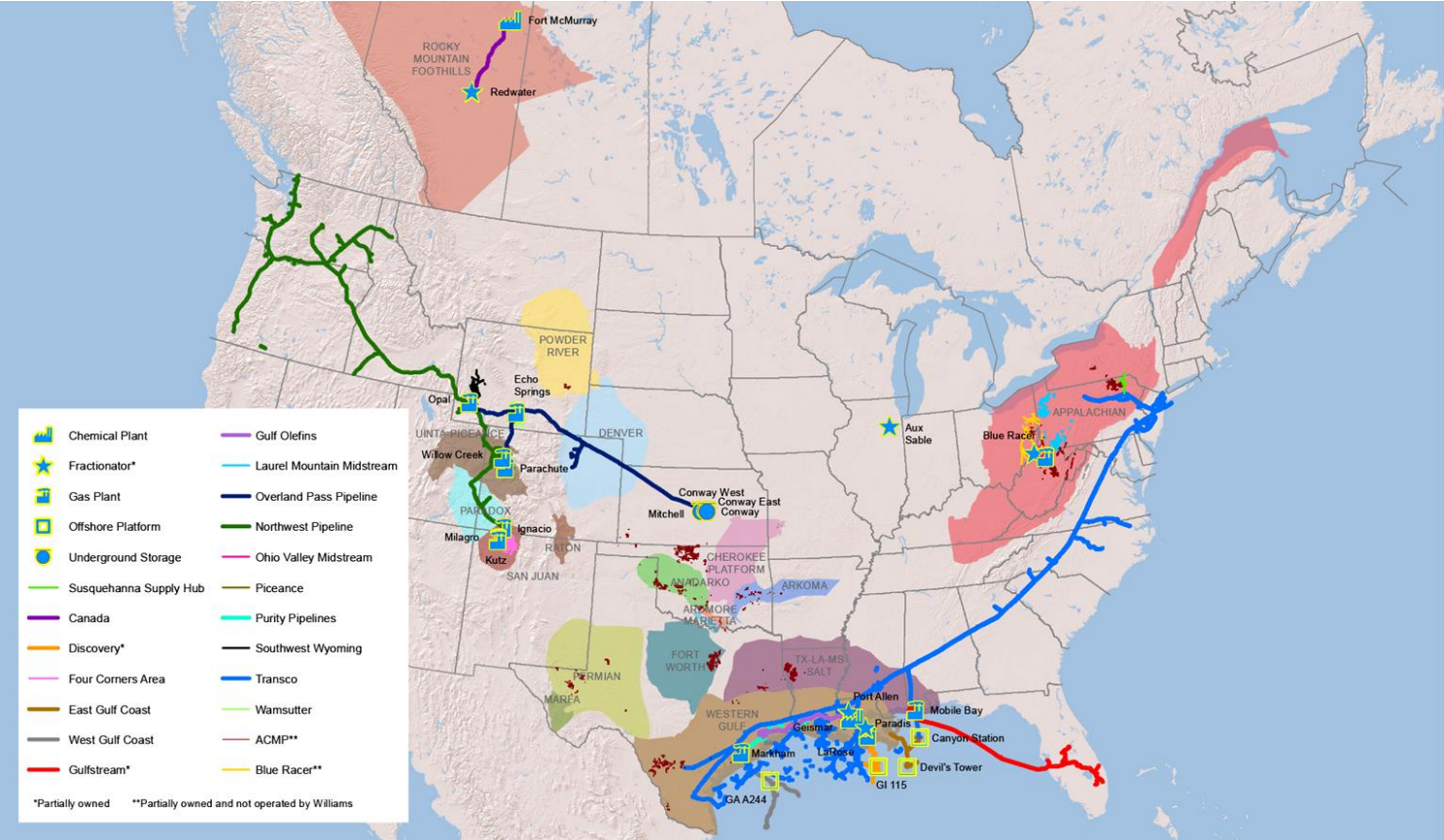


Williams Energy Canada

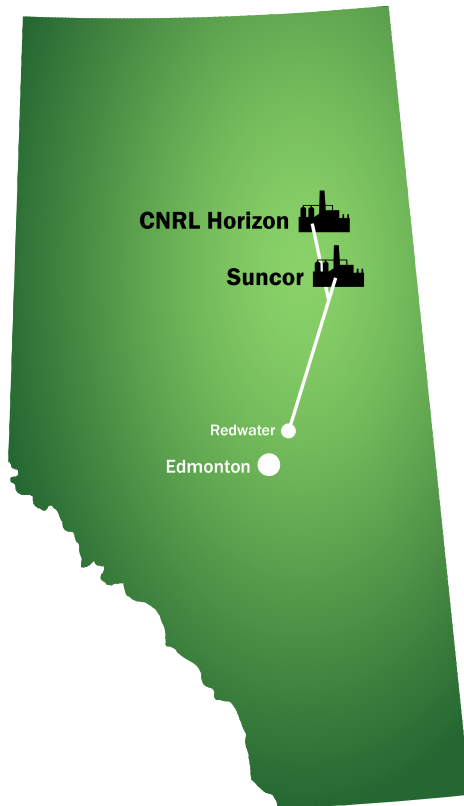
Adding Value in Alberta



Williams Assets & Operations



Williams Energy Canada



A Unique Company

- Williams extracts natural gas liquids and olefins from oil sands offgas
 - Offgas, previously burned, contains higher value natural gas liquids and olefins
 - Offgas mixture extracted at upgraders and delivered by the Williams Boreal Pipeline to our Redwater Fractionation and Storage Facility
- The owner of the only fractionator in Canada capable of producing these olefinic offgas liquids
- \$2 billion of assets in operation

Lower Emissions

SO₂ is a significant issue for oil sands development

- Upgraders remove certain sulphur compounds from offgas but not all
- These other sulphur compounds are removed by Williams when the natural gas liquids are extracted through our facilities at the Suncor and CNRL upgraders
- Williams reduces SO₂ emissions in the Fort McMurray area by 5,500 tonnes annually

CO₂ is released when a fossil fuel is burned

- The higher in the hydrocarbon chain the fuel is the more CO₂ that is released
- Our extraction of the natural gas liquids removes all the heavier hydrocarbons from the offgas
- Williams reduces CO₂ emissions in the Fort McMurray area by 500,000 tonnes annually

Horizon Offgas Liquids Extraction Plant



CNRL Horizon Offgas Processing

- Liquids Extraction Plant in-service February 2016
- Produces up to 15,000 bbl/day of NGLs and olefins (60% increase)
- All modules constructed in Edmonton area
- 300 construction jobs created at the Redwater Fractionation and Storage Facility
- Further 200,000 tonnes/year reduction in CO₂

Petrochemical Value Chains

NGL

Paraffin
(Gas at room temperature and pressure)

ETHANE

PROPANE (C3)

Olefin

Basic Petrochemical
(Gas at room temperature and pressure)

ETHYLENE

PROPYLENE (C3=)

Derivatives

(Plastics and liquid)

**POLYETHYLENE, ETHYLENE
GLYCOL, and OTHERS**

**POLYPROPYLENE, PROPYLENE
GLYCOL, and OTHERS**

Alberta PDH: Propane Dehydrogenation



Adding value to propane

- Commercial partnership between Williams and NAPP
- Alberta PDH expected to produce approx. 500 KTA polymer grade propylene.
- NAPP facility will have the capacity to produce 450 KTA polypropylene
- World-scale – the only complex of its kind in Canada
- In-service 2020
- PDH 2 planned two year lag

Alberta PDH: Propane Dehydrogenation



Adding value to propane

- ATCO Power will build and operate a natural gas-fired cogeneration plant to support both Alberta PDH and NAPP
- Once Alberta PDH and NAPP are in operation 20 train cars per day of polypropylene will be shipped to global markets
- Alberta PDH and NAPP will have the capacity to replace 87% of Canada's imported polypropylene

A Significant Value-Add Opportunity

\$250M
PER YEAR



\$750M
PER YEAR



\$900M
PER YEAR

22,000
PROPANE BPD

PROPYLENE

POLYPROPYLENE

TOTAL PROJECTED VALUE ADD:

+ **\$650M**
PER YEAR

Benefits to Albertans

- The four year construction period for the complex will result in 17,875 direct, indirect and induced person years of employment
- At peak construction there will be 2,500 full time equivalent jobs
- Once in operation there will be approximately 180 new permanent jobs created in Alberta's Industrial Heartland
- The complex will provide \$65 million annually in provincial and municipal revenues or \$1.95 billion over 30 years

Williams Energy Canada

Adding Value in Alberta

