

# CLEAN RESOURCES

## ADVANCED HYDROCARBONS

INNOVATIVE HYDROCARBON PRODUCTION – PARTIAL UPGRADING

### Pilot Plant Studies to Support Husky's HDR Field Demonstration

Husky Diluent Reduction (HDR) technology reduces the amount of imported diluent used by in-situ oil sands producers for diluting bitumen to make it pipeline ready and replaces it with locally produced synthetic crude oil (SCO). This serves to reduce pipeline and refining GHG related emissions related to processing the additional imported diluent and also improves profitability through lowering costs and improving product quality.

Canmet pilot plant research is required to optimize the process conditions, understand the fundamental chemistry and explore alternative methods to reduce the process capital and operating cost and to prepare the process and product for commercial acceptance.



### FUNDING DETAILS



**RECIPIENT:**  
Husky Energy



**PARTNERS:**  
CanmetENERGY



**TOTAL BUDGET:**  
\$2,876,000



**AI FUNDING:**  
\$961,000



**PROJECT DATES:**  
SEP 2018 –  
APR 2020



**PROJECT TRL:**  
Start: 4  
End: 6

### APPLICATION

Partial upgraders, like HDR, eliminate the need for US diluent imports as it replaces diluent with locally manufactured SCO (improving the trade balance for Canada). This reduced diluent dependency increases operating netbacks for producers and increases pipeline capacity within the existing infrastructure (reducing the need to build additional pipelines). Additionally, partial upgrading significantly improves the quality of the bitumen increasing its price value and widening its market base among American refiners.



# ALBERTA INNOVATES CLEAN RESOURCES

## ADVANCED HYDROCARBONS

### INNOVATIVE HYDROCARBON PRODUCTS – PARTIAL UPGRADING

#### PROJECT GOALS

- **Optimization:** Optimize and further validate the technology operating conditions, plant operation performance and commercial product quality.
- **Complementary R&D:** Operate the project in parallel with the 500 bbls/day field demonstration plant to enhance the available pilot plant test data and provide tailored engineering support.
- **Fundamental Research:** Further validate and explore the reaction kinetics, modelling and fundamental knowledge of the process science.

#### BENEFITS TO ALBERTA

- **Reduces greenhouse gas emissions**  
The commercial HDR process will reduce GHG's by ~14kg/bbl of bitumen produced through its transportation and refining life cycle.
- **Improves Alberta bitumen economic and market access**  
HDR reduces diluent blending cost with significant netback improvement. HDR also offers bitumen wider refinery acceptance with improved refined product yield, reduced sulfur content and lower total acid number.
- **Unlock pipeline space**  
With reduced diluent blending, pipeline space would be freed from both condensates import line and product export line to relieve pipeline constraint from the province.



3 Students  
Trained



12 Project  
People-year



4285 Future Jobs



14 kg/bbl Bitumen  
GHGs Reduced



7,100 kT/yr Future  
GHGs Reduced

#### CURRENT STATUS

#### APR 2020

The project successfully determined the optimal HDR process parameters and critical process engineering inputs to be used for future engineering design and in addition, validated the design of experiment. The project demonstrated exceptional synergy with the field pilot and provided a holistic view the HDR process.