

CLEAN RESOURCES

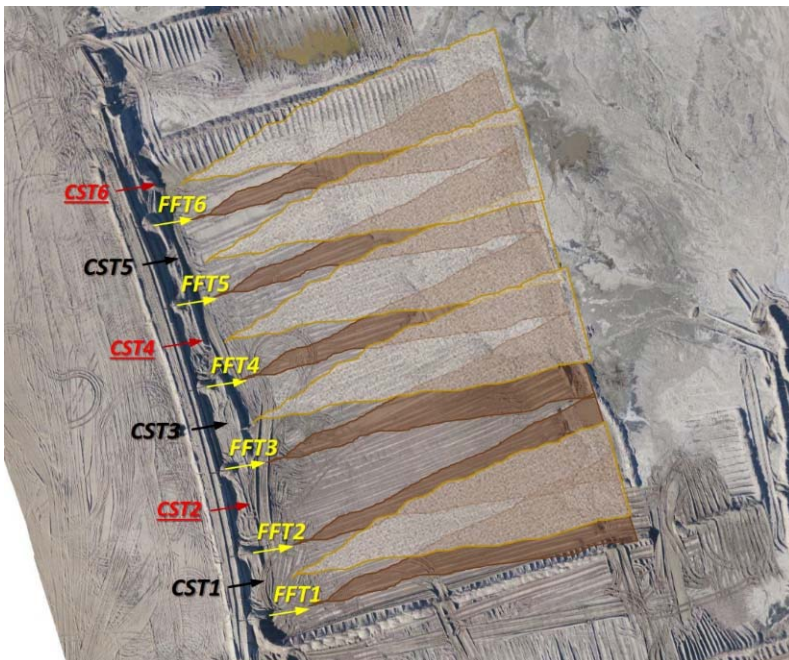
ENVIRONMENTAL INNOVATION

TAILINGS MANAGEMENT

FUNDING
DETAILS

Enhanced In-Line Flocculation (eILF) Phase 2

Imperial is piloting an advanced fluid fine tailings (FFT) treatment technology, called “Enhanced Inline Flocculation (eILF),” to supplement the primary thickening treatment at the Kearl mine. The pilot evaluates FFT treatment using a three-chemical system versus a single flocculant treatment typical of traditional inline flocculation. In addition, the pilot investigates the co-deposition of treated FFT with coarse sand tailings to generate a deposit that will maximize fines capture and eliminate deposit re-handling. If successful, this technology could reduce the cost of FFT treatment, fresh water demand, and GHG emissions, while accelerating tailings reclamation and enhancing the overall environmental performance of the oil sands industry.



RECIPIENT:
Imperial Oil Ltd.



PARTNERS:
Imperial Oil Ltd.



TOTAL BUDGET:
\$1,500,000



AI FUNDING:
\$750,000



PROJECT DATES:
APR 2020 –
JUN 2021



PROJECT TRL:
Start: 8
End: 9

APPLICATION

The eILF technology has the potential to be utilized across various oil sands mining operations to improve the treatment of fluid fine tailings through advanced chemistry and co-deposition with sandier compositions. This technology requires minimal capital modifications and can be used for a wide range of tailings compositions. As such, eILF is a versatile application that can be retrofitted into existing operations with minimal disruption.



PROJECT GOALS

The key goals of the project are to:

- Evaluate the maximum fines capture and geotechnical properties of the deposition cells using two different discharge methods (spigot vs. single discharge)
- Quantify and resolve some of the operational challenges associated with each deposition scenario

BENEFITS TO ALBERTA

The successful implementation of this technology or use of the knowledge generated could result in:

- Reduction of water intake from the Athabasca River (estimate ~3-6M m3 of released water/year by treating 1-2M T of FFT)
- Lower GHG intensity of the FFT treatment process compared to existing commercial technologies through the elimination of deposit re-handling (potential reduction by up to 3,500 T/year for every million tons of fines treated)
- Reduction in fugitive GHG emissions by shortening the period of FFT storage in ponds. By improving the treatment rate of pond FFT, the GHG profile of tailings treatment compared to water-capped pit lakes will decrease.
- Acceleration of terrestrial reclamation of tailings deposits due to enhanced geotechnical properties.



1 New Product/Service



1 Project Job



Up to 20 Future Jobs



3,500 T/yr Future GHGs Reduced

CURRENT STATUS

JUL 2021

The project was successfully completed in July 2021. Key highlights include:

- Overall, higher fines capture was observed in the coarse sand tailings beach compared to industry standard tailings operations
- Spigot discharge generated a more uniform deposit but requires more operator attention
- Wider operating window provided by the CIMA chemistry managed the feed fluctuations from the pond and minimized the requirement for continuous adjustment of chemical dosages