Implications of Changing Environmental Requirements on Oil Sands Royalties

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Oil Sands Research and Information Network

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OSRIN is a university-based, independent organization that compiles, interprets and analyses available information about returning landscapes and water impacted by oil sands mining to a natural state and provides knowledge to those who can use it to drive breakthrough improvements in reclamation regulations and practices. OSRIN is a project of the University of Alberta's School of Energy and the Environment (SEE). OSRIN was launched with a start-up grant of $4.5 million from Alberta Environment and a $250,000 grant from the Canada School of Energy and Environment Ltd.

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1 INTRODUCTION

This report provides a brief overview of the provincial royalty system, describes the concept of *allowed costs* as it relates to environmental expenditures and provides examples of changing environmental requirements that may affect royalty payments.

1.1 Alberta's Oil Sands Royalty System

Alberta's oil sands represent the third largest proven oil reserve in the world, behind Saudi Arabia and Venezuela (Alberta Energy n.d.a). Since the beginning of its large-scale industrial development in 1967, the oil sands have proven to be a reliable and secure source of energy for the North American market and oil sands royalties have formed an increasing source of revenue for the province (ENTRANS Policy Research Group Inc. 2011).

The oil sands resource is owned by the province and the province has allocated production rights to individual companies via a competitive bidding process. In return, the government receives payments in the form of royalties, land sales (bonus bids) and surface lease rentals.

Royalty rates are set with the expectation that industry will earn a reasonable rate of return given the risk and investment they make in developing the resource. When setting royalty rates, the government considers factors such as commodity prices, production, costs and the Province's competitive ability to attract industry investment (Government of Alberta 2010, Leach 2012).

Alberta's Department of Energy is responsible for establishing, administering and monitoring the effectiveness of the fiscal and royalty systems for Crown resources[1] and collects revenues from the development of Alberta's energy and mineral resources on behalf of Albertans (Ministry of Energy 2011, p. 8).

The provincial royalty system was first established in 1930, when the province gained control of its natural resources (Government of Canada 1930, 1982). The royalty system has evolved through time in response to changes in the discovery of new resources and the implementation of new extraction methods, as well as other factors such as volatility in capital costs of projects and oil prices.

The first oil sands royalty system was the *Bituminous Sands Royalty Regulation No. 1* (Government of Alberta 1963) enacted in 1963 in anticipation of the development of the Great Canadian Oil Sands (GCOS – now Suncor) mining project. Specific Crown Agreements applied to Syncrude and other pre-1997 projects (Government of Alberta 2007a) and Suncor transitioned to a royalty Crown Agreement July 1, 1987[2].

Effective January 1, 1997 a generic Oil Sands Royalty System was established by regulation, to provide equal and certain royalty treatment to all oil sands developments and to boost investment opportunities in an industry facing an uncertain future. The generic royalty formula, better

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[1] See http://www.energy.alberta.ca/OilSands/584.asp for information on Alberta's oil sands royalty system.

[2] Pers. Comm., Alberta Energy.

known as the "1% and 25% formula" (Alberta Royalty Review Panel 2007), is project-based[3] and applies to both mining and in-situ (e.g., Steam Assisted Gravity Drainage or Cyclic Steam Stimulation) projects. All mining projects now pay royalties based on bitumen production (even those that ultimately produce and market synthetic crude oil).

As noted above, Alberta's oil sands royalty system has two payment rates:

- **1% to 9% rate:** Based on gross revenue for oil sands projects that have not reached payout status (payout is "the point where the developer has recovered all the allowable costs of the project including a return allowance on those costs equal to the government of Canada long-term bond rate"). The rate starts at 1% and increases for every dollar that the West Texas Intermediate Crude (WTI) is above C$55 to a maximum of 9% when oil prices reach C$120 or higher.
- **25% to 40% rate:** Based on net revenue for an oil sands project that has reached payout. The rate starts at 25% and increases for every dollar that the WTI oil price increases over C$55 to a maximum of 40% when oil prices reach C$120 or higher.

Table 1 summarizes the important aspects of the royalty system and Table 2 shows the impact of changing WTI prices on royalty rates.

Table 1. Summary of Alberta's Generic Royalty System.

PROJECT STATUS	ROYALTY RATE		BASED ON	TRIGGER POINTS	
	Minimum	Maximum		If WTI >C$55	If WTI >C$120
Pre-Payout	1%	9%	Gross Revenue	The rate will increase from 1% to 9% based on the WTI Price	The rate will be 9% (the maximum rate)
Post-Payout	25%	40%	Net Revenue	The rate will increase from 25% to 40 % based on WTI Price	The rate will be 40% (the maximum rate)

Project Revenue is based on the total amount of final royalty product multiplied by its unit price (Government of Alberta 2011c). The unit price is adjusted to take into account handling charges related to the transportation of the final product from the royalty calculation point (generally the project boundary) to the point of sale.

[3] Oil sands developers must apply to the Department of Energy for the definition and approval of their oil sands "royalty project". The generic oil sands regime is not automatically applied to ERCB-approved extraction schemes. The definition of the project – the "ring fence" – is key in the subsequent calculation of allowed costs and royalties.

Gross Revenues are Project Revenue less the cost of any diluent contained in any blended bitumen at the royalty calculation point.

Net Revenues, on the other hand, are calculated as Project Revenues less all allowed costs (including the cost of diluent purchased in the Period), both operating and capital, which are credited to the project when they are incurred (Government of Alberta 2010).

Table 2. Example of the Impact of WTI Price on Royalty Rate.
After Government of Alberta (2010). A more detailed breakdown of price impacts is available in Leach (2012).

Price WTI C$/bbl	**Royalty Rate (based on gross revenue)**	**Royalty Rate (based on net revenue)**
Below C$55	1.00%	25.00%
C$55	1.00%	25.00%
C$60	1.62%	26.15%
C$65	2.23%	27.31%
C$70	2.85%	28.46%
C$75	3.46%	29.62%
C$80	4.08%	30.77%
C$85	4.69%	31.92%
C$90	5.31%	33.08%
C$95	5.92%	34.23%
C$100	6.54%	35.38%
C$105	7.15%	36.54%
C$110	7.77%	37.69%
C$115	8.38%	38.85%
C$120	9.00%	40.00%
Above C$120	9.00%	40.00%

The Alberta Royalty Review Panel (2007) recommended a variety of changes to the oil sands royalty system, many of which were adopted by the government with the October 2009 changes to the Alberta royalty framework (Government of Alberta 2009).

1.2 Magnitude of Royalty Payments for Mining and In-situ Projects

The growth of oil sands projects had a significant economic impact in the Province, especially once the generic royalty system was put in place in 1997. Bitumen royalties collected in 2010/2011 were C$3,723,412; and are predicted to be C$5.6B in 2012/13; C$7.6B in 2013/14; and C$9.9B in 2014/14 (Government of Alberta 2012[4]). As of 2010, mining accounted for 53% of bitumen production[5] with the rest coming from in-situ production (Alberta Energy n.d.a).

2 RELEVANT LEGISLATION AND POLICY DOCUMENTS

2.1 Royalty Legislation

Provincial Acts and Regulations establish the legal framework to determine how royalties are calculated.

The *Mines and Minerals Act* (Government of Alberta 2000a) defines the management framework of crown-owned minerals, which includes the collection of royalties, bonuses and rentals. Regulations related to oil sands royalties are derived from and based on this Act. Part 5 of the Act defines the lessee-government relationship for oil sands developments once the lease has been granted.

2.1.1 *Royalty Calculation*

The *Oil Sands Royalty Regulation, 2009* (Government of Alberta 2008a), under the *Mines and Minerals Act*, provides the regulatory framework for oil sands royalties. Part 3 of the Regulation provides information on costs and revenues while Part 4 provides information on royalty calculations.

In the following sections, note that pre-payout royalty is paid monthly, based on the monthly RG%, and post-payout royalty is calculated annually (per "Period") based on the annual RG% and RN% (Alberta Department of Energy 2011). Post-payout projects pay monthly installments towards their annual obligation. These "good faith estimates" (GFEs) are calculated monthly, but are based on the estimated annual RG% and RN% published by the Department. Actual annual royalty is not known until those rates are finalized at year end. The GFE calculation process is not RN% x (R-C) for the month. Allowed costs, post-payout, are calculated for the year and not by the month. See *Oil Sands Royalty Regulation, 2009* (Government of Alberta 2008a; s. 33(6), (7) and (8)) for the GFE calculation process.

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[4] See p. 52 of the report for a chart showing the growth of bitumen royalties since 1992-93.

[5] 2010 bitumen production was over 1.6 million bbl/d (Alberta Energy n.d.a).

2.1.1.1 Pre-Payout Royalty Calculations

Section 29(1) of the Regulation defines the royalty share for the project pre-payout as:

$$R_G\% = 1\% + [F_G(A - B)]$$

Where:

RG%: Crown's royalty share expressed as a percentage;

FG: Is 8% divided by $65 per barrel;

A: The lesser of:

- the WTI price for the given month calculated as "the product of the simple average of the WTI Prices for the trading days of the preceding month expressed in US$, and the simple average of the daily actual US$/C$ (noon) exchange rates for that month" (see example in Table 3); and
- $120 per barrel;

B: The lesser of

- A for the month, and
- $55 per barrel.

Table 3 shows the October 2011 and annual US$ WTI price and US$/C$ exchange rates. The average is calculated taking into account the actual WTI prices and exchange rates from previous months in 2011 and the estimated WTI prices and exchange rates for November and December.

Table 3. WTI Prices and Exchange Rates for October 2011.

Month	WTI US$ Price	Exchange Rate	WTI C$ Price
October 2011	US$85.61	0.98056039	C$87.31
Average	US$94.01	1.01967339	C$92.20

After Government of Alberta (2011a).

For pre-payout projects, the royalty rates based on gross revenue are calculated taking into account the monthly actual WTI price. Since the October WTI price in Table 3 (C$87.31) is between C$55 and C$120, we apply the formula below:

$$R_G\% = 1\% + [F_G(A - B)]$$

Where:

$$A = \left(\frac{US\$\,85.61}{0.98056039}\right) = C\$\,87.31$$

$B = C\$55$

$F_G = \frac{8\%}{C\$65} = 0{,}001231$

Then:

$R_G\% = 1\% + [F_G(A - B)]$

$R_G\% = 1\% + [0.001231(87.31 - 55)] = 0{,}0497662 = \mathbf{4.97662\%}$

2.1.1.2 Post-Payout Royalty Calculations

For the post-payout royalty share, section 29(2) of the Regulation states the royalty share will be **the greater** of:

$$R_G\% = 1\% + [F_G(A - B)]$$

Where:

RG%: Crown's royalty share expressed as a percentage;

FG: Is 8% divided by $65 per barrel;

A: The lesser of

- the WTI price for the year containing the Period calculated as "the simple average of the WTI prices for the months of that year (with the monthly average calculated as the simple average of the WTI prices for the trading days of the preceding month), expressed in American currency, and the simple average of the monthly exchange rates calculated in accordance with subsection (3)(b), for the months in that year" (see example in Table 3); and
- $120 per barrel;

B: The lesser of

- A for that year, and
- $55 per barrel.

Or,

$$R_{\mathrm{N}}\% = \frac{\left[25\% + [F_N(A - B)]\right][NR]}{GR}$$

Where

$R_N\%$: Crown's royalty share of the physical quantity of oil sands product expressed as a percentage;

FN: 15% divided by $65 per barrel;

A: The lesser of

- the WTI price for the year containing the Period, and
- $120 per barrel;

B: The lesser of

- A for that year, and
- $55 per barrel;

NR: Net revenue of the Project for the Period;

GR: Gross revenue of the Project for the Period.

2.1.2 *Allowed Costs*

The *Oil Sands Allowed Costs (Ministerial) Regulation* (Government of Alberta 2008b), under the *Mines and Minerals Act*, defines the framework under which allowed costs are considered for an oil sands development and how allowed costs are included in the royalty calculation. It is important to remember that:

- Allowed costs affect the calculated amount of royalties paid after payout has been reached. Allowed costs do not enter into the royalty calculation pre-payout but will affect the time that payout is reached (i.e., higher allowed costs extend the time to payout and therefore keep the royalty at the lower pre-payout rate).
- Only the oil sands royalty project-related costs are allowed costs – an oil sands operation may include royalty project and non-royalty project components (for example, if the royalty project is defined as the mine, any upgrader costs are not allowed costs as they are not part of the royalty project[6]. See section 2.1 in Government of Alberta (2011c) for further information on what a "royalty project" is).

[6] Section 8.1 of the *Oil Sands Allowed Costs (Ministerial) Regulation* describes how costs common to both components can be proportioned between the components (Government of Alberta 2008b).

- All cash costs (operating and capital) of the project are 100% deductible in the year in which they are incurred; however, since a key principle of Alberta's royalty system is that it is based on revenue minus costs the allowed costs are only deductible if they are incurred while the project is producing oil sands products[7] (Alberta Department of Energy 2011). Thus any expenditures, such as those related to plant site decommissioning, and tailings pond and mine reclamation, which occur after production ceases, are not eligible costs. Therefore the royalty system offers an incentive for industry to undertake as many environmental expenditures as possible before the project stops producing revenue.

Part 1, section 3 of the Regulation states that allowed costs are "incurred by or on behalf of the lessee or operator of the Project" and are "incurred to carry out Project operations".

Part 1, section 4(1) describes the fundamental costs of a project to include costs incurred directly:

(a) …

(b) to reclaim or abandon Project lands or

(c) to comply with environmental laws applicable to the Project or applicable to a lessee or operator of the Project in respect of the Project.

Part 2 Division 1 describes the amount of allowed costs and charges.

Schedule 1 at the end of the Regulation shows what costs are included as allowed costs and which ones are not included. Of specific interest to this report are:

- Item 9 – In relation to tailings management in oil sands mining Projects, the construction, acquisition and operation of the following equipment or facilities on Project lands:
    - lines, final tailings pump house, all pump trains and support equipment, including hydro cyclones for minerals separation
    - tailings ponds (including extraction tailings, upgrading process waters and mine pit drainage waters)
    - dikes
    - tailings pump house
    - piezometers
    - wildlife deterrent systems
- Item 20 – Complying with Board or Alberta Environment requirements regarding Project air and water quality, soil and wildlife monitoring.

[7] Since the Crown's royalty is defined as a physical share of output if there is no output there is no royalty.

- Item 21 – Acquiring, modifying or installing, operating and maintaining equipment on Project lands to reduce, or capture and dispose of, greenhouse gas emissions.
- Item 22 – Abandonment, reclamation and decommissioning as a result of Project operations as follows:
    - deposits paid to the Crown to ensure the proper reclamation of Project lands
    - payments required by the Crown to secure reclamation of Project lands
    - performing reclamation work on the Project lands
    - abandoning and decommissioning surface and subsurface facilities

2.2 Environmental Legislation

2.2.1 *Alberta Environment and Sustainable Resource Development*

The *Environmental Protection and Enhancement Act* (Government of Alberta 2000b) provides authority for establishing environmental standards and requiring approvals[8] for certain types of industrial developments (including oil sands).

The *Climate Change and Emissions Management Act* (Government of Alberta 2003) sets a greenhouse gas (GHG) emission reduction target (based on tonnes of carbon dioxide equivalent) at an amount equal to or less than 50% of 1990 levels by December 31st, 2020. The *Specified Gas Emitters Regulation* (Government of Alberta 2007c) requires a 12% reduction of emissions for existing projects (Section 3). For new projects (Section 4), a 3-year-period grace is given to establish their baseline and they are required to reduce GHG emissions at a rate of 2% per year until reaching the required 12% reduction. If the company cannot achieve the target, they can buy approved offsets from other companies or pay C$15/tonne of GHG generated (Alberta Environment and Water n.d.)[9].

The *Water Act* (Government of Alberta 2000c) provides for licenses and approvals to divert or use surface water or groundwater, thus managing the supply and allocation of water for all users. Of relevance for this report is Part 4 (Approvals, Licenses, Preliminary Certificates and Registrations).

2.2.2 *Energy Resources Conservation Board (ERCB)*

The *Oil Sands Conservation Act* (Government of Alberta 2000d) is established to "effect conservation and prevent waste of the oil sands resources of Alberta". It provides authority to establish operating standards for oil sands in-situ and mining developments. In particular the

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[8] See http://www.osrin.ualberta.ca/Resources/WebsiteLinks/EnvironmentalOperatingApprovals.aspx for access to oil sands mine *Environmental Protection and Enhancement Act* approvals.

[9] In 2008, the Oil Sands Mining and Upgrading sector paid C$6.66M into the Fund and the Oil Sands In Situ Extraction sector paid C$9.1M (Alberta Environment 2008).

ERCB establishes standards for the management of oil sands tailings and for the configuration and geotechnical stability of waste material dumps and structures.

For example, the ERCB issued Directive 074 (Energy Resources Conservation Board 2009) which "specifies performance criteria for the reduction of fluids tailings and the formation of trafficable deposits". New technologies are being developed to fulfill these requirements, which imply higher costs for oil sands developers.

3 IMPLICATIONS OF CHANGING ENVIRONMENTAL REQUIREMENTS

Environmental requirements have increased since the early development of oil sands in 1967 and are likely to continue to increase over time for a variety of reasons, including:

- Provincial, national and international awareness of the environmental impacts of oil sands development and the potential to affect the social licence to operate is increasing (e.g., Chapman and Das 2010, Gosselin et al. 2010, National Energy Board 2006, OSRIN et al. 2011, Squires et al. 2010).
- Public pressure for enhanced environmental protection is increasing (e.g., Bramley et al. 2011, Schneider and Dyer 2006).
- Advances in monitoring and analysis techniques are allowing for ever greater precision of measurement of impacts (e.g., Gibson et al. 2011, Hashisho et al. 2012, Rowland et al. 2012, Zhao et al. 2012).
- New standards or best practices are being developed (e.g., Alberta Environment and Water 2012, Shewchuk 2010).

Increased environmental requirements will most likely result in increased costs for oil sands operators. As noted in section 2.1.2, the costs to meet legislated environmental requirements are an allowed cost and thus reduce the royalties owed for a project.

3.1 Recent Environmental Requirements

Examples of recent environmental requirements that have likely increased allowed costs and thus reduced royalties include:

- Changes to soil salvage and replacement requirements for oil sands mines resulting in salvage from multiple soil types, and where direct placement of salvaged material is not possible, placing salvaged materials in segregated stockpiles (Richens and Purdy 2011)
- Implementation of the ERCB Directive 074 (Energy Resources Conservation Board 2009)
- Implementation of the Mine Financial Security Program which will ultimately result in increased financial security costs for oil sands mines (Alberta Environment 2010a,b)

- Implementation of the federal Department of Fisheries and Oceans compensation lake mitigation requirements (Canadian Association of Petroleum Producers 2009, Fisheries and Oceans Canada 2010)

3.2 Responses to Events and Public Pressure

Environmental costs may escalate due to increased public (and eventually regulatory) pressure and/or in response to specific events. Examples of environmental responses to public pressure and/or events include:

- Increased emphasis on wetlands reclamation, and in particular a focus on re-establishment of fen wetlands (Daly 2011, Price et al. 2007, Richens and Purdy 2011, Rooney et al. 2012)
- Increased emphasis on aboriginal interests, objectives and traditional ecological knowledge (Barnaby and Emery 2001, Chan and Lawn 2008, Daly 2011)
- Implementation of improved bird deterrent systems, especially after the deaths of ducks at the Syncrude Aurora mine site (Ronconi and St. Clair 2006, Syncrude 2009)

3.3 Potential Future Environmental Requirements

Examples of potential future environmental requirements that may increase allowed costs and thus reduced royalties include:

- Implementation of the federal-provincial oil sands monitoring initiative (Government of Canada and Government of Alberta 2012)
- Adoption of Qualifying Environmental Trusts as a vehicle for payment of financial security under the Mine Financial Security Program (Alberta Environment 2011b, s. 4.6)[10]
- Development of standards for release of process-affected water to the environment (contemplated in Oil Sands Water Release Technical Working Group 1996)
- Development of policy or standards for decommissioning oil sands plant sites (Morton et al. 2011)
- Development and implementation of a wetland policy applicable to the oil sands area (Government of Alberta 2011b; Key Action 2.1)

4 CONCLUSIONS

Environmental requirements for oil sands operations have increased over time and are likely to continue to do so. Oil sands operators are responsible for the costs associated with meeting

[10] OSRIN will be releasing a separate report on Qualifying Environmental Trusts.

environmental requirements prescribed by the government. However, the province's oil sands royalty regime incorporates deductions for *allowed costs* which include costs of meeting environmental requirements. Therefore, in effect, increasing environmental requirements, which often mean greater costs, results in reduced government royalties.

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6 GLOSSARY

6.1 Terms

Allowed Costs

Costs or other amounts under the *Oil Sands Allowed Costs (Ministerial) Regulation* that may be eligible for deduction from project revenues in the calculation of oil sands royalty (Alberta Energy n.d.b).

Gross Revenue

For an oil sands royalty project, the project revenue minus the cost of diluent contained in any blended bitumen included in the calculation of the project's revenue (Alberta Energy n.d.b).

Net Revenue

For an oil sands royalty project, the amount by which project revenue exceeds net project costs in a given reporting period. Net project costs are allowed costs less other net proceeds (Alberta Energy n.d.b).

Oil Sands Royalty Project (see Project)

An oil sands project for which royalty calculation and reporting is governed by the *Oil Sands Royalty Regulation, 2009*, and not a larger integrated project of which the royalty project may form a part (Alberta Energy n.d.b).

Payout

The point where the developer has recovered all the allowable costs of the project including a return allowance on those costs equal to the government of Canada long-term bond rate. See Government of Alberta (2007b).

Project

An activity approved pursuant to s. 11 of the Oil Sands Royalty Regulation, 2009 or the *Oil Sands Royalty Regulation, 1997* (AR 185/97) (Government of Alberta 2008a).

It is important to note that this definition may be quite different from the definition of the activity regulated under the *Environmental Protection and Enhancement Act* or under the *Public Lands Act*.

Royalty

The physical share of production retained by the resource owner (i.e., the Crown). This share is automatically transferred to the lessee (company) resulting in a cash payment to the government "in respect of" royalty.

The price charged by the energy resource owner (e.g., Alberta) for the right to develop those resources (Government of Alberta 2010). Royalties are part of the overall revenue share received from energy development. In addition, the Province receives revenue from bonus bids from the successful auction of mineral leases, rentals and fees associated with the leases, and through municipal and corporate income taxes. While these are not royalties, they are all part of the return Albertans receive for the development of their resources.

West Texas Intermediate

The light, sweet crude oil from the United States. This is an important price benchmark for North American oil (Alberta Energy n.d.b).

6.2 Acronyms

C$	Canadian dollars
C$B	Billions of Canadian dollars
C$M	Millions of Canadian dollars
ERCB	Energy Resources Conservation Board
GFE	Good Faith Estimates
GHG	Greenhouse Gas
OSRIN	Oil Sands Research and Information Network
SEE	School of Energy and the Environment
US$	US dollars
WTI	West Texas Intermediate (crude)

7 LIST OF OSRIN REPORTS

OSRIN reports are available on the University of Alberta's Education & Research Archive at https://era.library.ualberta.ca/public/view/community/uuid:81b7dcc7-78f7-4adf-a703-6688b82090f5. The Technical Report (TR) series documents results of OSRIN funded projects. The Staff Reports series represent work done by OSRIN staff.

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