An empire from a tub of goo

How did the quest to retrieve the treasure hidden beneath huge swaths of northern Alberta go from fool's errand to monumentous payoff?

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Murray Smith remembers what happened on the morning of April 9, 2003, the way other Canadians remember Paul Henderson's miracle goal against the Russians. For Mr. Smith, then Alberta's energy minister, the big score was a letter from his federal counterpart south of the border. It was about the oil sands – a resource that had long been underestimated at home and almost ignored internationally. No more, U.S. energy secretary Spencer Abraham wrote. From now on, when the Americans talked oil, they would be counting the reserves sitting beneath the forests of northern Alberta.

Mr. Smith had grown up among the oil rigs of central Alberta and bought his first share in an oil company when he was 11 by collecting his older brother's beer bottles. He had also spent much of his adult life in the oil patch and understood more than most the significance of Mr. Abraham's message. The endorsement from the world's hungriest oil consumer was like winning an Oscar. Keen to reduce its dependence on the Middle East, the U.S. was officially acknowledging for the first time that the tarry mud around Fort McMurray could be turned into gasoline, diesel and heating fuel at a profit.

The world finally was acknowledging what Albertans had been saying for decades: that their oil sands rival any source of crude on Earth. “If you took all the oil in the south of the United States and all the oil in Alaska and all the oil in Mexico,” Mr. Smith points out, “it doesn't hold a candle to Alberta.”

With rising prices and prospects of a Mideast war prompting concerns about the security of the U.S. supply, media giants from CBS's 60 Minutes and The New York Times flocked to the tale of an oil bonanza so close to home. Enthusiasts outnumbered the skeptics and the phrase “second only to Saudi Arabia” went from speculation to conventional wisdom. Alberta had become a bankable star in the global oil game.

Or as Mr. Smith jokes: “It only took 40 years to become an overnight success.”

A decade earlier, the oil sands had resembled a massive boondoggle, backed by only a few believers who struggled to attract capital for faltering projects. And now the race to profit off that pile of dirt spread across an area the size of Florida is transforming the country.

Now, oil production in northern Alberta is expected to quadruple to more than four million barrels a day by about 2020, if all the projects proposed go ahead. Virtually every major oil company in the Western world has picked up a piece of the action, investing nearly $90-billion to create what promises to be the biggest industrial project on Earth and sparking predictions that Canada will become what Prime Minister Stephen Harper calls an “energy superpower.”

The oil sands are seen as a crucial source in a world of increasingly tight supply, where many reserves are in politically volatile regions controlled by undemocratic states. Put another way: Should they disappear tomorrow, one industry expert estimates, the price of oil could jump a third to $130 a barrel.

The value and importance of the oil sands will make that much harder the choices that Albertans and all Canadians suddenly face. Canada has now become a major-league merchant of one of the most desirable – and dirtiest – sources of energy. The money is flowing in, and the profits are rolling out – good news for stockholders, the Canadian dollar and government coffers.

But there are environmental and social costs to stuffing our pockets while the oil speeds south. And Canadians will have to answer a question already being asked by many Albertans: When does a boom become a burden?

The wrinkles are beginning to show. The growing wealth of Alberta has aggravated the cleavage between Central Canadian assumptions and Prairie assertions, between haves and have-nots. The soaring Canadian dollar – viewed more and more as petro-currency – has savaged the Central Canadian manufacturing and forestry industries. The economy is increasingly concentrated on oil, which can be a fickle commodity. As people flock to the province, escalating housing costs have squeezed everyday Albertans and overburdened public services, most acutely in Fort McMurray, where men and women come to work but not to settle.

And it is far from certain that the bullish assumptions about development will pan out. There are at least two major hurdles: the growing protest at home and abroad over the massive environmental toll and a serious shortage of workers to build all those multibillion-dollar projects.

Before beginning to discuss how best to manage this mixed blessing, Canadians may wonder just how they created an empire from a tub of goo.

The road to riches

Oil does not sprout like geysers from wells in northern Alberta. It is trapped in the mud, in the form of bitumen, a thick, pasty hydrocarbon that native people once used to seal their canoes. (The Bible says Noah did the same to waterproof the Ark.)

Early explorers predicted that one day the sands would prove useful. In 1789, Alexander Mackenzie described how the banks of the Athabasca seeped oil into the river. A century later, a member of a delegation that had come to negotiate a land treaty wrote:

“That this region is stored with a substance of great economic value is beyond all doubt, and when the hour of development comes it will, I believe, prove to be one of the wonders of Northern Canada.”

The hour of development took more than a century to arrive. A tour of the oil sands in the early 1990s would have found only two companies trying to make a go of it and close to wishing they had not bothered. Suncor Energy Inc., partly owned by the Ontario government, had started first, along a stretch of the Athabasca River in 1967. “No other event in Canada's centennial year is more important,” Alberta premier Ernest Manning declared on opening day.

But despite all the cheerleading, the project was “a leap of faith,” says Paul Chastko, a University of Calgary historian and the author of Developing Alberta's Oil Sands. “It was based on this calculation that we don't necessarily need this resource today, but we may need it in some deep, dark distant day in the future.”

A tantalizing treasure lay in wait underground; digging it up with commercially untested methods and still managing to turn a profit was the challenge. And by 1990, after decades of technical hiccups and economic volatility, opening-day optimism had long since flagged. The Suncor mine was plagued by fires and machinery that constantly broke down in cold weather. The situation wasn't much better down the river at Syncrude Canada Ltd., a consortium of U.S. and Canadian companies that had started producing oil in 1978.

Crude prices had recovered from the disastrous lows of the mid-1980s, but were still hovering around $20 (U.S.) a barrel. The cost of production at both operations was not much below that. It was understood, one Suncor former executive recalls, that the company might have walked away then and there, were it not for the billions spent in capital costs and the mammoth environmental liability it had created, most of which was waste water sitting in vast ponds created next to the Athabasca River.

Rick George recalls his first trip to Fort McMurray as the new chief executive officer of Suncor, which The Globe and Mail had dubbed “the unluckiest company in Canada.” It was 1991, and Mr. George, an American who had come to Canada from the booming North Sea oil industry, found himself running an operation dogged by negative politicking and lumbering technology.

“I can remember coming over the horizon and looking at that plant for the first time, and I did wonder what I had got myself into,” he says. “But I'm a very optimistic person. I thought we could make a difference and the people here have executed way beyond anything I ever imagined would happen.”

It was no easy feat. Unlike the vast majority of the world's bitumen reserves, the first sites being developed around the Athabasca are shallow enough to mine from the surface, although this still requires a great deal of energy and labour.

To put the situation in context, Alberta writer David Finch, the author of Pumped: Everyone's Guide to the Oil Patch, suggests this experiment: “Take molasses out of your kitchen cupboard, put as much sand in there as molasses, stir it up, and then put it outside where it gets cold and thick and won't flow – well, that's what the tar sand is like. It's extremely hard to work with, and it wrecks all your equipment.”

The muddy dirt clogs gears and conveyors; the sand corrodes pipelines. To mine bitumen, the land must first be cleared and drained. Clumps of sand are shovelled out and then mixed with water and heated, to force the hydrocarbon to rise to the top. It is then processed in an “upgrader” to produce synthetic crude before being sent to a refinery and turned into gasoline and heating oil.

Estimates vary, but environmental groups says it now takes two to four barrels of fresh water from the Athabasca plus 750 cubic feet of natural gas and about two tons of oily sand to produce one barrel of oil. The process produces two to three times the carbon emissions of a conventional oil well and creates toxic waste water, called tailings, that cannot be allowed back in the river.

To expand profitably, the companies needed to have two things happen: The technology had to improve and the price of oil had to go up. In the early 1990s, a simple switch helped to solve the first problem. Companies went back to using enormous dump trucks – as big as a two-storey house – to haul out the sand, rather than conveyer belts, which were difficult to move when needed and often froze in the northern cold. At Suncor, this yielded immediate results: Energy requirements were reduced by 40 per cent and the overall cost per barrel was slashed by several dollars.

Syncrude also fared better after it figured out how to transport the bitumen more cheaply by sending it through pipes as a watery slurry. Even with the price of oil bouncing around $20 a barrel, the improvements were enough for both companies to turn a profit. But to the rest of the world, the oil sands might as well have been on another planet. The year Mr. George arrived at Suncor, they were producing about 350,000 barrels a day, a tiny fraction of what geologists believe the sands hold.

And how much oil is there? Estimates bounced around for years until 1999, when Alberta got serious about determining its potential. Based on data from 56,000 wells and 6,000 core samples, the Energy and Utilities Board (EUB) came up with an astonishing figure: The amount of oil that could be recovered with existing technology totalled 175 billion barrels, enough to cover U.S. consumption for more than 50 years. With the new math, Canada slipped quietly into second place behind Saudi Arabia's 265 billion barrels in oil reserves, followed by Iran and Iraq.

To the frustration of Albertans, nobody paid much attention. There was no war on terror and the world was awash in oil. The news “went virtually unnoticed,” recalls

Rick Marsh, a geologist who leads the EUB's oil-sands section.

Then, in the spring of 2002, Murray Smith, recently installed as Alberta's energy minister, was called to a Saturday-morning meeting to review the EUB's annual report. He spotted the big figure and “his eyes lit up,' says Neil McCrank, then the board's chairman. “Murray is a salesman and he could see the impact this would have on Alberta. This obviously put Alberta in a different position on the world energy scene.”

Mr. Smith now calls it “a defining moment. We looked at it and said, ‘We've got something we can tell the world about.'”

Soon, the province and the Canadian Association of Petroleum Producers had launched an aggressive lobbying campaign and persuaded the influential Oil & Gas Journal to adopt the 175-billion-barrel figure in its year-end review. (Journal editor Bob Tippee now says the move made sense, if only because “at the time, we were ascribing almost zero reserves to an area then producing close to one million barrels a day.”)

It didn't hurt that 9/11 and the looming war in the Middle East made the Americans keen to demonstrate that they were not entirely beholden to Mideast crude. Peter Tertzakian, chief energy economist for Calgary's ARC Financial and author of A Thousand Barrels a Second, says there is “no question” that the new reserve estimate “was a catalyst for comforting the Americans.”

Spencer Abraham, now a political consultant in Washington, agrees – although he insists the decision that led to his 2003 letter to Mr. Smith “was not my call” as energy secretary. Rather, a semi-independent agency within his department crunched the numbers to ensure that politics played no part. “It was a very objectively determined conclusion,” he contends, acknowledging that his vote of confidence in Alberta's resources “helped send a signal” to investors to take another look at the area.

It also signalled that the world was not running out of oil, Mr. Abraham adds. Even better: “When you have all the geopolitical uncertainties that the world of energy faces, it's great to have greater sources that are not only nearby, but also part of a country and government with whom the United States feels such closeness and affection.”

In addition, the price of oil began to rise, removing much of the doubt that mining the sands could be profitable. Striving to replace dwindling conventional reserves, energy companies from China, France, Norway and Japan came hunting for a share of Alberta forest and the United States began to overhaul pipelines and refineries to handle the promised growth in Canadian exports.

By the end of last year, leases for 6.5 million hectares had been granted (the province issues more every two weeks) and Fort McMurray had become the new Dawson City, with a population that has jumped from 35,000 in 1987 to an estimated 65,000 today, not counting the army of workers who live in surrounding camps.

Fourteen companies are producing at least 5,000 barrels a day (and often far more) at 24 different sites and 30 other projects are approved or under construction. This year, the Canadian Association of Petroleum Producers predicts, companies will spend $16-billion in capital costs. They can afford it: From 2003 to 2006, annual revenue from the oil sands doubled to more than $23-billion.

Not only Big Oil is getting rich. The boom also has made fortunes for small-scale entrepreneurs quick to stake a claim.

Greg Schmidt, then CEO of Deer Creek Energy, watched as the Calgary-based company's $50-million lease at Joselyn, north of Fort McMurray, sparked a bidding war. Two years ago, French oil giant Total SA spent $31 a share (a year earlier, the price was $9.50) to snap up the company and propel its overall value to $1.7-billion.

Mr. Schmidt has moved on to another project and declines to divulge just how much he took home from the deal. “I would just say,” he chuckles, “the Deer Lake transaction was pretty positive to my net worth.”

Of course, the projects are now so huge that some of the payoff is spreading across the nation. As Ontario Premier Dalton McGuinty said in a recent interview, “If Alberta is doing well, that's something that Canadians everywhere should celebrate. Ultimately, we all stand to benefit.”

Skilled tradespeople are certainly reaping the benefits, and Dave Bohonis, a 29-year-old journeyman carpenter from Thunder Bay, is a quintessential man of the boom. He is a new father with a mortgage and willing to venture 2,600 kilometres from home to make big money.

It's also a sign of the times that his employer, Tom Jones Inc., has formally joined a dozen other Thunder Bay contractors and manufacturing firms in a bid to profit from a resource three provinces away – and the city now has its own oil-sands pitchman in Calgary.

For two weeks at a time, Mr. Bohonis and more than a dozen other Tom Jones personnel work straight 10-hour shifts to put up a new recreation centre at Suncor's Firebag site, nearly two hours drive from Fort McMurray. His nights are spent, along with about 2,000 other employees, in dorms at a work camp.

It's not a bad life, he says: Suncor pays for everything but the chips in the vending machine and serves prime rib on Thursdays. He talks to his wife, Crystal, and their one-year-old, Logan, back home every night. But he has realized – like most others in the camp, he says – that he cannot do this forever, even with a week off between his stints away. He misses his son and, although there are plans to begin direct flights, the trek from Thunder Bay this week took nine hours, with three stops, using up a day he could have spent with his family.

But oil can be habit-forming: Mr. Bohonis won't talk precise figures, but he estimates that he comes back every two weeks with nearly double what he would earn by staying home. “Everybody has a goal out there,” he says. “It's always about money.”

And money is getting tight in Thunder Bay. Anyone who looks closely may see some irony in the fact that the closing of local paper mills is at least partly because the loonie has been driven to record heights thanks to Alberta's staggering wealth.

But one person's downturn is another's upswing. While places like Thunder Bay suffer, many Canadians enjoy the proceeds of rising oil stocks. The spotlight on Alberta ended the long-lamented discount attached to Canadian oil company shares, which have outperformed their U.S. counterparts of late. (Suncor, for instance, has become the world's best performer among big oil companies that are traded publicly.)

“So many of those stocks are held by Canadians in their RRSPs, individual stock portfolios and their pension plans,” Murray Smith says, again looking back to 2003. “That recognition of the oil sands, and the telling of its story, created new wealth for Canadians from British Columbia to Goose Bay.”

It's certainly a far cry from the late 1970s, when Ahmed Zaki Yamani, famous as Saudi Arabia's oil minister during the 1973 embargo by the Organization of Petroleum Exporting Countries, visited the oil sands. Consultant Robert Skinner, a former director of the Oxford Institute for Energy, says he heard later just how unfazed the sheik was while flying over the sprawling Syncrude project in a military helicopter.

“We in Saudi Arabia are very fortunate, indeed,” the sheik said, stroking his trademark goatee. “We have one well that produces as much as this.”

Today, even he concedes that one day the Canadian oil sands will give the members of mighty OPEC some serious competition.

A community torn

Celina Harpe is 69, yet the daughter of a Chipewyan chief and his Cree bride still recalls a conversation she had with her grandfather when she was a girl. The two were standing on a bluff looking down at the Athabasca River, when the old man said: “Granddaughter, see all that water? Some day you're going to have to buy water to drink. Some day, the white man is going to come and take all our land and spoil our water.”

Ms. Harpe pauses: “And today we see that. He was exactly right.”

If anyone sees the oil sands as a mixed blessing, it's the bitterly divided native communities on its doorstep. Band leaders in Fort Chipewyan, a remote hamlet nearly 300 kilometres downriver from Fort McMurray, have called for a moratorium on development amid fears their cancer rate is soaring because of all the oil activity.

But Fort McKay, where Ms. Harpe lives, is only two hours from Fort McMurray and its council not only endorses development, it also runs businesses that service the oil patch. Her own son drives for a band-owned outfit and she has watched young people in the community of 1,200 make enough money to buy big homes and new trucks.

A lonely voice of opposition, she worries there is a link between the rising fortunes and an epidemic of alcohol and drug abuse. She also feels that extracting the oil has poisoned a river her family once relied on for drinking water. The oil companies insist their impact on the Athabasca is relatively modest, compared with the farmers, foresters and towns that have grown up along the river. To which Ms. Harpe replies: “I tell them, ‘I might look stupid, but I'm not stupid. I know what it was like 50, 60 years ago and what it's like now.' I tell that them that, from the time Suncor started more than 40 years ago, we are not able to drink the water.”

Now, her community sits in the middle of a dozen proposed developments and she wants “to get away as soon as I can. I don't know where I'm going to move, but I am going to move away.”

She sounds like she may have to coax herself into following through, but her concerns mirror a growing uneasiness among people across the country: Have Canadians properly weighed the costs of an oil-sands boom?

There is no question that extracting, upgrading and transporting unconventional crude leaves a crushing ecological footprint. Based on current mining leases, the oil sands may transform that Florida-sized swath of forest into a massive lunar landscape – much of it unlikely ever to return to its original state. (Existing projects have already stripped roughly 460 square kilometres.) As well, the mining operations are licensed to draw 349 million cubic metres of fresh water from the Athabasca every year, twice the amount used by Calgary, a city of one million people. Some of the water is recycled, but most of the muddy leftovers, or tailings, wind up in those toxic “ponds” that are large enough to be seen from space.

By comparison, the so-called “in situ” operations needed to exploit the vast majority of sand reserves, which are located deep underground, cause less disturbance on the surface and require less water. But heating the bitumen underground and pumping it up also requires much more energy and produces far more greenhouse gas.

A swelling chorus of environmentalists – and a tide of bad publicity internationally – has led to calls to slow development until proper measures can be taken. Oil companies have managed to reduce their per-barrel environmental impact by recycling water and controlling toxins from their smokestacks. But there has been so much growth, the environmental impact has ballooned anyway.

“I don't think anybody gets how big it is and how much bigger it's going to get,” says Ruth Kleinbud, an outspoken naturalist who moved to Fort McMurray in the early 1980s.

Back then, a slowdown in the oil industry had residents “fighting over moving boxes” to get out of town. Almost overnight, the sleepy community nestled in a valley surrounded by old forest stretching to the horizon was replaced by a dense, hustling, housing-short boom town, encircled by just a narrow ring of trees.

“You come down into the river valley, and it's pretty, isn't it? That's all you see, the rest is completely gone,” Ms. Kleinbud says. “Things are happening so fast people aren't thinking.”

A study released jointly this month by the Pembina Institute, an environmental think tank in Alberta, and the World Wildlife Fund suggested that, with few exceptions, the companies are failing to reduce their overall environmental impact significantly and have been slow to spend on new, environmentally friendly technology. And the province has been criticized for not adopting strict enough regulations for such things as when companies should restrict their use of river water during low-flow winter months.

Complicating the matter, of course, is the lingering memory of 1980, when Ottawa adopted the national energy program and wound up driving investment from Alberta. As a result, any federal effort now to restrain production to protect the environment is sure to spark a battle.

But the environmental fallout has already created more than just bad publicity. California has decided to encourage “low-carbon fuel” by imposing added levies on oil from sources it considers dirty, such as the oil sands. And last month, U.S. President George W. Bush signed a law that prevents federal departments from using synthetic oil if producing it generates more greenhouse gas than producing conventional oil does.

Many projects proposed for the oil sands tout promising new technology, but much of it has yet to be proved on a larger scale. One of the more favourable approaches – known as sequestration – involves trapping carbon gases underground. It's not required yet, although recent proposals have included space to add such facilities if they ever become mandatory.

Unless improvements are made, the environmental damage will mushroom, given that production could triple over the next seven years, says study co-author Simon Dyer, a biologist and senior policy analyst at the Pembina, which has called for a moratorium on approving further projects. “We are really at the tip of the iceberg,” he warns. “If people are concerned about the environment, you don't want to be around in 2015.”

In the end, logistics may be the biggest damper on developing the oil sands. The rising price of natural gas needed to heat the bitumen, the limited pipeline capacity and constraints on how much water can be taken from Athabasca River all pose serious problems. But the biggest hurdle may be a shortage of human capital.

In the years ahead, an army of skilled workers like Thunder Bay's Dave Bohonis will be needed – as many as 30,000 of them, ranging from engineers to welders, pipe fitters and electricians. And Petro-Canada senior vice-president Neil Camarta says the province historically has trouble if worker demand tops 10,000.

His company is already looking for skilled labour to build Fort Hills, its largest project in the sands. Phase one alone calls for 7,000 trades people and 2,500 engineers – and "we're struggling right now," he says from his Calgary office. Based on projections, he says, "there just aren't going to be enough construction workers here in Alberta available to build all these projects."

Just as many labourers were brought from China to build the railway, oil companies are now recruiting abroad. But the sudden influx of newcomers is already overwhelming Alberta's social services, causing a spike in housing costs and clogging the 435 kilometres of two-lane highway between Edmonton and Fort McMurray.

The boom has led to wage inflation and worker shortages; on the plus side, fast-food managers can earn up to $60,000 annually, and last year Wal-Mart was advertising bonuses for employees who stayed for 1,000 days. Small businesses find it hard to compete for staff; it's not uncommon, Prof. Chastko says, to drive by a darkened Burger King franchise in Calgary, closed because no one wanted to flip burgers.

The bottom line

Today, Murray Smith is 58 and no longer in politics – but he still has that framed letter from Spencer Abraham as a reminder of the campaign to create an oil power from Alberta's tub of goo. "It just showed what perseverance can do," he says. "We stuck with it. … Everybody worked hard for that result."

Now a consultant in the oil patch, he has seen black gold's fortunes rise and fall in Alberta, but feels there is no real cause for concern because the fortunes of the province and the country as well as the corporate world have nowhere to go but up.

According to Mr. Smith, companies are already making huge strides toward more energy-efficient technology and environmentally responsible practices – spurred on by natural market incentives to reduce costs. "That drive is on," he says. "The next generation is here already."

Perhaps, but many others are less optimistic. They argue that none of the problems facing the oil sands – and the governments required to manage them –

will be solved easily. The bigger the oil business gets, the more dependent Canada's economy becomes on a single resource. Alberta's infrastructure will be strained with the arrival of more and more workers. Until companies can produce the oil without leaving a permanent shadow on the land, the protests will only get louder.

How all these issues are weighed and resolved will shape Canada's future. “We are in an era of tradeoffs,” explains Peter Tertzakian, the energy economist. “And anybody who comes forward and says, ‘Here's a simple solution, do this,' is not being honest.”

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