



Oil Sands Bitumen Processability Project Update

CCQTA/COQA Meeting
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New Orleans





Oil Sands Bitumen Processability Project Update



- Project Scope
- Participants
- Work Summary
- Results Summary
- Proposed Future Activities





Oil Sands Bitumen Processability Scope

- **Scope:**

- Study unique features of Canadian Oil Sands Bitumen that may enhance or impede processability.
 - 🔥 Solids, Salts
 - 🔥 TAN, Asphaltenes
 - 🔥 Others ?
- Step I → Front end - Assess potential desalting issues
- Step II → Back end – Estimate coking, potential fouling issues



Oil Sands Bitumen Processability Participants

BP

ConocoPhillips

NCRA

CITGO

Petro-Canada

MEG Energy

Devon Canada

Work in kind

Maxxam Analytics

BakerPetrolite

Encana

NCUT

Suncor

Marathon

Shell

Total

Champion

ARC



Oil Sands Bitumen Processability Work Summary



- **Samples**

- 6 commercial Athabasca bitumens tested
 - 🔥 Bitumen #1, not fully commercialized (insufficient diluent)
- 1 heavy oil
- WCS
- 5 samples collected from each location to assess variability

- **Test Matrix**

- Properties
 - 🔥 TAN, salt, filterable solids, asphaltenes, metals content, density



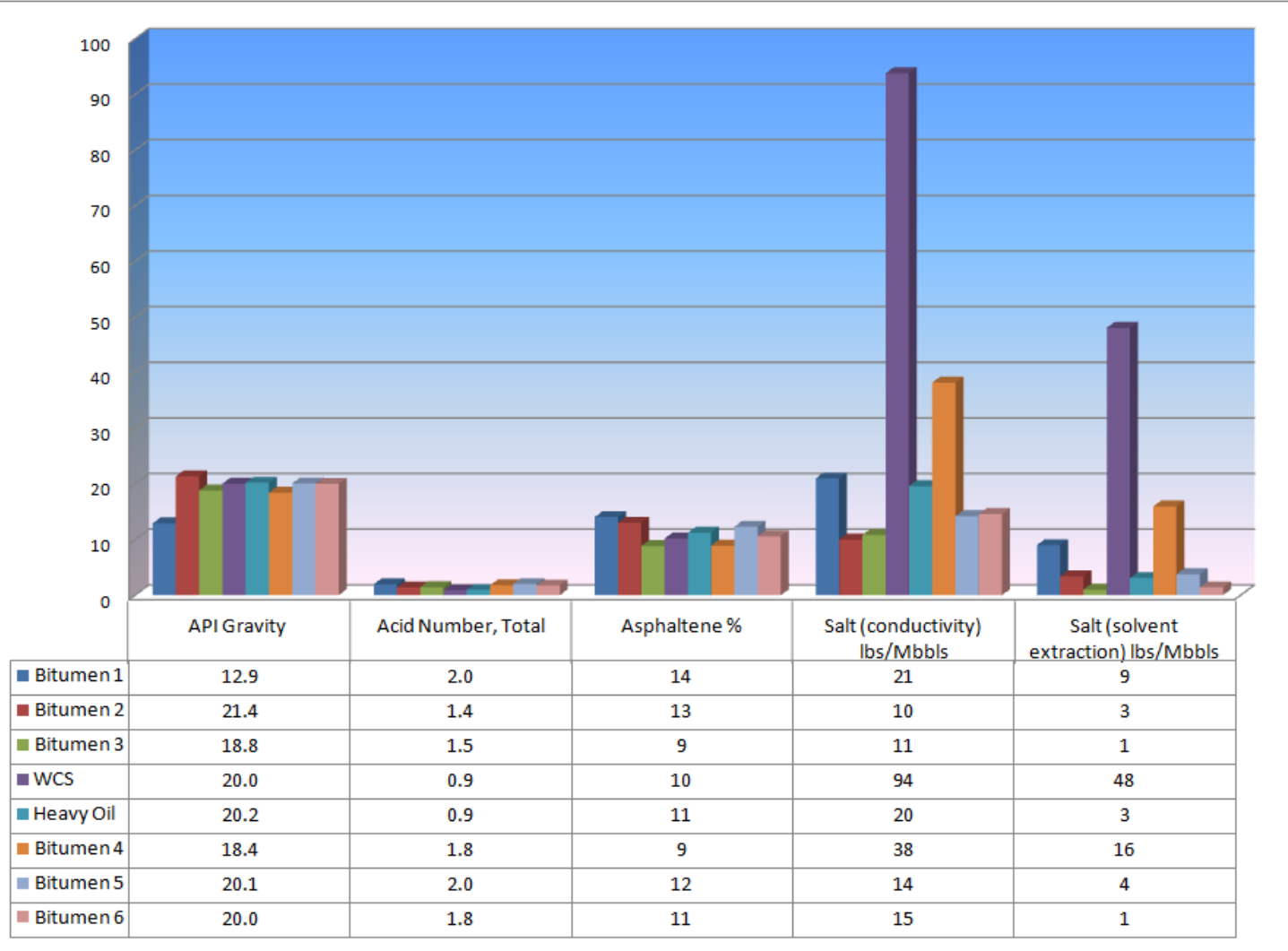
Oil Sands Bitumen Processability Work Summary- continued

- **Test Matrix**

- Filterable solids Analysis
 - 🔥 Composition, EDS, XRD & Particle Size Distribution
- Emulsification tendencies
 - 🔥 Work completed by Champion and BakerPetrolite
 - 🔥 Very basic - EB Testing
- Coking and Fouling Tendencies - NCUT
 - 🔥 Fouling work completed using ALCOR unit
 - 🔥 Coking onset study based on solubility parameters
 - 🔥 Only WCS & Bitumen #5 samples tested to date



Oil Sands Bitumen Processability Properties – Averaged Results





Oil Sands Bitumen Processability Emulsion Tendency & Solids Content



Sample	Emulsification Tendency Scoring System Low number is best Performer	Average Filterable Solids wppm
Bitumen 2	17	19
Bitumen 4	11	111
WCS	42	191
Heavy Oil	29	150
Bitumen 5	49	311
Bitumen 3	41	217



Oil Sands Bitumen Processability Fouling & Coking Study Results

- **Fouling work – ALCOR Testing**
 - Both WCS & Bitumen #5 deemed to be low fouling crudes
 - Overall fouling tendency
 - 🔥 Bitumen #5 < WCS
- **Coking Onset Testing – SBN/IN Method**
 - Bitumen #5 \approx WCS



Oil Sands Bitumen Processability Results Summary

Based on testing to date:

1. Little variability in measured sample properties.
2. No special processing issues/challenges were identified with commercial bitumens.
3. On average, commercial bitumens contaminant levels appear similar to, or less than those measured in WCS and the heavy oil samples.



Oil Sands Bitumen Processability Proposed Future Activities

1. Complete fouling & coking work on additional samples
2. Compare coking & fouling tendencies of dilbit vs. synbit created from a common bitumen
3. Upgrade emulsion studies on all sample
4. Complete coking yield study on all samples
5. Undertake sulfur speciation of all samples
6. Complete an organic analysis of Bitumen 6 sample filters



CCQTA Contact Information

- Project Manager
 - Eric Veters
 - ☛ Ph: 918 661 3233
 - ☛ E-mail: eric.w.veters@conocophillips.com
- Secretary
 - Andre Lemieux
 - ☛ Ph: 780-975-3026
 - ☛ E-mail: secretary@ccqta.com