

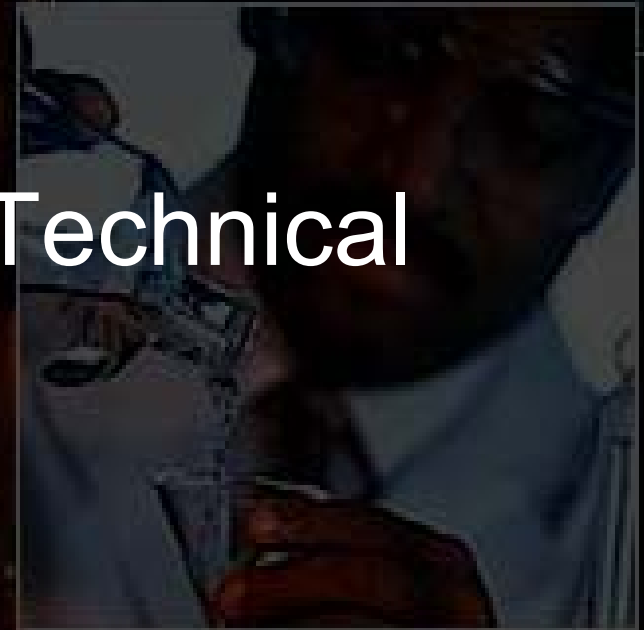
CCQTA

# Canadian Crude Quality Technical Association Project Update

## COQG Meeting

San Francisco, CA

October 31, 2007



October 17, 2007

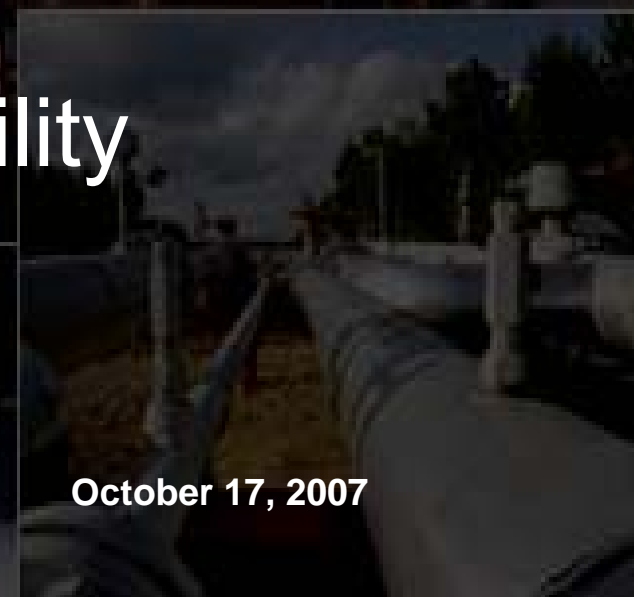
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# CCQTA

The Canadian Crude Quality

## Active Projects List

- Heavy Oil Manual
- Iron Fouling
- NGL Contamination
- Phosphorus in Crude
- Oilsands Bitumen Processability
- TAN Phase III



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# Heavy Oil Manual Project

- Goal is to review methods applied to heavy oils and bitumens, identify issues associated with their application to a heavy oil matrix, and provide recommendations/upgrades to the test methods
- TAN, asphaltenes, sample preparation, viscosity and density completed
- Chlorides section out for review in draft form
- Sulfur section near completion of first draft
- Funded by CCQTA membership
- Project manager – Bryan Fuhr 1-780-450-5032

# Iron Fouling Project

## Objective

- Project goal is to understand role of iron as a contaminant in condensate and crude oil
  - as an emulsion stabilizer
  - as a process foulant, i.e., in furnaces, reboilers, fuel gas filters, etc.
  - as a process contaminant, e.g., catalytic units



# Iron Fouling Project

## Participants

- BP
- ConocoPhillips
- Flint Hills Resources
- CITGO
- Halliburton
- Imperial Oil Limited
- Maxxam
- Nalco
- NCRA
- Chevron Canada
- Encana
- NCUT
- Petro-Canada
- Grace Davison

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# Iron Fouling Project Status

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- Reviewing ECAT data from participants to establish metal/metal correlations
- Using correlations to identify potential sources of iron in feed (i.e., solids, porphyrins, frac fluids)
- Examining desalter emulsions for unusual iron behavior
- Project manager - Jack Suggett - 1-780-645-2807

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# NGL Contamination Objective

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- Understand the nature and source of plant fouling associated with;
  - processing field butane at the refinery/chemical plant (inlet filters/DIB reboiler)
  - processing of Natural Gas Liquids at Fractionators ( $C_2$ ,  $C_3$ ,  $C_4$  reboilers)



# NGL Contamination

## Participants

- ARC
  - BP
  - Keyera
  - Maxxam
  - Pall Corporation
  - Shell
- Alberta Envirofuels
  - Dow Chemical
  - Imperial Oil
  - Nova Corporation
  - Provident

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# NGL Contamination

## Status

- Refiners employing mechanical filtration to help manage fC<sub>4</sub> quality issues
- Work to date suggests that contamination sources appear to be related to pipeline interface management;
  - Condensate into field butane
  - Condensate into NGL
- Lab analysis identifies NGL Fractionator reboiler foulant as iron based deposit, salt and oxygenated organic compounds (carboxylates, esters, ethers, etc.)
- Project manager – Bob Falkiner 1-416-441-7145



# Phosphorus in Crude Objective

- Identify sources of Phosphorus based plant fouling
- Develop alternatives to volatile Phosphorus
- Implement solutions
- Monitor effectiveness of solutions

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# Phosphorus in Crude Project Participants

- CCS Energy
- Chevron
- Clearwater
- Enerchem
- Halliburton
- Rev Fluids

- BP
- ConocoPhillips
- Imperial Oil
- Maxxam
- NewAlta
- Petro-Canada

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# Phosphorus in Crude Status

- Evidence shows that Refinery tower fouling continues
- Recently, one Canadian refinery reported deactivation of ULSD hydrotreater catalyst after very short run – high P content on catalyst bed
- Phosphorus based fouling of jet engines reported by US military – USAF investigating jet for evidence of volatile phosphorus

# Phosphorus in Crude

## CAPP Enforcement Program

- Enbridge testing of receipt streams for sweet crude show no results for volatile phosphorus (P) over action limit of 1.5 ppm for composite samples
  - 21 of 78 however samples reported results greater than the detection limit but less than 1.5 ppm
- Project group recommended that CAPP change actions for composites with results  $\geq 1.0$  ppm P
  - Test all individual samples used to create composite sample
- Project manager – Sachin Kansal (403) 237-3306

# Oilsands Bitumen Processability

## Project - Objective

- Estimate potential processability issues associated with refining oilsands bitumen
- Initial phase focusing on density, gravity, asphaltene, salt content, filterable solids, TAN and metals of targeted streams
- Gather available information via questionnaire, identify gaps, collect and analyze samples to fill gaps

# Oilsands Bitumen Processability Project - Participants

- BP
- ConocoPhillips
- NCRA
- CITGO
- Petro-Canada

- Encana
- NCUT
- Suncor
- Marathon
- Shell



# Oilsands Bitumen Processability

## Project - Status

- No useful data collected to date from information questionnaire
- Sample collection and analysis protocol developed and planned for targeted streams
- Project manager – Bruce Randolph (918) 661-5077

# TAN Project Phase III

## Objective

- Phase III goal is to confirm results of Phase II by conducting corrosion testing under vacuum conditions
  - Minimize influence of (H<sub>2</sub>S) sulfur passivation
- First step involves validating new autoclave by running high Tan SJV

# TAN Project – Phase III

## Project Participants

- ARC
- BP
- ConocoPhillips
- ENCANA Corporation
- IOL
- JACOS
- Marathon
- NCUT
- NCRA
- Petro-Canada
- Suncor
- Shell

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# TAN Project – Phase III

## CCQTA Status

- Qualification runs completed for SJV gas-oil
  - 48 hour test without coupons to test impact of process system on sample – negligible changes
  - 7 day test to establish capability of measuring high corrosion rates - successful
- Upgrader oilsands gas-oil has been tested
- Bitumen gas-oil sample from conventional operation just completed
- Project manager – Randy Segato (403) 920-8994

# Next meetings

- Next project meetings to be held in Calgary in December and March.
- CCQTA GM in Calgary on December 4<sup>th</sup> or 5<sup>th</sup>.
- Joint CCQTA AGM/ COQG meeting scheduled for mid June in Calgary, Alberta
- See web site for details: [www.ccqta.com](http://www.ccqta.com)