TotalEnergies E&P North Sea UK Limited

Gryphon Alpha FPSO and Riser Disconnection Decommissioning Programmes

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Consultation Draft

Approvals

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Revision Control

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Distribution List

Name	Company	Copies
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning (OPRED)	Electronic
Sojitz	Sojitz Energy Development Limited	Electronic
Rockrose	Rockrose (UKCS3) Limited	Electronic

CONTENTS

Terms and Abbreviations

Abbreviation	Explanation
AIS	Automatic Identification Systems
CA	Comparative Assessment
CO_2e	Carbon Dioxide Equivalent
COP	Cessation of Production
CFR	Carbon Footprint Reduction
DP	Decommissioning Programme
EA	Environmental Appraisal
EHC	Electrohydraulic Controls
ENVID	ENVironmental aspects IDentification
EoFL	End of Field Life
EPS	European Protected Species
FPSO	Floating Production Storage and Offloading unit
FSU	Floating Storage Unit
HES	Historic Environment Scotland
HSE	Health and Safety Executive
ICES	International Council for the Exploration of the Seas
IHM	Inventory of Hazardous Materials
IMO	International Maritime Organisation
INTOG	Innovation and Targeted Oil and Gas Scheme
IUCN	International Union for Conservation of Nature
JNCC	Joint Nature Conservation Committee
km	Kilometre
L x W x H	Length x Width x Height
LAT	Lowest Astronomical Tide
LSA	Low Specific Activity scale
m	Metres
MATs	Master Application Template
MCAA	Marine and Coastal Access Act
MDAC	Methane-Derived Authigenic Carbonate
MWA	Mid Water Arch
NLB	Northern Lighthouse Board
NMPi	National Marine Plan interactive
NNS	Northern North Sea
NORM	Naturally Occurring Radioactive Materials
NSTA	North Sea Transition Authority
OCR	Offshore Chemicals Regulations
OEUK	Offshore Energies UK

OPPC	Offshore Combustion Installations (Pollution Prevention and Control) Regulations
OPRED	Offshore Petroleum Regulator for Environment & Decommissioning
OSPAR	The Convention for the Protection of the Marine Environment of the North-East Atlantic
OWF	Offshore Wind Farm
PDQ	Production Drilling & living Quarters
PMF	Priority Marine Feature
PWA	Pipeline Works Authorisation
SAC	Special Area of Conservation
SAGE	Scottish Area Gas Evacuation
SAT	Supplementary Application Template
SCAP	Supply Chain Action Plan
SEPA	Scottish Environmental Protection Agency
SMRU	Sea Mammal Research Unit
SPM	Single Point Mooring
Te	Tonne
TEPNSUK	TotalEnergies E&P North Sea UK Limited
TFSW	Trans Frontier Shipment of Waste
THC	Total Hydrocarbon Concentration
UK	United Kingdom
UKBAP	UK Biodiversity Action Plan
UKCS	United Kingdom Continental Shelf
UKHO	UK Hydrographic Office
WGS84	World Geodetic System 1984

Figures and Tables

HOLDS List

Hold Number	Hold	Page / Section
1	To be completed following consultation and to include any informal stakeholder engagement.	Table 5 1: Summary of Stakeholder comments
2	letters of support from all notice holders are required in the final draft (after consultation).	Section 7

1 EXECUTIVE SUMMARY

1.1 Combined Decommissioning Programmes

This document contains two combined decommissioning programmes (DPs) for each set of Section 29 notices covering the removal of the Gryphon Alpha Floating Production Storage and Offloading (FPSO) vessel including mooring system and for the disconnection and recovery of the associated flexible risers and dynamic umbilicals. The items included in the combined Gryphon DPs are:

1. *Gryphon Section 29 Notice – Offshore Installations*
    - *The Gryphon "A" Floating Production Storage and Offloading Vessel (FPSO)*
2. *Gryphon Section 29 Notices – Submarine Pipelines*
    - *PL2944 (Flexible Riser Only)*
    - *PL2948 (Flexible Riser Only)*
    - *PL2951 (Flexible Riser Only)*
    - *PL2952 (Flexible Riser Only*
    - *PL2953 (Flexible Riser Only)*
    - *PL2954 (Flexible Riser Only)*
    - *PL2955 (Flexible Riser Only)*
    - *PL2956 (Flexible Riser Only)*
    - *PL2957 (Flexible Riser Only)*
    - *PL2961 (Flexible Riser Only)*
    - *PL1896 (Flexible Riser Only)*
    - *PL1900 (Flexible Riser Only)*
    - *PL1901 (Flexible Riser Only)*
    - *PLU2996 (Dynamic Umbilical Only)*
    - *PLU1899 (Dynamic Umbilical Only)*

These DPs include the full removal of the FPSO, flexible risers, dynamic umbilicals and associated mid-water arches (MWAs) (buoyant elements only), mooring lines, and anchors (please refer to Figure 1-2). The remaining field infrastructure, which is listed on the Section 29 Notices, will be subject to separate decommissioning programmes and will be submitted separately to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED). It is intended that the removal of the items identified within these DPs shall be performed in such a way as to not prejudice any further decommissioning work in the field.

1.2 Requirement for Decommissioning Programmes

Installations:

In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Gryphon installations (see Table 1.2) are applying to OPRED to obtain approval for decommissioning the installations detailed in Section 2.1 and 2.2 of these DPs. (See also Section 7 – Section 29 Notice Holders' Letters of Support).

Pipelines:

In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Gryphon pipelines (see Table 1.4) are applying to OPRED to obtain approval for decommissioning the pipelines detailed in Section 2.3 of these DP's. (See also Section 7 – Section 29 Notice Holders' Letters of Support).

In conjunction with public, stakeholder and regulatory consultation, these DPs are submitted in compliance with national and international regulations and OPRED guidelines. The schedule outlined in this document is for a 2-year decommissioning project plan due to begin in 2024. See Section 6.3 for more detail.

1.3 Introduction

These DPs have been prepared to support the decommissioning of the Gryphon Alpha FPSO and associated risers and mooring system.

The Gryphon Alpha FPSO vessel (FPSO) is the host installation for the Gryphon, Tullich, Ballindalloch and Maclure fields and is operated by TotalEnergies E&P North Sea UK Limited (TEPNSUK). The FPSO is located in the United Kingdom Continental Shelf (UKCS) Block 9/18b in the Northern North Sea (NNS) approximately 169 km southeast of Shetland and approximately 11 km from the United Kingdom (UK) / Norwegian transboundary line. Figure 1-1 provides a map of the field location in the UKCS. The water depth in the area is approximately 112 m below Lowest Astronomical Tide (LAT). The overall area layout is provided schematically in Figure 1-2:

- The Maclure field is in Block 9/19 of the UKCS, 2.3km to the east of the FPSO.
- The Tullich field is in Block 9/23a of the UKCS, 5.5km to the southwest of the FPSO.
- The North Gryphon field is in Block 9/18b of the UKCS, 1.6km to the northwest of the FPSO.
- The South Gryphon field is in Block 9/18b of the UKCS, 1.5km to the southwest of the FPSO.
- The Ballindalloch field is in Blocks 9/18b, 9/19a, 9/23d and 9/24e, 3.5km to the southeast of the FPSO

The FPSO is an Isle of Man flagged, DNV Class +1A ship shaped oil production unit with Tentech 850C hull design and drag chain type turret and thruster turning system to rotate the vessel about the turret to maintain optimum heading with respect to the prevailing weather conditions.

At the FPSO location, the flowlines and umbilicals from the Gryphon, Tullich, Ballindalloch and Maclure fields are connected to riser bases on the seabed, which serve as anchor points for the risers. The flexible risers and umbilicals are routed from the riser bases to the turret over three mid water arches or supported in a steep wave riser configuration.

The mooring system comprises 10 lines of studless chain (including 100m triple chain section connected using a tri-plate arrangement) connected to a rotating turret through which the risers and umbilicals run. Each mooring line is equipped with a 35 tonne Stevpris anchor.

The Gryphon Owners have evaluated the remaining production life of the asset, considering safety, integrity management, environmental performance, costs and economics, and are currently planning for a FPSO sail-away in Q2 2025. This planning has been shared with the FPSO user fields. The planning has also been shared with the North Sea Transition Authority (NSTA).

The FPSO is not required to perform any further decommissioning related activities on the subsea infrastructure after completion of the decommissioning activities detailed in Section 1.1, and it is proposed that the FPSO is removed thereafter from its current location.

The removal of the FPSO is part of the wider Gryphon field decommissioning which will be carried out in three distinct project phases:

- Phase 1 - Removal of the FPSO from the field
- Phase 2 - Well plug and abandonment.
- Phase 3 - Decommissioning of subsea installations and pipelines

These DPs address Phase 1 only, that are scheduled for 2025. Phase 2 and Phase 3 projects will be addressed under separate decommissioning programme(s). The first draft of the decommissioning programme(s) for Phases 2

and 3 is expected to be ready for OPRED review in Q4 2024. The earliest project execution start to the Phase 2 well P&A multi-year campaign is 2026.

The boundary of these DPs for Phase 1 includes the full removal of the FPSO, flexible risers, dynamic umbilicals and associated MWA's (buoyant elements only), mooring lines and anchors. In preparation to disconnect and remove these elements the FPSO and all the Gryphon, Tullich, Ballindalloch and Maclure field's infrastructure connected to the FPSO will be made safe. All wells will require to be shut in prior to the making safe activities of draining, flushing, purging, and venting the FPSO; and flushing all subsea flowlines, risers, spools, jumpers, and structures.

In total there are 26 production wells; 1 gas injection well; and 5 water injection wells across all the connected fields. A risk assessment has been carried out of the integrity status of each well for leaving in a shut-in state after FPSO sail-away. The frequency of subsea inspections to monitor the wells status will be defined based on the outcome of initial inspections in 2024 and 2025. Once this has been determined this will be discussed and agreed with OPRED.

Subsea pipework will be flushed of hydrocarbons prior to disconnection. Combined with the isolation of the wells, flushing will mitigate the risk of hydrocarbon release from the subsea pipework following the removal of the FPSO. The gas export pipeline will also be made safe and isolated.

After the facilities have been made safe the FPSO will be disconnected from its mooring system and risers and then towed to shore for re-deployment or sale, or recycling and disposal in compliance with the applicable laws and regulations. Mooring lines and anchors will be recovered for re-use or recycling; risers and distributed buoyancy will be recovered and transported to shore for re-use, recycling and disposal; and MWA buoyancy elements will be disconnected beneath their bridle delta plates and towed to shore.

Once the FPSO has been removed, the riser bases (previously falling under the protection of the FPSO 500m zone) and other pipelines related infrastructure (out with FPSO 500m zone) will require to be monitored to mitigate hazards for other users of the sea. TEPNSUK will provide a guard vessel or alternative navigational aid option.

Following public, stakeholder and regulatory consultation, these DPs are submitted without derogation and in full compliance with OPRED guidelines.

Environmental impacts associated with the work in these DPs have been assessed and detailed in Section 4 of this document.

1.4 Overview of Installations/Pipelines Being Decommissioned

1.4.1 Installations

Table 1-1: Installations Being Decommissioned			
Fields	Gryphon	**Production Type**	Oil & Gas
Water Depth (m)	112	**UKCS block**	9/18b
Distance to median (UKCS/NCS) (km)	11	**Distance from nearest UK coastline (SE Shetland) (km)**	169

Surface Installation		
Number	**Type**	**FPSO/Vessel Weight (Te)**
1	FPSO	38,165 (Lightweight, Gross Dry Weight)

Subsea Installations		
Number	**Type**	**weight (Te)**
10 (5 groups of 2 lines)	Mooring Lines (connected to FPSO rotating turret)	329.4 Te per mooring line
10	Anchors	35 Te per Anchor
3	Mid-Water Arch (MWA)	**Buoyancy element** MWA-A & MWA-B 94.7 Te MWA-G 96.2 Te Tether Assembly MWA-A, MWA-B & MWA-G 6.7 Te

Table 1-2: Installations Section 29 Notice Holders Details		
Section 29 Notice Holders	**Registration Number**	**Equity Interest (%)**
TotalEnergies E&P North Sea UK Limited	03682299	86.5%
Sojitz Energy Development Limited	10596616	13.5%
Rockrose (UKCS3) Limited	04620801	0% (Exited)

1.4.2 Pipelines

Table 1-3: Pipelines Being Decommissioned	
Number and total length (km) of Pipelines Full details given in Table 2.3	17 pipelines with 5.412 km total length

Table 1-4: Pipelines Section 29 Notice Holders Details		
NORTH GRYPHON (NGRY)		
Pipelines: (GRY): PL1900, PL1901, PL2944, PL2948, PLU1899, PL2952, PL2953, PL2954, PL2955, PL2956A, PL2956B, PL2956C, PL2957, PLU2996 and (NGR) PL2961		
Section 29 Notice Holders	**Registration Number**	**Equity Interest (%)**
TotalEnergies E&P North Sea UK Limited	03682299	86.5%
Sojitz Energy Development Limited	10596616	13.5%
Rockrose (UKCS3) Limited	04620801	0% (Exited)
SOUTH GRYPHON (SGRY)		
Pipelines: PL2951		
Section 29 Notice Holders	**Registration Number**	**Equity Interest (%)**
TotalEnergies E&P North Sea UK Limited	03682299	89.88%
Sojitz Energy Development Limited	10596616	10.12%
Rockrose (UKCS3) Limited	04620801	0% (Exited)
GRYPHON (PL1896 riser)		
Section 29 Notice Holders	**Registration Number**	**Equity Interest (%)**
Pipelines: PL1896		
TotalEnergies E&P North Sea UK Limited	03682299	86.5%
Sojitz Energy Development Limited	10596616	13.5%

1.5 Summary of Proposed Decommissioning Programmes

Table 1-5: Summary of Decommissioning Programmes	
Proposed Decommissioning Solution	**Reason for Selection**
1. Surface Installation (FPSO)	
Full Removal–- The FPSO will be disconnected from its mooring system and risers. Topsides equipment will be drained, flushed, purged and vented offshore prior to preparation for removal. Following disconnection, the FPSO will be towed to be redeployed or recycled / disposed of in compliance with the applicable laws and regulations. OPRED will be informed once a redeployment opportunity or disposal yard has been confirmed Any applications and permits required for work associated with removal of the FPSO will be submitted.	No further re-use opportunity has been identified for the FPSO to date. Redeployment or sale opportunities will continue to be explored in parallel with preparing for onshore recycling or disposal.

2. Mooring System	
Full Removal – Mooring lines and Stevpris anchors will be disconnected from the FPSO drag chain type turret using an Anchor Handler Tug Vessel (AHTV) and recovered for re-use or recycling, in compliance with regulatory requirements - The upper studless chain sections of FPSO mooring lines up to and including the upper H-links will be recovered to the FPSO prior to FPSO sail away, the lower studless chain sections connecting to the Stevpris anchors will be temporarily laid on the seabed for recovery by AHTV immediately post sail away. Any applications and permits required for work associated with disconnection and removal of the mooring lines will be submitted. There is no drill cuttings impact from recovery of mooring lines/anchors	Removes a potential obstruction to fishing operations and maximises re-use and recycling of materials.
3. Mid-Water Arches	
Full Removal – Following FPSO sail away and riser/umbilical recovery the MWA buoyancy elements will be disconnected beneath their bridle delta plates and towed to shore. Where necessary (e.g., adverse weather), the MWA buoyancy elements may be punctured, sunk and temporarily wet stored adjacent to their respective gravity bases aiding their subsequent recovery later during the 2025 execution window. In the instance that recovery is not feasible immediately following FPSO sail away a guard vessel, or alternative navigational aid option, will remain on location after FPSO sail away to mitigate hazards for other users of the sea until these can be removed. There is no drill cuttings impact from the recovery of riser/umbilical recovery or the MWA buoyancy elements.	To remove all seabed structures and leave a clear seabed
4. Risers & Umbilicals	
Full Removal – Prior to FPSO sail away the flexible risers will be made safe by flushing the pipelines, manifolds, and risers to the FPSO topsides. The risers and dynamic umbilicals will then be disconnected from the FPSO with their upper ends temporarily laid on the seabed under the turret centre, with the hog bends staying supported over the three mid water arches A, B & G and by the distributed buoyancy for the Gryphon umbilical, Water Injection and 4" Gas lift risers. The risers will remain connected at the subsea ends. Following FPSO sail away, during the 2025 execution window, the risers and distributed buoyancy will be recovered and transported to shore for re-use, recycling or disposal. If recovery is not feasible immediately following FPSO sail away a guard vessel, or alternative navigational aid option, will remain on location after FPSO sail away to mitigate hazards for other users of the sea until these can be removed.	Leaves clear seabed and water column and to satisfy the regulatory requirement.

5. Wells
The 26 production wells; 1 gas injection well; and 5 water injection wells will not be decommissioned at this time and will be subject to a separate decommissioning programme(s). A risk assessment has been carried out of the integrity status of each well for leaving in a shut-in state after FPSO sail-away. The frequency of subsea inspections to monitor the wells status will be defined based on the outcome of general visual inspection planned for 2024 and 2025. Once this has been determined this will be discussed and agreed with OPRED.
6. Interdependencies
There is a direct impact for the subsea user fields of Tullich, Maclure and Ballindalloch, for which the decommissioning of Gryphon FPSO removes their current production route. Equity holders have been engaged to ensure the impact has been acknowledged for the activities described by these DPs. Gryphon area gas is exported to Beryl A and commingled, without processing, and is subsequently exported to St Fergus via the SAGE system. Activities within these DPs will, where necessary, be discussed with the operators of these systems such that preparations can be made for cessation of gas export from the FPSO.

1.6 Field Location Including Field Layout and Adjacent Facilities

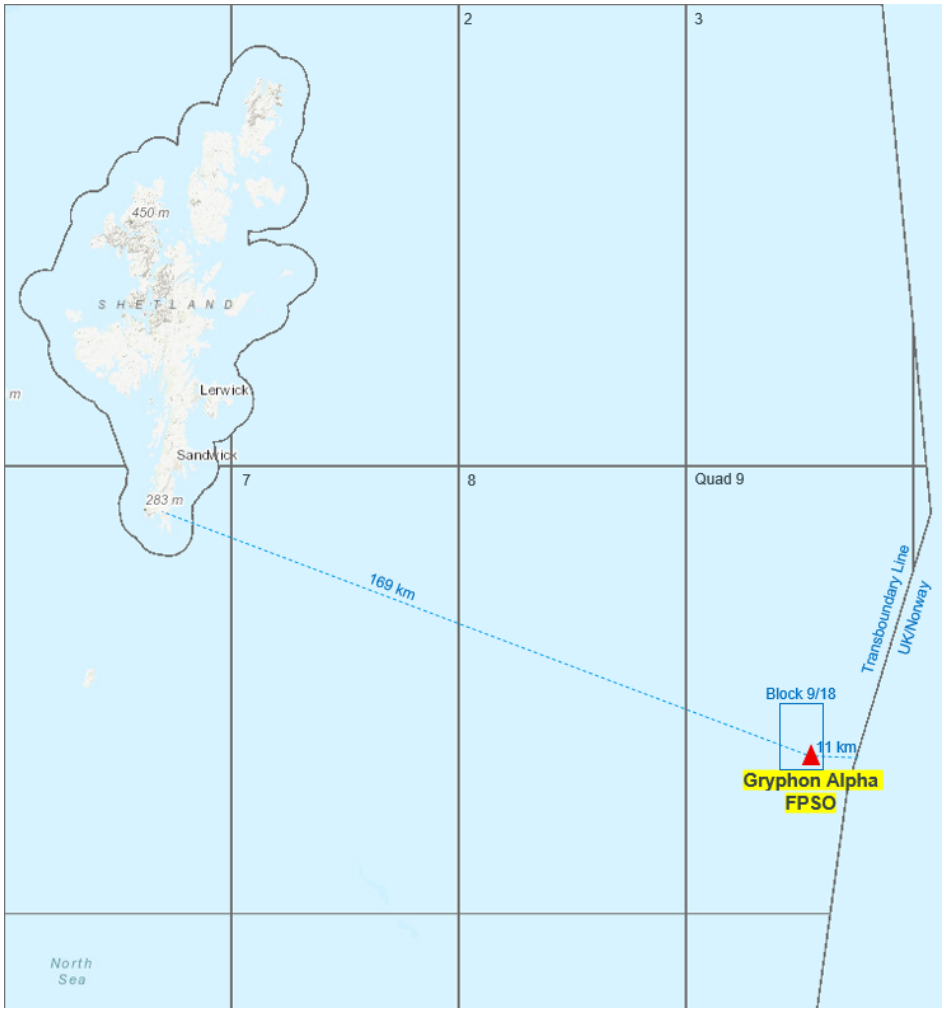

Figure 1-1: Field Location in UKCS[1]

[1] *For location of adjacent facilities please refer to Figure 1-3 and Table 1-6.*

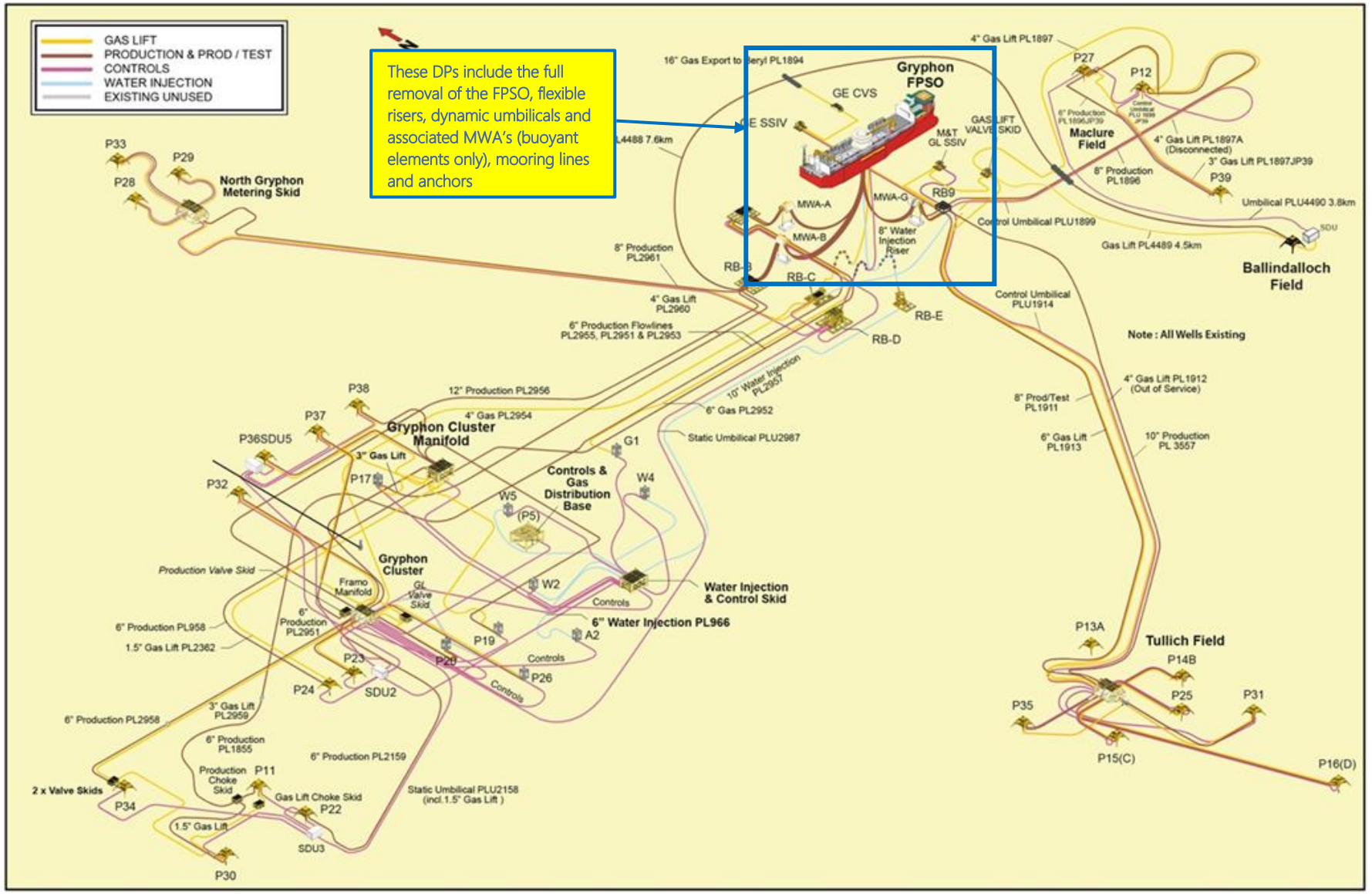

Figure 1-2: Field Layout

Table 1-6: Adjacent Facilities					
Operator	**Name**	**Type**	**Distance/Direction**	**Information**	**Status**
TotalEnergies E&P North Sea UK Ltd	Maclure	Subsea field	2.2 km / ENE	Operating Asset	*Operational*
TotalEnergies E&P North Sea UK Ltd	Ballindalloch	Subsea field	3.8 km / SE	Operating Asset	*Operational*
TotalEnergies E&P North Sea UK Ltd	Tullich	Subsea field	5.0 km / S	Operating Asset	*Operational*
TAQA EUROPA B.V.	Harding	Platform	8.3 km / SSW	Third Party Asset	*Operational*
TAQA EUROPA B.V.	Harding Submerged Turret Loading Buoy	Buoy	8.3 km / SSE	Third Party Asset	*Operational*
APACHE CORPORATION	Beryl SPM-3	Single Point Mooring	20.4 km / NNW	Third Party Asset	*Operational*
APACHE CORPORATION	Beryl A	Platform	21.6 km / NNW	Third Party Asset	*Operational*
APACHE CORPORATION	Beryl SPM-	Single Point Mooring	22.7 km / NNW	Third Party Asset	*Non-Operational*
APACHE CORPORATION	Beryl B	Platform	29.0 km / NNW	Third Party Asset	*Operational*
EQUINOR ASA	Mariner Seawater (UKCS)	Buoy	32.7 km / NNW	Third Party Asset	*Non-Operational*
Aker BP	Alvheim	FPSO	34.9 km / NNE	Third Party Asset	*Operational*
EQUINOR ASA	Mariner PDQ	Platform	38.6 km / WNW	Third Party Asset	*Operational*
EQUINOR ASA	Mariner B	FSU	39.4 km / WNW	Third Party Asset	*Operational*
ANCALA	SAGE Pipeline	Pipeline	13.0 km / W	Third Party Asset	*Operational*
Impacts of Decommissioning Proposals					
There is a direct impact for the subsea user fields of Maclure, Ballindalloch, and Tullich, for which the decommissioning of Gryphon FPSO removes their current production route. There are no other direct impacts on adjacent facilities from the work associated with the Gryphon FPSO sail away. Any decommissioning activities associated with the export line to Beryl will be dealt with within a separate subsea decommissioning programme.					

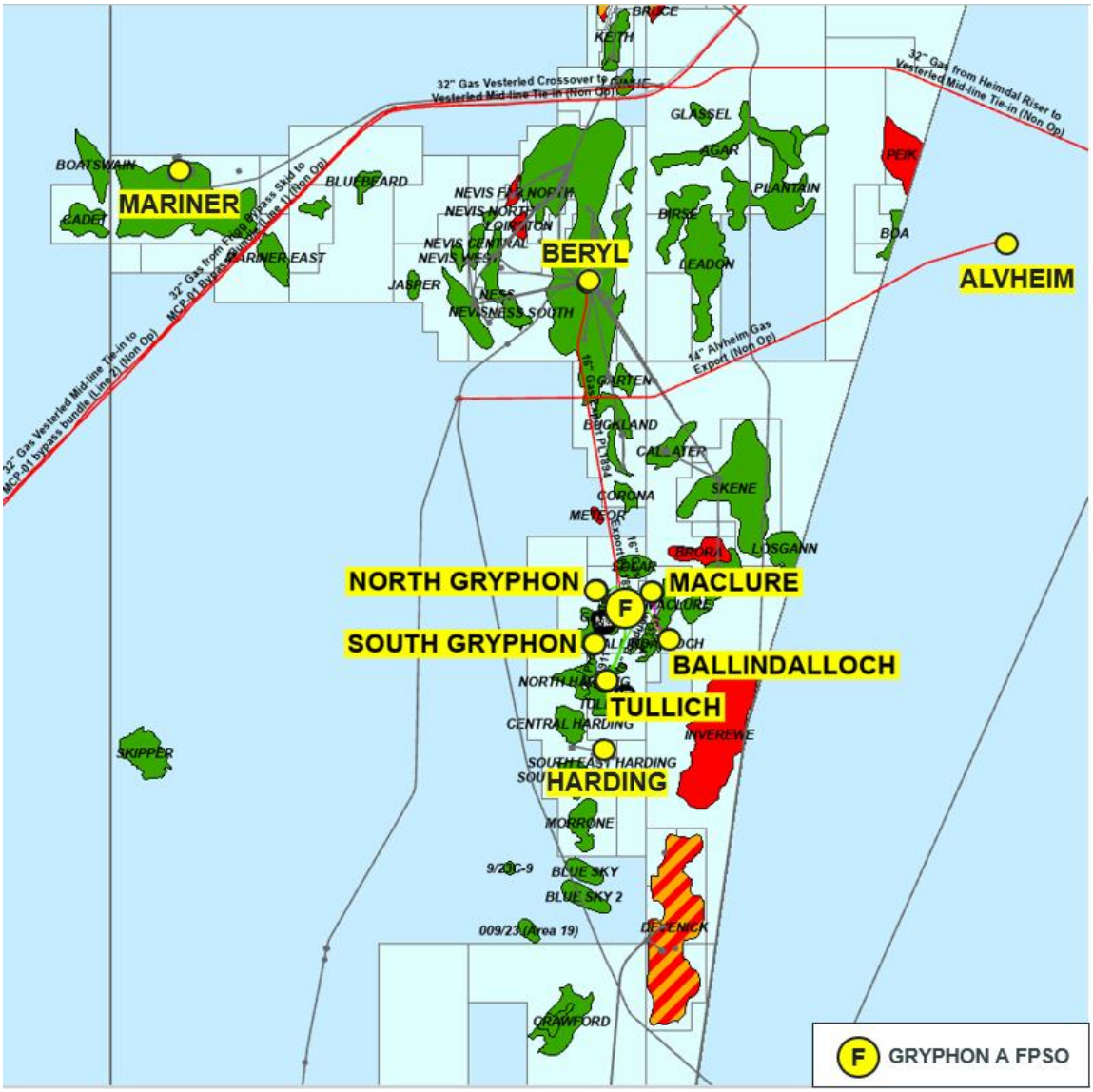

Figure 1-3: Adjacent Facilities

1.7 Industrial Implications

The FPSO decommissioning activities will be managed by TEPNSUK. All decommissioning activities will be planned to realise synergies and efficiencies in offshore execution. A Supply Chain Action Plan (SCAP) has been produced for these DPs in accordance with NSTA guidance. The SCAP has been submitted to the NSTA.

A competitive tendering exercise has been completed following an extensive market investigation. Suppliers' offers have been assessed using several criteria, including the capability and capacity to execute the work safely; and the commercial offer and experience of carrying out this type of operation in the UKCS.

TotalEnergies has committed to Net Zero across all its production and energy products used by its customers in Europe by 2050 or sooner (Scope 1, 2 & 3). TEPNSUK has an Energy Transition roadmap.

Supported by accreditation to ISO50001, this roadmap provides a logical and systematic process to embed emission reduction activities and energy transition strategies throughout TEPNSUK to meet the company's Net Zero ambition.

TEPNSUK also has an environment management system accredited to ISO14001. By integrating these two systems, the requirements are efficiently embedded into day-to-day operations and performance monitored.

2 DESCRIPTION OF ITEMS TO BE DECOMMISSIONED

2.1 Installations: Surface Facilities - FPSO

Table 2-1: Surface Facilities Information					
Name	**Facility Type**	**Location**	**Topsides/Facilities**	**Mooring System**	
			Weight (Te)	**Weight (Te)**	**Number of mooring lines**
Gryphon	FPSO Tentech 850C hull design and drag chain type turret and thruster turning system	Latitude 59°21'04.1N Longitude 01°33'09.9E	38,165 (Lightweight, Gross Dry Weight)	Total weight is 3,644Te • 329.4 Te per mooring line • 35 Te per Anchor	10 (5 groups of 2 lines) 10 anchors

2.2 Installations: Subsea

Table 2-2: Subsea Installations					
Description	**No.**	**Size/Weight (Te)**	**Location**		**Comments/Status**
MWA-A	1	Buoyancy Element 17.8 x 8.9 x 4.4m (L x W x H) 94.7 Te (In Air) Tether assembly (Upper) 6.7 Te total comprising: 2 x D-shackle towards MWA pad eye. 2x Twin Trunnion Plate with 1 x Anchor shackle for pull down attachment 2 x Bridle Tethers 1 x. Delta Plate	WGS84 Decimal	59.36175 N 1.57108 E	Each MWA Buoyancy element is secured to its respective tether base by two individual synthetic tether assemblies weighing ~ 8000 kg each. The upper portion of the assemble from delta plate up shall be recovered along with the buoyancy elements as part of these decommissioning works. The lower tether sections shall be recovered along with the tether bases and associated ballast as part of a separate decommissioning programme to be submitted separately to OPRED.
			WGS84 Decimal Minute	59° 21' 42.30" N 01° 34' 15.88" E	
MWA-B	1	Buoyancy Element 17.8 x 8.9 x 4.4m (L x W x H) 94.7 Te (In Air) Tether assembly (Upper) 6.7 Te total comprising: 2 x D-shackle towards MWA pad eye.	WGS84 Decimal	59.36136 N 1.56956 E	As above
			WGS84 Decimal Minute	59° 21' 40.88" N 01° 34' 10.40" E	

		2 x Twin Trunnion Plate with 1 x Anchor shackle for pull down attachment 2 x Bridle Tethers 1 x. Delta Plate			
MWA-G	1	<u>Buoyancy Element</u> 17.9 x 8.9 x 6.5m (L x W x H) 96.2 Te (In Air) <u>Tether assembly (Upper)</u> 6.7 Te total comprising: 2 x D-shackle towards MWA pad eye. 2x Twin Trunnion Plate with 1 x Anchor shackle for pull down attachment 2 x Bridle Tethers 1 x. Delta Plate	WGS84 Decimal	59.36104 N	As above
				1.57268 E	
			WGS84 Decimal Minute	59° 21' 39.75" N	
				01° 34' 21.63" E	

2.3 Pipelines

Table 2-3: Pipeline/Flowline/Umbilical Information									
Description	Pipeline Number (as per PWA)	Diameter (inches)	Length (km)	Description of Component Parts	Product Conveyed	From – To End Points	Burial Status	Pipeline Status	Current Content
Gas Export Riser	PL2944	6	0.319	Flexible	Gas	Gryphon FPSO – Riser Base 9	Initially surface laid then in suspension over MWA to FPSO	Operational	Export Gas
Gas Lift Riser	PL2948	4	0.314	Flexible	Gas	Gryphon FPSO to Riser Base 9	Initially surface laid then in suspension over MWA to FPSO	Operational	Lift Gas
Production Riser	PL2951	6	0.325	Flexible	Oil	Gryphon FPSO to Riser Base A	Initially surface laid then in suspension over MWA to FPSO	Operational	Production Fluids
Gas Cap Riser	PL2952	6	0.325	Flexible	Gas	Gryphon FPSO to Riser Base A	Initially surface laid then in suspension over MWA to FPSO	Operational	Gas
Production Riser	PL2953	6	0.325	Flexible	Oil	Gryphon FPSO to Riser Base A	Initially surface laid then in suspension over MWA to FPSO	Operational	Production Fluids
Gas Lift Riser	PL2954	4	0.314	Flexible	Gas	Gryphon FPSO to Riser Base C	Initially surface laid then in suspension with distributed buoyancy to FPSO	Operational	Lift Gas
Production Riser	PL2955	6	0.325	Flexible	Oil	Gryphon FPSO to Riser Base B	Initially surface laid then in suspension over MWA to FPSO	Operational	Production Fluids

Production Riser	PL2956.5A	6	0.325	Flexible	Oil	Gryphon FPSO to Riser Base B	Initially surface laid then in suspension over MWA to FPSO	Operational	Production Fluids
Production Riser	PL2956.5B	6	0.325	Flexible	Oil	Gryphon FPSO to Riser Base B	Initially surface laid then in suspension over MWA to FPSO	Operational	Production Fluids
Production Riser	PL2956.5C	6	0.325	Flexible	Oil	Gryphon FPSO to Riser Base B	Initially surface laid then in suspension over MWA to FPSO	Operational	Production Fluids
Water Injection Riser	PL2957	8	0.319	Flexible	Produced / Injection Water	Gryphon FPSO to Riser Base E	Initially surface laid then in suspension with distributed buoyancy to FPSO	Operational	Injection Water
Production Riser	PL2961	6	0.325	Flexible	Oil	Gryphon FPSO to Riser Base B	Initially surface laid then in suspension over MWA to FPSO	Operational	Production Fluids
Production Riser	PL1896	6	0.330	Flexible	Oil	Gryphon FPSO to flange face at the base of the riser	Initially surface laid then in suspension over MWA to FPSO	Operational	Production Fluids
Production Riser	PL1900	8	0.319	Flexible	OIl	Gryphon FPSO to Riser Base 9	Initially surface laid then in suspension over MWA to FPSO	Operational	Production Fluids
Production/Test Riser	PL1901	6	0.319	Flexible	Oil	Gryphon FPSO to Riser Base 9	Initially surface laid then in suspension over MWA to FPSO	Operational	Production Fluids
Electro-Hyd-Chem Umbilical	PLU2996	9	0.259	Dynamic	Chemical Injection & Hydraulic Fluid	Gryphon FPSO to Riser Base D	Initially surface laid then in suspension with distributed buoyancy to FPSO	Operational	Chemical Injection & Hydraulic Fluid

EHC Umbilical	PLU1899	9	0.319	Dynamic	Chemical Injection & Hydraulic Fluid	Gryphon FPSO to Riser Base 9	Initially surface laid then in suspension over MWA to FPSO	Operational	Chemical Injection & Hydraulic Fluid

2.4 Inventory Estimates

The approximate quantity of key materials used in the make-up of the FPSO, mooring system, risers, umbilicals and associated MWA buoyancy elements and upper tethers have been evaluated. Further review of the inventories of materials will be conducted during the detailed engineering phase of decommissioning. Summaries of the material inventories are shown in Table 2-4 and Table 2-5 below. An inventory will be shared with SEPA as part of the Active Waste Management Plan for decommissioning activities.

Table 2-4 Gryphon FPSO Estimated Inventory (Inc. Mooring System & MWAs)

Item	Weight (Te)
Ferrous Metal	36,994
Non-Ferrous Metal	1,102
Plastic	766
Hazardous	1,135
NORM	Not Expected[2]
Other	2,119
Total (Te)	**42,116**

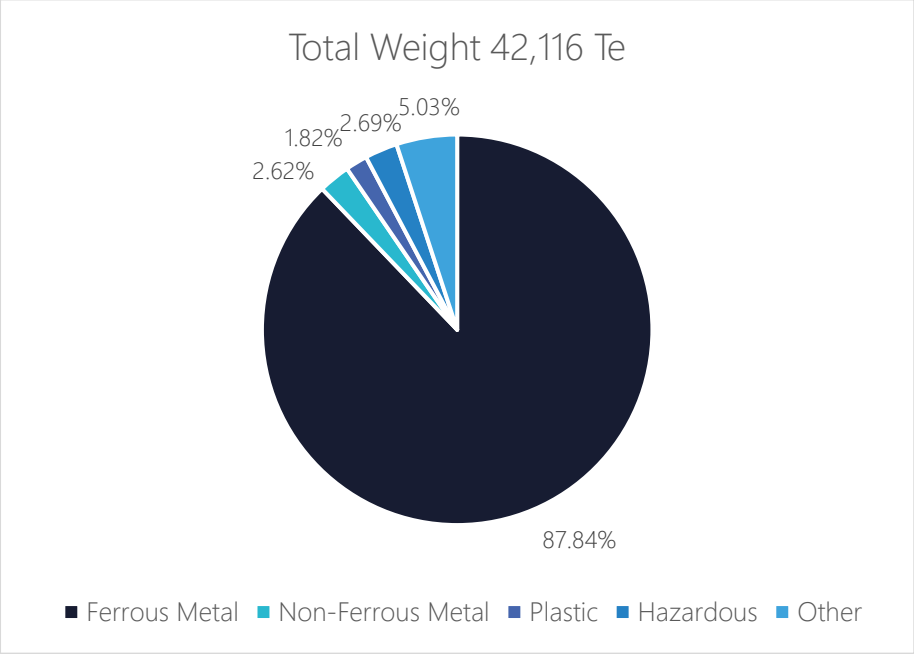

Figure 2-1: Pie Chart of Estimated Inventories (FPSO inc. Mooring System & MWAs)

[2] *All previous measurements of NORM demonstrated to be out-of-scope of the regulations i.e. not regarded as radioactive under the EASR18.*

Table 2-5 Gryphon Risers and Umbilicals Estimated Inventory	
Item	**Weight (Te)**
Ferrous Metal	433
Non-Ferrous Metal	1
Plastic	81
Hazardous	0
NORM	0
Other	0
Total (Te)	**515**

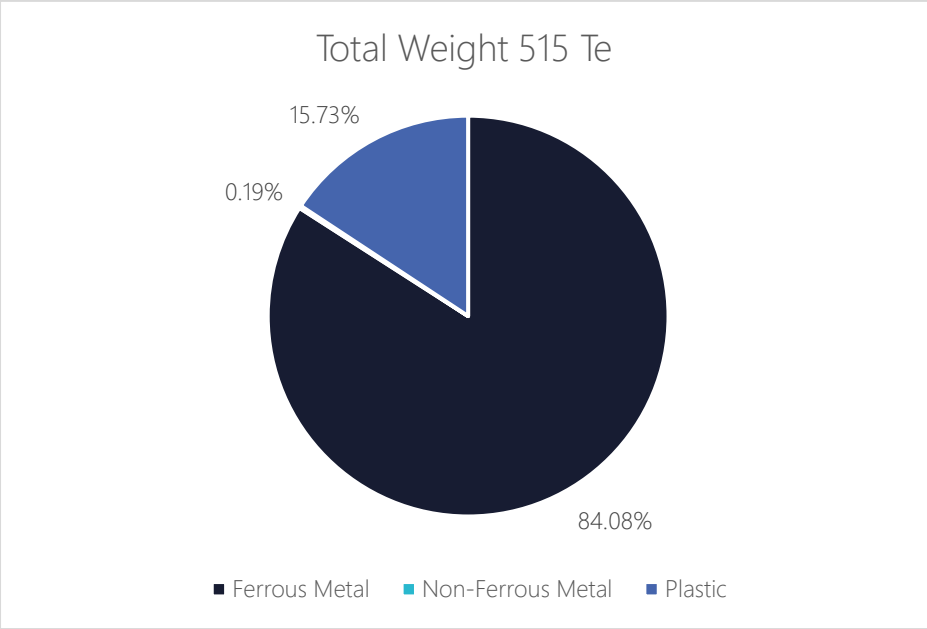

Figure 2-2 Pie Chart of Estimated Inventory (Risers and Umbilicals)

3 REMOVAL AND DISPOSAL METHODS

Decommissioning of the FPSO, flexible risers, dynamic umbilicals and mooring system and MWAs will generate a quantity of waste. TEPNSUK is committed to establishing and maintaining environmentally acceptable methods for managing wastes in line with the Waste Framework Directive and principles of the waste hierarchy.

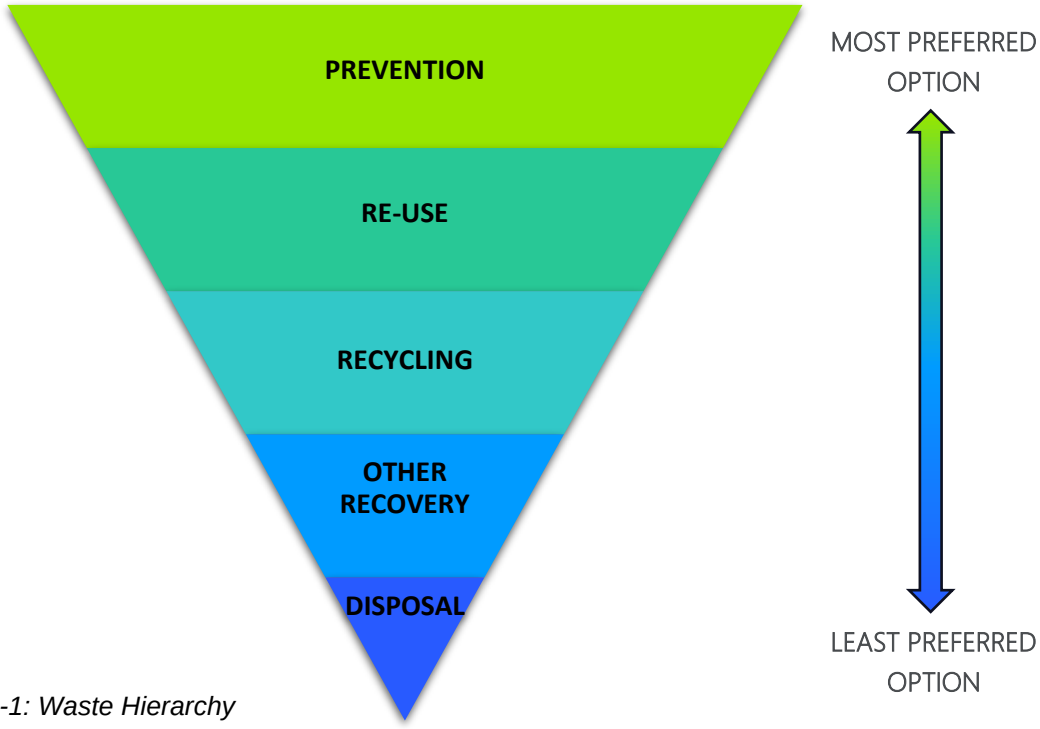

Figure 3-1: Waste Hierarchy

The FPSO has reached the end of its operations in field. In line with the waste hierarchy, potential reuse options have been considered by TEPNSUK, including redeployment or sale. None have yielded viable opportunities to date; however, redeployment or sale opportunities will continue to be explored in parallel with preparing for onshore recycling.

The decommissioned waste and FPSO will be returned to shore and transferred to a suitably licenced waste treatment facility. It is expected that the recovered infrastructure will be cleaned before being largely recycled. If there are no redeployment or sale opportunities identified the FPSO will be recycled at an approved shipyard in compliance with UK and EU ship recycling laws and regulations.

Early engagement with the regulatory authorities is ongoing to ensure that any issues with Trans Frontier Shipment of Waste (TFSW), including hazardous materials, are addressed.

3.1 Surface Facilities - FPSO

3.1.1 FPSO Description

The Gryphon ‘A’ installation consists of an FPSO facility connected to subsea well clusters. The FPSO is equipped with topsides production facilities which perform conventional separation of gas/oil/water mixtures and compression of gas for use as fuel and lift gas. Crude oil is stored on board and offloaded to shuttle tankers for transportation to shore. In addition, there is a gas export pipeline from Gryphon ‘A’ to the Beryl A installation.

The FPSO is a Tentech 850C vessel and was purchased by Kerr-McGee in early 1993 and subsequently fitted out with the topsides production facilities. The vessel was originally moved to its offshore location in September 1993, and production commenced in October 1993. The original facility was upgraded in 2003 to include provisions for processing fluids from the Maclure and Tullich reservoirs, as well as a gas export

line to Beryl A. Ownership was transferred to Maersk Oil North Sea UK Limited in 2005 and then to TEPNSUK in 2018. The main dimensions of the FPSO are set out in Table 3-1.

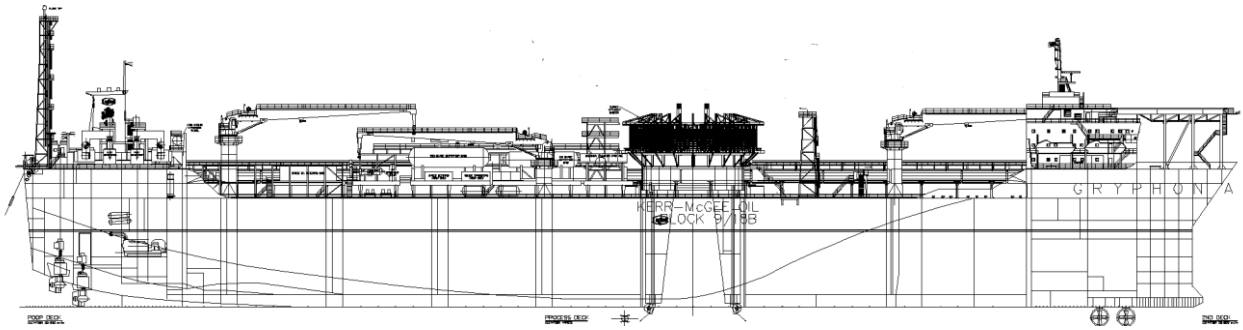

Figure 3-2: Diagram of FPSO

Table 3-1: FPSO Dimensions	
Dimensions	**Metres**
Length overall	259.512
Breadth moulded	41.000
Depth moulded	23.600

3.1.2 Preparation/Cleaning

Table 3-2: Cleaning of FPSO for Removal		
Waste Type	**Composition of Waste**	**Disposal Route**
Onboard Hydrocarbons	Process fluids, fuels and lubricants	Crude inventory will be offloaded to a shuttle tanker for sale. Any production chemical stock inventory will be sent onshore for disposal. Flushing fluids will be disposed via produced water re-injection wells. Fuels and lubricants will remain in their dedicated storage tanks for the FPSO transit, and then disposed of onshore using an approved hazardous waste contractor using appropriate methods and under the appropriate permits.
Other hazardous materials	NORM, LSA Scale, any radioactive material, instruments containing heavy metals, batteries	Transported to shore for disposal by an approved hazardous waste contractor using appropriate methods and under the appropriate permits.

3.1.3 Removal Methods

Table 3-3: FPSO Removal Methods	
Method	**Description**
Reverse Install / Sail away	Following the flushing, cleaning and disconnection of all risers and umbilicals and putting in place appropriate barriers for retention of hydrocarbons, the FPSO shall be towed to be redeployed or recycled / disposed. The decommissioned FPSO recycling or disposal will be in compliance with the applicable UK and EU laws and regulations. Monitoring arrangements for the wells are being discussed with OPRED and HSE.

3.2 Mooring System

The mooring system comprises 10 lines (5 groups of 2 lines) of studless chain (including 100m triple chain section connected using a tri-plate arrangement) connected to a drag chain type turret and thruster turning system to rotate the vessel about the turret to maintain optimum heading with respect to the prevailing weather conditions. The risers and umbilicals run through the rotating turret. Each mooring line is equipped with a 35 tonne Stevpris anchor.

3.2.1 Mooring System Decommissioning Overview

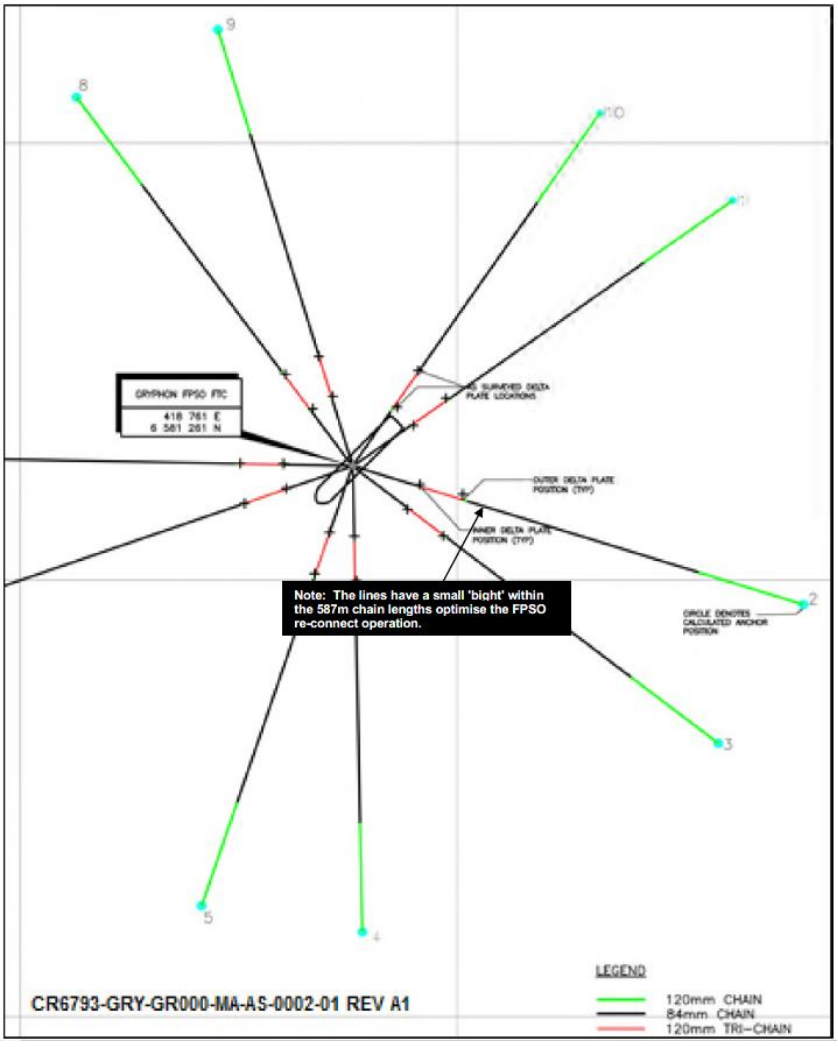

Figure 3-3 As-Laid Mooring Positions

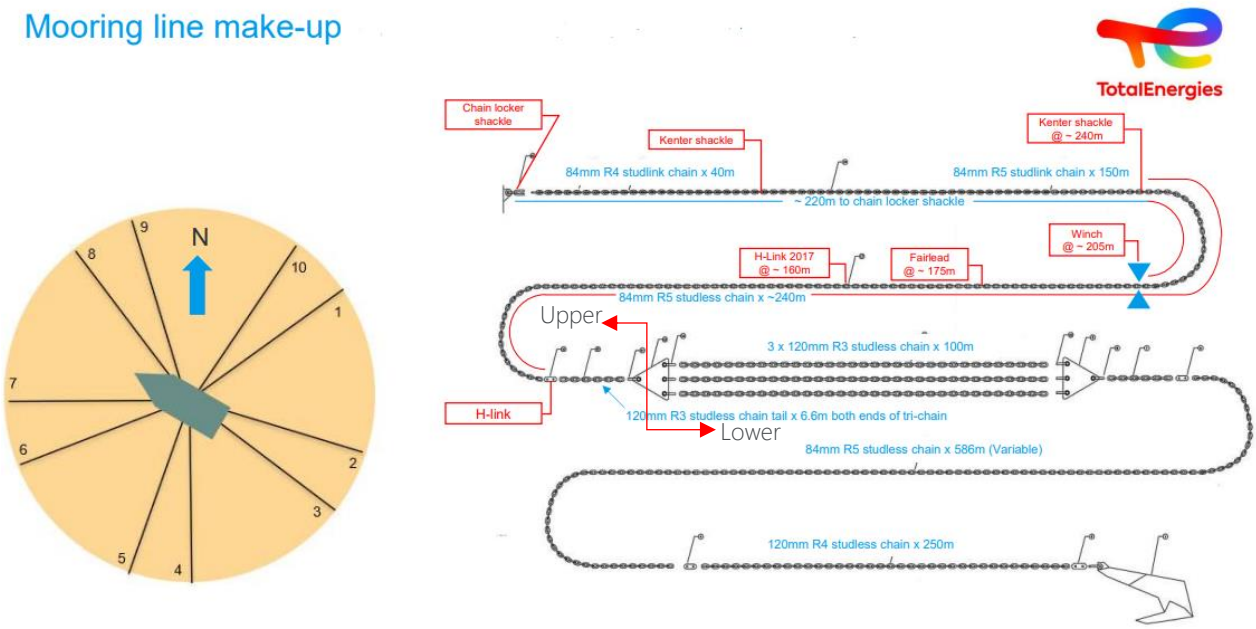

Figure 3-4: Mooring Layout & Line make-up

Table 3-4: Mooring System Removal Methods			
Mooring System	**Number**	**Option**	**Disposal route**
FPSO Mooring lines	10	Mooring lines and anchors will be recovered for re-use, recycling or disposal, in compliance with regulatory requirements - The upper sections of FPSO mooring lines up to and including the upper H-links will be recovered prior to FPSO sail away, the lower sections of the chain connecting to the anchors will be temporarily wet stored for recovery post sail away. On completion of these DPs the entire mooring line shall be recovered.	Transported to shore for recycling, or disposal

3.3 Subsea Installation

Table 3-5: Subsea Installations and Stabilisation Features Decommissioning Options			
Subsea installations and stabilisation features	**Number**	**Option**	**Disposal Route (if applicable)**
MWA (Buoyancy Elements & Upper Tether)	3	Full Removal	Transported to shore for recycling, or disposal.

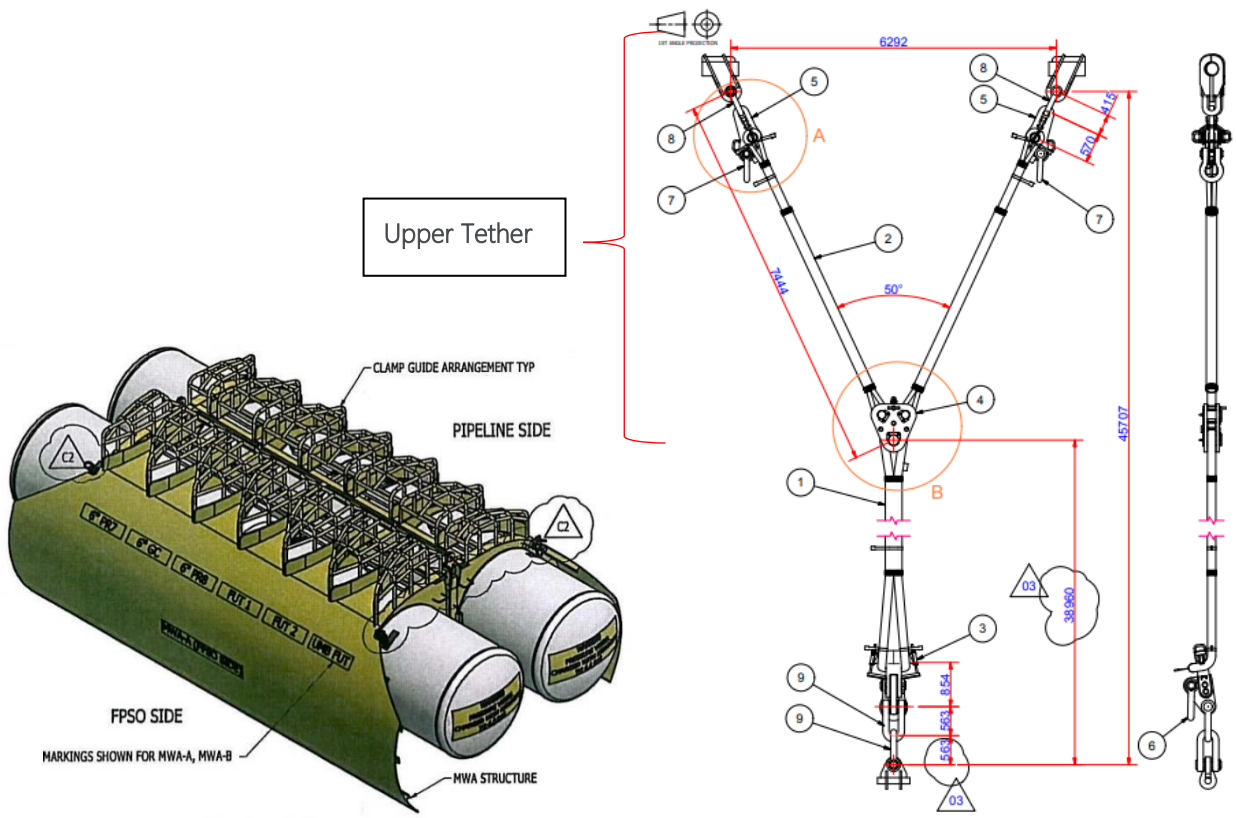

Figure 3-5: Typical MWA (Buoyancy Element & Tether)

3.4 Risers and Umbilicals

Table 3-6: Risers and Umbilicals Removal Methods			
System	**Number**	**Option**	**Disposal route**
Production	10	Subsea pipework will be flushed of hydrocarbons prior to riser disconnection. The flexible risers and dynamic umbilicals shall be disconnected at the FPSO via cut and drop method and disconnected subsea and recovered for transport to shore. If recovery is not feasible at time of FPSO sail away the risers and dynamic umbilicals may be temporarily wet stored for recovery later during the 2025 execution window. In this instance a guard vessel vessel, or alternative navigational aid option, will remain on location after FPSO sail away to mitigate hazards for other users of the sea.	Transported to shore for reuse, recycling, or disposal
WI Riser	1		
Gas Lift	2		
Gas Cap	1		
Gas Export	1		
Dynamic Umbilicals	2		

3.4.1 Comparative Assessment

A Comparative Assessment (CA) has not been carried out for the risers and dynamic umbilicals covered by these DPs as the lines are being fully removed. Only the upper ends are to be laid down temporarily on the seabed to facilitate FPSO sail away. As the risers and dynamic umbilicals will subsequently be recovered and returned to shore for recycle and disposal, it is considered that a CA is not required.

A CA will be carried out for remaining field infrastructure, which is listed on the Section 29 Notices and in support of the relevant decommissioning programmes which will be submitted separately to OPRED. The CA will be carried out in line with the recommendations of OPRED Guidance Notes.

3.5 Waste Streams

Table 3-7: Waste Stream Management Methods	
Waste Stream	**Removal and Disposal method**
Bulk liquids	Bulk liquid waste will be produced during the flushing of the production systems and during the cleaning of the FPSO process equipment and storage tanks. Bulk liquids will be processed and re-injected into a reservoir via the produced water reinjection system (PWRI) or will be offloaded and transported to shore for treatment and disposal.
Marine growth	Any marine growth on the FPSO hull will be removed and disposed of onshore at the ship recycling facility in accordance with guidelines. Any marine growth on the risers will be removed during riser recovery operations. Any marine growth on mid-water arches and moorings will be removed onshore in accordance with guidelines.
NORM/LSA Scale	Tests for NORM will be undertaken offshore and work will be carried out in full compliance with all relevant regulations. NORM contaminated material may be removed and discharged offshore under the appropriate authorisation. Some material or contaminated equipment may be recovered to shore for disposal or decontamination, selected waste management contractor will have appropriate authorisation for the disposal/decontamination of NORM contaminated waste.
Asbestos	Will be recovered to shore and in full compliance with all relevant regulations and disposed of under an appropriate permit by the selected waste management contractor.
Other hazardous wastes	Will be recovered to shore and in full compliance with all relevant regulations and disposed of under an appropriate permit by the selected waste management contractor.
Onshore Dismantling sites	Appropriate licenced sites will be selected. Facility must demonstrate proven disposal track record and waste stream management throughout the deconstruction process and demonstrate their ability to deliver innovative recycling options.

Table 3-8: Inventory Disposition			
	Total Inventory Tonnage	Planned tonnage to shore	Planned left *in situ*
Installations	42,104	42,104	0
Risers and Dynamic Umbilicals	515	515	0

4 ENVIRONMENTAL APPRAISAL OVERVIEW

Proposed decommissioning activities have the potential to impact the environment. TEPNSUK has undertaken an ENVID in line with the Decommissioning Guidance Notes regarding the activities described within these DPs.

Long term environmental impacts from the decommissioning operations are expected to be low. Incremental cumulative impacts and trans-boundary effects associated with the planned decommissioning operations are also expected to be low.

TEPNSUK understands the importance of minimising the potential for environmental impact during decommissioning, in parallel with safety and technical feasibility requirements. To this end, environmental impacts will be fully considered in the design of arrangements for the disconnection and sail away of the FPSO. Where necessary, additional measures will be developed to limit the extent of any potential impact.

All operations described in these DPs will be subject to all the relevant environmental permits and approvals. All permit applications and reporting will be managed through a Permits, Licences, Authorisations, Notifications and Consents (PLANC) register.

The ENVID did not identify any activities required to undertake the removal of the FPSO that would be considered to have a significant environmental impact. As a result, a standalone EA has not been considered necessary to support these decommissioning activities. Decommissioning activities will be subject to permitting application via the Portal Environmental Tracking System (‘PETS’).

4.1 Environmental Sensitivities

Table 4-1: Environmental Sensitivities	
Environmental Receptor	**Main Features**
Conservation interests	The FPSO is located approximately 38 km from the nearest conservation site – the Braemar Pockmarks Special Area of Conservation (SAC). The SAC is designated for the presence of Annex I habitat submarine structures made by leaking gases. In this location, large blocks, pavement slabs and smaller fragments of Methane-Derived Authigenic Carbonate (MDAC) have been deposited through a process of precipitation during the oxidation of methane gas. These carbonate structures provide a habitat for marine fauna usually associated with rocky reef, and very specific chemosynthetic organisms which feed off both methane (seeping from beneath the seafloor) and its by-products, hydrogen, and sulphide (Judd, 2001). All other conservations sites are located over 90 km from the project area. The FPSO is located approximately 169 km from the east coast of Sumburgh on Shetland, Due to this distance, no impacts to onshore conservation sites are expected from the proposed operations. Seabed survey imagery in the vicinity of the FPSO (or wider field area) has thus far failed to identify any Annex I habitats or communities of conservation value (e.g. Fugro, 2009; Gardline, 2009). There has been no evidence of OSPAR threatened and/or declining species or any UK Biodiversity Action Plan (UKBAP) species in the project area.
Seabed	Site-specific seabed survey data indicates that the majority of sediments proximate to the FPSO comprised silty fine sands with shell fragments (Fugro, 2009; Gardline, 2009). Sediments were considered very well to moderately well sorted very fine sand under the Wentworth classification (Fugro, 2009; Gardline, 2009). Mean total hydrocarbon concentrations (THC) were typical of background levels in areas where oil and gas exploration occurs, with concentrations considerably lower than background levels for the region (Gardline, 2009). The majority of heavy and trace metals were recorded at levels either below the limits of detection or lower than typically expected background levels for the northern North Sea (NNS) (Fugro, 2009), with concentrations unlikely to be of ecological consequence (Gardline, 2009). Gardline (2009) describes fauna as largely uniform, species-rich and taxonomically diverse, albeit with a slight dominance structure, and consisting of fauna typical of muddy, sandy habitats. Of the 77 taxa recorded (47.0%) were annelid, 44 (26.8%) were crustacean, 26 (15.9%) were molluscan and six (3.7%) were echinoderm. Representatives of the Cnidaria, Nemertea, Sipuncula, Phoronida, Brachiopoda and Tunicata made up the 11 taxa (6.7% of the total) belonging to other phyla (Fugro, 2009).
Fish	The FPSO is located in an area of nursery grounds for anglerfish (*Lophius piscatorius*), blue whiting (*Micromesistius poutassou*), European hake (*Merluccius merluccius*), haddock (*Melanogrammus aeglefinus*), herring (*Clupea harengus*), ling (*Molva molva)*, mackerel (*Scomber scombrus*), Norway lobster (*Nephros norvegicus*), Norway pout (*Trisopterus esmarkii*) and whiting (*Merlangius merlangus*) (Coull *et al.*, 1998; Ellis *et al.*, 2012). Cod (*Gadus morhua*), haddock, mackerel, Norway lobster, Norway pout and saithe (*Pollachius virens*) use the area as grounds for spawning throughout the year with peak spawning occurring between January and July. Of the species which are known to use the area in some capacity, a number are species of conservation concern. Anglerfish, cod, herring, ling, mackerel, Norway pout, saithe and whiting are all Scottish Priority Marine Features (PMFs).

Fisheries	The FPSO sits within ICES rectangle 47F1. According the Scottish Government (2022) landings data for 2021, Rectangle 47F1 is targeted primarily for demersal species. In 2021, demersal catch live weight was 1,474 Te with a corresponding value of £2,348,402. This accounts for approximately 81% of the landings by weight (1,812 Te) and approximately 86% of the total landings by value (£2,716,396) in Rectangle 47F1 for that year. To put these figures into context, a total of 538,469 tonnes with a value of £686,410,368 was landed in the UK in 2021 (Scottish Government, 2022). Fisheries in Rectangle 47F1 therefore contribute approximately 0.34% of landings and 0.40% of value when compared to overall UKCS values (Scottish Government, 2022). 2021 saw 377 fishing days with effort most concentrated in August (83 days). This compares to 505 days in 2020, 328 in 2019 and 338 in 2018. From 2018 to 2021, fishing took place in all months, with the exception of December 2021. Overall, fishing effort remains relatively low as there are <100 days of fishing in each month (Scottish Government, 2022).
Marine Mammals	Harbour porpoise (*Phocoena phocoena*) are frequently found throughout UK waters. They typically occur in groups of one to three individuals in shallow waters, although they have been sighted in larger groups and in deep waters. They are present in UK waters throughout the year and are most likely to be observed in the Gryphon field in the summer months (Reid *et al.,* 2003). The density of harbour porpoise in the project area is estimated to be 0.3210 animals/km^2 (Hammond *et al.,* 2021). Minke whales (*Balaenoptera acutorostrata*) occur in water depths of 200 m or less throughout the NNS. They are usually sighted in pairs or in solitude; however, groups of up to 15 individuals can be sighted feeding. It appears that animals return to the same seasonal feeding grounds (Reid *et al*., 2003). Minke whales are most likely to be observed in the project area in the summer months and in low numbers. Their density is predicted to be 0.0150 animals/km^2 which is the highest across all areas surveyed (Hammond *et al*., 2021). Atlantic white-sided dolphin (*Lagenorhynchus acutus*) are usually sighted in large groups of up to 1,000 individuals in UK waters. They are present in UK waters throughout the year and are most likely to be observed in the project area in March, June and July (Reid *et al.,* 2003). The relative density of Atlantic white-sided dolphin is estimated at 0.0030 animals/km^2 in the project area (Hammond *et al*., 2021). Killer whales (*Orcinus orca*) are the largest member of the oceanic dolphin family. Most sightings in UK waters are of singles or groups of less than eight individuals (mean = 4.6), although groups of up to one hundred have been observed (Reid *et al.,* 2003). Killer whales are most likely to be observed in the project area in the summer months and in low numbers. Harbour porpoise, minke whale, Atlantic white-sided dolphin and killer whales are Priority Marine Features (PMFs), European Protected Species (EPS) and are covered by OSPAR and the UKBAP. In addition, harbour porpoise, minke whale, Atlantic white-sided dolphin are also listed on the IUCN Global Red List as species of lower risk. No other cetacean species are likely to be present in the project area. Two species of seal are resident in UK waters: the grey seal *Halichoerus grypus* and the harbour or common seal *Phoca vitulina*, both occurring regularly over large parts of the North Sea. Since the FPSO is located approximately 169 km offshore, grey and harbour seals may be encountered from time to time but it is not likely that they use the area with any regularity or in great numbers. This is confirmed by the grey and harbour seal density maps published by the Sea Mammal Research Unit (SMRU), which are provided in the NMPi (2020). The maps report the presence of grey and harbour seals in the Gryphon area as between 0 and 1 per 25 km^2.

Birds	The area surrounding the FPSO is utilised by the following species at various times of the year: northern fulmar (*Fulmarus glacialis*), manx sheawater (*Puffinus puffinus*), European storm-petrel (*Hydrobates pelagicus),* northern gannet (*Morus bassanus*), pomarine skua (*Stercorarius pomarinus*), Artic skua (*Stercorarius parasiticus*), great skua (*Stercorarius skua*), black-legged kittiwake (*Rissa tridactyla*), great black-backed gull (*Larus marinus*), common gull (*Larus canus*), lesser black-backed gull (*Larus fuscus*), herring gull (*Larus argentatus*), common guillemot (*Uria aalge*), razorbill (*Alca torda*), little auk (*Alle alle*), Atlantic puffin (*Fratercula arctica*) (Kober *et al*., 2010).
Other Users of the Sea	Shipping activity within Block 9/18 is considered to be very low (Oil and Gas Authority, 2016). There are no operational offshore wind farms (OWFs) in the vicinity of the FPSO. There are no other renewables developments, proposed or active, near the project area. The Innovation and Targeted Oil and Gas (INTOG) scheme identifies areas within which projects targeting oil and gas decarbonisation, or which will generate >100 MW of energy, will be considered for approval (Marine Scotland, 2021). The FPSO lies within the INTOG NE-c area. There are four active telecommunication cables within 40 km of the FPSO. The Havfrue/AEC-2 is located approximately 23 km south-southwest, the TAT 14 is located approximately 27 km south-southwest; the Tampnet 4 is located approximately 30 km north-northwest; and the Atlantic Crossing 1 is located approximately 33 km south-southwest (KIS-ORCA, 2019). Block 9/18 is not considered a block of concern to the Ministry of Defence (Oil and Gas Authority, 2019). There are four non-dangerous wrecks, as identified by Historic Environment Scotland (HES) in November 2018, located within 20 km of the Gryphon FPSO: an unknown wreck (7.3 km north-north-east; Rosemount (7.9 km west-south-west); Morning Dawn (9.6 km north-north-west) and Grampian Glen (13 km south-south-east) (NMPi, 2020). Oil and gas surface installations located within 40 km of the FPSO are presented in **Table 1-6**.
Atmosphere	Emissions to atmosphere will arise from activities associated with FPSO Decommissioning. An emission forecast of 26,371Te (CO2e) for this phase of the FPSO decommissioning project has been estimated for offshore activities that are directly associated with Scope 1 and 3 emissions, namely: post-CoP operations; power generation; flaring/venting; offshore transport (comprising logistics and vessels); and project vessel support.

4.2 Potential Environmental Impacts and their Management

4.2.1 Environmental Impact Assessment Summary

Table 4-2: Environmental Impact Management

Activity	Main Impacts	Management
FPSO Sail away	Fuel use / atmospheric emissions	• Minimal number of vessels deployed • Use of low sulphur diesel • TEPNSUK Vessel Assurance process / procedure • TEPNSUK-commissioned Energy and Emissions Assessment
	Hazard to navigation	• UKHO standard communication channels including Kingfisher, Notice to Mariners and radio navigation warnings • Use of Automatic Identification Systems (AIS) and other navigational controls • TEPNSUK Stakeholder Engagement Management Plan / Process
	Disturbance of nesting seabird habitat	• Adherence with "Undertaking of Seabird Survey Methods for Offshores Installations: Black-legged kittwakes", JNCC (2021) • No known history of nesting seabirds on the installation • Implementation of a Nesting Seabird Monitoring Plan in the lead up to execution phase • Non-lethal deterrent methods if required • Ornithologist support if required • Disturbance licence in consultation with OPRED if required
Disconnection, dropping, wet store and recovery of dynamic flexible risers and dynamic umbilicals	Fuel use / atmospheric emissions	• Minimal number of vessels deployed • Use of low sulphur diesel • TEPNSUK Vessel Assurance process / procedure • Vessel & equipment maintained according to manufacturer's recommendations • TEPNSUK-commissioned Energy and Emissions Assessment

	Hazard to Navigation	• Deployment of dedicated Guard Vessel, or alternative navigational aid option • Safety zones (when applicable and being mindful that arrangements will change upon FPSO sail away) • Appropriate level of stakeholder engagement • UKHO standard communication channels including Kingfisher, Notice to Mariners and radio navigation warnings • Use of Automatic Identification Systems (AIS) and other navigational controls • TEPNSUK Stakeholder Engagement Management Plan / Process
	Chemical / oil discharge to sea	• Appropriate Risk Assessment through the MATs / SATs (OCR / OPPC) system • Flushing and cleaning of dynamic flexible risers completed as part of the wider subsea system cleaning operations • Selection of flushing chemicals with lesser potential for environmental impact • Send flushing chemicals back to FPSO for processing and re-injection into PWRI wells.
	Seabed disturbance	• Appropriate Risk Assessment through the MATs / SATs (MCAA) system
	Onshore waste management	• Use of appropriately authorised waste management contractors and facilities • Compliance with Waste Hierarchy. • Detailed inventories (including IHM) • Active Waste Management Plan • Compliance with Gryphon Decommissioning Waste Management Plan • Project Waste Management Targets
Sinking, wet store and recovery of mid-water arches NOTE: Sinking of MWA is considered only as a contingency measure. Base	Fuel use / atmospheric emissions	• Minimal number of vessels deployed. • Use of low sulphur diesel • TEPNSUK Vessel Assurance process / procedure • Vessel & equipment maintained according to manufacturer's recommendations

case is full removal as planned without need for wet storage		• TEPNSUK-commissioned Energy and Emissions Assessment
	Hazard to Navigation	• Deployment of dedicated Guard Vessel, or alternative navigational aid option • Safety zones (when applicable and being mindful that arrangements will change upon FPSO sail away) • Appropriate level of stakeholder engagement • UKHO standard communication channels including Kingfisher, Notice to Mariners and radio navigation warnings • Use of Automatic Identification Systems (AIS) and other navigational controls • TEPNSUK Stakeholder Engagement Management Plan / Process
	Seabed disturbance	• Appropriate Risk Assessment through the MATs / SATs (MCAA) system
	Onshore waste management	• Use of appropriately authorised waste management contractors and facilities • Compliance with Waste Hierarchy. • Detailed inventories (including IHM) • Active Waste Management Plan • Compliance with Gryphon Decommissioning Waste Management Plan • Project Waste Management Targets
Laydown, wet store and recovery of lower mooring system chains	Fuel use / atmospheric emissions	• Minimal number of vessels deployed • Use of low sulphur diesel • TEPNSUK Vessel Assurance process / procedure • Vessel & equipment maintained according to manufacturer's recommendations • TEPNSUK-commissioned Energy and Emissions Assessment
	Hazard to Navigation	• Deployment of dedicated Guard Vessel, or alternative navigational aid option • Safety zones (when applicable and being mindful that arrangements will change upon FPSO sail away) • Appropriate level of stakeholder engagement

		• UKHO standard communication channels including Kingfisher, Notice to Mariners and radio navigation warnings • Use of Automatic Identification Systems (AIS) and other navigational controls • TEPNSUK Stakeholder Engagement Management Plan / Process
	Seabed disturbance	• Appropriate Risk Assessment through the MATs / SATs (MCAA) system • There is no drill cuttings impact from recovery of mooring lines/anchors
	Onshore waste management	• Use of appropriately authorised waste management contractors and facilities • Compliance with Waste Hierarchy. • Detailed inventories (including IHM) • Active Waste Management Plan • Compliance with Gryphon Decommissioning Waste Management Plan • Project Waste Management Targets
Vessels	Hazard to Navigation	• Safety zones (when applicable and being mindful that arrangements will change upon FPSO sail away) • UKHO standard communication channels including Kingfisher, Notice to Mariners and radio navigation warnings • Use of Automatic Identification Systems (AIS) and other navigational controls • TEPNSUK Stakeholder Engagement Management Plan / Process
	Discharges to sea	• Treatment and maceration to IMO standards • Bilge management procedures • Good operating practices • Vessel equipment maintained according to manufacturer's recommendations • TEPNSUK Vessel Assurance process / procedure
	Noise	• Vessel noise unlikely to be far above ambient noise levels. • No use of explosives
	Fuel use / atmospheric emissions	• Minimal number of vessels deployed

		• Use of low sulphur diesel • Vessel equipment maintained according to manufacturer's recommendations • TEPNSUK Vessel Assurance process / procedure • Third Party Contractor Assurance process / procedure • TEPNSUK-commissioned Energy and Emissions Assessment
Waste	Onshore Waste Management	• Use of appropriately authorised waste management contractors and facilities • Compliance with Waste Hierarchy. • Detailed inventories (including IHM) • Active Waste Management Plan • Compliance with Gryphon Decommissioning Waste Management Plan • Project Waste Management Targets • SCAP
	Use of landfill	
	Radioactive waste NORM	

5 INTERESTED PARTY CONSULTATIONS

5.1 Consultations Summary

Table 5-1: Summary of Stakeholder Comments		
Who	**Comment**	**Response**
Statutory Consultations		
National Federation of Fishermen's Organisations		
Scottish Fishermen's Federation		
Northern Ireland Fish Producers Organisation		
Global Marine Systems Limited		
North Sea Transition Authority		
Public Consultations		
Informal Stakeholder Consultations		

6 PROGRAMME MANAGEMENT

6.1 Project Management and Verification

A Project Management team has been appointed to manage suitable contractors for the decommissioning in these DPs. Standard procedures for operational control and hazard identification and management will be used. The Project Management team will monitor and track the process of consents and the consultations required as part of this process. Any changes in detail to the offshore decommissioning programme will be controlled by TEPNSUK Management of Change processes and discussed and agreed with OPRED.

6.2 Post-Decommissioning Debris Clearance and Verification

On completion of all works captured by these DPs an as-left survey of associated seabed and subsea infrastructure affected by these works will be carried out.

A full post decommissioning site survey will be carried out following completion of all decommissioning works captured under the separate further decommissioning programme(s) covering the P&A and subsea infrastructure phases. Any seabed debris related to offshore oil and gas activities will be recovered for onshore disposal or recycling in line with existing disposal methods. Upon verification of a clear seabed a statement of clearance to all relevant governmental departments and non-governmental organisations will be issued. It is proposed the verification work for the scope of these DPs be completed in conjunction with the subsea decommissioning programme(s).

Once the FPSO has been removed, the riser bases (previously falling under the protection of the FPSO 500m zone) and other pipelines related infrastructure (out with FPSO 500m zone) will require to be monitored to mitigate hazards for other users of the sea. TEPNSUK will provide a guard vessel or alternative navigational aid option.

6.3 Schedule

A proposed schedule for the decommissioning of Gryphon is provided in Figure 6-1. This schedule is based on a CoP of 31st December 2024.

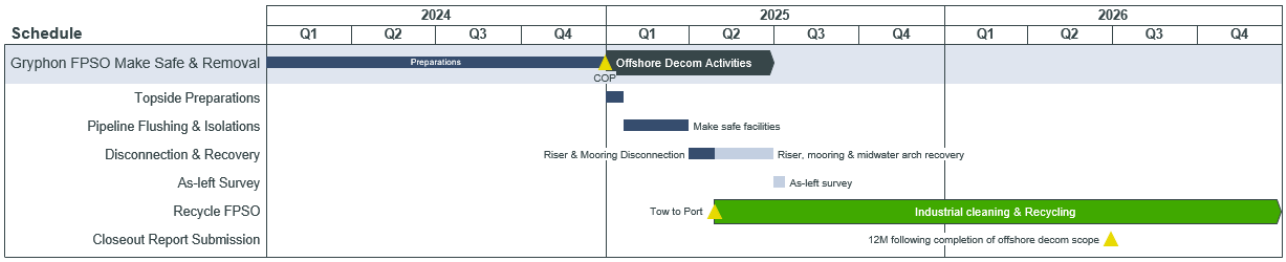

Figure 6-1: Gantt Chart of Project Plan

6.4 Costs

The decommissioning programme costs will be provided directly to OPRED.

6.5 Close Out

In accordance with OPRED guidelines, a close out report will be submitted to OPRED within 12 months of the completion of the offshore decommissioning scope covered by these programmes. The report will detail the scope performed and explain any variances from the programmes.

6.6 Post-Decommissioning Monitoring and Evaluation

On completion of all works captured by these DPs, only the FPSO, mooring lines, flexible risers and dynamic umbilicals and associated MWA buoyancy elements will be decommissioned. As such post decommissioning surveys will be limited to “as-left” surveys of associated seabed and subsea infrastructure affected by these works.

Following FPSO decommissioning a guard vessel, or alternative navigational aid option, will remain on site to monitor and mitigate hazards for other users of the sea.

Until all wells have been plugged and abandoned, an inspection routine will be implemented to monitor the wells status. The frequency of subsea inspections to monitor the wells status will be defined based on the outcome of general visual inspection planned for 2024 and 2025. Once this has been determined this will be discussed and agreed with OPRED.

Until all subsea infrastructure has been removed, an inspection routine will be implemented to monitor the subsea pipelines and infrastructure. The gas export pipeline will be inspected on no longer than a 3-yearly frequency for free spans and any snagging hazards. All other subsea infrastructure will be inspected on a no longer than 6-yearly frequency, recognising that decommissioning may take place within that period.

7 SECTION 29 NOTICE HOLDERS' LETTERS OF SUPPORT

To be included post consultation