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TAGS: ENRG, EPET, SENV, CA

SUBJECT: Special Envoy and Coordinator for International Energy  
Affairs David Goldwyn's Visit to the Canadian Oil Sands, October  
25-28

Sensitive But Unclassified (SBU)

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SUMMARY  
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1. (SBU) During a visit to Alberta, Canada, October 25-28, 2010, Special Envoy and Coordinator for International Energy Affairs David Goldwyn engaged with industry, government, regulators and First Nations and environmental leaders regarding the development of Alberta's oil sands and the need to balance that development with environmental and social stewardship. Goldwyn pressed his interlocutors on the current and projected impacts of resource development on land, water, air, biodiversity, and

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communities and the ability of the government and the regulator to manage those impacts. He heard from public and private researchers about technologies under development that could significantly reduce industry's impacts within the next five to ten years, and was encouraged by the rigor of the regulations in place and their enforcement by the provincial bodies. Goldwyn also spoke with journalists of three Canadian newspapers to reinforce key U.S. messages including the need to balance energy and the environment and Canada's key role in U.S. energy security. End Summary.

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 Current and Projected Oil Sands Production  
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2. (SBU) Oil sands are the second largest proven deposit of crude oil in the world, and most of its reserves consist of extra-heavy bitumen. The bitumen can be extracted using two methods, depending on how deep the deposit is below the surface. About 20% of the resource is within 200 feet of the surface and can be accessed only through mining. The remaining 80% is too deep to mine and requires drilling, or "in-situ" production, which normally involves Steam Assisted Gravity Drainage (SAGD), or pumping steam underground to separate the bitumen from the sand and recover the bitumen through wells.

3. (SBU) Current oil sands production stands at about 1.5 million bpd, of which just over 1 million bpd are exported to the U.S. The National Energy Board forecasts production rising to 2.8 million bpd by 2020. The Canadian Association of Petroleum Producers predicts production will reach 2.9 million bpd by 2020. Current production is split approximately evenly between the two extraction methods, but in situ extraction will surpass mining by the end of the decade.

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 Key Environmental/Social Impacts of Oil Sands Production  
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4. (SBU) Greenhouse Gas Emissions (GHGs): Oil sands production currently represents 5% of Canada's GHG emissions, or approximately 0.1% of global GHG emissions. Various interlocutors reported to Goldwyn that emissions intensity has declined by an estimated 39% since 1990. Reductions are largely a result of a move from bucket-wheel excavators to truck and shovel, the introduction of hydro-transport (which adds water to the ore to start the separation process on the way to the extraction plant), more

efficient heat exchange throughout the process and reducing required steam pressures and temperatures. Emissions are slightly higher in the in situ process than in mining, due to the significant amount of steam required. While emissions intensity per barrel has improved, questions arise as to the trajectory of absolute emissions under the more aggressive development schedules.

5. (SBU) Water: Oils sands mining operations use three to four barrels of water per barrel of bitumen, while in situ operations require one barrel of water per barrel of bitumen. In situ operations rely largely on groundwater, with a majority being saline or brackish. They recycle up to 97% of their water. Most mining operations recycle over 90% of their water, and draw make up water from the Athabasca River. Two percent of the river's annual flow is allocated for mining operations' use under the province's Water Management Framework, and less than 1% is actually used. While additional restrictions apply during low flow conditions, critics allege that too much is withdrawn.

6. (SBU) Another challenge is managing tailings resulting from the mining process, which contain a mixture of water, clay, un-recovered bitumen, solvent, and dissolved chemicals, including some toxic organic compounds. Downstream communities and some activists have expressed strong concerns about higher than average cancer rates and about possible contamination of water, air and food due to the oil sands development. The industry-funded, province-managed Regional Aquatics Monitoring Program (RAMP) determined that oil sands operations have had negligible differences from regional baseline water quality, but University of Alberta scientist Dr. David Schindler's recent contrary analysis prompted federal and provincial panels to review his claims by the end of 2010.

7. (SBU) Land: After more than 40 years of development, oil sands mining has disturbed some 602 km<sup>2</sup> of land (Canada's boreal forest is 301 million km<sup>2</sup>). While in situ operations have their own impacts, such as forest fragmentation and wildlife disturbances, much less land is disturbed. Companies are required by law to remediate and reclaim all disturbed land to sustain vegetation and wildlife. Currently, 67 km<sup>2</sup> are under active reclamation.

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 How Technology Will Help  
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8. (SBU) Goldwyn heard from several representatives of the R&D community working on solutions to oil sands challenges.

9. (SBU) Government: The province of Alberta funds research through various mechanisms, the principal of which is Alberta Innovates: Energy and Environment Solutions (EES). EES Senior Advisor Duke du Plessis explained that with a base budget of some \$17 million (Cdn), EES leverages significant additional government and industry contributions (the latter provides two-thirds of project funding). EES's R&D priorities include reducing water use and tailings from mined oil sands processes and reducing water, natural gas and diluent requirements from in situ extraction processes. Some promising, game changing technologies being evaluated include SAGD solvent processes and steam assisted solvent processes, which could reduce water use by up to 100% and energy use by up to 90%. Another area is electrical processes, which use electricity rather than steam to heat the bitumen and could reduce energy use by up to 60% and water use by up to 50%. As projected by EES, these technologies could be deployed within a ten-year period. Other, more modest mitigation measures that are currently being undertaken in SAGD include minimizing stack loss (i.e., recovering heat emitted by boilers for reuse); minimizing glycol (which cools down hot water used in the process); and down-hole pumps (which also help recover heat).

10. (SBU) The province has also created a \$2 billion (Cdn) fund for large-scale demonstration of carbon capture and storage (CCS) and is currently negotiating contracts for four separate projects.

11. (SBU) A third mechanism is the Climate Change and Emissions Management Fund (CCEMC), which makes investments in clean energy development with proceeds from the province's \$15/ton levy on carbon dioxide emissions that exceed ceilings set on large industrial operations (emitting over 100,000 tons of GHGs per year). The fund has collected over \$180 million in two years, \$71 million of which has been allocated to date for projects on energy efficiency, alternative energy sources, reducing costs associated with CCS and cutting energy inputs into fossil fuel production.

12. (SBU) Through these and other mechanisms, the Conference Board of Canada estimates that Alberta province will invest more than its provincial peers - \$6.1 billion - in technology committed to reducing industry-related GHGs between 2010-2014 (Note: the study includes private and public technology investments made under government programs. End note.)

13. (SBU) Goldwyn also visited a federal laboratory, Canmet Energy Research Center, at Devon near Edmonton. Canmet Devon's budget is approximately \$30 million (Cdn), and it employs 150 scientists and support staff. The lab's goal is to make oil sands and heavy oil a cleaner energy option. Research at the Devon facility focuses on developing systems to reduce water and energy use, to manage tailings ponds and to lower air emissions. Canmet partners with

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industry, which usually funds one-third of total project costs, and aims to help industry commercialize technology. Researchers outlined four promising methods for de-watering the tailings and reducing the tailings ponds: consolidated tailings (using polymers to help the tailings clump); centrifuges; thin lift drying (spreading the tails out on a pond); and rim ditching (chemically treating the tails, causing the water to seep out over the sides of the pond into a ditch for collection). The lab is also working with the private Titanium Corporation, to test processing of tailings to recover additional bitumen as well as heavy metals with market value (Zircon, Ilmenite and Leucoxene).

14. (SBU) Industry: Goldwyn learned about some industry efforts to improve environmental and social performance. He met with representatives from ConocoPhillips and Suncor, two of the six companies which established the Oil Sands Leadership Initiative (OSLI) in 2010. OSLI sees itself as leading the oil sands industry in the responsible development of bitumen resources by taking demonstrable action to improve performance in land stewardship, water management, sustainable communities and tailings. One of the more developed concepts involves creating a regional water supply for oil sands facilities, in part by piping water from mining tailings ponds for use in the in situ extraction facilities. Other ideas under active development include solvent-assisted SAGD, application of biological organisms to assist the SAGD process, and creating a water operator certification. OSLI's budget for collaborative development (i.e., joint studies that would lead to projects, funded separately by each company) will increase from \$10 million in 2010 to \$26 million in 2011.

15. (SBU) Industry is working with government-funded researchers toward significant improvements in tailings management techniques to reclaim the tailings ponds to boreal forest or equivalent land capability more rapidly. Most processes under development aim to achieve "dry stackable tails," which reduce the amount of water required by half and allows for quick reclamation of disturbed land. For example, Suncor has spent \$300 million to develop its Tailings Reductions Operation (TRO) and will spend \$1.2 billion over the next two years on execution of the TRO plan. Under TRO, tailings are mixed with a polymer flocculent, then deposited in thin layers over sand beaches with shallow slopes. The drying process takes place over weeks, allowing for much more rapid reclamation to occur (current processes take decades). This process is expected to improve tailings management going forward, but can also be used to reduce existing tailings ponds, as Suncor illustrated in its recent reclamation of an area referred to as 'Pond One.'

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16. (SBU) Provincial: Canadian provinces have jurisdiction over development of natural resources, including the oil sands. The Energy Resources Conservation Board (ERCB) is Alberta's primary upstream oil and gas regulator, with over 70 years in the business. It is a quasi-judicial, independent body with 9 board members and over 900 staff in 13 locations around the province. The ERCB regulates 49 commercial oil sands plants (8 surface mines and 41 in situ operations) as well as 5 upgraders. The ERCB's 160 field officers carry out regulatory surveillance through announced and unannounced inspections, ensuring compliance with approval conditions and regulatory requirements.

17. (SBU) ERCB Chairman Dan McFadyen specifically outlined for Goldwyn the organization's efforts to regulate tailings ponds. In February 2009, the ERCB issued Directive 074, which requires mining companies to reduce tailings and provide target dates for closure and reclamation of tailings ponds. Between 2012 and 2016, the companies must implement plans that virtually eliminate growth in fluid tailings and after 2016, they must process tailings at the same rate as they produce them. Environmental groups have criticized ERCB's approval this year of three companies' tailings management plans with various extensions and exemptions included. McFadyen observed that most mining companies are not technologically capable of meeting the aggressive targets set by the ERCB. While they will be given additional time to comply, they must reach a higher level of compliance by the extended date. The ERCB is now looking at how to regulate companies' management of existing tailings ponds and expects a draft plan to be before the Alberta government by the end of November 2010.

18. (SBU) Environmental NGOs and others have questioned Alberta's ability to regulate the growing aggregate environmental and social impacts of oil sands development, particularly under the more aggressive production scenarios. ERCB Chair McFadyen reported that in connection with project-based authorizations, the ERCB considers the discrete environmental and social impacts as well as the cumulative. He pointed to ongoing provincial efforts to create Land Use Frameworks for the seven principal watersheds in the province. The frameworks will use cumulative effects management at the regional level to manage the impacts of development on land, water, air and biodiversity and will set aside lands for conservation. The first plan being developed is for the Lower Athabasca region, which encompasses the large majority of oil sands development. The final plan should be published by summer 2011. Marlo Reynolds, Executive Director of the Pembina Institute, told Goldwyn that the government's effort could potentially address

Pembina's concerns that aggregate development could surpass the carrying capacity of the environment, but the proof will be in the pudding. Goldwyn raised the issue with leaders of Alberta's Energy and Environment ministries and emphasized the importance of a strong framework to address concerns.

19. (SBU) ERCB Chair McFadyen also emphasized to Goldwyn the rigor of the ERCB's regulatory process. He pointed to the case of Total's application to develop a new mine, which is in its fourth year of evaluation to ensure proper adjudication. He also pointed out that the ERCB is willing and able to open previous approvals in order to place additional conditions on companies in light of new regulatory or technological advances. Finally, McFadyen discussed the use of royalty credits for investments in technology as an incentive to industry research efforts.

20. (SBU) Federal: The federal government has or shares specific regulatory responsibilities for issues including trans-boundary water and migratory birds. In addition, the federal National Energy Board (NEB), headquartered in Calgary, regulates the construction and operation of interprovincial and international pipelines; regulates traffic, tolls and tariffs of interprovincial and

international pipelines and regulates the export of oil. An NEB official explained that NEB carries out environmental impact assessments of pipeline projects applying for federal permits, but excludes evaluation of upstream factors. The NEB also determines whether the permit applicants have demonstrated an economic need for the pipeline. The NEB is charged with stakeholder outreach and consultation and has a constitutionally-mandated duty to consult with First Nations. The NEB has established greater linkages with the NGO community through an NGO coordinator to ensure a full spectrum of views. The NEB has approved a permit for construction of the Canadian portion of TransCanada's proposed Keystone XL pipeline to the Gulf coast, and is currently evaluating an application by Enbridge to construct an oil pipeline to the Canadian west coast to facilitate exports of oil sands product to Asia.

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Key Messages

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21. (SBU) Goldwyn communicated a number of key messages to his interlocutors as well as to the public, through three interviews with prominent provincial and federal journalists. Goldwyn recognized the importance to U.S. energy security of Canada: a friendly, non-OPEC member in close proximity with a world class

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resource. He emphasized that the United States wants to be an informed, responsible consumer of Canadian energy. In that regard, we are extremely interested in the existence of policy, regulation, and public sector capacity to deal appropriately with the cumulative effects of oil sands development over the long run. We are also interested in new technologies being developed by government and industry researchers toward greater efficiencies and fewer impacts, and the ability of policy and regulation to encourage innovation and its implementation.

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Comment

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22. (SBU) Feedback from Goldwyn's Canadian interlocutors indicate that they appreciated his candor and readiness to get to the heart of the issues surrounding development of the oil sands resource. They commented that Goldwyn left them with much food for thought and a renewed sense of the imperative to balance to the extent possible resource development with environmental and social impacts.

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