COSIA Tailings Opportunities and Gaps and
COSIA / IOSI Call for Letter of Intent (LOI)

‘Deji Dunmola - Chair, COSIA Tailings Research Working Group

2018 International Oil Sands Tailings Conference
Tailings EPA seeks “solutions to transform tailings from waste into a substrate that speeds up land and water reclamation, without causing negative environmental impacts in other areas”
Tailings Opportunity Areas & Gaps

**Technology Fundamentals**
- Clay Chemistry impacts on permeability and consolidation of fines-dominated deposits
- Impact of froth treatment diluent on tailings
- Optimize flocculant/coagulant suite and dosage to improve de-watering and consolidation performance for TT, FFT, and NST/CT deposits

**Tailings Optimization and Commercialization**
- Tailings treatment optimization to improve/predict fines capture
- Assessment of Environmental Net Effects (ENE)
- Optimizing existing tailings treatment technologies
- Commercially ready online instrumentation

**Tailings in Pit Lakes and Soft Deposits**
- Impact of residual bitumen on tailings
- Modelling to improve predictions of commercial deposit consolidation
- In situ amendments to soft tailings deposits to create boreal forest landforms

**Tailings Improving Deposit Performance**
- Treatment of FFT prior to placement to improve performance in pit lakes
- Capping of tailings deposits
- Atmospheric drying of fines-dominated tailings deposits
- Consolidation enhancement and adaptive management

**Collection, Transportation and Depositional Flow**
- Freeze-Thaw effects on consolidation
- Co-deposition of tailings streams
- Harvesting FFT

**Collection, Transportation and Depositional Flow**
- Impacts of shear and chemical dosage on dewatering and segregation
- Applied rheology and effects of pipeline shear

**Tailings**
COSIA EPA members will strive to transform tailings from waste into a resource that speeds land and water reclamation.
Pathway to Accelerating Tailings Performance

**Opportunity Areas:**

- Represent areas of focus that have the potential to significantly contribute to achieving COSIA’s related Performance Goals and ultimately its Aspirations and Vision.
- Identifies what may be accomplished through targeted research objectives suited for the various scales of research opportunity.
- Intended to mobilize external resources and stakeholders.

**Gaps:**

- Several innovation or knowledge Gaps within each Opportunity Area are identified.
- Gaps in science-based evidence guiding tailings management practice.
Desired Results: Better understanding of tailings technology fundamentals must ultimately result in practical ways of improving the performance of existing or planned commercial processes or deposits or at lending insights into potential new processes or deposits types.

Gaps:

1. Impact of water chemistry on tailings treatment and consolidation
2. Modelling to improve predictions of commercial deposit consolidation
3. Clay Chemistry impacts on permeability and consolidation of fines-dominated deposits
5. Impact of residual bitumen and asphaltenes on tailings
6. Optimize flocculants / coagulant suite and dosage to improve de-watering and consolidation performance for TT, FFT, and NST/CT deposits
Technology Optimization and Commercialization

**Desired Results:** Improved performance of existing equipment and technology and ability to bring promising lab scale and pilot technologies through to commercialization.

**Gaps:**

1. Commercially ready online instrumentation
2. Optimizing existing tailings treatment technologies
3. Assessment of Environmental Net Effects (ENE)
4. Tailings treatment optimization to improve/predict fines capture
Improving Deposit Performance

**Desired Results:** Ensure that the caps are placed in a manner that is cost effective, safe, and which supports the success of the reclamation activities to deliver self-sustaining landscapes.

**Gaps:**

1. Surface Drying
2. Capping of fines dominated tailings deposits
3. Consolidation enhancement
4. Co-deposition of tailings streams
5. In situ amendments to FFT and soft tailings deposits to create boreal forest landforms
Collection, Transportation and Depositional Flow

 Desired Results: To continuously improve upon established tailings transportation, deposition and placement practices:

 – Capability to 'engineer' deposition composition and performance characteristics.
 – Improved understanding of fundamentals of rheological characteristics and effects.

 Gaps:

 1. Collection of (Harvesting) FFT
 2. Effects of transportation and of depositional flow on segregation of tailings slurries
COSIA / IOSI Call for Letter of Intent

- 1 page submission
- To be jointly reviewed by COSIA and IOSI
- Successful applicants notified to submit full proposals
- Emphasis is on tailings fundamentals (Pilots, database preparation, non-Tailings EPA etc out of scope)
- Solicited full proposals will be assessed and ranked, funding decision to be made
COSIA / IOSI Call for Letter of Intent (Timelines)

<table>
<thead>
<tr>
<th>Event</th>
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<tr>
<td>Letters of Intent Due</td>
<td>December 20, 2018</td>
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<tr>
<td>Request for full proposals</td>
<td>February 8, 2019</td>
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<tr>
<td>Full Proposals Due</td>
<td>March 15, 2019</td>
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<tr>
<td>Start of new projects</td>
<td>Variable</td>
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https://www.ualberta.ca/engineering/research/groups/oil-sands-innovation/call-for-letters-of-intent
Thank You

email: Dunmola.Adedeji@syncrude.com