Ethane Supply

- Alberta ethane (C₂) production from natural gas at processing facilities declined by 2.5 per cent in 2017 compared with 2016. However, it is projected to increase year over year until 2022 before declining to 36.0 thousand cubic metres per day (10³ m³/d)—227.9 thousand barrels per day (10³ bbl/d)—by the end of the forecast period, as shown in Figure S6.4, in line with the natural gas production forecast. This decline after 2022 is despite an increased focus on wet gas production, as producers are leaving ethane in the stream to realize a better natural gas price as a result of competition from imports.

- Ethane produced from oil sands off-gas increased 17.6 per cent in 2017 relative to 2016 and is projected to gradually grow in response to the forecast increase in upgraded bitumen production as additional off-gas is sent for processing.

- Pembina’s Vantage pipeline imported 5.1 10³ m³/d (32.3 10³ bbl/d) of ethane into Alberta in 2017, and this is projected to grow to 7.8 10³ m³/d (49.4 10³ bbl/d) by the end of the forecast period in response to Alberta demand.
In 2017, with ethane prices relatively low, producers chose to leave ethane in the gas stream to sell as marketable gas and realize a higher natural gas price reflecting the higher heating value of the gas stream. As shown in Table S6.4, ethane production from Alberta is projected to trend with the natural gas production forecast, increasing from $35.4 \times 10^3$ m$^3$/d (224.1 $10^3$ bbl/d) in 2017 to $39.5 \times 10^3$ m$^3$/d (250.0 $10^3$ bbl/d) in 2021, before declining to $36.0 \times 10^3$ m$^3$/d (227.9 $10^3$ bbl/d) in 2027. This is due to producers continuing to leave ethane in the gas stream as a result of competition from increasing imports through the Vantage pipeline. Table S6.5 shows ethane extraction volumes at gas plants in 2017.

Ethane from off-gas is projected to increase gradually based on the forecast for processed gas from upgraded bitumen production. Ethane from off-gas is forecast to increase from an estimated $2.0 \times 10^3$ m$^3$/d (12.6 $10^3$ bbl/d) in 2017 to $2.6 \times 10^3$ m$^3$/d (16.4 $10^3$ bbl/d) by 2027, as shown in Figure S6.4.

### Ethane Demand

- In 2017, ethane demand remained relatively stable year over year at an estimated $41.6 \times 10^3$ m$^3$/d (263.3 $10^3$ bbl/d). Demand is forecast to reach $46.5 \times 10^3$ m$^3$/d (294.3 $10^3$ bbl/d) in 2027, assuming continued investment in the petrochemical sector.
- Since 2008, there have been no removals of specification ethane from the province, and this is expected to remain the case over the forecast period.
- NOVA Chemicals began commercial shipments at the Polyethylene 1 Expansion Project at their Joffre site in January 2017.

The petrochemical industry in Alberta is the major consumer of ethane recovered from natural gas, with four ethylene plants using ethane as feedstock. NOVA Chemicals completed expansion of its polyethylene facilities at the Joffre site by adding an additional reactor, R3, which will consume additional ethane supply to increase polyethylene capacity by 40 per cent. Demand for ethane is anticipated to increase after 2017 as a result of continued investment and improvements in processing capacities to current facilities, with demand projected to grow to
46.5 \times 10^3 \text{ m}^3/\text{d} (294.3 \times 10^3 \text{ bbl/d}) by 2027.

**Ethane Methodology**

**2017 Estimates**

All values for 2017 demand have been estimated using data reported by industry up until the end of August 2017. Full-year estimates for 2017 were derived using these data, adjusting for seasonality. All other figures, namely production, have been revised with actuals in the July 2018 update.

**Forecasting Methodology**

Natural gas liquids (NGLs) are a by-product of associated gas from oil well production, shale production, and raw conventional natural gas production in Alberta. The NGL production forecast model considers all types of gas production and all seven Petroleum Services Association of Canada (PSAC) areas. The model then accounts for the liquids content traced back to the reservoir pools and the liquids recovery factor from a representative field and from fractionation plants and straddle plants. The production forecast also includes ethane from bitumen off-gas produced from upgraders.

The ethane demand forecast accounts for the ethylene production capacities in the petrochemical sector.

When production is less than consumption, the difference is assumed to be met by imports. However, the AER checks import capacity and availability to ensure that the demand forecast is realistic. When Alberta’s production exceeds demand, the surplus is assumed to be stored or removed from the province.

The AER uses ethane production volumes submitted to Petrinex by field plant, fractionation plant, and straddle plant operators. Petrinex is a secure, centralized information network used to exchange petroleum-related information.