

As crude oil is a naturally occurring, unprocessed material, its physical and chemical properties may vary. To better characterize our product, Cenovus conducts routine sampling. The following test report represents the range of data obtained over the last year of routine sampling for proof of dangerous goods classification.

**TEST REPORT**

- 1. **Name of substance** : CHRISTINA LAKE RAIL BITUMEN (CRB)
- 2. **General data**
  - 2.1 Composition : 100% Petroleum Crude Oil
  - 2.2 Proper Shipping Name : Petroleum Crude Oil
  - 2.3 UN Number : UN 1267
  - 2.4 Molecular formula : Complex mixture of hydrocarbons
  - 2.5 Physical form : Liquid
  - 2.6 Colour : Brown/black
  - 2.7 Density : 984kg/m<sup>3</sup> ±10kg/m<sup>3</sup>@ 15°C
  - 2.8 Last Sample Date : August 16, 2014\*
- 3. **Flash Point Determination**
  - 3.1 Method : ASTM 93-08, Pensky-Martins Closed Cup (Automatic)
  - 3.2 Sample conditions : Ambient barometric pressure
  - 3.3 Observations : Instrument detected flash at lowest setting
  - 3.4 Result : 17°C ±22°C
- 4. **Initial Boiling Point Determination**
  - 4.1 Method : ASTM D-86M
  - 4.2 Sample conditions : Ambient barometric pressure (101.3 kPa)
  - 4.3 Observations : first drop of condensate falls from the lower end of the condenser tube
  - 4.4 Result : 52°C ±14°C
- 5. **Class Determination**
  - 5.1 Method : UN Manual of Tests and Criteria, 5<sup>th</sup> Rev Ed, 32.2.2; TDG Part 2
  - 5.2 Criteria : Flash point no greater than 60°C in closed-cup test
  - 5.3 Result : Class 3 substance
- 6. **Packing Group Determination**
  - 6.1 Method : UN Manual of Tests and Criteria, 5<sup>th</sup> Rev Ed, 32.2.2; TDG Part 2
  - 6.2 Criteria : Table 32.1 (FP≤23°C; IBP>35°C)
  - 6.3 Result : Packing Group II
- 7. **Conclusion** : Class 3 PG II Substance

\*The latest laboratory results available on request.