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CCQTA Project Activities Update for the COQG

September 29th, 2005



Contact: president@ccqta.com or
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September 27, 2005

Projects List

- Heavy Oil BS&W
- Phosphorus in Crude
- TAN Project
- NGL Contamination
- Heavy Oil Emulsion Viscosity
- Heavy Oil Methods Manual
- Additive Impact - proposed
- Olefins Test Method



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Heavy Oil BS&W Project Status Report

September 21st 2005

Project Manager:

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September 27, 2005

Heavy Oil BS&W

Participants - 21/09/05

- Baker Petrolite
 - Champion Technologies
 - Conoco Phillips
 - Encana Corporation
 - GE Betz
 - Maxxam Analytics
 - NCUT
 - Suncor Energy
- BP
 - CITGO
 - Enbridge
 - ExxonMobil
 - Husky Oil
 - Nalco Canada
 - Petro-Canada

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Heavy Oil BS&W

Project Status

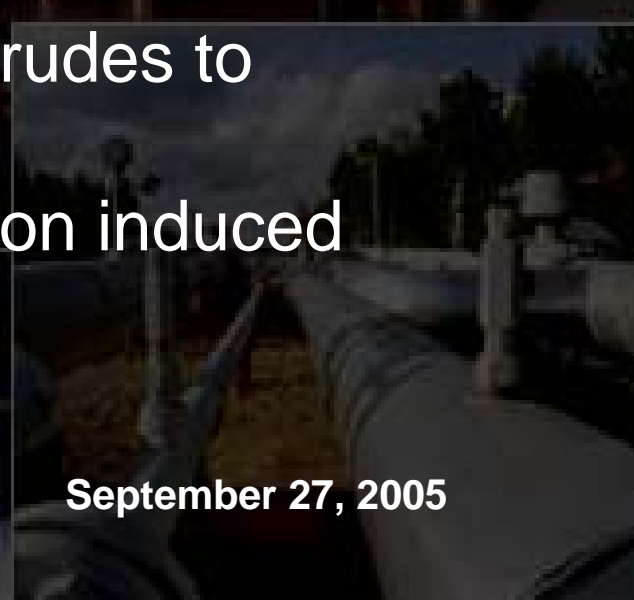
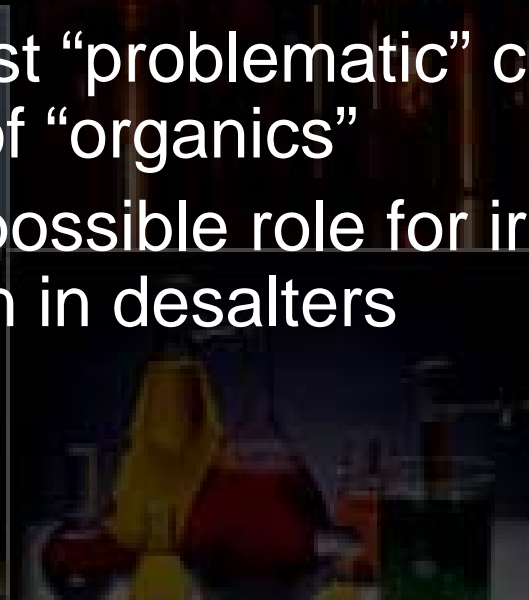
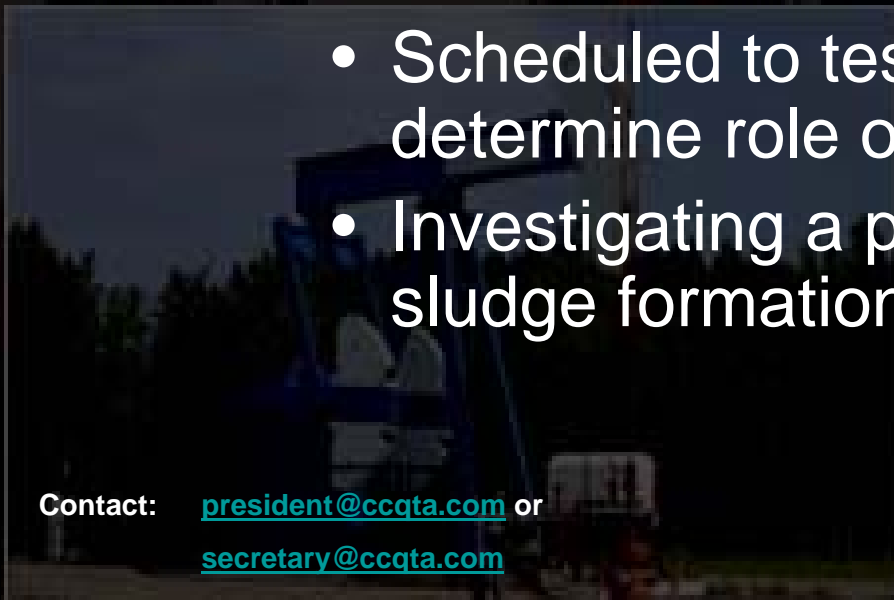
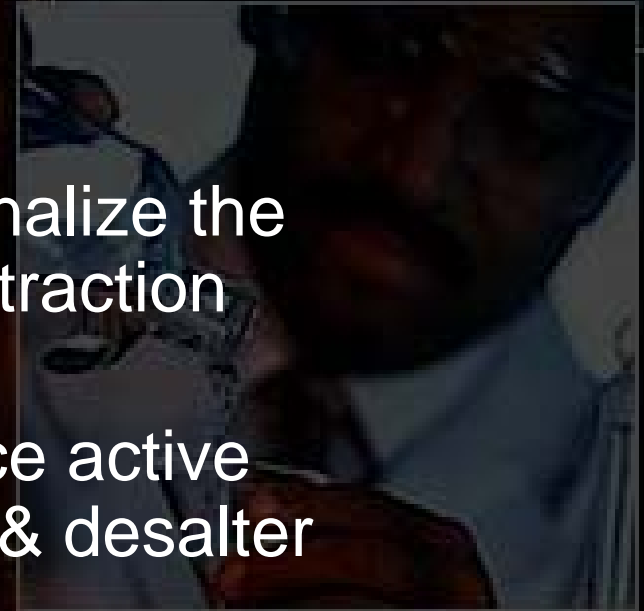
- Phases 1 & 2
 - No clear correlation between the abundance/composition of filterable solids and heavy oil processability
- Phase 3
 - Exploring the possible role of other factors:
 - Role of organic sediment (additives, natural chemicals) on desalter interface stability/fouling
 - Impact of blended crude/crude incompatibility on asphaltene precipitation at interfaces
 - Possible role of foulant precursors (eg. metals) on above



Heavy Oil BS&W Project Status

The Canadian Crude Quality

- Phase 3 - extended
 - Extensive work undertaken to finalize the development of the “organic” extraction procedure
 - Identified the presence of surface active materials in raw crude samples & desalter interfaces
 - Scheduled to test “problematic” crudes to determine role of “organics”
 - Investigating a possible role for iron induced sludge formation in desalters



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Phosphorus in Crude Project Status Report

September 20th, 2005

Project Manager:

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September 27, 2005

Phosphorus in Crude

Participants - 21/04/05

- B.J. Services
- Chevron Canada Resources
- Clearwater Inc.
- Enerchem
- Halliburton Energy Services
- Imperial Oil Limited
- Maxxam Analytics
- Nalco Canada
- New Alta Corporation
- Petro-Canada
- United Refining



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Phosphorus in Crude Project Status

- Project participants have developed alternative “low-volatile” chemistries, and field treatment options.
- CAPP Crude Oil Quality Committee has reviewed CCQTA work and imposed a phosphorus in crude spec of 0.5 wppm in the distillate fraction effective July 2005.
- Enforcement of spec scheduled to begin July 2006.

Phosphorus in Crude Project Status

- Preliminary CAPP testing indicates phosphorus volatilities much greater than anticipated from frac fluids
- Ongoing activities include:
 - Confirm volatility of frac gellants
 - Determine if new high volatile additives are being used
 - Evaluate pilot plant fouling tendencies of “low volatile” alternatives

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TAN Project- Phase 2 Status Report

September 21st 2005

Project Manager:

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TAN Project

Participants - 21/09/05

The Canadian Crude Qu

CCQTA

- Alberta Research Council
- BP
- Enbridge Pipelines
- GE Betz
- Marathon Petroleum
- Nalco Canada
- Petro-Canada
- Suncor Energy
- Total

Baker Petrolite
Conoco Phillips
Encana Corporation
JACOS
Maxxam Analytics
NCUT
Shell
Terasen Pipelines

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TAN Method Modifications

- Agreement reached between labs on appropriate method modifications
- Modifications do not alter the solvent ratios use in ASTM D664
- Mini-round robin completed with Lloyd Blend (pipeline spec) and Athabasca bitumen
- Method modifications to be published

Mini Round Robin TAN Results

Lab	ID	Run	Wt	Result	Average
1	Lloyd Blend	1	1.0175	0.72	0.741
1	Lloyd Blend	2	1.0026	0.73	RSD (%)
2	Lloyd Blend	1	1.98	0.79	4.7
2	Lloyd Blend	2	1.98	0.79	
2	Lloyd Blend	3	2.02	0.72	
3	Lloyd Blend	1	1.9573	0.75	
3	Lloyd Blend	2	2.381	0.74	
3	Lloyd Blend	3	1.8875	0.69	Average
1	Athabasca bitumen	1	1.0036	3.19	3.30
1	Athabasca bitumen	2	1.0038	3.13	RSD (%)
2	Athabasca bitumen	1	1.001	3.42	3.3
2	Athabasca bitumen	2	1.002	3.36	
2	Athabasca bitumen	3	1.007	3.23	
3	Athabasca bitumen	1	1.0968	3.37	
3	Athabasca bitumen	2	1.0785	3.42	
3	Athabasca bitumen	3	1.0785	3.28	

Corrosivity testing

- Corrosivity testing completed on MacKay River (MKH pipeline blend) gas oil, SJV (low TAN) gas oil, and SJV (high TAN) gas oil
- Approval has been received for provision of samples from the Albian gas-oil cut for corrosivity testing
- Results support hypothesis that Athabasca oilsands product is not as corrosive as the TAN would suggest
- Potential exists for testing a fifth gas oil sample

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NGL Contamination Project Status Report

September 20th 2005

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September 27, 2005

NGL Contamination

Participants - 20/09/05

- ARC
- BP
- Keyera
- Maxxam
- Pall Filters
- Provident Energy

Alberta Envirofuels
Dow Chemical
Imperial Oil
Nova Corporation
Petro-Canada

NGL Contamination Project Objectives

- Confirm the existence of a “common cause” contamination at multiple locations.
- Track contamination from affected plant(s) to source.
- Identify critical activity/process responsible for foulant generation.
- Develop management process to help reduce/eliminate contamination at source.

NGL Contamination Activities

- Determined that fC₄ delivered to end users contain sediment, polar organics & asphaltenes
- Preliminary results suggest that contamination during pipeline transport (batched with condensate) has minimal impact
- Evidence to suggest that NGL contamination is carried through to fC₄ during distillation
- Conformational work to be completed by the end of November

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Heavy Oil Emulsion Viscosity Project Status Report

September 21st 2005

Project Manager:

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Heavy Oil Emulsion Viscosity Project - Phase II - Design Concept

- Phase I findings indicated that current viscosity models take into consideration only the amount of water present in an emulsion
- Other factors are likely significant
- Propose to gather the following field data;
 - pressure drop in existing gathering system piping
 - operating and configuration information
- Compare measured pressure drop against calculated pressure drop provided for the tested facilities
- Establish adequacy of current modeling software

Phase II – Activities

- Gather information from participants on available facilities for measurement

Step 1

- At each facility:
 - Gather information on gathering system
 - Select wells to be tested

Step 2

- Measure pressure drop on selected wells
- Gather production and configuration information on tested wells – data to remain confidential

Phase II - Activities

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Step 3

- Calculate pressure drop for each measured well, using measured test conditions as input
- Compare output results to measured test data
- Establish whether current commercial models are adequate for pressure drop calculations



Cost per site – Step 1: Estimated at \$2000 per site

- Steps 2 & 3: To be determined based on input from step 1, i.e., number of wells to be tested, etc.

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CCQTA Heavy Oil Methods Manual Project

September 21st 2005

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CCQTA Objective

- Provide a document to assist users of heavy oil methods with an understanding of their capabilities and limitations and allow users to make informed decisions on method selection
 - Users include: analytical chemists, researchers, site engineers and marketing personnel

Scope

- Density
- Viscosity
- Sulphur
- BS&W
- Asphaltenes
- TAN
- Distillation
- Chloride Testing

- Water & solids cleanup techniques

Deliverables

- PDF document outlining heavy oil and bitumen methods, their pros and cons, applicability and limitations, helpful hints and reference to round robin results
- Manual to be updated & maintained as required
- Manual provided to Project/CCQTA membership (to be determined by funding protocol)
- Manual made available to interested third parties, at a cost

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Additive Impact Proposed Project

September 20th 2005

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CCQTA Objective

- Improve awareness of commercially used chemistries used in all up-stream activities in the petroleum industry.
- Share information with refinery technical staff in order to improve their awareness of chemistries used in petroleum production.
- In return, obtain from refinery technical staff information regarding sensitive products, processes, and chemistries
- Assist in future product development activities and possible testing of pre-commercialized additives.

CCQTA Scope

Phase 1 – Complete a thorough literature review and focus follow up work.

- Review/summary of books and publications on additive usage.
- Identify additives/applications for follow-up work.

CCQTA Scope

Phase 2 – Compile information specific to additives/applications.

- Summarize Additive Supplier in-house knowledge related to target additive/application.
- Review patent literature on additive/application if required.
- Undertake group discussions on expected additive fate of additive/applications

CCQTA Next Steps

- Phase 1 costs estimated at \$20K
- Identify interested participants
 - Key participation required from Additive suppliers & Refiners sectors
 - Interest has been expressed by other parties (e.g. pipelines)
- Scope out third party activities
 - Conduct literature review
 - Communication between project participants

Olefins Method Development Project Status

Goal: To develop a new method for measurement of olefins in crude oil and condensate by H^1 -NMR

- Method has been developed, tested and reviewed by CAPP COQC
- Test method to be posted on CCQTA website shortly