Sullom Voe Terminal

Location

The Sullom Voe Terminal is located at the northern end of the largest of the Shetland Islands. It is one of the largest oil terminals in Europe.

Sullom Voe Terminal

The terminal was built between 1975 and 1981 and covers ~1,000 acres. Its main purpose is to act as a buffer between the producing fields offshore and tankers waiting to ship oil to refineries worldwide. The terminal has been designed to allow continuous production offshore, even in bad weather.

Sullom Voe Terminal is operated by EnQuest and handles production from more than two-dozen oil fields in the East and West of Shetland basins in the Northern North Sea. Approximately 12 different companies have ownership interests in the terminal which receives production from the East of Shetland through the 36" Brent and Ninian pipelines and West of Shetland through the 22" Clair Pipeline. Condensate is also imported to the terminal from the adjacent Shetland Gas Plant.

Terminal Infrastructure and Facilities

Sullom Voe Terminal receives oil and gas from the many fields East of Shetland through the Brent and Ninian Pipelines, commingling to produce Brent Blend. The production from East of Shetland enters the terminal through pig reception facilities and is then stabilised before being stored in crude oil storage tanks. In the stabilisation process, gas is separated from the oil before being used as fuel in the on-site power station. Brent Blend is then piped to the storage tanks where it is allowed to settle to separate the water, which is then drained off prior to export; the oil is then exported by tanker. In 2016 a new pipeline was built to transport condensate from the adjacent Shetland Gas Plant, the condensate is imported to site by this dedicated pipeline before being exported as part of the comingled service.

The terminal also receives stabilised oil from the Clair field, West of Shetland. In 2003 a 22" oil pipeline was laid between the Clair Field and Sullom Voe Terminal. Clair initially came on stream in 2005, with the Clair Ridge phase subsequently coming online in 2018. Clair oil does not require stabilisation upon arrival therefore it is pumped direct to the dedicated storage tanks prior to being exported by tanker via a dedicated loading system.

Gas from the Clair and other fields West of Shetland is imported to Sullom Voe Terminal via the 20" West of Shetland Gas Pipeline System (WoSPS). This gas is dried and treated to remove H2S, some of it is then used as fuel in the power station. The remainder is exported to the Magnus platform via the 20" East of Shetland Pipeline System (EoSPS) and is then exported to the Northern Leg Gas Pipeline (NLGP) for onward transportation to St Fergus via the Shell operated Far North Liquids and Associated Gas System (FLAGS) Pipeline.

As a result of its remote location, the Sullom Voe Terminal has to be entirely self-sufficient, particularly where emergency services are concerned. On site there is a fire brigade and a pollution response team, both of which hold regular exercises to test their readiness to cope with emergencies.

Infrastructure Information

Description:	Onshore Processing, Storage and Export Terminal receiving: East of Shetland: • Unstabilised crude via the 36" Brent Pipeline • Unstabilised crude via the and 36" Ninian Pipeline System West of Shetland: • Condensate from Shetland Gas Plant Pipeline • Stabilised crude via 22" pipeline from Clair Field • Gas import via the 20" West of Shetland Pipeline System At present these facilities are dedicated to the existing users but there is sufficient capacity in the pipelines and also at site to handle additional volumes from new entrants or new 3rd party users.

Main Facilities:

Oil and gas processing & storage facilities:

- Oil and gas processing, stabilisation & separation plant
- 16 floating roof crude oil storage tanks (10 currently operational) with ~520,000bbl capacity
- Sour Gas Sweetening Facility
- Gas export (via 20" East of Shetland Pipeline System onwards to 20" Northern Leg Gas Pipeline)

Export Facilities:

- Four jetties, (two currently operational)
- Crude loading system consisting of dedicated Meter Banks and Crude Loading Pumps (one system dedicated to Brent Blend & one for Clair)
- Crude Oil Metering System (COMS) to meter oil from tanks to jetties via flow computers
- Gas export to EoSPS metered through ultrasonic metering system

Jetty Operating Parameters:

- Ship size of between 30,000 – 350,000 DWT
- Maximum draft of 24.0m (note: max draft can impact on ability to handle some ULCC's)
- Vessel length of 170m – 365m
- Standard parcel size for export loading is 600,000bbls

Other Facilities:

- Four fixed-roof ballast water tanks fitted with oil skimmers (two currently operational)
- On-site power station and steam generation plant providing power to the terminal
- Main flare, Standby flare and two ancillary surge flares (one ancillary flare currently available)
- Administration buildings and on-site laboratory
- Dedicated on-site fire station and medical centre for emergency response

Exit Specification:	Oil is loaded via the loading lines and crude oil pumps to the jetties and onto tankers (one system dedicated to Brent Blend & one for Clair) Exit specification is 0.5% BS&W Gas is dried and sweetened (H2S removal) in the Sweetening Facility prior to export
Import/export facilities for Clair crude:	Dedicated Pipeline reception facilities including pig receiver Dedicated use of four (of the 16) tanks Shared use of jetties with Brent Blend Dedicated pumping and metering of crude export
Processing facilities:	Stabilisation – one stabilisation train with sub trains. Capacity 410,000 bbls p/d Compression – 1 high pressure and 1 low pressure train Fuel gas production from East of Shetland (with a back-up supply from West of Shetland gas and diesel) Effluent treatment

High Level Capacity & Availability Information

SVT does not operate a capacity booking system. Decisions leading to increase or decrease in capacity are anticipated on the basis of forecast throughput, may incur additional cost and (subject to that) are reversible.

The Terminal has been designed to allow continuous receipt of production from offshore even in bad weather, as a result the availability of site is consistently above 95% (actual figure is ~99.9% availability each year). Site processing capacity is ~410,000bbls p/d via the single stabilisation train. Current and future throughput forecasts from the existing East and West of Shetland fields yield a remaining capacity in excess of 25% resulting in available capacity for any new fields / customers entering site.

Site Availability:

SVT Site Availability	2017	2018	2019	2020	2021
% Availability	●	●	●	●	●

● >95% Site Availability

● 80% - 95% Site Availability

● <80% Site Availability

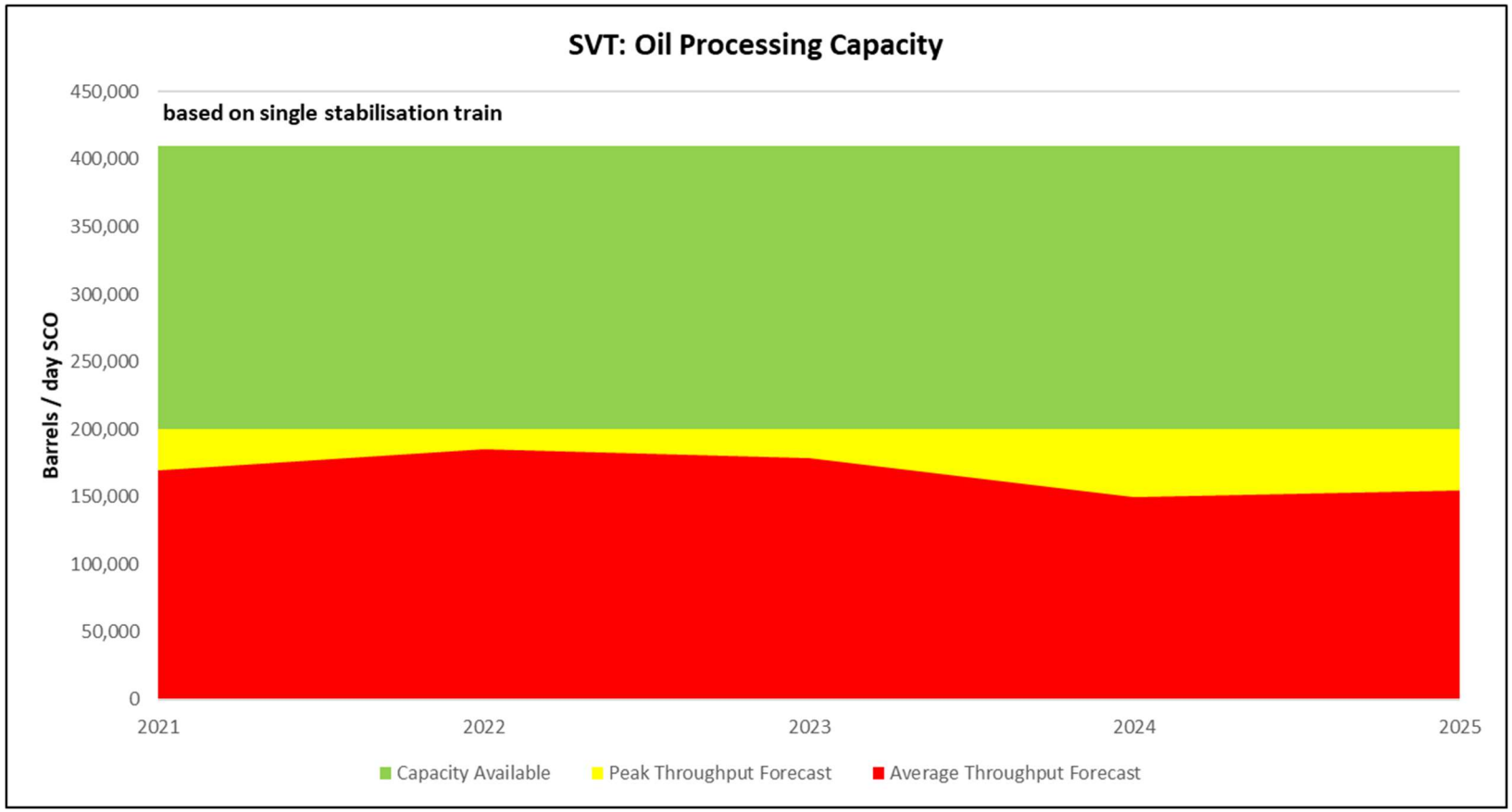
Site Processing Capacity:

SVT Processing Capacity	2021	2022	2023	2024	2025
% Availability	●	●	●	●	●

● >25% Available Capacity

● 5% - 25% Available Capacity

● <5% Available Capacity


SVT: Oil Processing Capacity
based on single stabilisation train
Barrels / day SCO
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
2021
2022
2023
2024
2025
Capacity Available
Peak Throughput Forecast
Average Throughput Forecast

Entry specification (pipeline)	BS&W – maximum 5% vol True vapour pressure – maximum 220 psia at 100degF

Exit specification	**Level**	**Test Method**
Reid Vapour Pressure, psi	target 10.0	IP 69 (mod)
BS & W vol%	max 0.5	IP386 (mod)
Acidity mgKOH/g	target 0.05 max	-
Density at 15°C	to be reported	SVTA 101
Salt Content 1bs/10,000bbl	to be reported	IP265 (mod)

Details of primary separation processing facilities	One operational stabilisation train of 410,000 bbls/day
Details of Gas treatment facilities	Fractionation to produce fuel gas (which is burnt in the onsite power station)
Oil export capacity	Oil is generally exported in 600,000 barrel parcels (+/- 5%)
Gas compression capacity	N/A
Gas export capacity	N/A
Produced water handling capacity	100 m3/hr (subject to ullage at time of request)
Gas Dehydration capacity	N/A
H2S removal capacity	-

Contact Information

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