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SUBJECT: ALBERTA'S OIL SANDS: ENERGY SECURITY VERSUS CLIMATE "THREAT"

SENSITIVE BUT UNCLASSIFIED -- NOT FOR DISTRIBUTION OUTSIDE USG CHANNELS

1. (SBU) Summary and Introduction. Canada's oil sands anchor our northern neighbor as our top oil supplier and are now rated at 174 billion commercially recoverable barrels, second only to Saudi Arabia. This "proven" level is likely to increase as technology advances, oil prices rise and more of the resource is counted. Oil sands output of some 1.2 million barrels per day (against a global total of roughly 85 million bpd) should rise sharply in significance as output expands to 3 - 4.5 million bpd in 2015-2020. By 2015 Canada will trail only Saudi Arabia, the U.S. and Russia as an oil producer. Escalating production costs and calls for carbon constraints and concern about localized environmental impacts could slow growth.

Rising production will require new pipeline capacity, primarily to the U.S., and has engendered a lively debate over where the gummy output should be upgraded. Many here are increasingly calling for a more sophisticated dialogue on the tension between our collective energy security need for reliable supply and our desire to reduce carbon output. Recent discussion of low carbon fuel standards, and North American dismissal of Alberta's not insignificant climate change and related carbon sequestration efforts, have highlighted this conflict. We believe that, as with coal at home, U.S. interests are best served by creating a context that facilitates the "greening" rather than the suppression of oil sands output. End Summary and Introduction.

What Are Oil Sands?

2. (SBU) The oil sands, concentrated in north-eastern Alberta and washing over into north-western Saskatchewan is essentially a vast deposit of sand grains covered with a film of oil surrounded by a layer of water. Geologists believe the total deposit is some 2.3 trillion barrels, but much, maybe most, will never be recovered. Sometimes the deposit is

close to the surface, in which case it is mined and the oil is then extracted, but if it is deeper exotic drilling technology is used for in-situ oil production (more below).

The World's Largest Auditable Reserve?

3. (SBU) After the resource became commercially viable on a big scale in the 1990s, following decades of development, the Alberta Energy Utilities Board (AEUB) did an exhaustive survey and declared the now famous figure of 174 billion commercially recoverable barrels. This number was eventually recognized by industry rating agencies and then by the United States Energy Information Agency (EIA). While a ramp-up in investment and production was already underway, recognition by EIA had a very real impact on the profile, capital cost and rate of development. Today, well over $100 billion in projects are underway. The quality and transparency of the data available on the oil sands has led some to declare this the largest "auditable" reserve on earth, a statement that casts aspersions on the transparency if not the volume of Saudi, Iranian, Russian and other large reserves.

Is 174 Billion About It -- or Just a Start?

4. (SBU) In our talks with the leadership of the former AEUB, now the Alberta Energy Resource Conservation Board (ERCB), they indicate that while they are not yet ready to raise the number officially, the number is too low. Most simply, the number is low because it is based almost entirely on the huge Athabasca deposit around Fort McMurray and largely ignores Alberta's smaller but significant Peace River and Cold Lake deposits, and excludes Saskatchewan's portion of Cold Lake.

5. (SBU) The other ways in which the number may be low will be harder to assess as analysts must account for dynamic technology, prices, costs and fiscal regimes. Today, oil sands are produced in three ways: by mining after the surface above the oil sands is removed, or by two in-situ technologies: by drilling vertical holes and then alternating pumping steam in to melt the oil sands and then pumping it out (often called huff and puff or cyclic steam); or by Steam Assisted Gravity Drainage (SAG-D) through which long horizontal wells are drilled, steam is pumped for some months in a higher well and then oil is pumped out from a deeper well. At heart, all three processes use steam or very hot water to heat the oil sands to facilitate separation. This is an energy intensive way to produce energy and is a huge consumer of natural gas. Whereas any recovery rate in conventional oil production that yields over a third of the oil in place is considered very efficient production, both mining and in-situ oil sands regularly yields two-thirds or more.

The Next Technologies

6. (SBU) Both mining and in-situ technologies are evolving. New approaches to mining reduce water use and could significantly reduce energy use by limiting transport of the mined oil sands prior to separation. In-situ production in particular may be on the edge of a revolution similar to what SAG-D brought over the last ten years. Producers are now operating commercial scale test use of Toe-Heel Air Injection (essentially setting the

oil sands on fire below ground and letting it heat itself to the melting point), use of solvents to effect the separation underground without heat, and some are even experimenting with genetically modified micro-organisms that would break the oil sands down. The long-term goal of all these approaches is to find ways to reduce costs, energy consumption and environmental impact by carrying out the first steps of upgrading underground in sealed areas. And it should be noted that while mining operations are the public face of oil sands operations, over time, because of the depth of most of the resource, in-situ production will account for 75 - 80 percent of output. Bitumen upgrading (the processing of the raw oil sands output after initial separation) is also undergoing technological change with some firms moving from use of high-value natural gas toward gasifying the petroleum bottoms or coke (the gunk left over) from the upgrading process as a fuel source. Nuclear energy is also being seriously considered as an oil sands industry heat source.

Prices, Costs and Taxes

7. (SBU) The world price of oil plays a big part in what percentage of that 2.3 trillion barrels will ultimately be economically recoverable. Sustained high oil prices will lift recoverable reserves and lower prices will suppress them. Likewise, costs, which have been rising very rapidly here, have a big impact on what is recoverable. While only a few major projects have been postponed due to the rapidly rising costs of inputs and labor in northern Alberta, cost overruns and delays in completion have become pretty standard operating procedure. Many firms cite both shortages of labor and the cost of labor as their most intractable challenge. An eventual cost of emitting carbon (more below) is a big unknown. And finally, fiscal regimes, including 2007 changes in Alberta's royalty regime (reftel) do have an impact. However, the consensus seems to be that in the grand sweep of things while the changes (increases) last year in Alberta's oil sands royalty regime will have negative impact, it will be modest compared to the effect of the bigger and more unknown dynamics of technology, oil prices and production costs. In the short run, royalty changes are predictably driving down the prices for oil sands land sales.

So What Is the Recoverable Reserve?

8. (SBU) Bluntly put, we do not know, but we are convinced, as are our contacts, that it will ultimately be far above 174 billion barrels, most likely over 250 billion barrels and on a par with Saudi Arabia, but perhaps far higher. It is simply too soon to know what technology, oil prices and costs will make viable in what is essentially a production process from known reserves with almost no exploration risk.

But What of Output in 2015, 2020 and 2030?

9. (SBU) Because oil sands production output to 2015 is primarily based on projects in fairly advanced states of development, there is a relatively high level of confidence that output will reach 3.0 - 3.4 million bpd. With conventional output thrown in, this would move Canada to total oil production of over four million bpd by 2015, behind only Russia, Saudi Arabia and the U.S. While this could be set back by extreme

price shocks or abrupt policy changes, these projects with 50 year life-cycles are likely to proceed in all but the most extreme circumstances. Estimates to 2020 and beyond, quickly grow less precise, with the general range for 2020 often placed at 3.5 - 4.5 million bpd. However, projects to be completed between 2015 and 2020 are not as firm as those on track to be finished in the next eight years and various price, cost, technology and regulatory factors could have a big impact on the level in 2020. As Pierre Alvarez, President of the Canadian Association of Petroleum Producers (CAPP), has told us, "oil sands output will run on a schedule to three million barrels, but then will walk more uncertainly to four."

10. (SBU) Beyond 2020, the uncertainty is huge. Various estimates have put oil sands output at or above five million bpd by 2030. Some, including former Alberta Energy Minister Greg Melchin, have argued that Alberta can eventually be the world's top oil producer at over ten million bpd, but this is a generational project subject to all the variables of technology (including some unknowable energy revolution) price, costs, environmental and regulatory policy. With the strain of rapid growth already showing in Alberta, such grand over the horizon talk is not very popular here today.

Where Does it Go, How Does it Get There and In What Form?

11. (SBU) Today the market for Alberta's oil sands output is the U.S. and Canada. However, even delivering it to those markets will not be possible without additional pipeline capacity. In response, the pipeline industry has a raft of proposals on the table to address a capacity gap that most expect will emerge in the 2008-2009 time-frame as output rises rapidly. In likely sequence, new capacity includes: Enbridge Southern Access, followed by TCPL's Keystone and then Enbridge's Alberta Clipper and a range of other proposal such as the Altex concept for a bullet line from Alberta to the Gulf of Mexico. While all of these proposals would move output to the U.S. heartland, Enbridge is also considering its Gateway pipeline to the Pacific in BC to serve West Coast and Asian markets.

12. (SBU) These pipeline proposals are part of a complex dance in which the pipeliners want to stay up with but not too far ahead of production and in which producers and refiners have to match capacity as well. The basic choice is between upgrading the oil sands raw product (bitumen) in Alberta to ship as syncrude (synthetic crude oil) to the U.S. or whether to merely blend it with diluent (making a blend called dilbit) for shipping and upgrading in the U.S. Massive upgrading capacity is being built in "Upgrader Alley" near Edmonton and it is expected that a fairly steady state of upgrading some 60 - 70% in Alberta will be maintained for some time.

Despite this, there is some controversy among Albertans surrounding projects to ship to the U.S. as dilbit since this is viewed as a failure to "capture all the value added." This controversy appears similar to one that surfaced some eight years ago, when Alberta's petrochemical industry opposed plans by operators of the Alliance natural gas bullet line to strip natural gas at Chicago and bypass Alberta's petchem operators. As with that case, we expect that cooler heads will prevail by and large in Alberta and let the market work

this out. The labor shortage here is a hard reality for the "keep the jobs at home" crowd as is the cost logic of "refining only once." The dynamic between producer and refiners has led to a number of joint ventures and acquisitions. Conoco-Phillips and EnCana have entered a complex deal to pair up Encana's production with CP's U.S. refining capacity while Calgary's Husky Energy purchased Valero's refinery assets in the U.S.

Environmental Factors: Land and Water

13. (SBU) Those of us, including many of our readers, who have seen the projects in Northern Alberta, have no doubt that the environmental costs are high. Arid while mining operations, with their vast, over the horizon scale are the most shocking at first viewing, even in-situ projects with their dense drilling, massive above ground steam plumbing and upgrading facilities, have a far more visible footprint than conventional fields. Over time, the major players are committed to spend billions, perhaps tens of billions, of dollars on reclamation, but the land will never look like it did before. Paradoxically, when the soil is returned and replanted, as has been done on a limited scale, the land lacks the roughness of the native taiga forest and is unnaturally fertile. Massive ponds to dispose of contaminated water and sludge are another long-term issue.

Still, it is important to keep in mind that while the oil sands are spread over an area "the size of Switzerland," perhaps "only" 20 percent of this "Switzerland" will be mined versus 80 percent being developed in in-situ, all with a much higher recovery rate than from conventional fields. Albertans and others are also very focused on water usage. Just how much can be drawn from the Athabasca River without significant damage is beyond our technical knowledge, but we would note that even with all the projects on the drawing board are completed, the take will be well below ten percent of average flow. Currently the industry uses about three percent from a seven percent allotment. The companies would note that many have reduced their water use per barrel of oil produced by as much as 75 percent in recent years.

But It Is CO2 Output That Has Folks Most Worried

14. (SBU) No one can question that Alberta's CO2 emissions are rising rapidly as a result of booming oil sands development and will rise for years, maybe decades to come. Industry and provincial leaders acknowledge this, but ask that all of us pay more attention to the energy intensity progress that is being made and to the supply security benefits of the oil sands. Provincial leaders would particularly point out that while output is rising and Alberta is coming in for increasing criticism, Alberta is among the few, and is perhaps the only, jurisdiction in North America in which major final emitters already are paying a cost for carbon above set levels. These payments are going into a provincial technology fund and generated 175 million dollars over the past year. Alberta leaders also emphasize that the province, the federal government and the upstream, pipeline and utility industries in the province are on the verge of making major decisions and investments to control CO2 emissions by building huge carbon capture and storage (CCS) infrastructure. We are among those waiting to see this rather serious discussion make the leap to serious construction.

And Low Carbon Fuel Standards Have Their Attention

15. (SBU) Albertans in government and the oil and gas industry have for some time been growing nervous over the sense that they have a target on their back over rising C02 output. They feel this from their fellow Canadians and from their market to the south. Discussion of low carbon fuel standards (LCFS) in California began to worry them but recent U.S. legislation that would contemplate LCFS for government procurement, whether it would ultimately apply to oil sands for not, has them alarmed. On the positive side, this does seem likely to accelerate CCS efforts here. In a one week period of late the Federal-Alberta CCS study group chaired by Transalta CEO Steve Snyder released its report, Premier Stelmach announced provincial funding for feasibility studies and Enbridge announced a consortium of companies apparently determined to start building.

16. (SBU) LCFS discussions have also lit a fire under the Albertans to get people to look at C02 output more holistically, or at least more their way. They point out that while the "production" of oil sands may produce 300 - 400 percent more C02 than production of Saudi light, what we really need to look at is the full C02 footprint of various fuels from exploration and production to the tail pipe of our SUVs. While they admit that by this metric the C02 output of oil sands is still higher, rather than 3 - 4 times higher, it drops radically to perhaps 15% higher C02 output than to Saudi light and probably less than ten percent higher than Venezuelan Heavy. The difference with "California heavy" is probably on the order of 10 percent. Many would argue, including technically strong environmental groups such as Alberta's Pembina Institute, that with investments and over time, oil sands output can be made carbon neutral on a life-cycle basis with other petroleum sources.

But Isn't Energy Security Still A Priority?

17. (SBU) Concerned senior Albertans have been asking us for some time where energy security fits into U.S. policy and how we are balancing it with concerns over C02 levels. Senior business leaders such as Enbridge CEO Pat Daniel, for some time have been asking why can't both federal governments provide a greater balance to what he refers to as BANANA (build absolutely nothing anywhere at any time) localism and assert the national and even continental interest in energy security. LCFS discussions have dramatically heightened this concern and today regional leaders, including new Saskatchewan Premier Brad Wall are asking us when the U.S. (and Canada, in fairness), are going to start looking at the hard and real trade offs that must be considered between energy security (which the oil sands provide in abundance and which the U.S. has long welcomed) and our climate change goals.

Comment: Toward a Hard Balance

18. There is no doubt our climate change objectives are complicated by rising oil sands output. At the same time, we have no doubt that in a tough world our energy security interests are very well served by that same rise in output. Both countries need more serious internal discussions of the trade-offs between energy security and climate

change. We need to extend that exchange across the border. The choices are hard and real and the possible trade-offs are many, each with complex cost-benefit ratios that are beyond the scope of this message.

What we call for is, thus, rather simple. and perhaps too glib: as the U.S. grapples with climate change policy, in particular such measures as LCFS, we should never forget that we have profound energy security (and investment) interests in the game in Alberta and Saskatchewan. In our view, our goal should be to encourage, where we can, a process that is already making fitful progress, the "greening" of the oil sands. Should we opt instead to support policies that damage the market for the oil sands and raise the cost of capital here, we should at least do so knowingly, well aware that, while this may seem to advance our environmental interests, it will harm our energy security.

HUFFAKER

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DECONTROLLED/UNCLASSIFIED - RELEASED IN FULL

From: Fennell, Daniel J
To: SMART Core
Subject: Canadian Oil Sand Production Continues Rising. But More Slowly Than Projected

Date IDTG: Nov 30, 2009

From: AMCONSUL CALGARY
Action:WASHDC, SECSTATE ROUTINE
Subject: Canadian Oil Sand Production Continues Rising, But More Slowly Than Projected

Sensitive But Unclassified (SBU)
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Summary:

1. (SBU) Canadian oil sands production has continued to rise despite the past 18 months of economic downturn. Production is currently near 1.5 million barrels per day (bpd), up from 1.2 million bpd in 2008; growing, although at a rate slower than that projected early last year. Analysts tell us the oil sands industry needs oil commodity prices in the range of $70 to $100 usd per barrel to justify new investments. Several large oil sands projects, including Imperial Oil's Kearl and Nabiye projects, and Suncor Energy's Firebag Phase 3, are now moving forward after previously being put on hold. With demand slowly returning and oil spot prices hovering within the appropriate range

on commodity markets, we will likely see more stalled oil sands projects rescheduled for development in the coming months. End Summary.

Oil Sands Installed Capacity As High As 1.8 Million bpd

2. (SBU) While some private studies now peg total oil sands "installed capacity" in Alberta, for both mining and in-situ projects, at 1.8 million barrels per day (bpd), normal output is always somewhat below total capacity due to continued development of start-up projects, scheduled and unscheduled maintenance, etc. Robert Dunbar, president of Strategy West, a private analyst firm studying existing and proposed Canadian oil sands projects, estimates that current Canadian oil sands production is currently in the range of 1.45 to 1.5 million bpd (of total Canadian oil production of 2.7 million bpd in 2009), depending on the specific conditions affecting daily output. This matches projections made for end-of-year 2009 by the National Energy Board (NEB), the principal Canadian federal energy-regulator. Dunbar pointed out that output has not risen as fast as some in the industry and the regional government had hoped, due to lower commodity prices and market uncertainties in the wake of the global financial crisis.

3. (SBU) Greg Stringham, Vice President of the leading industry trade group, the Canadian Association of Petroleum Producers (CAPP), confirmed that 1.5 million bpd output represents a slower increase than previously predicted, but still shows that oil sands output is growing -- up from approximately 1.2 million bpd in 2008 -- even during an economic downturn. In addition to current production, Stringham noted that oil sands projects representing about 300,000 bpd of crude production are now under construction. (Note: Post will report septel specific Canadian oil sands projects in operation, cancelled or suspended, and those planned for the future. End Note.)

Light Emerges: Some Stalled Projects Now Re-Starting

4. (SBU) Providing further evidence of an upward trajectory, several oil sands projects put on hold in 2008 and early 2009 are now coming off the shelf and moving forward. In May 2009, Canadian energy giant Imperial Oil (70 percent owned by ExxonMobil) was the first to buck the trend by announcing that it will proceed with the first phase of its suspended Kearl oil sands project in Alberta's Athabasca deposit. The Kearl mining project is projected to produce 300,000 bpd when fully operational, and will cost nearly $8 billion cdn to develop. In September 2009, Imperial followed up by announcing its intent to apply for a license to develop the new Nabiye oil sands project northeast of Cold Lake. Plans for the 30,000 bpd Nabiye in-situ project include a 170-megawatt cogeneration plant, sulfur recovery facilities and a new drilling plan that reduces the number of well pads — all innovations added to an earlier version of the project that Imperial put on hold in late 2008. Local analysts estimate the required investment in the Nabiye project to be between $1.2 and $1.5 billion cdn. Heavy crude oil generated from these two oil sands projects will likely feed Imperial refineries in Alberta and ExxonMobil refineries in the U.S.

5. (SBU) Most recently, in November 2009, Suncor Energy Inc. announced it will re-start work on the third phase of its Firebag in-situ oil sands project. Noting "some improvement" in crude prices and in the overall economy, Suncor's President and CEO Rick George said conditions now allowed the company to press forward with a "conservative strategy" on some new development plans. Suncor hopes to have the project on-line by 2011, with production at 68,000 bpd, and to add a fourth stage with similar output by 2012.

Forecasts Looking for More Than 3 million bpd by 2025

6. (SBU) Recent forecasts provided by CAPP project that oil sands production is expected to average 3.3 million barrels per day by 2025, forming the majority of a total Canadian production of roughly 4.2 million bpd by that year. CAPP's short term oil sands outlook predicts production in 2015 between 1.9 and 2.2 million bpd. CAPP estimates 2009 industry investment in the oil sands at $10 billion (cdn) compared to $18 billion (cdn) in 2008, reflecting, in part, stalled or withdrawn oil sands projects. The Alberta Energy Resources Conservation Board (ERCB) is slightly more bullish, and expects Alberta's oil sands production to increase to more than 3 million bpd by 2018, representing 88 percent of the province's total oil production as conventional output wanes.

Comment:

7. (SBU) While the economic and financial crisis of the past 18 months has caused some project deferrals and cancellations, oil sands growth has continued, albeit at a rate slower than originally projected. Although forecasts now suggest that projects under construction will increase oil sands installed capacity to about 2 million barrels per day by 2012, actual production growth rate will depend upon a variety of factors, including capital availability, prices for light-sweet and heavy-sour oils on commodity markets, energy consumption, labor and other project costs, and infrastructure development such as rail and roads. Industry also worries about the possible imposition of a "carbon tax" or other costs associated with environmental regulations, including various provisions in pending U.S. energy and climate legislation. However, with world and North American demand gingerly returning, and oil spot prices now approaching the appropriate range, we will likely see more stalled projects start to find new schedules for development in the Canadian oil sands in the coming months.

Signature: LOCHMAN

Drafted By: CALGARY: Fennell, Daniel J

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