

Alberta

Alberta Bitumen Assay Program Overview & Technical Challenges

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Introduction

- **Overview**
 - Alberta Energy
 - Program importance and objectives
 - Overview of program design
 - Technical challenges
 - Sampling
 - Sample preparation
 - Assays
 - Implementation
 - Questions

Alberta Energy

- Steward of Alberta's energy system for Albertans.
- Develop policy for and manage development of Alberta's non-renewable resources and renewable energy.
- Grant industry the right to explore for and develop Alberta's energy and mineral resources.
- Establish, administer and monitor the effectiveness of Alberta's fiscal and royalty systems.
- Collect revenues from the development of Alberta's energy and mineral resources on behalf of Albertans.
- Promote energy efficiency and conservation by Albertans and industry.
- Encourage investment in Alberta's energy industry to create jobs and economic prosperity for Albertans.

Importance

- Majority of Oil Sands owned by Alberta
- Oil Sands Royalty (OSR): royalty is based on project revenue and costs (either 1-9% gross revenue or 25-40% net revenue).
- Royalty rates are based on WTI price.
- Royalty collected on bitumen.
- ~\$5.6 billion in bitumen royalties for 2012-13 (over 50% of ALL royalty revenue – AE 2012 budget forecast).

Importance

- Over 50% of Alberta bitumen is not sold to third parties and considered non-arms length (NAL) transactions
- NAL bitumen is valued with a bitumen valuation methodology (BVM)
- BVM variable is bitumen density

Objectives

- **Data may be used in a variety of ways:**
 - Review of BVM
 - Enhances knowledge of oil sands resource
 - Advocacy – studies to show:
 - Carbon pathway
 - Other (i.e. CCQTA studies on corrosivity, processability, bitumen compatability)
 - Assess value added and other strategies
 - Other general work
- **Authority:**
 - Section 52 of *Mines and Minerals Act*

Program Design

■ Program Overview:

- ADOE pays for sampling, preparation, and analyses
- Approximately twenty OSR Projects representing over 90% of bitumen production
- Mining and in-situ (thermal & cold) Projects included from all three oil sand areas
- Two phases (phase 1 is 14 Projects)

■ Program Design:

- ADOE will retain an independent laboratory to collect and prepare samples, and perform laboratory tests
- Assays conducted over two years (2012 to 2013)
- Assay results will be shared with project operator⁷

Assay Requirements

Table 1 - Bitumen Assay Program Test Matrix

Property	Possible Test Method	Whole Crude	Naphtha (IBP-266C)	Distillate (266-343C)	LGO (343 – 399C)	Atm. Resid (399C+)	HGO (399 – 454C)	VGO (454 – 527C)	Residue (527+C)
Volume and Mass % Yields	D2892, D5236		X	X	X	X	X	X	X
Density (kg/m3)	D4052, D5002, D70	X	X	X	X	X	X	X	X
Sulphur, total (mass %)	D4294	X	X	X	X	X	X	X	X
Total Acid Number (TAN)	D664, D664M	X	X	X	X	X	X	X	X
MicroCarbon Residue (mass %)	D4530	X			X	X	X	X	X
Nitrogen, total (mass%)	D5762	X	X	X	X	X	X	X	X
Nitrogen, basic (mass%)	UOP 269							X	
Chlorides, Total Organics	D4929	X							
Viscosity at 3 temps (cSt)	D7042, D445, D4402, D341	X	X	X	X	X	X	X	X
Simulated Distillation	D7169, D2887, D6352	X	X	X	X		X	X	X
Metals (Iron, Vanadium, Nickel)	D5708B	X							
Asphaltenes, C5 & C7 Insoluble	D4055, D6560	X							X
Pour Point (°C)	D5835A, D97	X		X	X		X	X	X
Cloud Point (°C)	D2500		X	X	X				
Softening Point (°C)	D36								X
PONA (mass %)	D2425, D2549, D1319		X	X					
Smoke Point (°C)	D1322		X						
Aniline Point (°C)	D611		X	X	X	X	X	X	
Cetane Index	D976			X	X				
K Factor, UOP	UOP 375		X	X	X		X	X	X
Ash (mass %)	D482	X							
CHNS (mass %)	D5291	X							
Water Content (mass%)	D6304, D4007	X							
Salt (mass%)	D3230	X							

Note: Final list of tests are subject to adjustment

Sampling Requirements

- **Samples to be collected prior to diluent addition (PFT exception)**

- **Sampling Issues:**
 - Sample points exist?
 - Multiple samples (representative of project)
 - Limit/eliminate loss of light ends
 - Size of samples (high water content & Naphtha cut)
 - Safety

Sample Preparation

- **Samples prepared according to industry standard (same method – data integrity)**

- **Preparation Issues**
 - Mining vs. In-situ
 - Dewatering: Toluene vs. Distillation (decanting?)
 - Loss of light ends (preparation)
 - Solids removal
 - Solvent removal
 - Volume – size of sample for assay (naphtha cut)

Assay

- **Tests conform to ASTM and other recognized standards**

- **Assay Issues**
 - Standards applicable for bitumen
 - Distillation (first cut volume)
 - Still availability
 - Consistent test methods between cuts
 - Analysis of data – representative?

Implementation Requirements

■ Sampling Process

- Will respect operator environmental, health and safety requirements.
- Laboratory will oversee sampling, conduct the testing and analysis work (data integrity).
- ADOE staff will accompany during sample collection.
- Schedule is adaptable (turnarounds, lab availability, other program impacts).

■ Future Sampling

- New projects.
- Updates to ensure data is current.
- Tests may be adjusted to ensure data is useful.

Implementation

■ Program Timeline

- ADOE is currently finalizing RFP contract.
- Vendor for phase 1 was selected through competitive RFP process in Q2 of 2012.
- Sample collection, preparation, and laboratory testing scheduled to commence in Q2/Q3 of 2012.

■ Oil Sands Operator Engagement

- Past - Original presentation in December 2011.
- Ongoing - Individual technical sessions.
- Future - access to project site for sample collection.
- Future - comments and feedback on assay results.

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Thank You

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