction costs include labor, steel and heavy

Black Sands of Canada

Three major oil sands regions in Alberta are said to hold the world's largest petroleum reserves outside Saudi Arabia.



Sources: PennWell MAPSearch (pipelines and refineries data); Alberta Energy and Utilities Board; Alberta Geological Survey; U.S. Geological Survey

Dan DeLorenzo/The Wall Street Journal

equipment. Shell Canada Ltd., a unit of Royal Dutch Shell PLC, disclosed last month that it has boosted its cost projection for a proposed 100,000 barrel-a-day expansion of its Athabasca oil-sands mine by 80%, to 7.3 billion Canadian dollars (US\$6.18 billion).

Even so, the wave of development engulfing the forested oil-sands region has gathered so

much momentum that some say it is unstoppable. "Really, there is no price scenario that could derail the oil sands, be it oil prices or natural-gas prices," says Greg Stringham, vice president of the Canadian Association of Petroleum Producers. Recent lofty natural-gas prices aren't sustainable

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A Black-Gold Rush in Alberta

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long term, he argues.

Mr. Stringham estimates that the average cost of producing synthetic light crude from oil-sands deposits has risen to \$22 to \$25 a barrel from \$13 to \$18 a barrel about three years ago. His estimates include production from established oil-sands projects, which have lower costs than do new developments, in part because they don't face inflated construction costs.

Many oil-sands industry participants are projecting prices of \$40 to \$50 a barrel for West Texas crude for the long term. "It is very difficult to find anyone who will tell you the price will be lower than \$40," says Juan Osuna, an oil-market analyst with Enbridge Inc., a Calgary pipeline and natural-gas distribution concern that has proposed several large oil-sands-related projects.

Mr. Osuna notes that pipeline companies, usually the most risk-averse players in the energy sector, have recently flocked to the oil sands. Enbridge's chief Canadian rivals Terasen Inc. and TransCanada Corp. also have proposed big pipeline projects to transport more crude oil from northern Alberta oil-sands projects to U.S. refining regions, or to Canada's Pacific coast for tanker shipment to western U.S. refineries or China. Just last month, Kinder Morgan Energy Partners LP, a large U.S. pipeline and energy-storage concern, offered \$3.1 billion for Terasen.

Terasen shareholders are scheduled to vote on the deal on Oct. 18.

Alberta doesn't have enough bitumen-processing capacity to convert all its oil-sands production into synthetic light crude, so a lot of bitumen must be transported to refiners elsewhere in Canada or the U.S. for processing. Mr. Osuna points to Alberta's short supply of diluent—in the petroleum industry, a sticky substance used to thin out sticky bitumen and allow it to flow through pipelines—as another factor complicating efforts to ramp up production.

Mr. Stringham of the Canadian Association of Petroleum Producers says northern Alberta's tight labor market also could slow plans to expand production.

Oil-sands producers are working to overcome such challenges. Among other things, they have been throwing their support behind several of the proposed pipeline projects with promises to sign long-term contracts to ship oil. Some producers are testing new oil-sands extraction technology that would burn bitumen instead of natural gas to generate steam.

Commodity Indexes Wednesday, September 14, 2005

	CLOSE	NET CHG	YR AGO
Dow Jones-AIG Commodity	168.284	+2.031	143.010
Dow Jones-AIG Spot	239.130	+2.959	183.804
Reuters U.K.	1654.35	-6.67	1533.88
Reuters/Jefferies CRB	321.66	+3.66	273.09

Futures listings appear on page C11.

Newmont offering up oil-sands leases, stands to profit big

The Canadian leases cost less than \$1 million in '99. Now they could fetch up to \$541 million.

By Ian McKinnon
Bloomberg News

D.P.
17 May 06
4C

Newmont Mining Corp., the world's largest gold producer, is seeking to sell Alberta oil-sands leases that may fetch up to \$541 million for an investment of less than \$1 million in 1999.

Newmont spokeswoman Deb

Witmer confirmed in an interview Tuesday that the Denver-based company is exploring options for its BlackGold leases. A notice of the offering was posted on the website of Scotia Waterous, a unit of Canada's Bank of Nova Scotia that's advising Newmont.

The company is seeking to capitalize on surging global interest in Alberta's tarlike oil reserves, estimated to be the largest outside of the Middle East, as oil prices surge and conventional reserves become harder

to find. Oil futures traded in New York are 43 percent higher than a year ago after touching a record \$75.35 a barrel on April 21.

"There's now a market for this stuff," Richard Wyman, senior oil analyst at Calgary brokerage Canaccord Adams, said in an interview. "Five years ago, nobody cared" about oil-sands assets, he said.

Royal Dutch Shell Plc's Canadian unit agreed on May 8 to pay \$2.2 billion for BlackRock Ventures Inc., or about \$3.60

per barrel of reserves owned by the Calgary-based oil-sands producer. Newmont's reserves may sell for \$1.35 per barrel because its project is less developed than BlackRock's, Wyman said.

BlackGold contains an estimated 305 million barrels of oil capable of producing 35,000 barrels of oil a day, according to the notice from Scotia Waterous. The gold producer is willing to take cash, cash and shares, or cash and a retained royalty, the notice said.

High oil prices contributed to

Newmont's decision to explore options and see what bids it would get for BlackGold, Witmer said.

"The oil sands are at a pretty high value," she said.

"It's an opportune time to look at getting the max value out of it."

Newmont owns three leases covering 9,600 acres located near oil-sands properties controlled by EnCana Corp., Devon Energy Corp. and Nexen Inc., according to the Scotia Waterous website.

Chevron again eyes Colo. shale

By Steve Quinn
The Associated Press

26 Sep 00
4c

Thirty years after quitting one of the nation's most promising yet costly energy resources, Chevron Corp. wants to take another crack at unlocking shale oil from western Colorado's Piceance Basin.

Chevron announced its return — which will come with help from scientists at Los Alamos National Laboratory in New Mexico — on Monday at a petroleum engineers conference in San Antonio.

Oil companies have struggled for decades to unlock the solid organic kerogen from sediment layers ranging from surface outcrops to deep underground.

Now, with rising oil prices and instability with overseas supplies making such endeavors more attractive, Chevron is turning to chemists at Los Alamos to determine how this fuel can be liberated at the molecular level.

Chevron chief technology officer Don Paul said the venture with Los Alamos could enable the company to tap some of the estimated 1 trillion barrels of oil locked in the shale, four times the holdings of Saudi Arabia.

"It's a combination nobody else has," he said.

Paul said it could be decades before any meaningful production begins.

Last week, the federal government determined that experimental oil-shale works in Colorado by Chevron and two other oil companies would have no significant environmental impact.

Bureau of Land Management

officials expect to award leases for 160-acre parcels in Colorado and Utah that will give the oil companies production rights on nearly 5,000 acres of adjacent land.

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Black gold brings senators to state

Panel to examine oil-shale potential

By Nancy Lofholm
Denver Post Staff Writer

Grand Junction — In a scramble reminiscent of the oil-shale boom a quarter century ago, would-be shale developers are promoting plans to bake, microwave, gasify and dig up the rock-locked oil under western Colorado and parts of Utah and Wyoming.

Members of the Senate Energy Committee are coming west today and Thursday to look at some of those efforts. A hearing Thursday in Grand Junction will examine the potential impacts of development of a resource that has stymied energy experts for a century and devastated western Colorado once before.

"Go slow" is the shared message that civic leaders and conservation groups are preparing to deliver at the Senate field hearing.

"We need to develop these resources in a thoughtful manner that respects the other economic, cultural and environmental values that contribute to the Western Slope's way of life," said Kathy Hall, chairwoman of Club 20, a coalition of Western Slope government and business interests.

"It's important that everyone recognize that this is an industry in its infancy," said Bob Randall, attorney for Western Resource Advocates, an environmental law and policy organization.

While local voices urge caution, the Bush administration

has been pushing for development of areas containing an estimated 1 trillion barrels of oil — an enticing promise with oil prices above \$70 a barrel.

The Bureau of Land Management has approved five research-and-development leases on federal land in Colorado to give three companies a chance to prove they can cost-effectively produce oil from rock. The oil is in the form of kerogen, a precursor of petroleum that hasn't yet been liquefied by millions of years of deep-Earth heat.

Shell Exploration and Development Co. has three of those leases for variations of a method of heating the oil underground.

Chevron and EGL Resources Inc. have leases where they will attempt to show they can use electricity to heat the shale underground and then use the natural gas released in that process to further liquefy the kerogen.

In Utah, the Oil Shale Exploration Co. has a lease to mine shale and cook it above ground — a method that failed during the last boom.

Oil companies without research leases also are moving ahead with plans for demonstration projects. Those companies will vie for the attention of the Senate committee, as will those urging the government to look at potential impacts before allowing commercial production.

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Oil shale energizes optimism

Salazar: Senate field hearing in Grand Junction today is a good sign

By Nancy Lofholm
Denver Post Staff Writer

Rio Blanco County — Standing on barren ground that holds one of the world's richest but trickiest-to-access fuel sources, Senate Energy and Natural Resources Committee chairman Pete Domenici predicted that new technology will unlock that resource and lessen America's dependence on foreign oil.

"In a few years, we will be able to tell the world we have unlocked this great, great reserve," Domenici said during a tour of Shell Exploration & Production's Mahogany Research Project in the remote hills between Rangely and Rifle. "There is great hope that it will work."

Domenici, R-N.M., and committee member Sen. Ken Salazar, D-Colo., were touring the project as they prepare for a Senate field hearing in Grand Junction this morning on oil shale development.

Salazar was more circumspect in his predictions for the future of oil shale, but he said the presence of the committee chairman in western Colorado and the field hearing signal strong interest in Washington in finding a way to economically develop an oil shale reserve that is equal to the national oil supply.

"There is great potential.



Ed Andrieski | The Associated Press

From left, Shell Oil vice president Terry O'Connor walks with Sen. Pete Domenici, R-N.M., Sen. Ken Salazar, D-Colo., and state Department of Natural Resources director Russ George at Shell's Mahogany facility near Meeker on Wednesday.

There is also great risk," he said.

Calling tourism the Western Slope's "gold mine," Salazar said any shale development must be balanced with the need to sustain that economy.

"We will not do anything in the context of oil shale that will endanger that," he said.

Shell has been working since the 1970s on a way to heat the kerogen in shale rock underground

rather than mining the rock and cooking it above ground — a method that proved so costly it led to the oil shale bust in 1982 when companies shut down massive shale projects in this area without producing oil.

Shell is building a football field-sized "freeze wall" in a test that Shell vice president Terry O'Connor said is a crucial component of being able to produce

oil from shale. The wall of underground ice — as deep as 2,000 feet and as thick as 300 feet — would prevent underground water from reaching the electric heaters the company is lowering deep into the ground to melt the kerogen. The ice wall, created by circulating a cooling solution in pipes, would also prevent contamination of groundwater.

O'Connor said the company is ready to begin another field test of its heating method but cannot go forward until — and if — the Bureau of Land Management approves research and development leases on federal lands where the shale oil is richest. Shell is being considered for three leases for three variations of its patented technology.

The research leases for Shell and three other companies may be approved as early as this summer.

Domenici did not answer questions about how much water and energy might be needed for oil shale development. He said companies such as Shell wouldn't be sinking huge amounts of money into such research projects if there wasn't a strong belief that new technologies will finally make oil shale a usable resource.

"I believe they do have a technology that has great hope for the future — great hope," he said.

Sen. Ken Salazar, left, attends a hearing of the Senate's Energy & Natural Resources Committee on Thursday in Grand Junction, with chairman Sen. Pete Domenici, R-N.M., center, and Sen. Orrin Hatch, R-Utah. Salazar called oil shale's prospects "tantalizing."

Oil shale's future: boom or bane?

By Nancy Lofholm
Denver Post Staff Writer

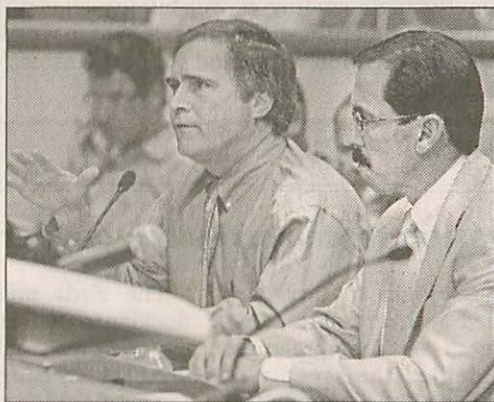
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Grand Junction — Senate Energy & Natural Resources Committee chairman Pete Domenici predicted Thursday that development of the oil in shale and sands under western Colorado and neighboring Wyoming and Utah will "shake the world."

Domenici pointedly repeated that phrase as he led a packed committee field hearing to take testimony on the prospects and pitfalls of oil shale development.

Domenici, R-N.M., linked development of oil shale to patriotism as he lauded Shell Exploration & Production for sinking \$50 million into a research project that could produce 100,000 barrels of oil a day at a cost of about \$30 a barrel if it moves from its current research phase on private lands in Rio Blanco County and into commercial development on federal lands.

Committee member Sen. Ken Salazar, D-Colo., called the prospect of pulling as much as 1.1 trillion barrels of oil from shale "tantalizing," but he cautioned that past experiences "have taught us to be cautious and methodical when others are impatient and frenzied."



Stephen Mut, left, of Shell Oil testifies on Shell's oil shale research, while Chris Treese of the Colorado River Water Conservation District awaits his turn.

"We know that too often we have allowed the whims of non-Western interests to drive our development. We neither control the pace of development nor enjoy its full benefits, yet we pay the greatest costs and assume the greatest risks," he told an audience that was sprinkled with "Go slow on oil shale" T-shirts.

Sen. Orrin Hatch, R-Utah, joined Domenici and Salazar at the hearing.

"North America has a solution that matches the scale of the (supply) problem and is sufficient to meet our demands and needs," Hatch said.

Hatch said he feels that laws such as the Clean Water Act and the Endangered Species Act that have been enacted since the oil shale boom and bust of the 1970s and '80s will ensure the judicious development of oil shale this time around.

Other testimony at the hearing came from county commissioners, state and industry officials and a spokesman for The Wilderness Society.

Russell George, director of the Colorado Department of Natural Resources, warned that "technological and environmental oversight must be rigorous."

He said his department is setting up an oil shale task force to prepare for the pressures of potential oil shale development.

Mesa County Commissioner Craig Meis said that his growing county stands ready to do its part to help the nation's energy crunch, "but we in northwest Colorado will not be a national sacrifice zone."

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As Prices Surge, Oil Giants Turn Sludge Into Gold

Total Leads Push in Canada To Process Tar-Like Sand; Toxic Lakes and More CO₂

Digging It Up, Steaming It Out

By RUSSELL GOLD

CO₂
27 Mar 06
A1

FORT MCMURRAY, Alberta—In February, engineers from French oil giant Total SA fired up colossal drum boilers to generate steam that will be pumped to a depth of 300 feet under the frozen ground here. If all goes well, by May, the steam will marinate a tar-like mix of oil and sand until the crude begins to flow.

Nearby, Total will go after the oil-soaked sands closer to the surface, scraping away an ancient forest of spruce and poplars and shoveling the black soil into two-story dump trucks. Fully loaded, the trucks weigh as much as a Boeing 747. Total will then use in-

Heavy Lifting

Venezuela and Canada jump to the top of the oil patch when extra-heavy reserves are counted along with conventional sources.

In billions of barrels:



dustrial versions of giant washing machines to remove the oil, generating enough liquid waste to create vast toxic lakes.

Heavy-duty oil-extraction projects like these are turning Fort McMurray into the first great oil boom town of the 21st century. A Florida-size section of sandy soil beneath the boreal forest in this sparsely populated area of Northern Canada is loaded with bottom-of-the-barrel petroleum.

These deposits were once dismissed as "unconventional" oil that couldn't be recovered economically. But now, thanks to rising global oil prices and improved technology, most oil-industry experts count oil sands as recoverable reserves. That recalculation has vaulted Venezuela and Canada to first and third in global reserves rankings, although Venezuela's holdings in extra-heavy crude are a rough guess. Saudi Arabia is No. 2. Not including the oil sands, Canada would fall to No. 22. Led by Total, nearly every major Western oil company as well as their Chinese and Indian brethren are gearing up to go after the deposits here. In all, they plan to spend more than \$70 billion in the next decade unlocking the oil from the sand.

The surging interest in Canadian oil sands is stark evidence that the world isn't about to run out of oil. Instead, it is running low on readily accessible light, sweet crude—oil that flows like water, has few impurities and can be easily turned into gasoline. As the good stuff gets scarce, Big Oil is turning its attention and pouring money into extra-heavy crude, such as the giant

Please Turn to Page A15, Column 1

Oil Giants Turn Sludge Into Gold

Continued From First Page

deposits near Fort McMurray and another similar one in Venezuela.

But heavy oil has big economic and environmental drawbacks. It costs more to produce and takes more energy to turn into gasoline than traditional light oil. Recovering and processing Fort McMurray's heavy crude releases up to three times as much greenhouse gas as producing conventional crude. And upgrading it into refined products, such as gasoline or diesel, will require a gigantic investment to retool global refineries.

"The light crude undiscovered today is getting scarcer and scarcer," says Jean-Luc Guizou, president of Total's Canadian operations. "We have to accept the reality of geoscience, which is that the next generation of oil resources will be heavier."

Total is making the biggest bet on heavy crude of any of the half-dozen international Western oil giants. Nearly one-fifth of its commercial reserves are in heavy-oil belts, according to oil consultant Wood Mackenzie, a larger portion than any of its Western rivals. Its stockpile of heavy-oil reserves is second only to that of Exxon Mobil Corp., a company that is more than twice as large. Total has spent years developing the complex technology needed to extract oil from tar sands in the frigid environment of Northern Canada. So much heat is required to separate the oil from the tar that Total briefly floated the idea of building a nuclear-power plant there.

The rush into the oil sands also has turned a longstanding belief about fossil fuels and the environment on its head. For years, environmentalists have argued that higher gasoline prices would be good for the Earth because paying more at the pump would promote conservation. Instead, higher energy prices have unleashed a bevy of heavy-oil projects that will increase emissions of carbon dioxide, suspected of causing global warming.

"As oil prices have gone up, you get this increased desire to get out onto the new frontiers of oil," says Mario Reynolds, executive director of the Calgary-based Pembina Institute, an energy and environment think tank. "We're now getting into the dirtiest sources of oil anywhere." To be sure, rising energy prices have spawned more interest in renewable fuel sources, but those investments pale in comparison to what's going on here.

Canada, which exports more oil to the U.S. than any other country, already is having trouble meeting its pledge to cut CO₂ emissions largely because of its mushrooming heavy-oil production. By 2015, Canada's Fort McMurray region, population 61,000, is expected to emit more greenhouse gases than Denmark, a country of 5.4 million people.

Canada's northern forest contains at least 174 billion barrels of recoverable heavy oil, equivalent to five years' supply for the planet, according to the U.S. Geological Survey.

mining operations. To chase off migratory birds, propane cannons go off at random intervals and scarecrows stand guard on floating barrels.

Alberta's energy minister, Greg Melchin, says oil-sands development creates a minimal environmental disturbance that is outweighed by the opportunities and jobs created. "It's worth it. There is a cost to it, but the benefits are substantially greater," he said.

Environmental groups are increasingly critical of the government's reluctance to regulate the oil sands. "The pace of development is outstripping our ability to manage the environmental issue," says Mr. Reynolds of the Pembina Institute. "Our unwritten energy policy is dig it up and sell it as fast as possible."



Jean-Luc Guizou

and sell it as fast as possible." The remarkable properties of Fort McMurray's oil sands have been known for centuries. Native tribes mixed the tar-like substance with tree sap to waterproof their canoes. In the 1960s, companies now known as Suncor Energy Inc. and Syncrude Canada

Ltd., a consortium of oil companies, opened oil-sands mines in the area. Both operations stumbled through periods of low oil prices but are now rapidly expanding. When oil was trading at \$12 a barrel in the late 1990s, Big Oil had little interest in oil sands. But surging energy prices have made heavy-oil investments significantly more attractive. It costs about \$25 a barrel to produce crude from Canada's oil sands, an acceptable cost when oil is trading for \$60 a barrel. By comparison, it can cost as little as about \$5 a barrel to produce crude in the Middle East and \$15 in the deep waters of the Gulf of Mexico.

For Paris-based Total, the world's fifth-largest publicly traded energy company by market capitalization, the oil sands play to its strengths. Total had its roots as a refiner rather than an exploration and production company. Oil sands were easy to find but hard to process.

Total's first foray into heavy oil was in Venezuela's Orinoco belt. In 1997, the company's giant \$4.2 billion Sincor project there began producing market-grade crude. Sincor, which Total owns with Norway's Statoil ASA and Petróleos de Venezuela SA, now produces 180,000 barrels of oil a day.

The same year, Total opened an office in Calgary to determine if a similar investment was warranted near Fort McMurray. It was soon clear to Total engineers brought in from Sincor that Canadian oil sands were more technically difficult than Venezuela's heavy-oil belt. The key difference was

the geology of Alberta. In Venezuela, the oil was being considered as a byproduct of natural gas. In Alberta, he flew into Fort McMurray, where the oil sands were about 100 feet underground. The industry for years had been looking for the look and feel of conventional oil. When he visited Syncrude's operations, the cranes scooped up 100-gallon buckets capable of holding 100 gallons of oil. He was flabbergasted. "It was a 44-year-old Mr. Guizou."

In some places near Fort McMurray, the oil sands are close to being mined. But at Surmont, 100 feet underground, full-scale steam-assisted gravity drainage operation. The part needed to find a way to pump the oil.

The solution was suggested by a consultant, John Butler, an engineer with an independent company. He had been hired by Exxon Mobil, hit on two wells that started to slowly bend until they were located one on top of the other. The first would pump steam into the reservoir, and the other pumped oil to the surface.

Surmont was to be Total's first venture with the technology. In 1997 they started small-scale pilot. They pumped a pipe lined with millions of dollars worth of material, no wider than the thickness of a pencil. The initial results were promising but expanding into a full-scale operation several more years.

One pressing issue with the oil sands, including Paradigm Energy Ltd., were producing natural gas from shallow underground zones. Total and its partners in Alberta regulatory board. The project threatened the natural gas deposit. The theory was that the gas would be pumped out of the well, but the water would lose pressure.

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will require a gigantic investment to retool global refineries.

"The light crude undiscovered today is getting scarcer and scarcer," says Jean-Luc Guizou, president of Total's Canadian operations. "We have to accept the reality of geoscience, which is that the next generation of oil resources will be heavier."

Total is making the biggest bet on heavy crude of any of the half-dozen international Western oil giants. Nearly one-fifth of its commercial reserves are in heavy-oil belts, according to oil consultant Wood Mackenzie, a larger portion than any of its Western rivals. Its stockpile of heavy-oil reserves is second only to that of Exxon Mobil Corp., a company that is more than twice as large. Total has spent years developing the complex technology needed to extract oil from tar sands in the frigid environment of Northern Canada. So much heat is required to separate the oil from the tar that Total briefly floated the idea of building a nuclear-power plant there.

The rush into the oil sands also has turned a longstanding belief about fossil fuels and the environment on its head. For years, environmentalists have argued that higher gasoline prices would be good for the Earth because paying more at the pump would promote conservation. Instead, higher energy prices have unleashed a bevy of heavy-oil projects that will increase emissions of carbon dioxide, suspected of causing global warming.

"As oil prices have gone up, you get this increased desire to get out onto the new frontiers of oil," says Mario Reynolds, executive director of the Calgary-based Pembina Institute, an energy and environment think tank. "We're now getting into the dirtiest sources of oil anywhere." To be sure, rising energy prices have spawned more interest in renewable fuel sources, but those investments pale in comparison to what's going on here.

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Canada's northern forest contains at least 174 billion barrels of recoverable heavy oil, equivalent to five years' supply for the planet, according to the Alberta Energy and Utilities Board. Venezuela has perhaps even more in the Orinoco River delta. By comparison, Saudi Arabia has about 260 billion barrels of more traditional crude, or 8½ years' global supply, according to the Energy Information Administration, the statistical arm of the federal Department of Energy. Heavy oil also is being produced in the Middle East, the Caspian Sea, Brazil and even in California's San Joaquin Valley.

In northern Alberta, the oil-sands boom is remaking the landscape. The mining operations have clear-cut thousands of acres of trees and dug 200-foot-deep pits. The region is dotted with large man-made lakes filled with leftover waste from the

environmental groups are increasingly critical of the government's reluctance to regulate the oil sands. "The pace of development is outstripping our ability to manage the environmental issue," says Mr. Reynolds of the Pembina Institute. "Our unwritten energy policy is dig it up and sell it as fast as possible."



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The same year, Total opened an office in Calgary to determine if a similar investment was warranted near Fort McMurray. It was soon clear to Total engineers brought in from Sincor that Canadian oil sands were more technically difficult than Venezuela's heavy-oil belt. The key difference: The heavy oil in Venezuela was quite warm and flowed easily, albeit slowly, while in Canada the oil-sand mixture had the look and consistency of tar-like Play-Doh. But Canada was attractive because it offered a haven from politically unstable oil hotspots.

In November 1999, Total teamed up with the financially struggling Gulf Canada Resources Ltd. on a promising project called Surmont. Gulf Canada was later acquired by Conoco Inc. and is now part of Houston-based ConocoPhillips.

For Total, sorting out the mechanics of producing this heaviest of oils fell on the shoulders of Mr. Guizou, a French earth scientist who had worked his way into management from his first assignment studying

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the geology of Argentina. In 2001, when he was being considered for the Canadian job, he flew into Fort McMurray to see what the oil sands were about. Having worked in the industry for years, he was accustomed to the look and feel of oil fields. But when he visited Syncrude's mine, where giant cranes scooped up the oil-soaked earth in buckets capable of carrying 100 tons, he was flabbergasted. "It was another world," the 44-year-old Mr. Guiziou says.

In some places near Fort McMurray, the oil sands are close to the surface and can be mined. But at Surmont, located southeast of Fort McMurray, the oil sands are 1,200 feet underground, far too deep for a mining operation. The partners in the venture needed to find a way to get the oil.

The solution was steam. In 1973, Roger Butler, an engineer with Imperial Oil Ltd., an independent company majority-owned by Exxon Mobil, hit on the idea of drilling two wells that start off vertically, then slowly bend until they are horizontal and located one on top of the other. The top well would pump steam into the reservoir while the other pumped oil out.

Surmont was to be Total's and Conoco's first venture with the technology, so in late 1997 they started small with a 1,000-barrel-a-day pilot. They pumped steam down a pipe laced with millions of tiny slits, each no wider than the thickness of a piece of paper. The initial results were encouraging but expanding into a full-scale project took several more years.

One pressing issue: Several companies, including Paramount Resources Ltd., were producing natural gas from a shallow underground zone above the oil sands. Total and its partner convinced an Alberta regulatory body that the gas project threatened the much larger oil deposit. The theory was that if the gas were allowed to be pumped out, the steam chamber would lose pressure and Surmont

would have to be scrapped. In a landmark ruling, an Alberta regulatory body ordered 146 gas wells shut off in 2000.

In December 2003, Total and ConocoPhillips decided to build the first phase of Surmont. The steaming is slated to begin later this year, with production expected to grow to 27,000 barrels a day next year. Future expansions could bring it to 200,000 barrels a day—a good-size oil field but not the biggest in the area.

At Surmont, Total was merely an investor with ConocoPhillips and its predecessor companies operating the project. Last year, the French company went from being an investor to a full-fledged participant in the oil-sands boom.

In September, it bought Deer Creek Energy Ltd. for \$1.6 billion, acquiring its only significant asset: a giant oil-sands project called Joslyn north of Fort McMurray. Once fully developed, Joslyn is expected to yield 200,000 barrels a day for decades. Total plans to produce oil from Joslyn by both mining and by shooting steam underground.

Becoming an operator, Mr. Guiziou needed to confront environmental problems as Total expanded its heavy-oil holdings in Canada. Mining oil sands generates enormous volumes of liquid waste that are stored in toxic lakes that have concentrations of naturally occurring naphthenic acid, an odorless liquid used to help paint dry quickly. The prospect of cleaning up these lakes is "daunting," the Canadian National Energy Board, a federal regulatory body, noted in a 2004 report. "There is currently no demonstrated means to reclaim fluid fine tailings," it said.

Since the lakes are likely to be around for years to come, Mr. Guiziou is working on a plan that will result in smaller lakes. He hopes to install a new technology at Joslyn that will suck out water and leave a smaller volume of waste laced with metals before it is dumped in the lakes. But he said the technology "needs to be proved at the industrial scale." Total expects to conduct a test later this year at a neighboring facility.

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Total is also trying to figure out ways to curb greenhouse-gas emissions at its Fort McMurray facilities by using pure oxygen instead of air in its combustion engines. The company is running a pilot project in Lacq, France, to capture carbon dioxide in exhaust flues more effectively. If the technology proves workable, it could be used in Fort McMurray as well.

Despite the environmental concerns, there is a strong economic incentive for Alberta's free-market-oriented government to let oil-sands development gallop ahead. Alberta added nearly 26,000 jobs in resource extraction in the past two years. That 25% jump helped drive the province's unemployment rate down to 3.1%, a 30-year low, according to the government. For the first time, every Albertan received a 400 Canadian-dollar (\$340) check from the government earlier this year from an unexpected fiscal surplus.

Total and other oil companies are continuing to announce new oil-sand projects and shovel money into the region. Earlier this month, Chevron Corp. said it planned to spend "billions" to turn 75,000 acres into a 100,000-barrel-a-day field. And last week, Royal Dutch Shell PLC said it had spent nearly \$400 million to lease 219,000 acres west of Fort McMurray, shattering records for public-land leases.

In February, Total moved quickly to file the regulatory permit for Joslyn to move to the front of a growing queue of projects. With all the development, everything is in short supply, including steel, energy to power the projects, fresh water and skilled construction workers.

Some projects could end up being delayed for years. "It's like you've got one door frame and the Three Stooges trying to get through at the same time," said Tom Ebbert, executive managing director of Tristone Capital, a Calgary-based investment adviser. "Without a doubt, we can become the next Saudi Arabia but it will take 10 years longer than the market thinks."

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Total May Use Atomic Power

Alternative to Costly Gas Is Sought for Canada Fields; Fear of Environmentalists

By DAVID GAUTHIER-VILLARS

Dow Jones Newswires

PARIS—French oil giant Total SA, amid rising oil and natural-gas prices, is considering building a nuclear power plant to extract ultraheavy oil from the vast oil-sand fields of western Canada.

This comes as oil prices—driven even higher by Hurricane Katrina and now the threat of Hurricane Rita—are removing lingering doubts about the long-term profitability of extracting the molasseslike form of oil from sand, despite the fact that the output is much more expensive to produce and to upgrade than is conventional crude.

At the same time, prices of natural gas—which oil-sands producers have relied on to produce the steam and electricity needed to push the viscous oil out of the ground—have risen 45% in the past year. That is prompting Total, which holds permits on large fields in Alberta that contain oil sands, to consider building its own nuclear plant and using the energy produced to get the job done.

Despite the attraction of abundant electricity, industrial companies have been reluctant to install nuclear devices, however small, on their premises because of safety and cost concerns. Small nuclear reactors have been used for purposes other than generating commercial electricity, but mainly to power ships—submarines, icebreakers and aircraft carriers, for example.

A notable exception was the Soviet Union, which built four small nuclear reactors at Bilbino, inside the Arctic Circle, in the mid-1970s to operate a gold mine. The plant still is in operation.

Even now, despite wanting to cut production costs, few oil-sands producers have been willing to talk openly about the nuclear possibility for fear of protests from environmentalists. Nuclear power doesn't bring back good memories in Alberta, where in the 1950s U.S. and Canadian scientists looked into the possibility—

later abandoned—of detonating an atomic bomb to bring oil to the surface.

Total would speak about its plan only in general terms. "It's not foolish to look into the nuclear option," Yves-Louis Darricarrère, Total's director for natural gas and power, said in a recent interview. "We have a team looking into it."

Total's interest is the latest sign that nuclear energy is making a global comeback. Finland commissioned a new reactor in 2003, the first such order in Western Europe in 13 years. France has chosen a site in Normandy where a reactor will be built. The U.S. hasn't commissioned a new nuclear plant for three decades, but the industry is talking seriously about a revival, encouraged by the Bush administration and the rising cost of fossil fuel.

In Canada, Total holds half of an oil-sands permit in Alberta and has secured more heavy-oil acreage with the purchase of Deer Creek Energy Ltd., located in the same western province. Total said it plans to invest \$7 billion in Deer Creek, on top of the \$1.4 billion it expects to pay for the company. The company says it could one day produce 200,000 barrels of heavy crude a day, close to 8% of Total's current global output.

Canada's oil sands contain 174 billion barrels of recoverable reserves, the world's second-largest oil resource behind those of Saudi Arabia, according to Canadian government estimates.

Oil sands, a mixture of grit and a tarlike grade of crude oil known as bitumen, were discovered more than a century ago but have been considered economical to produce only in recent years as the price of oil has surged. In addition to nuclear power, producers are considering burning oil-sands residue and coal as alternatives to natural gas to make the steam needed for extraction.

Mr. Darricarrère said a nuclear power plant would help Total comply with tougher constraints on carbon dioxide and other so-called greenhouse-gas emissions. Although they generate toxic, radioactive waste, nuclear reactors don't emit greenhouse gases that scientists believe contribute to global warming.

The government of Alberta said that although there are no nuclear power plants in the province, there is no morato-

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rium on nuclear energy. "We don't favor one form of energy over another," said Alberta Energy Ministry spokeswoman Donna McColl. "We let the market decide."

Atomic Energy Canada Ltd., the Canadian government-owned nuclear-power developer, has proposed building a regional nuclear power plant in northern Alberta to provide electricity and steam to oil-sands projects, according to company spokesman Dale Coffin. He said the proposal has been received with "great interest" by Alberta oil-sands producers.

Still, Jerry Hopwood, Atomic Energy Canada's general manager of product applications, said it would take several years to get a regulatory application on the table. Among other hurdles, any new nuclear project in Canada would face rigorous environmental scrutiny, from both provincial and national authorities.

Such reviews also would apply to any application for a Total nuclear plant. "I'm not confident that the public in Alberta would be supportive of opening Al-

berta to the nuclear industry," said Dan Woynillowicz, an oil-sands expert with Pembina, an environmental policy research institute based in the province.

Mr. Darricarrère said Total is relying on Areva SA, the French state-run nuclear engineering company, to define what type of reactor might suit its needs in Canada. Research is focusing on a dedicated reactor significantly smaller than those used by utility companies to produce electricity for large city grids.

Areva said discussions with Total are centering on a new type of reactor, known as a High Temperature Reactor, with a capacity of around 500 megawatts, about a third of the size of a traditional reactor. Areva also has been approached by other oil companies but discussions are most advanced with Total, Jean-Jacques Gautrot, Areva's director for international operations and marketing, said.

A spokesman for Imperial Oil Ltd. of Canada, an affiliate of Exxon Mobil Corp., which operates some of the

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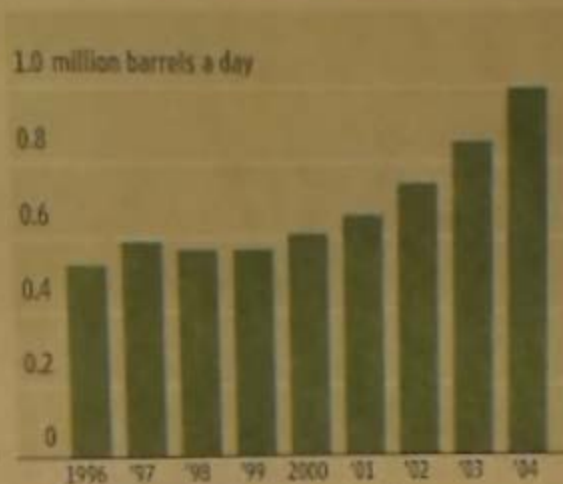
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y," said Dan expert with al policy re- ne province. al is relying state-run nu- ay, to define suit its needs ocusing on a antly smaller companies to re city grids. with Total are e of reactor, ature Reactor, 00 megawatts, f a traditional en approached ut discussions Total, Jean- director for in- nd marketing, rial Oil Ltd. of Exxon Mobil some of the

Pushing for Petroleum

Oil-sands production has doubled...

Canada's production of bitumen and synthetic crude oil from oil sands



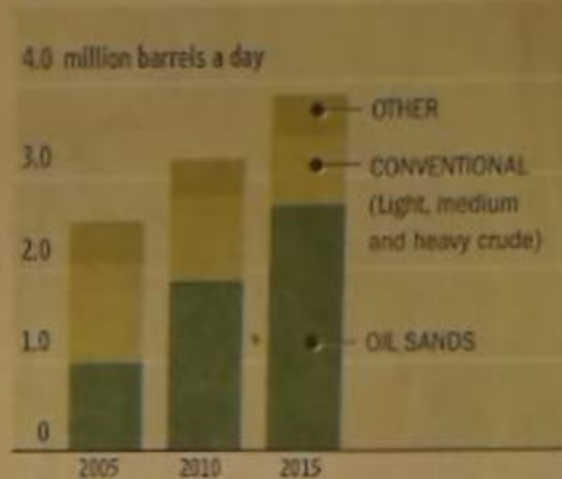
Source: Canadian Association of Petroleum Producers

world's largest oil-sands operations, said it looked into the nuclear option in the past but didn't pursue it because of cost and technology challenges.

Shell Canada Ltd. said it isn't considering nuclear power as part of its oil-

And fast becoming Canada's leader

Canada's projected total crude-oil production



sands plans. Rather, the company said it is looking into the possibility of turning asphaltene, very heavy oil, into gas to save on its natural-gas bill.

—Tamsin Carlisle in Calgary, Alberta, contributed to this article.

Alberta's Draw: Oil Sands

Petroleum-Thirsty Nations and Investors Seek

By TAMSIN CARLISLE

Calgary, Alberta

CHINA, INDIA and other foreign investors are flocking to Alberta to snatch up massive petroleum reserves trapped within the Western Canadian province's oil sands. But the lure isn't just the oil itself.

The foreign investors are also chasing the chance to acquire or develop heavy-oil technology in a world where new big supplies of traditional light crude are becoming hard to find.

Increasingly, the world's oil supply is tilting toward stickler, or "heavier," grades of crude. Typically, heavy-crude deposits are easier to locate than undiscovered light-crude pools, but the oil they contain is more difficult and costly to extract, transport and process into fuels like gasoline and diesel.

The tilt comes as growing global demand, especially from the U.S. and rapidly developing nations like China and India, has led to a doubling of oil prices in about two years. The price gains and advances in squeezing fuels out of heavy oil have made it a more economically viable alternative to meeting the world's growing energy needs.

One of the heaviest types of oil is bitumen, a tar-like crude found mixed with grit in Alberta's oil sands. While oil sands

are found in many countries, Canada's deposits stand out because they are the biggest, consisting of an estimated 1.7 trillion barrels of oil in place, though the amount recoverable depends on further technology improvements and whether oil prices justify the expense of a project. Alberta has become the world's proving ground for emerging technology for extracting and handling ultra-heavy crude at lower cost.

Canadian and international energy companies are prepared to pour as much as 100 billion Canadian dollars (US\$86.7 billion) into oil-sands development over the next 10 years, if all the announced projects are built. Canada's top oil-industry research investors spent a total of C\$272 million on research and development in 2004, according to Research Info-source Inc., of Toronto.

Some of the world's biggest multinational oil companies see opportunities elsewhere for applying oil-sands technology developed in Canada. Total SA of France, for example, is in negotiations with the Venezuelan government over plans to expand an existing oil-sands project in that country. While Venezuela's sands contain heavy oil, which is a less-viscous grade of crude oil than bitumen, Total may seek to apply some of the improved production techniques it is developing in Canada, said company spokeswoman Patricia Marie.

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China Plans to Curb Oil, Coal Use Despite Expected Demand Growth

By SHAI OSTER

BELJING—China, the world's second-biggest consumer of oil, aims to cut its oil and coal dependency and increase its use of alternative-energy sources such as wind, solar and

ergy prices could leave the economy vulnerable to price surges on the global market, potentially sparking inflation and social unrest. Meanwhile, pollution has surged because of the rising numbers of cars on the road and the coun-

ENERGY

Sands, and Technology

Seek Tools for Tapping Heavy-Crude Deposits

sions to Alberta regularly for a couple of decades, but made two modest oil-sands investments only last year. A Chinese government official at the time cited interest in securing both new oil supplies and oil-sands technology.

China's go-slow approach to investment is more consistent with gaining technology than securing supplies for its own immediate needs, analysts say. For one, it is unlikely that much oil will be piped west from Alberta across rugged mountain ranges to Pacific Coast export terminals any time soon. For the foreseeable future, the upper limit to Canadian oil exports to China will be a modest 200,000 barrels a day, or half the capacity of one of two proposed multibillion-dollar pipelines that would carry oil from Alberta's main pipeline hub to a deep-water port in northern British Columbia. The other half of the pipeline's capacity is expected to be earmarked for shipments to the U.S. via West Coast tankers.

The two pipeline proposals are competing for backing from Alberta oil-sands pro-

ducers and other shippers that eventually would cover construction costs through their oil-transportation tolls. Analysts doubt that shippers will risk paying higher tolls by backing two westbound pipelines, at least for another few years.

Peter Zeihan, chief analyst for global economic issues at private-intelligence firm Stratfor, Washington, D.C., believes China isn't likely to seek significant new oil supplies from Canada, partly because of logistics. "There's a reason why the pipelines run south and east from Alberta, not west," he said. More likely, he reckons, China will build pipelines to import more oil from its Asian neighbor Kazakhstan, and that it will invest heavily in new technology for producing and processing its own untapped oil resources.

One area of technology with Chinese involvement is carbon gasification, a process that can use fuels like coal to power oil-sands operations with less polluting sulphur emissions and without burning pricey natural gas, as is currently used.

Heavy Lift

Higher petroleum prices and improved technology have led to increased interest in heavier forms of crude oil. Regional distribution of natural bitumen and heavy oil, technically recoverable as of 2003:

	Bitumen (billions of barrels)	Heavy oil (billions of barrels)
Western Hemisphere	531.0	301.0
North America	530.9	35.3
South America	0.1	265.7
Eastern Hemisphere	119.7	133.3
Africa	43.0	7.2
Europe	0.2	4.9
Middle East	0	78.2
Asia	42.8	29.6
Russia	33.7	13.4
World total	650.7	434.3

Source: U.S. Geological Survey

One project, the proposed C\$10.7 billion Northern Lights oil-sands project, is 60% owned by Synenco Energy Inc. of Canada and 40% owned by China Petroleum & Chemical Corp., known as Sinopec. In a recent presentation, Steve Gilliland, Synenco's executive vice president, operations, said the company plans to invest C\$1.7 billion in bitumen-processing and carbon-gasification at Northern Lights over several years, while roughly

C\$800 million would be spent on oil-sands mining and bitumen extraction.

India and Japan have also recently sent delegations to Alberta to kick tires in the province's oil sands, with both teams visiting provincial government scientists at the Alberta Research Council. During his visit, an Indian government official said India is interested in investing as much as \$1 billion in Canadian oil sands in the next 12 months.

Main Identity

From: "Mark Schofield" <mark@wccongress.org>
To: "'Mark Schofield'" <mark@wccongress.org>
Sent: Thursday, May 18, 2006 11:01 AM
Subject: WCC members - oil shale is coming!

Dear Western Colorado Congress member –

Ready or not, oil shale development is coming to western Colorado. **Please read on to learn about three concrete actions you can take to protect and enhance your quality of life in the face of this threat...**

If you were here for the last oil shale boom and bust of the early 1980's, then you know the disastrous impacts that full-scale development can bring to our communities, our air, and our water.

The federal Energy Policy Act of 2005 directs the Bureau of Land Management (BLM) to move aggressively on commercial leasing of the oil shale reserves in Colorado, Utah and Wyoming as soon as 2007 – long before new technologies, which may ease some of the worst pollution problems, can be evaluated.

Given oil shale development's impacts to land, air, and water, this rush to full-scale extraction spells trouble for communities on the Western Slope. Actually producing energy from this oily rock using existing proven technologies requires open pit mines up to 2,000 feet deep, five barrels of water for every barrel of oil, and the consumption of energy equivalent to at least 40% of the energy ultimately captured from the shale! **Because half of the world's oil shale is within 150 miles of Grand Junction, our region will truly be ground zero for the resulting impacts of development.**

But WCC is not waiting until the impacts arrive. We're starting to organize local residents who don't want another boom and bust imposed on their towns. **Our demand is that if the federal government and corporations are going to proceed with oil shale development, then they must conduct it in a way that protects our communities and environment.**

This is a new campaign for WCC, and it will require fresh resources and leadership from members. Here are three ways you can help get this campaign moving:

1) Spread the word about the new *WCC Oil Shale Organizer* job opening

Western Colorado Congress seeks a full-time organizer for our oil shale campaign. This organizer will implement a two-year campaign to protect community values and environmental health in the face of likely large-scale development of oil shale in western Colorado. A full job description and application instructions can be found at www.wccongress.org. Deadline is June 2nd (or until the position is filled). Please pass this information on to anyone who you think might be interested and qualified.

2) Join the hiring committee for the *WCC Oil Shale Organizer*

WCC members fulfill vital leadership roles in all aspects of the organization, including the hiring of staff. Would you like to be part of the team that reviews candidates and selects a dynamic organizer? If so, please contact Mark at 970-256-7650 or mark@wccongress.org as soon as possible.

3) Attend the June 1st public hearing on oil shale with Senators Salazar and Domenici

In a rare opportunity to interact with several national elected officials here on our home turf, the public can take part in a hearing with members of the U.S. Senate Committee on Energy and Natural Resources. Senator Ken Salazar (CO) and Senator Pete Domenici (NM) will be taking testimony on issues surrounding oil shale development. Please attend to voice your thoughts, connect with other

concerned citizens, and learn more about this looming threat. Here are the details:

Oil Shale Public Hearing with U.S. Senators

Thursday, June 1st

10:00am – Noon

Grand Junction (*exact location TBA*)

For more information, call Western Colorado Congress at 970-256-7650.

Thank you – Mark Schofield, WCC Director of Organizing

Mark Schofield, Director of Organizing

Western Colorado Congress

970.256.7650 - office

970.250.8515 - cell

www.wccongress.org

THE NEW LAND GRAB



Thomas McKay | The Denver Post



Jeff McIntosh | The Associated Press

A truck passes a settling pond last year at the Syncrude oil-sands project in Fort McMurray, Alberta, Canada. Alberta's oil sands are estimated to contain 175 billion barrels of recoverable oil.

Companies are paying record prices for undeveloped land in Alberta to tap huge oil-sands petroleum deposits

By Ian McKinnon
Bloomberg News

D.P.
21 Feb 06
IC

Canada's hottest piece of real estate isn't much to look at, a mix of swamp and scattered spruce and pine trees in northern Alberta.

Underneath the muskeg lie the oil sands, by some measures the world's largest petroleum reserves outside Saudi Arabia. To tap the deposits, companies such as Royal Dutch Shell Plc are paying record prices for undeveloped land. Already this year, the province of Alberta has raised more money from oil-sands leases than the record amount earned in all of 2005.

The oil sands have "become the Beverly Hills of the oil patch," said Gregg Scott, president of Calgary-based Scott Land & Lease Ltd., Canada's biggest land broker. "This is the most high-profile play I've seen in my 24 years as a broker."

Producers such as Shell Canada Ltd., the Canadian arm of Royal Dutch Shell, are searching for new sites to develop oil sands as Asian countries buy more fuel and the U.S. seeks supply alternatives to the Middle East. U.S. Treasury Secretary John Snow toured the oil sands last year, the first visit by a Treasury secretary to Canada in two decades.

Oil companies will spend about \$63 billion U.S. in the next 20 years to boost output in Alberta, according to the province's Energy Ministry. Part of that will be spent on new sites.

Synenco Energy Ltd., developing a \$4.5 billion project with China Petrochemical Corp., also known as Sinopec, kicked off the rush in September by paying a then-record \$65.3 million for 22,763 acres. Calgary-based Synenco paid 3,298 times the minimum price of \$19,780.

"We were quite nervous

> See OIL on 4C



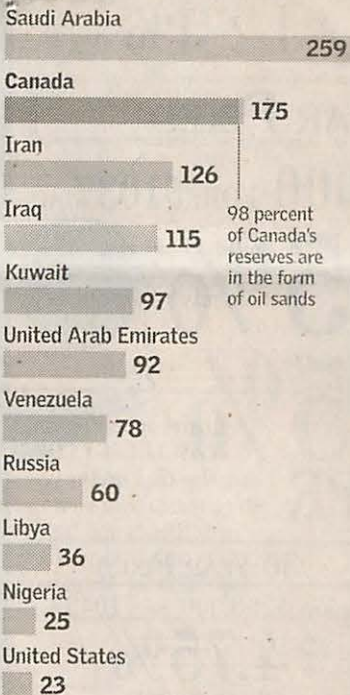
Jerry Cleveland | Denver Post file

"There's a bit of a mentality in the industry that if you don't have the land, then you're short of luck."

Wilf Gobert, vice chairman, Calgary real-estate brokerage Peters & Co., and oil analyst; land rich in oil sands, such as the handful above, is fetching record prices from oil companies.

Global crude-oil reserves

In billions of barrels



Sources: Canadian Association of Petroleum Producers; Oil & Gas Journal

Thomas McKay | The Denver Post

Suncor boosts Colo. refinery for oil sands

By Steve Raabe
Denver Post Staff Writer

Suncor Energy Inc. has placed a \$390 million bet that doughy Canadian oil sands will play a key role in Colorado gasoline supplies.

That's the amount Suncor is spending at its Commerce City oil refinery to meet new environmental regulations and to increase its capacity to process oil sands from Alberta.

Suncor is Canada's second-largest producer of petroleum from oil sands.

Improvements at the Commerce City refinery will enable Suncor to increase oil-sands refining from the current 8,000 to 9,000 barrels per day to 15,000 barrels per day, and also process oil sands with higher sulfur content than the refinery can handle.

Upon completion of the project, up to 17 percent of the refinery's 90,000-barrel-a-day capacity will come from oil sands. The remainder comes from Colorado oil fields and conventional crude oil in Canada.

Suncor last year purchased the Valero Energy refinery, also in Commerce City. The combined facility, the only refinery in Colorado, supplies about 35 percent to 40 percent of the state's gasoline and diesel fuels.

Staff writer Steve Raabe can be reached at 303-820-1948 or sraabe@denverpost.com.

OIL: Companies snap up Alberta land

< CONTINUED FROM 1C

about it," said Todd Newton, Synenco's 43-year-old president.

He found out Synenco got the land after hearing "a loud whooping sound" from the desks outside his office, where employees were monitoring the government website.

That exuberance hasn't abated. A record for a land package was set Feb. 8, bringing Alberta's total for oil-sands land sales to \$736.3 million from three auctions this year. That eclipsed the old record of \$376.7 million set in 2005 from 21 auctions, according to provincial government data.

Alberta's tarlike reserves cover an area almost as big as Florida. The oil sands, about 500 miles north of Calgary, are estimated to contain 175 billion barrels of recoverable oil, second only to Saudi Arabia's 259 billion barrels, according to the Canadian Association of Petroleum Producers. The oil sands have helped Canada become the biggest supplier of oil to the U.S.

Producers and land agents, used by some companies to disguise their identities, paid \$754 per acre for leases this year, almost double the amount paid last year.

Oil-sands output in Alberta is forecast to triple to about 3 million barrels a day in the next nine years, according to a report from Calgary brokerage First Energy Capital Corp. in December. That would almost equal the current output from OPEC members Algeria and Libya combined.

Compared with multibillion-dollar investments to build a mine and a refinery, land is the cheapest cost for oil-sands projects, said Wilf Gobert, vice chairman of Peters & Co., a Calgary brokerage.

"There's a bit of a mentality in the industry that if you don't have the land, then you're short of luck," said Gobert, an oil analyst for more than 30 years.

Some clients were "blown away" after losing land auctions to bids triple their offers, land broker Scott said. Some properties sold this year aren't in areas with proven output, so the land rush depends on owners being able to economically produce oil from these leases, he said.

If the deposit is less than 250 feet underground, the oil can be extracted through strip mining, which can cost \$21.75 a barrel, compared with \$10.44 for traditional pumping. If the reserves are deeper, companies inject

steam into the ground to soften the heavy oil, or bitumen, to extract it.

Companies are more willing to use the expensive methods because they're confident the projects will be profitable as rising demand boosts prices, Gobert said.

Most oil-sands deposits are economically feasible as long as oil prices are higher than \$30 a barrel. A barrel of crude oil cost \$61.48 on London's ICE Futures exchange at Monday's close. U.S. markets were closed Monday because of the Presidents Day holiday.

Even if these projects are never developed, there is one clear winner from the land auctions: the Alberta government and the province's taxpayers.

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A GRASSROOTS

May 2006

Dear Western Colorado Congress member,

Whether you love to visit western Colorado's pristine mountains, have settled here recently, or have called it home for generations, you know that our region is rich with natural beauty, abundant in opportunity, and steeped in community values of neighborliness, where clean air and pure water are a fixture.

Today, however, a voracious energy industry (along with the politicians it supports) is rapidly destroying our traditions and our quality of life. Yet your organization, Western Colorado Congress, is bringing together more people like you to sustain hope and to keep our dream alive.

For a quarter century, Western Colorado Congress (WCC) has upheld the belief that a prosperous future for our region is predicated on sustainable use of resources, protection of air and water, democratic decision-making, and basic fairness.

Unfortunately not everyone shares this vision. With the likely resumption of large-scale oil shale development, WCC is facing an immense new challenge. In response, we must increase our collective power to promote a more just, sustainable Western Slope. We need your additional financial support now.

A tale of shale

Even if you didn't live in western Colorado back in 1982, you've probably heard about it—Black Sunday. That was May 2nd, the day that Exxon closed the doors on its massive Colony oil shale operation and laid off thousands of workers. That bust created an economic shock wave that swept over the entire region and devastated local communities.

That was then...but will tomorrow's oil shale development be any different? With the price of oil climbing skyward, western Colorado appears to be headed down a distressing path toward rapid development of this expensive, dirty, and hard to access resource.

The federal Energy Policy Act of 2005 directs the Bureau of Land Management (BLM) to move aggressively on commercial leasing of the oil shale reserves in Colorado, Utah and Wyoming as soon as 2007—even though Shell Oil, the industry leader in oil shale technology, has stated that it does not believe it will know if oil shale will be commercially viable for at least **another five years**. This bill allows a company to hold up to 50,000 acres of oil shale leases in a state, a tenfold increase over previous Mineral Leasing Act limits. The bill also encourages the Department of Interior to transfer public lands to corporations for oil shale development through land exchanges.

Community Alliance of the Yampa Valley • Routt County
Concerned Citizens Alliance • Mesa County
Grand Valley Citizens Alliance • Garfield County
Ridgway-Courty Community Council • Ouray County

Sheep Mountain Alliance • San Miguel County
Uncompahgre Valley Association • Montrose County
Western Colorado Action Network • Mesa County youth
Western Slope Environmental Resource Council • Delta County

WCC is a member group of the Western Organization of Resource Councils and Community Shares of Colorado

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PO Box 472
Montrose, CO 81402
(970) 249-1978; (970) 249-1983
www.wcccongress.org
info@wcccongress.org

By rushing to commercial leasing, the federal government is promoting older, failed technologies such as strip mining and retorting (cooking) the shale rather than the newer, less invasive technologies that still are being developed in the industry. To meet the 2½-year deadline for commercial oil shale leasing, the Energy Bill requires the BLM to prepare an environmental analysis of a new commercial oil shale program as soon as possible. The BLM will have to analyze the impacts of oil shale development prematurely, without knowing what technology the industry will use!

Given oil shale development's impacts to land, air, and water, this rush to full-scale extraction spells trouble for communities on the Western Slope. Producing energy from this oily rock using existing proven technologies requires open pit mines up to 2,000 feet deep, five barrels of water for every barrel of oil, and the consumption of energy equivalent to at least 40% of the energy ultimately captured from the shale! Because half of the world's oil shale is within 150 miles of Grand Junction, our region will truly be ground zero for the resulting impacts of development.

But WCC is not waiting until the impacts arrive. We're starting to organize local residents who don't want another boom and bust visited on their towns. **Our demand is that, if the federal government and corporations are going to proceed with oil shale development, then they must conduct it in a way that protects our communities and environment.**

WCC is taking the lead among our allies to confront this ill-conceived plan. For this new initiative, we have an \$84,000 budget in 2006. That includes salary and overhead for a full-time organizer who will focus solely on meeting the oil shale threat to Western Colorado.

Of our \$84,000 budget, we need to raise \$12,000 from our existing members. **Can you help us? The sooner we raise this amount, the sooner we can hire a full-time person and get to work! Only through the generous support of members like you can we move forward with this endeavor. Please make a special contribution today of \$100, \$200, or whatever you can afford.**

Meanwhile, WCC members like you are making a difference in other areas and I've provided several updates in the remainder of this letter. I want you to know that, even while an oil shale boom threatens, we continue to confront the other issues that WCC members consider a priority.

Nothing more precious than water

Like me, you might often take the quality of your municipal drinking water for granted. The tap turns on, the glass fills up, your thirst is satisfied. But for residents of Palisade and Grand Junction, this simple daily ritual is taking on new meaning.

In February, the Bureau of Land Management (BLM) leased rights for drilling gas wells in thousands of acres of land owned by the city of Grand Junction and the town of Palisade in both towns' watersheds. WCC joined and supported the Palisade town council, Grand Junction city council, Rep. John Salazar, and Sen. Ken Salazar in protesting this ill-conceived lease sale. As of this writing our protest is still pending.

The BLM isn't stopping there. The agency recently revealed plans to lease hundreds of additional acres in the town of Craig's municipal watershed during the May lease sale. One parcel is actually underneath Elkhead Reservoir, a source of water for the town. In their rush to develop energy resources the BLM seems to have left their common sense behind.

WCC is now engaging a new group of member-leaders who understand that water is the foundation of life and is our communities' most valuable resource in this arid Western landscape. Together, we are formulating effective strategies and taking necessary actions to ensure that toxic chemicals don't find their way into our communities' water supplies.

Being good neighbors shouldn't be so hard!

If you live in one of western Colorado's many small communities, you understand that being a good neighbor comes with the territory. In many cases, oil and gas industries coming in from other states and other countries don't seem to know how to be a good neighbor.

During this current gas drilling crush, landowner rights are taking a back seat to energy companies' drilling plans. At issue are split-estate lands, where an individual or family may own the surface of the land, but another entity, like the federal government or an energy company, owns the mineral rights below the surface.

All over Colorado gas developers are drilling on private property without first crafting a fair surface use agreement with the landowner, turning their once rural setting into an industrial area. And the costs borne by landowners have been significant: direct health impacts, new roads plowed through the middle of irrigated fields, loss of property values, etc.

That's why WCC members have made a strong push this year to pass a surface owner rights bill in the Colorado legislature. We formed a formidable coalition with homebuilders, realtors, and other diverse groups to support this legislation. We worked closely with our state legislators to craft a bill that would be a real advance for landowners. Though no bill passed in the 2006 session, WCC did get closer to successful legislation than ever before and made it a state-wide issue that elected leaders just could not ignore. **And we will not rest until landowners get the justice they deserve.**

Saying yes to a sustainable energy future

Not content to simply bemoan the miserable state of U.S. energy policy, WCC members are working at the grassroots level right now to secure a clean, safe energy future. WCC's Grand Junction-based college and young adult group, WeCAN (Western Colorado Action Network), will soon install at least 10 kilowatts of solar energy capacity at Mesa State College. That's enough clean, renewable energy to power the college radio station (or four average homes), while preventing the annual emission of 68,000 lbs of carbon dioxide and 270 lbs of nitrogen oxides.

WeCAN members raised tens of thousands of dollars for the purchase of photo-voltaic (PV) panels and other equipment. They've also effectively worked to convince the college

administration that this project is worthy of their support—not a tough sell, given that the sun-derived energy will be saving the school nearly \$82,000 over the guaranteed life of the solar panels.

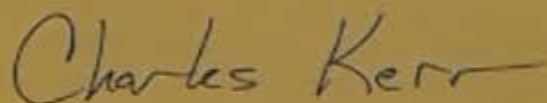
This solar student movement will produce not only kilowatts, but also skilled campaign leaders ready to take the next steps in forging a sustainable energy future.

Time to organize!

Whether it's proposed gas drilling in our municipal watersheds, oil and gas companies running roughshod over the rights of landowners, or the head-long rush to devastating oil shale development, western Colorado is experiencing injustices and environmental degradation at a level not witnessed before.

But this is no time to despair. It's time to organize! And that is exactly what neighbors across western Colorado are doing...getting together to decide what kind of communities we want to live in, and then getting to work on making that vision a reality. Thank you for your membership in WCC. **Please make a special and generous contribution at this time towards our oil shale campaign. Help us meet our goal of \$12,000 from our members towards our \$84,000 budget and allow us to hire a full-time organizer to lead this effort.** Thank you for sustaining our work at this critical time.

Sincerely,



Charlie Kerr, President
Western Colorado Congress

P.S. Not every member will be capable of responding to this special appeal. If you are able to give \$100 or more, that will significantly contribute to our \$12,000 goal! We are grateful for your continued annual dues and participation, as well as for special donations in any amount.



western views

WRA CONDEMNS OIL SHALE LEASE PLAN Almost 2.5 Million Acres of Public Land Are at Stake

by Nicole Theerasatiankul, Development and Communications Coordinator

On March 20, 2008, WRA led a coalition of 23 conservation groups in opposing the plan by the Bureau of Land Management (BLM) to open up almost 2.5 million acres of public land in Colorado, Wyoming, and Utah for industrial oil shale and tar sands development. The BLM plan would prematurely permit

commercial leasing of public lands for oil shale and tar sands development before completion of industry research to accurately assess the social, economic, and environmental impacts of these proposed developments, and in the case of oil shale, ahead of the development of technology that can even extract it.

Additionally, large-scale oil shale and tar sands development would require up to 10 new coal-fired power plants, thwarting efforts to reduce greenhouse gas emissions. These power plants alone would consume almost as much water each year as all of metro Denver, straining municipal water supplies and permanently altering the agricultural economy of the three states.



PHOTO: ISTOCK

The BLM plan would permit commercial leasing of public lands for development before completing industry research to assess social, economic, and environmental impacts.

Oil shale and tar sands development, if approved, will consume great quantities of energy and scarce water resources, compromise air quality, release large amounts of greenhouse gasses during production, destroy wildlife habitat, diminish recreational opportunities and have negative consequences that will be felt on a local, regional, and national level.

Oil shale deposits in Wyoming and Colorado are sedimentary rock layers that are infused with a compound called kerogen from which petroleum products can be derived. The tar sands of Utah are layers of sand or clay that contain bitumen, a thick, gooey precursor to crude oil. Both resources are more difficult to extract than regular crude oil and cause even greater environmental impacts.

The BLM's plan is awaiting review by the U.S. Congress. WRA remains committed to protecting the West's land, air, and water from the unnecessary risks of oil shale and tar sands development. We invite you to read the comments and other related material at www.westernresourceadvocates.org.

With the Bear River's Fate at Stake, Ogden Improves Water Conservation

by Nicole Theerasatiankul, Development and Communications Coordinator

Western Resource Advocates and the Utah Rivers Council (URC) worked tirelessly — and successfully — to convince the City of Ogden, Utah, to adopt a more aggressive approach to its water management. Beset with aging and leaky water infrastructure, high residential water consumption levels, and plans to dam the Bear River to solve its water demand woes, the City of Ogden acted to adopt an improved water rate structure to both drive down demand and raise more capital for water system repairs. Because of this measure, the Bear River

should be able to remain a free-flowing river, a scarce commodity in Utah.

For more than two years, WRA and the URC met with the staff of the Ogden Public Utility and members of the Ogden City Council, provided sample rate plans and analysis, and educated the public on the benefits of the new water rate structure. The city's strengthened increasing block rate structure assigns the most cost to those who place the highest burden on water supplies and rewards those who use water efficiently. The improved water rate



Avocets in the Bear River Migratory Bird Refuge.

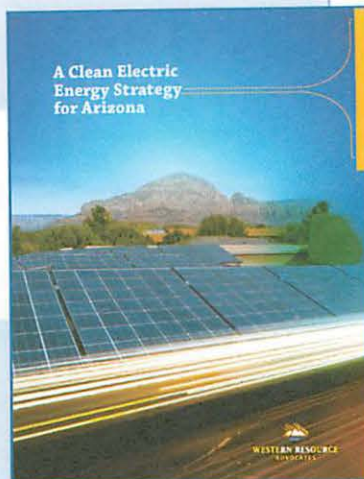
PHOTO: U.S. FISH AND WILDLIFE SERVICE

structure better reflects the true value and cost of water in the arid West.

The WRAP Up

WESTERN RESOURCE ADVOCATES NEWS IN BRIEF

- ▶ WRA's David Berry wrote *Investment Risk of New Coal-Fired Power Plants*, which shows that **projections given to investors often underestimate the costs of new coal-fired power plants**, leading to adverse financial consequences. The report advises that renewable energy sources may be less vulnerable to cost surprises and equally effective in meeting energy demands.
- ▶ WRA released the report **A Clean Electric Energy Strategy for Arizona**, demonstrating Arizona's electricity demand through 2025 can be met reliably and cost effectively with renewable energy, increased energy efficiency, natural-gas-fired generation and advanced fossil fuel technologies with low CO₂ emissions.
- ▶ WRA is working to speed approval of Arizona Public Service's contract to purchase clean energy from a 280-MW **central solar power** project, significantly advancing the use of this technology in the U.S.
- ▶ WRA played a central role in the development of amendments to **energy efficiency legislation** in New Mexico. The amendments call for utilities to deploy *all* cost-effective demand-side management tools and also establish aggressive energy efficiency requirements.
- ▶ Sierra Pacific Resources confirmed it was **delaying plans to develop the coal-fired Ely Energy Center** in Nevada. This delay was spurred primarily by Senator Harry Reid's aggressive stance against any new coal plant development in the state, as well as rising coal plant construction costs, increased public awareness, uncertainties of future carbon regulation, and opposition to the plants by WRA's Nevada office, local partners in Nevada, and our Western Clean Energy Campaign (WCEC).
- ▶ WRA continues to work with state policymakers and regulators in the West who are developing a **regional CO₂ cap-and-trade program** for a subset of states in the western United States. WRA developed a cap-and-trade design alternative that avoids many of the complexities of other designs that arise in a regional cap-and-trade program where all states are not participating.
- ▶ WRA partner The Western Clean Energy Campaign collaborated with Navajo group Diné Citizens Against Ruining our Environment (Diné CARE) to release a report entitled **Energy and Economic Alternatives to the Desert Rock Energy Project**. While the Navajo Nation continues to press forward with the coal-fired Desert Rock Energy Project, it recently announced a joint venture with Citizens Energy Corporation for a 500-MW wind power project, due in large part to the report and the organizing efforts of Diné CARE.



- ▶ The federal government rejected the State of Colorado's recommendations to **improve the BLM's Roan Plateau management plan**. The Roan Plateau in western Colorado is a unique area unusually rich in wildlife species. Regional mayors have complained that the gas industry finds "no place is too special for your drilling rigs." WRA is now focused on challenging the plan and any proposed oil and gas leases in federal court.

anyon ablaze in fall color, Roan Plateau. 2003, Colorado Environmental Coalition

Xcel Energy's Resource Plan Headed in Right Direction

by Nicole Theerasatiankul, Development and Communications Coordinator

Western Resource Advocates supports Xcel Energy's proposed Colorado Resource Plan, which will halt the growth in the company's greenhouse gas (GHG) emissions and begin to bring them down. Xcel aims to accomplish this all while continuing to reliably meet Colorado's growing electricity needs. The reductions will contribute to the goals set forth in Governor Ritter's Climate Action Plan.

Key elements of Xcel's plan include retiring two coal-fired power plants located in Denver and Grand Junction, substantially expanding customer energy efficiency programs, and accelerating its use of renewable energy. By 2015, it is expected over 15% of the company's electricity sales will come from renewable resources, exceeding Colorado's Renewable Energy Standard.

WRA has reviewed many utility resource plans. This is the first utility plan we have seen that would actually reduce GHG emissions.

Xcel Energy's plan, awaiting approval by the Colorado Public Utilities Commission, represents a major shift away from the utility's past operations. Since its founding over 15 years ago, WRA has reviewed many utility resource plans in states across the West. This is the first plan we have seen that would actually reduce GHG emissions.

WRA's Energy Program Director John Nielsen calls Xcel's plan "precedent-setting," remarking that the "plan will hopefully serve as a model for other utilities on how they can affordably and reliably meet growing demand for energy while at the same time addressing the pressing problem of global warming."



Continued on back cover

Tom Darin by *Andria Bronsten, Human Resource Director*

In the one year attorney Tom Darin has been at Western Resource Advocates, he has become the "go-to" guy in the world of western energy transmission, focusing on the infrastructure of power lines that carry electricity from generation plants to homes and businesses.

"I like working toward solutions. Smartly planned transmission will play a role in bringing wind, solar, and geothermal energy sources onto the power grid."

In 2007, WRA created an energy transmission program called "Smart Lines for the West." The goals of the program are to ensure that increasing energy use efficiency is used as a tool to meet growth in demand,

new transmission lines connect to renewable and clean energy sources and that new transmission corridors adequately protect the region's outstanding landscapes and wildlife resources. A year later, Tom's work in this area has caught the ear of two House Natural Resources subcommittees — the National Parks, Forests and Public Lands, and the Energy and Mineral Resources — in front of which Tom testified in mid-April.

"I like a good challenge," says Tom. "I like working toward solutions. Smartly planned transmission will play a role in bringing wind, solar, and geothermal energy sources onto the power grid. Perhaps my favorite aspect is bringing both the utility and renewable energy industries together with the environmental community to ensure a smooth transition to the new energy economy in the West."



Growing up in Illinois, Tom fell under the spell of the West during fishing trips in Yellowstone with his father. He fulfilled his dream to relocate to the West when he moved to Montana to work for the National Wildlife Federation, and later to Wyoming as a public lands attorney, first for the Wyoming Outdoor Council and then for the Jackson Hole Conservation Alliance. Tom moved to Boulder in 2007 with his wife, Hope Sieck, and daughter, June. Their son, Jackson, arrived on Leap Day 2008.

Shaping the future of renewable energy and the developing new technologies for both energy storage and transmission are important tasks. With an eye to his two young children and their future, Tom understands the importance of our energy legacy. WRA is impressed and excited with Tom's work!

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www.westernresourceadvocates.org

Aveda Honors WRA With Earth Month Partnership

by *Nicole Theerasatiankul, Development and Communications Coordinator*

In the 1960s, a senator from Wisconsin traveled around the United States on "conservation tours" in hopes of bringing attention to environmental issues. What Senator Gaylord Nelson found on his travels was that "the people were concerned, but the politicians were not." Inspired by the anti-war demonstrations of the late 60s, Senator Nelson believed that aligning people's environmental concerns with the power of public demonstration would finally put environmental issues on the national agenda. He announced that, in the spring of 1970, there would be a one-day national grassroots demonstration expressing the public's environmental concerns. It succeeded beyond the Senator's wildest dreams: 20 million demonstrators across the United States gathered on behalf of the environment on April 22, 1970 for the first Earth Day.

By Earth Day's 20th anniversary in 1990, over 200 million people in over 141 countries were promoting the importance of environmental issues on the global agenda. Among the growing crowd were new-found Earth Day supporters at the Aveda Corporation. For Aveda, what began as a day of support for environ-

mental consciousness in 1990 has now turned into a month-long international effort to raise awareness, educate customers, and contribute funds to promote a healthy environment. Aveda has grown into a global corporation that is dedicated to an ethical approach to business, which includes a steadfast commitment to addressing environmental issues.

AVEDA

the art and science of pure flower and plant essences

For 2008, the Aveda Corporation's Earth Month campaign focused on water conservation, and Western Resource Advocates was proud to be named as one of 21 international Earth Month partners for a second year in a row! Throughout April, 133 salons across the Rocky Mountain region held charity events to benefit our water program, which focuses on meeting human water needs while also protecting the West's rivers, streams, and aquifers. Finding this balance is especially challenging and important in the arid Southwest, where population is rapidly increasing.

Local Aveda Salons and Spas engaged in cut-a-thons, Earth Day parties, gift basket raffles, silent auctions, and even a raffle for a brand new Prius hybrid car to raise funds for Western Resource Advocates. Aveda's grassroots support not only brought in funding, but also brought recognition for WRA and its mission.

WRA thanks Aveda and all its partner salons and spas for their work on a very successful Earth Month!

Timothy Tobin, a handyman living in Boulder, won the Prius raffle with the purchase of just one lucky ticket.

In this issue

BLM Plan Opposed

WRA condemns reckless oil shale proposal.

Ogden Opts for Conservation

Increased water efficiency avoids damming Bear River.

Xcel Energy

Xcel Energy supported for making progress cutting its greenhouse gas emissions.

Earth Month

Aveda Salons and Spas embrace grassroots action for Earth Month by raising funds to support WRA's water program.

Meet WRA's Tom Darin

Tom is focusing on an often overlooked part of the clean energy picture: energy transmission.

The WRAP Up

WESTERN RESOURCE ADVOCATES NEWS IN BRIEF

Continued from inside

▶ WRA is appealing a decision by the State of Utah to deny citizen input on allowing the industrial development of 33,000 acres of the bed of Great Salt Lake. At issue are plans to increase the extraction of minerals from the lake and its impact on water quality. At the center of the debate is a numeric **water quality standard in the Great Salt Lake for selenium**, a mineral that causes reduced hatches and embryonic deformations in bird eggs at certain levels. The state and industry are attempting to secure a standard that would allow for 10 percent mortality among water bird eggs, a level WRA considers too high for an essential stop for migrating birds on the Pacific flyway.

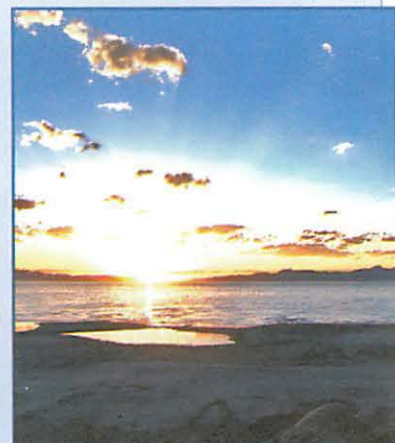


PHOTO: ISTOCK

▶ WRA Energy Program Director John Nielsen co-authored an article with Energy Program Lead Attorney Steve Michel for *The Electricity Journal*, the leading policy journal for the U.S. electric power industry. The article proposed a simplified yet **more efficient version of cap-and-trade policy to reduce greenhouse gas emissions** produced by power generation.

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