



**ENTRY SPECIFICATION**

**Typical Receiving Pressures**

- Beryl Alpha - 10-11 barg

**Typical Liquids Inlet Specifications**

- TAN less than 0.5 mg KOH/g
- Wax 7.5 wt %
- Oil (Typical) 38°API - 40°API
- Cloud Point 20°C – 25°C max

**Typical Gas Inlet Specifications**

- Up to saturated if import stream is part of a full well stream
- H<sub>2</sub>S normally less than 3 ppm mol (or up to NACE MR-01-75 limits if gas can be diluted by blending)

**Produced Water Inlet**

- Compositional and quantity information of any produced water should be provided if they are part of the import stream.
- Generally produced water should not have emulsion forming tendencies nor have a composition that may cause incompatibility with existing streams.
- All chemicals, (batch or continuous) added to any import streams must be minimized and approved by the Beryl field operator prior to use.
- Beryl Alpha is not designed to handle H<sub>2</sub>S beyond NACE MR-01-75 thresholds.

**EXIT SPECIFICATION**

**Typical Gas Export Specification**

Gas entering the SAGE System shall be within the following:

- Water Content less than 63 ppm by volume (Notes 1 & 2)
- Carbon Dioxide less than 22.0 mol%
- Oxygen Content less than 7 ppm by volume
- Sulphur Content H<sub>2</sub>S - less than or equal to 500 ppm by volume
- SAGE pipeline MAOP 173.4 Bar abs
- Sediment/metals Mercaptans Negligible (Note 4)
- Mercury Negligible (Note 4)
- Duodecanes or heavier Negligible (Note 4)
- Temperature 50 degrees C max
- Contaminants: Free from radioactivity, odours (Note 3), other noxious contaminants such as corrosion/scale inhibitors, flow enhancers, alcohol/glycols, hydrate inhibitors, emulsion breaking or stabilising elements or other substances without prior approval from the SAGE Operator

**Notes**

- (1): Offshore high water content alarm set at water content = 42 ppmv
- (2): Offshore trip set at water content = 63 ppmv
- (3): As determined by nationally recognised standards
- (4): For the purposes of this entry specification negligible is defined as less than a concentration of the relevant species that: would cause difficulties with transportation, processing, safety, facilities integrity, or meeting sales gas, NGL or other product specifications through the SAGE System; or would cause difficulties in facilities downstream from the SAGE System (e.g. National Grid gas distribution, NGL handling systems) with SAGE product transportation, processing, safety, facilities integrity or meeting derivative product specifications; or would impair the value or marketability of any ultimate products derived from feed gases entering the SAGE System.

All the above gas export conditions will be subject to the capability of the SAGE terminal at St Fergus to receive and process the gas.

**Typical Oil Export Specification**

- Oil export by tanker only (via Beryl Alpha storage cells)
- Oil TVP 14.5 psia maximum at 85°F
- Less than 2% BS&W
- Typically, 65°F bulk wax formation temperature maximum
- Typical TAN Number less than 0.5 mg KOH/g

**Process Facilities**

Separation of oil, gas and water is carried out in two parallel two-stage separation trains. Train A is currently used to process fluids from the Buckland, Garten, Callater, Skene fields and condensate from Storr field and the Skene gas compression module. Train B handles all of Beryl Alpha's own platform wells plus fluids from the Nevis and Ness subsea developments. Two test separators run in parallel with the inlet separators. Crude oil is stored in cells at the base of the platform prior to being pumped to export tankers.

Produced water from Train A is carried over with the crude into the storage cells. Produced water from Train B is re-injected into platform wells.

Gas is compressed in two stages from the atmospheric separator pressure up to inlet separator pressure of 10 barg by a low pressure (LP) gas compressor. This gas is then mixed with gas from the inlet separator/test separators and is compressed to 160 barg by three parallel trains of compression (G160/AGCM/Skene). This gas is either used for fuel, gas lift or exported to the SAGE pipeline. Each compression train includes a TEG system to dehydrate the gas to the required export water dewpoint specification. De-aerated seawater is injected into Beryl platform using parallel high-pressure water injection pumps.