TERN AREA
KESTREL AND FALCON
SUBSEA FACILITIES
DECOMMISSIONING PROGRAMMES

March 2025 – Consultation Draft

77IFS-188054-H99-0001-000

DOCUMENT CONTROL

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Revision Control

Revision No	Reference	Changes/Comments	Issue Date
1	First Draft		December 2022
2	Pre-Consultation Draft	OPRED comments incorporated	September 2023
3	Consultation Draft	OPRED comments incorporated	February 2025
4	Consultation Draft	Issued for Consultation	March 2025

Distribution List

Name	Company
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TABLE OF CONTENTS

FIGURES

TABLES

ABBREVIATIONS

Abbreviation	Explanation
AWMP	Active Waste Management Plan
CA	Comparative Assessment
CO_2	Carbon dioxide
CoP	Cessation of Production
EA	Environmental Appraisal
ESDV	Emergency Shutdown Valve
EUNIS	European Nature Information System
FPAL	First Point Assessment Limited
FPSO	Floating Production Storage and Offloading
GMS	Global Marine Systems Limited
HSE	Health and Safety Executive
ICES	International Council for the Exploration of the Sea
INTOG	Innovation and Targeted Oil and Gas
JNCC	Joint Nature Conservation Committee
LAT	Lowest Astronomical Tide
MDAC	Methane Derived Authigenic Carbonate
MEG	Mono Ethylene Glycol
MM	Million
MODU	Mobile Offshore Drilling Unit
NCMPA	Nature Conservation Marine Protected Area
NFFO	National Federation of Fishermen's Organisations
NIFPO	Northern Irish Fish Producers' Organisation
NNS	Northern North Sea
NORM	Naturally Occurring Radioactive Material
NSTA	North Sea Transition Authority
ODU	Offshore Decommissioning Unit
OEUK	Offshore Energies UK
OPEX	Operational Expenditure
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
P&A	Plug and Abandon
PL	Pipeline (as in pipeline number)
PLU	Umbilical (as in umbilical number)
PMF	Priority Marine Feature
SAC	Special Area of Conservation
SAM	Subsea Accumulator Module
SDU	Subsea Distribution Unit
SEPA	Scottish Environment Protection Authority
SFF	Scottish Fishermen's Federation
SPA	Special Protection Areas
SSIV	Subsea Isolation Valve
TAQA	TAQA Bratani Limited
Te	Tonnes
TUTU	Topside Umbilical Termination Units

Abbreviation	Explanation
UKCS	United Kingdom Continental Shelf
UMC	Universal Manifold Centre

1 Executive Summary

1.1 Combined Decommissioning Programmes

This document contains six Decommissioning Programmes for the Kestrel Field's subsea pipelines and installations and Falcon Field's subsea pipelines and installations.

There is a separate Decommissioning Programme for each set of associated notices served under Section 29 of the Petroleum Act 1998. The Decommissioning Programmes are for:

1. The Kestrel installations including two production and one water injection wells, a Subsea Isolation Valve (SSIV), Subsea Distribution Unit (SDU), two SkoFlo Injection skids, Subsea Accumulator Module (SAM) and nine sentry bollards each with an anchor pile;
2. The Falcon Field installations comprising a single production well with over-trawlable Xmas tree;
3. The Kestrel Field pipelines and umbilicals PL1851, PL1852, PLU1854, PLU1854(J)P1 and PLU1854(J)P2;
4. The Kestrel Field umbilicals PLU2976, PLU2977JP1, PLU2977JP2, PLU2978JW1, PLU2979 and PLU6295;
5. The Kestrel water injection jumper PL1317JKEU-W1; and
6. The Falcon Field pipelines and umbilical PL2765, PL2766 and PLU2767.

1.2 Requirement for Decommissioning Programmes

1.2.1 Installations:

In accordance with the Petroleum Act 1998, as amended, TAQA Bratani Limited (TAQA), as operator of the Kestrel and Falcon subsea fields, and on behalf of the Section 29 Notice Holders (see Table and Table 1-3), is applying to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) to obtain approval for decommissioning the Kestrel and Falcon subsea installations as detailed in Section 2.1 of this document. (See also Section 8 – Section 29 Holders' Letters of Support).

1.2.2 Pipelines:

In accordance with the Petroleum Act 1998, as amended, TAQA, as operator of the Kestrel and Falcon subsea pipelines, and on behalf of the Section 29 Notice Holders (see Table 1-5 and Table 1-6), is applying to OPRED to obtain approval for decommissioning the Kestrel and Falcon pipelines as detailed in Section 2.2 of this document. (See also Section 8 – Section 29 Holders' Letters of Support).

In conjunction with public, stakeholder and regulatory consultation the Decommissioning Programmes are submitted in compliance with national and international regulations, and OPRED guidance [1].

The estimated schedule outlined for the Kestrel decommissioning project spans a ten-year period, commencing in 2024.

The estimated schedule outlined for the Falcon decommissioning project spans an eleven-year period, commencing in 2024.

1.3 Introduction

The Kestrel Field is located in UK Block 211/21a3, in a water depth of approximately 164 m, 111.2 km to the north-east of the Shetland Islands. The field was produced via the Tern platform, which is located in UK Block 210/25a approximately 7.6 km to the southwest of the Kestrel Field. Hydrocarbons were exported from Tern platform via the North Cormorant platform to the south and onwards through the Brent Pipeline System to the Sullom Voe Terminal in the Shetlands.

The Falcon Field is located in UK Continental Shelf (UKCS) Blocks 210/25a, 210/20f, 211/16c and 211/21a3, in a water depth of approximately 160 m, 110.5 km to the north-east of the Shetland Islands. The field is produced via the Kestrel P2 flow base, which is located in UK Block 211/21a3 approximately 3.6 km to the southeast of the Falcon Field.

The Kestrel facilities comprise:

- two production and one water injection wells and the associated Xmas trees, wellheads and flowbases;
- An SSIV, an SDU, two SkoFlo Injection skids, a SAM and nine sentry bollards each with an anchor pile; and
- three pipelines and nine umbilicals.

The Falcon facilities comprise:

- a production well with an over-trawlable Xmas tree and wellhead; and
- two pipelines and an umbilical.

The Kestrel and Falcon Fields were discovered in 1997 and 2000 respectively and first production was achieved in November 2001 and July 2011. Falcon production was routed to Kestrel and the combined production was then routed to the Tern platform. The Kestrel and Falcon production was combined with production from other subsea assets and platform production before export to Sullom Voe via the Brent pipeline system. The Kestrel and Falcon Fields have come to the end of their productive lives, and TAQA will therefore decommission these facilities.

The Kestrel and Falcon Fields cannot produce after Tern Cessation of Production (CoP), as the assets depended on Tern as their control point and export route. The North Sea Transition Authority (NSTA) accepted a proposed CoP date for Tern of no earlier than Q4 2023, and the same CoP date for Kestrel and Falcon. The Tern platform and the associated subsea installations, including Kestrel and Falcon, ceased production in Q1 2024.

The decommissioning programmes contained in this document cover the Kestrel and Falcon subsea facilities, from the Kestrel P1, P2 AND W1 well locations, Falcon P1 well location to Kestrel and Falcon pipelines and umbilical risers at the Tern platform. At Tern, if derogation to leave the platform footings in place is granted, the Kestrel and Falcon pipelines and umbilicals will be removed to a point in close proximity to (within approximately 75 m of) the base of the Tern jacket/sub-structure. This approach represents a reasonable balance between the level of risk associated with removing the facilities, the degree of disturbance of the seabed, the use of resources during decommissioning, and, following decommissioning, the loss of amenity for other sea users. If derogation to leave Tern platform footings in place is not granted, the surface laid portions and concrete mattresses of the pipelines at Tern will be removed, unless they are rock covered or buried. Notwithstanding, final decommissioning solutions for the Kestrel pipelines and umbilicals at Tern will be discussed and agreed with OPRED to align with

decommissioning arrangements for the platform and associated infrastructure. The precise limit of "close proximity" will be agreed with OPRED on a case by case basis for each pipeline and umbilical.

Kestrel and Falcon decommissioning activities may be integrated with the overall Tern Area and wider NNS scope of multiple decommissioning projects to maximise synergies, optimise the use of resources, and minimise disturbance of the environment.

Following public, stakeholder and regulatory consultation, the Decommissioning Programmes are submitted without derogation and in full compliance with OPRED [1] and Offshore Energies UK (OEUK) [2] guidelines. The Decommissioning Programmes explain the principles of the decommissioning activities and are supported by a Comparative Assessment (CA) [3] of decommissioning options and an Environmental Appraisal (EA) [4].

1.4 Overview of Facilities Being Decommissioned

1.4.1 Installations

Table 1-1: Installations Being Decommissioned

Field(s)	Kestrel and Falcon	**Production Type**	Oil
Water Depth	Kestrel: 164 m Falcon: 160 m	**UKCS Block**	Kestrel:211/21a3, and 210/25a, Falcon: 210/25a, 211/21a3, 210/20f and 211/16c
Distance to Median	Kestrel: 40 km Falcon: 41.8 km	**Distance to UK Coastline**	Kestrel: 111.2 km Falcon: 110.5 km

Subsea Installations

Number	Type	Total Weight (Te)
1	Kestrel SSIV	20
1	Kestrel SDU	1
2	Kestrel SkoFlo Skids	0.8
9	Kestrel Sentry Bollards with Piles	527.6
3	Kestrel Xmas Trees / Flowbases / Wellheads	185.2
1	Falcon Xmas Tree / Wellhead	59.1

Subsea Wells

Number	Type
2	Kestrel Oil Production
1	Kestrel Water injection
1	Falcon Oil Production

Table 1-2: Kestrel Installations Section 29 Notice Holders		
Company	**Registration Number**	**Equity Interest (%)**
TAQA Bratani Limited	05975475	100
Shell U.K. Limited	00140141	0
Esso Exploration and Production UK Limited	00207426	0

Table 1-3: Falcon Installations Section 29 Notice Holders		
Company	**Registration Number**	**Equity Interest (%)**
TAQA Bratani Limited	05975475	100
TAQA International B.V.	NL342609370000	0

1.4.2 Pipelines

Table 1-4: Pipelines Being Decommissioned	
Number of pipelines and umbilicals. (Details given in Tables 2-3 and 2-4)	15

Table 1-5: Kestrel Pipelines Section 29 Notice Holders		
Company	**Registration Number**	**Equity Interest (%)**
PL1851, PL1852, PLU1854, PLU1854(J)P1 and PLU1854(J)P2		
TAQA Bratani Limited	05975475	100
Shell U.K. Limited	00140141	0
Esso Exploration and Production UK Limited	00207426	0
PLU2976, PLU2977JP1, PLU2977JP2, PLU2978JW1, PLU2979 and PLU6295		
TAQA Bratani Limited	05975475	100
PL1317JKEU-W1		
TAQA Bratani Limited	05975475	100
Shell U.K. Limited	00140141	0
Esso Exploration and Production UK Limited	00207426	0

Table 1-6: Falcon Pipelines Section 29 Notice Holders		
Company	**Registration Number**	**Equity Interest (%)**
PL2765, PL2766, PLU2767		
TAQA Bratani Limited	05975475	100
TAQA International B.V.	NL342609370000	0

1.5 Summary of Proposed Decommissioning Programmes

The proposed decommissioning options for the Kestrel and Falcon infrastructure are shown in Table 1-7.

Table 1-7: Summary of Decommissioning Programme

Proposed Decommissioning Solution	Reason for Selection
Subsea Installations	
Full Removal: All materials, structures and equipment will be removed at end of field life. All recovered materials will be transported to shore for re-use, recycling, or disposal.	To leave a safe, clear seabed and in compliance with regulatory requirements.
Pipelines, Flowlines and Umbilicals	
All pipelines and umbilicals will be flushed to an appropriate standard. TAQA has assessed the likelihood of wax being present in the Kestrel and Falcon production pipelines. The presence of wax is considered unlikely taking into account the fluid composition, operational history, process conditions and pipeline design. Environmental assessment considering the chemical composition and properties of the wax concluded that there is no significant risk to the marine environment in the unlikely event that wax is present. Further information on this assessment can be found in section 3.2.3 of the Tern Area Environmental Appraisal [4].	
Flexible Flowlines and Umbilicals Surface Laid. Surface laid portions of pipelines and umbilicals and associated protection materials that are not in close proximity[1] to the Tern platform jacket footings will be removed together with protection features. The recovered items will be transported to shore for re-use, recycling, or disposal. Limited sections of surface laid pipelines and umbilicals in close proximity[1] to the Tern platform jacket footings may be left in place, subject to derogation to leave the footings in place, and agreement with OPRED.	This is the lowest risk, least seabed disturbance option. If derogation to leave the jacket / sub-structure footings in place is not granted, all surface laid pipelines and umbilicals will be recovered and taken to shore for appropriate re-use, recycling, or disposal.

[1] "Close proximity" is considered within approximately 75 m of the platform footings. Logical break points between portions left *in situ* and portions removed will be selected, e.g., pipeline crossings, etc. This option represents a reasonable balance between the level of risk associated with removing the facilities, the degree of disturbance of the seabed, the use of resources during decommissioning, and, following decommissioning, the loss of amenity for other sea users. If derogation to leave the jacket/sub-structure footings in place is not granted, the surface laid portions of the pipelines and umbilicals will be recovered and taken to shore for appropriate re-use, recycling, or disposal unless they are rock covered or buried. The precise limit of "close proximity will be agreed with OPRED on a case by case basis for each pipeline and umbilical.

Table 1-7: Summary of Decommissioning Programme	
Proposed Decommissioning Solution	**Reason for Selection**
Flexible Flowlines and Umbilicals Trenched and Buried. *Leave in situ (minimal intervention):* Remove line ends and remediate snag risk. Depth of burial can be found in Appendix A of the Tern Area EA. Rock placement to remediate snag risk from cut ends. Recovered ends return to shore for reuse, recycling or appropriate treatment and disposal.	The flowlines and umbilicals are considered to be sufficiently trenched and buried with no areas of spans, exposure, or shallow burial, posing no risk to marine users. If following pre-decommissioning surveys, exposures of less than 20 m long are identified, the full length of the exposure would be covered with rock, otherwise it would be removed. Minimal seabed disturbance, lower energy use, reduced risk to personnel engaged in the activity.
Flexible Pipelines and Umbilicals Trenched and Rock Covered. *Leave in situ (minimal intervention):* Remove line ends and remediate snag risk. Depth of burial can be found in Appendix A of the Tern Area EA. Rock placement to remediate snag risk from cut ends. Recovered ends return to shore for reuse, recycling or appropriate treatment and disposal.	The flowlines and umbilicals are considered to be sufficiently trenched and buried with no areas of spans, exposure, or shallow burial, posing no risk to marine users. If following pre-decommissioning surveys, exposures of less than 20 m long are identified, the full length of the exposure would be covered with rock, otherwise it would be removed. Minimal seabed disturbance, lower energy use, reduced risk to personnel engaged in the activity.
Flexible Risers and Umbilical Risers, Rigid Risers, Spools and Jumpers, Protection and Stabilisation. *Full Removal:* Risers will be dealt with in the Tern Platform Upper Jacket and Footings DPs. Lower portion of risers will be decommissioned *in situ* if derogation is granted to leave the Tern footings in place. If derogation is not granted for the footings, then these risers' portions will be removed. Spools and jumpers and the associated stabilisation and protection features will be returned to shore for reuse, recycling or appropriate treatment and disposal.	To leave a safe, clear seabed and in compliance with regulatory requirements.

Table 1-7: Summary of Decommissioning Programme	
Proposed Decommissioning Solution	**Reason for Selection**
Wells	
Kestrel and Falcon wells will be Plugged and Abandoned (P&A'd) using a Mobile Offshore Drilling Unit (MODU) or well servicing vessel in alignment with the TAQA 'Well Barrier Standard TUK-11-B-009', and with reference to OEUK Guidelines for Well Decommissioning [2] and other governing standards at the time of abandonment. If compliance with standards cannot be achieved, TAQA will adopt a risk-based approach in consultation with the relevant authorities. Xmas trees, flowbases, wellheads and the top section of the well conductors to a depth of at least 3 m will be removed to shore for appropriate reuse, recycling, or disposal. Following removal of the wells, the seabed will be surveyed for debris and depressions, etc., and any necessary remediation will be performed.	Meets TAQA standards and NSTA and Health and Safety Executive (HSE) regulatory requirements.
Drill Cuttings	
There are no drill cuttings in the scope of this decommissioning programme.	
Interdependencies	
Two Kestrel pipelines (PL1851 and PL852) and one umbilical (PLU1854) terminate on the Tern platform. Decommissioning of the Kestrel risers and the portions of the umbilical attached to the Tern jacket, and the pipelines and umbilicals on the seabed in proximity to the Tern platform will be managed in conjunction with Tern Area decommissioning. This will minimise risk, impacts on the environment and use of resources. The upper sections of the rigid risers and J tubes will be cut at 132 m below LAT and will be removed with the Tern upper jacket as described in the Tern Upper Jacket Decommissioning Programme [5]. Please refer to Section 2.2.1 for more details.	

1.6 Field Locations Including Field Layouts and Adjacent Facilities

The location of the Kestrel and Falcon Fields within the UKCS and the adjacent facilities are shown in Figure 1-1and Figure 1-2. Figure 1-3 shows the Kestrel and Falcon facilities layout in more detail.

The Kestrel Field is located in Block 211/21a3 in 164 m of water, approximately 112 km northeast of the Shetland Islands. There are 3 wells at Kestrel.

The Falcon Field is located in Blocks 210/25a, 210/20f, 211/16c and 211/21a3, in a water depth of approximately 160 m, 110.5 km to the north-east of the Shetland Islands. There is a single well at Falcon. Kestrel and Falcon production was exported to the Tern platform, in Block 210/25 which stands in 167 m of water approximately 104 km northeast of the Shetland Islands.

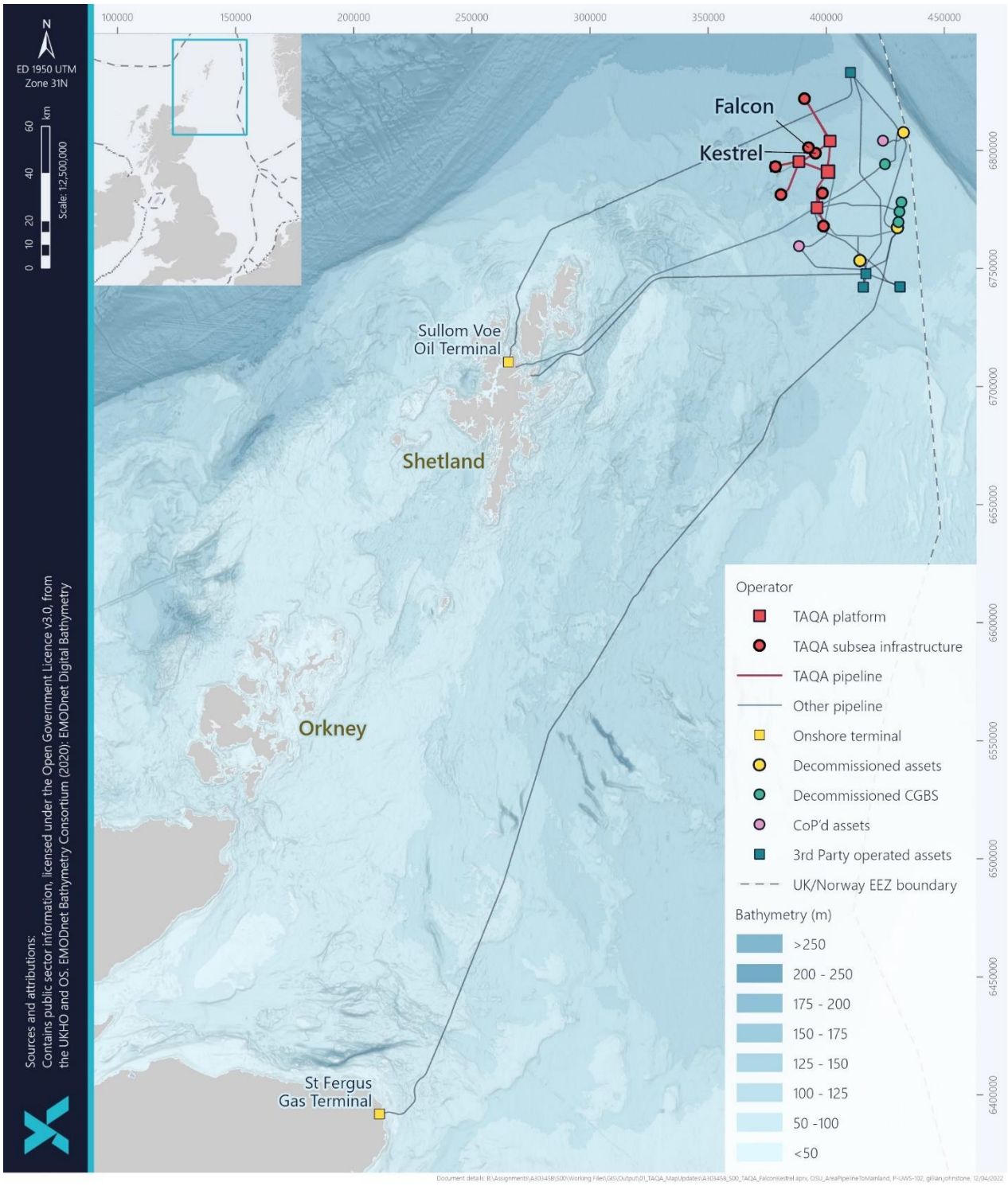

Figure 1-1: Kestrel and Falcon Field Location

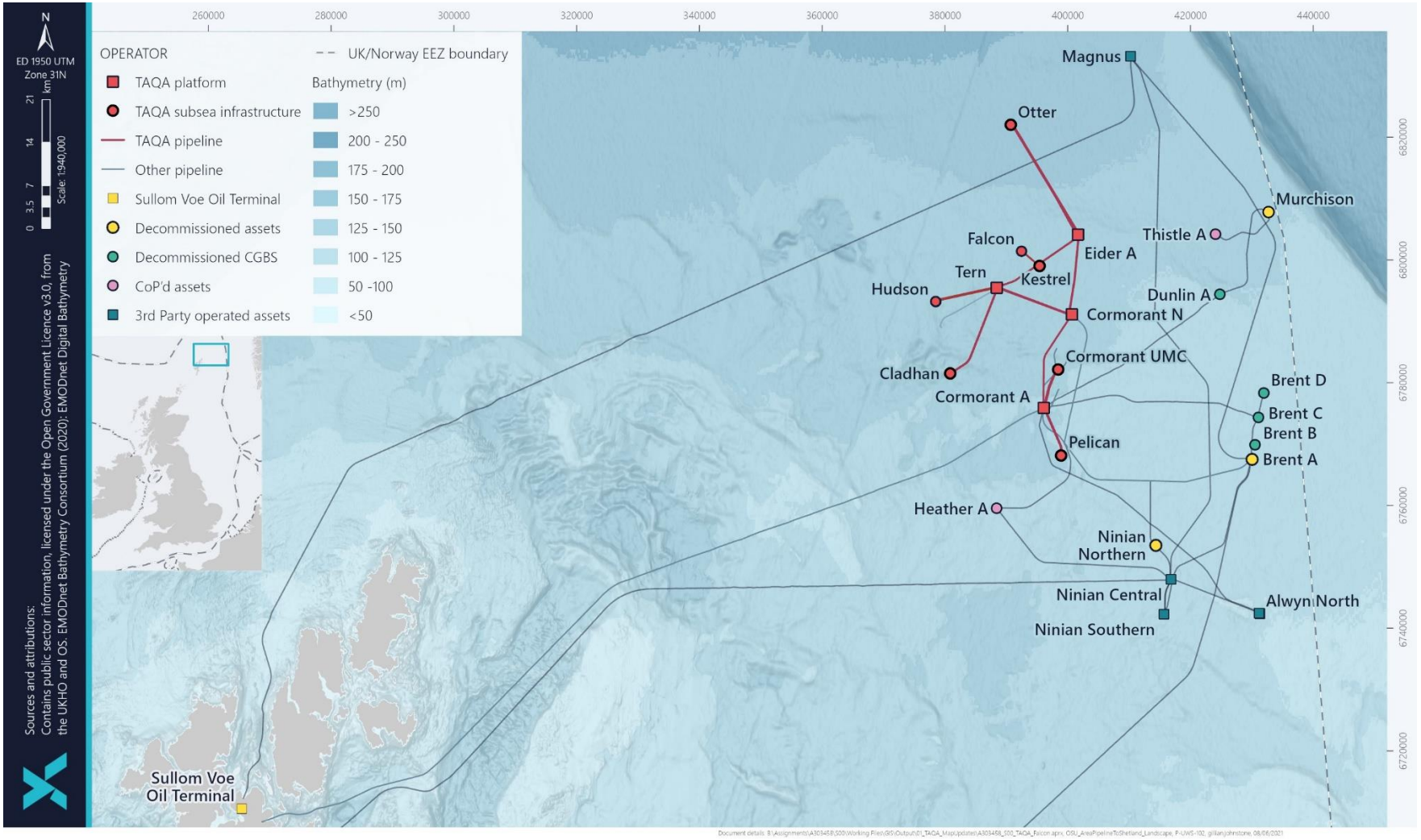

Figure 1-2: Kestrel and Falcon Adjacent Facilities

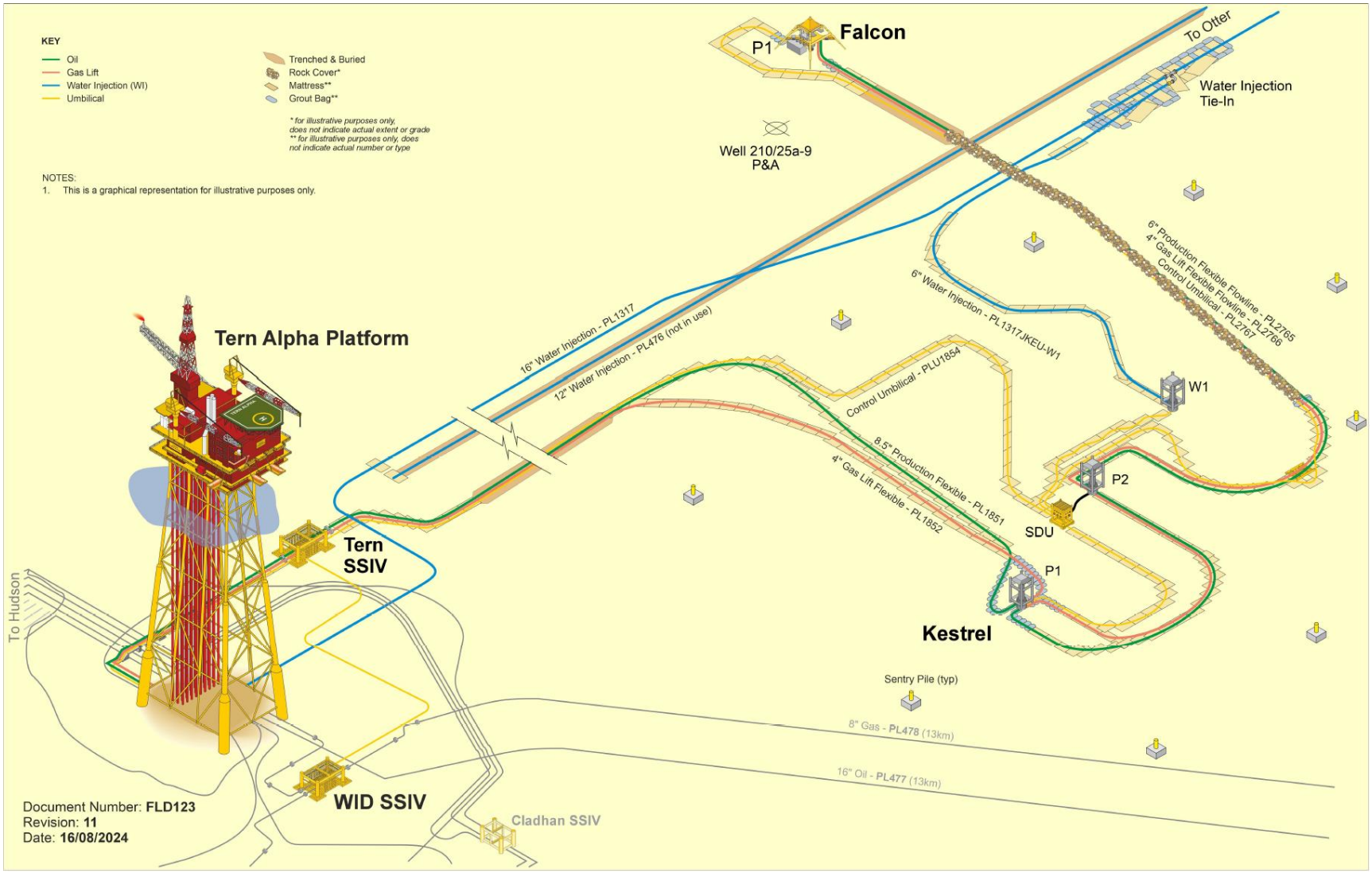

Figure 1-3: Kestrel and Falcon Facilities Layout

Table 1-8: Adjacent Facilities

Operator	Name	Type	Distance/ Direction from Kestrel	Distance/ Direction from Falcon	Information	Status
TAQA	Tern	Platform	7.6 km Southeast	7.2 km Southeast	Oil and Gas Development	Non-Operational
TAQA	Cladhan	Field	22.5 km Southwest	23km South Southeast	Oil and Gas Development	Non-Operational
TAQA	Hudson	Field	17.6 km Southwest	16.2 km South Southwest	Oil and Gas Development	Non-Operational
TAQA	Cormorant Alpha	Platform	23.4 km South	25.8 km South	Oil and Gas Development	Non-Operational
TAQA	North Cormorant	Platform	9.7 km Southeast	13 km Southeast	Oil and Gas Development	Non-Operational
TAQA	Eider	Platform	8.3 km Northeast	9.6 km East Northeast	Oil and Gas Development	Non-Operational
TAQA	Otter	Field	23.3 km North Northwest	20.9 km North	Oil and Gas Development	Non-Operational
TAQA	Pelican	Field	31.2 km South	34.1 km South Southeast	Oil and Gas Development	Non-Operational
TAQA	PL4	Pipeline	23.4 km South	25.8 km South	Oil Pipeline	Non-Operational
TAQA	UMC	Field	16.9 km South	19.9 km South Southeast	Oil and Gas Development	Non-Operational
TAQA	PL1317	Pipeline	N/A	3.4 km Southeast	Water Injection pipeline	Non-Operational
TAQA	PL476	Pipeline	0.2 km northwest	3.4 km Southeast	Water injection pipeline	Disused

Impacts of Decommissioning Proposals

TAQA has been, and will continue to be, in contact with operators and owners of adjacent facilities. There are no known interactions between the adjacent facilities and the proposed Kestrel and Falcon Decommissioning Programmes, other than the Tern platform and other subsea fields associated with Tern Area: Cladhan and Hudson. Decommissioning of Kestrel, Falcon and Tern are inextricably linked as Tern provided the only export route for Kestrel and Falcon production via Cormorant North and Cormorant Alpha to the Sullom Voe Terminal.

Several of the Kestrel pipelines cross Hudson pipelines connecting the Hudson Field to Tern. The removal of these crossings will be managed as part of the execution of Tern Area decommissioning. The Falcon and Kestrel pipelines also cross over PL1317, the Tern to Otter water injection line and PL476, the redundant Tern to Eider water injection line. Any associated stabilisation features will be removed along with the Falcon and Kestrel lines.

1.7 Industrial Implications

TAQA is developing the decommissioning contract and procurement strategy for these works, on behalf of the Section 29 Notice Holders. TAQA envisages that this strategy may include using incumbent contractors for recurring items / services covered by Master Services Agreements held by TAQA.

Notwithstanding, TAQA has, and will continue to:

- Publish Kestrel and Falcon decommissioning project information, including the project schedule, on the TAQA decommissioning website;
- Publish project information and contact details on the NSTA Pathfinder website;
- Engage with the NSTA and the decommissioning supply chain on any relevant issues relating to the Kestrel and Falcon decommissioning programme and schedule; and
- Where appropriate use the FPAL / SEQual database as the sources for establishing tender lists for supply chain items.

2 Description of Items to be Decommissioned

2.1 Subsea Installations

Key information regarding the Kestrel and Falcon subsea facilities is presented in Table 2-1 and Table 2-2.

Table 2-1: Kestrel Subsea Installations

Item	Number	Size (m) [LxWxH]	Weight (Te)	Location		Comments / Status
SSIV	1	8x4x3	20	WGS84 Decimal	61.3096° N 00.9175° E	Gravity based
				WGS84 Decimal Minute	61° 16’ 34.52 “ N 00° 55’ 03.13 “ E	
SDU	1	2.52x2.02x 2.2	1	WGS84 Decimal	61.3093° N 01.0401°E	Gravity based
				WGS84 Decimal Minute	61° 18’ 33.43 “ N 01° 02’ 25.91 “ E	
SkoFlo Skid (Well P1)	1	1.4x0.6x0.7	0.4	WGS84 Decimal	61.3093° N 01.0403°E	Gravity based
				WGS84 Decimal Minute	61° 18’ 33.33 “ N 01° 02’ 25.39 “ E	
SkoFlo Skid (Well P2)	1	1.4x0.6x0.7	0.4	WGS84 Decimal	61.3093° N 01.0404°E	Gravity based
				WGS84 Decimal Minute	61° 18’ 33.50 “ N 01° 02’ 25.33 “ E	
P1 Well Xmas Tree	1	4.24 x 3.86 x 3.35	61.24	WGS84 Decimal	61.3091° N 01.0400°E	P1 Weight includes Xmas Tree, flowbase and wellhead.
				WGS84 Decimal Minute	61° 18’ 32.62 “ N 01° 02’ 24.17 “ E	
P2 Well Xmas Tree	1	3.91 x 3.66 x 3.6	59.56	WGS84 Decimal	61.3093° N 01.0404°E	P2 Weight includes Xmas Tree, flowbase and wellhead.
				WGS84 Decimal Minute	61° 18’ 33.46 “ N 01° 02’ 25.37 “ E	

Table 2-1: Kestrel Subsea Installations

Item	Number	Size (m) [LxWxH]	Weight (Te)	Location		Comments / Status
W1 Well Xmas Tree	1	3.91 x 3.66 x 3.6	64.44	WGS84 Decimal	61.3094° N 01.0412°E	W1 Weight includes Xmas Tree, flowbase and wellhead.
				WGS84 Decimal Minute	61° 18’ 33.85 “ N 01° 02’ 28.35 “ E	
Sentry Bollards with Piles	9	4 x 2 x 1.5 18 x 0.76 Ø	527.6 (total)	WGS84 Decimal	61.3092° N 01.0402°E	The bollards and piles are located on a 90 m radius centred at the given location. (The piles will be cut at -3 m and removed with the bollards)
				WGS84 Decimal Minute	61° 18’ 33.05 “ N 01° 02’ 24.89 “ E	

Table 2-2: Falcon Subsea Installations

Item	Number	Size (m) [LxWxH]	Weight (Te)	Location		Comments / Status
Xmas Tree and wellhead	1	5.1 x 5.1 x 4.4	59.05	WGS84 Decimal	61.3301° N 00.9894° E	Weight includes over-trawlable Xmas Tree, wellhead, and SAM.
				WGS84 Decimal Minute	61° 19’ 48.18 “ N 00° 59’ 21.70 “ E	

2.2 Pipelines including Stabilisation Features

Table 2-3: Kestrel Pipeline / Flowline / Umbilical Information

Description	Pipeline Number	Diameter	Length (km)	Description of Component Parts	Product Conveyed	From – To	Burial Status	Pipeline Status	Current Contents
Water Injection Jumper	PL1317JKEU-W1	9.473”	0.495	Flexible	Water	Tern to Eider reducing Cross – Kestrel Well -W1	Surface Laid	Out of Use	Seawater
Production Flowline	PL1851	12.66”	8.04	Flexible	Hydrocarbons	Kestrel Well P2 – Tern Kestrel ESDV	Trenched and Buried	Out of Use	Seawater
Gas Lift Pipeline	PL1852	5.5”	8.04	Flexible	Hydrocarbons	Tern platform ESDV – Kestrel Well P2	Trenched and Buried	Out of Use	Seawater
Umbilical	PLU1854	14.74”	7.99	Umbilical	Chemicals	Tern TUTU – SUT	Trenched and Buried	Out of Use	Chemicals
Chemical Jumper	PLU1854JP1	5.15”	0.05	Umbilical	Chemicals	SUT – Tree P1	Surface Laid	Out of Use	Chemicals
Chemical Jumper	PLU1854JP2	5.15”	0.05	Umbilical	Chemicals	SUT – Tree P2	Surface Laid	Out of Use	Chemicals
Control / Chemical Umbilical	PLU2976	2.913”	0.01	Umbilical	Chemicals / Hydraulic Fluid	Kestrel BUTA3 – Kestrel SDU	Surface Laid	Out of Use	Chemicals / Hydraulic Fluid
Control / Chemical Umbilical	PLU2977JP1	2.913”	0.08	Umbilical	Chemicals / Hydraulic Fluid	Kestrel SDU – Kestrel Well P1	Surface Laid	Out of Use	Chemicals / Hydraulic Fluid

Table 2-3: Kestrel Pipeline / Flowline / Umbilical Information

Description	Pipeline Number	Diameter	Length (km)	Description of Component Parts	Product Conveyed	From – To	Burial Status	Pipeline Status	Current Contents
Control / Chemical Umbilical	PLU2977JP2	2.913”	0.01	Umbilical	Chemicals / Hydraulic Fluid	Kestrel SDU – Kestrel Well P2	Surface Laid	Out of Use	Chemicals / Hydraulic Fluid
Control / Chemical Umbilical	PLU2978JW1	2.913”	0.06	Umbilical	Chemicals / Hydraulic Fluid	Kestrel SDU – Kestrel Well W1	Surface Laid	Out of Use	Chemicals / Hydraulic Fluid
Control / Chemical Umbilical	PLU2979	2.913”	0.01	Umbilical	Chemicals / Hydraulic Fluid	Kestrel SDU – Kestrel BUTA5	Surface Laid	Out of Use	Chemicals / Hydraulic Fluid
Control Umbilical	PLU6295	2.913	0.052	Umbilical	Chemicals	Adjacent to Well P2 - Adjacent to Well W1	Surface Laid	Out of Use	MEG/Water

Table 2-4: Falcon Pipeline / Flowline / Umbilical Information

Description	Pipeline Number	Diameter	Length (km)	Description of Component Parts	Product Conveyed	From – To	Burial Status	Pipeline Status	Current Contents
Production Pipeline	PL2765	6”	3.801	Flexible	Hydrocarbons	Falcon Well – Kestrel P2 Well	Trenched and Rock Covered	Out of Use	Seawater
Gas Lift Pipeline	PL2766	4”	3.812	Flexible	Hydrocarbons	Kestrel P2 Well – Falcon Well	Trenched and Rock Covered	Out of Use	Seawater
EHC Umbilical	PLU2767	3.641”	3.851	Umbilical	Chemicals / Hydraulic Fluid	Kestrel P2 Well – Falcon Well	Trenched and Rock Covered	Out of Use	Chemicals / Hydraulic Fluid

Table 2-5: Kestrel Subsea Pipeline / Flowline / Umbilical Stabilisation Features				
Stabilisation Feature	**Total Number**	**Weight (Te)**	**Locations**	**Exposed/Buried/Condition**
Concrete Mattresses (6 x 3 x 0.3 m)	1	8.3	At Tern platform	Partially buried in sediment
Concrete Mattresses (6 x 3 x 0.3 m)	3	25	PL1851, trench transition at Kestrel drill centre	Partially buried in sediment
Concrete Mattresses (6 x 3 x 0.15 m)	27	127.3	At Tern platform	Partially buried in sediment
Concrete Mattresses (6 x 3 x 0.15 m)	128	603.7	Kestrel drill centre and water injection jumper	Partially buried in sediment
Grout Bags	330	8.3	Kestrel drill centre	Partially buried in sediment
The total quantities of pipeline stabilisation features are: Mattresses: Total number = 159. Total weight = 764.3 Te Grout Bags: Total number = 330. Total weight = 8.25 Te				

Table 2-6: Falcon Subsea Pipeline / Flowline / Umbilical Stabilisation Features				
Stabilisation Feature	**Total Number**	**Weight (Te)**	**Locations**	**Exposed/Buried/Condition**
Concrete Mattresses (6 x 3 x 0.3 m)	16	132.8	PL2765, PL2766, PLU2767 tie-in and crossing locations	Partially covered in sediment
Concrete Mattresses (6 x 3 x 0.15)	322	1518.23	PL2765, PL2766, PLU2767	Partially covered in sediment
Concrete Mattresses (5 x 1.5 x 0.15)	2	3.93	PL2765, PL2766 at Falcon Well	Partially covered in sediment
Grout Bags	5,540	138.5	PL2765, PL2766, PLU2767 Various locations Note 1	Partially covered in sediment
Rock	N/A	51,388	PL2765 Various locations Note 1	Partially buried within trench
The total quantities of pipeline stabilisation features are: Mattresses: Total number = 340. Total weight = 1,65 Te Grout Bags: Total number = 5,540. Total weight = 138.5 Te Rock cover: Total weight = 51,388 Te				

Notes:

1. Pre-decommissioning survey shall be carried out to validate the quantity of rocks, grout bags and mattresses prior to execution of decommissioning activities.

2.2.1 Pipeline and Umbilical Risers

There are three Kestrel lines that terminate at the Tern platform:

- PL1851 Production Flowline
- PL1852 Gas Lift Flowline
- PLU1854 Umbilical

The pipelines run up the side of the Tern jacket as “risers” in J-tubes and terminate on the platform topsides. Similarly, the Kestrel umbilical runs up the jacket in a caisson and terminates on the platform topsides.

The Kestrel pipeline and umbilical risers will be cut at the proposed Upper Jacket cut depth at -132 m LAT. The riser sections between the Tern Topsides and the cut depth at -132 m LAT will be removed with the Tern Upper Jacket. The remaining sections of the Kestrel risers attached to the Tern footings will be decommissioned as part of the Tern Footings Decommissioning Programme.

2.3 Wells

Table 2-7 lists the well information pertinent to the four wells covered by this decommissioning programme. The wells will be plugged and abandoned to Phase 3 with reference to OEUK Well Decommissioning Guidelines [2]. Operations will be supported by appropriate regulatory applications and submissions.

Table 2-7: Well Information

Kestrel Subsea Wells	Designation	Status	Category of Well
211/21a-17z	Oil Producer	Shut-In	SS 3-3-3
211/21a-19	Oil Producer	Suspended	SS 3-3-3
211/21a-20	Water Injector	Suspended	SS 3-3-3
Falcon Subsea Wells	**Designation**	**Status**	**Category of Well**
210/25a-10z	Oil Producer	Suspended	SS 3-3-3

2.4 Drill Cuttings Piles

There are no drill cuttings piles associated with the Kestrel and Falcon Fields.

2.5 Inventory Estimates

An estimate of the Kestrel material inventories is presented in Table 2-8 and Table 2-9 and in Figure 2-1 and Figure 2-2. An estimate of the Falcon material inventories is presented in Table 2-10 and Table 2-11 and in Figure 2-3.

The inventories are described in Section 2.5 of the Tern Area EA [4].

Table 2-8 Kestrel Subsea Installations and Stabilisation Materials Inventory

Material	Weight (Te)	% of Total
Ferrous metals (all grades)	545.5	74.3
Non-ferrous metals (aluminium alloys)	0.1	<0.1
Concrete	189.0	25.7
Total	**734.6**	**100.0**

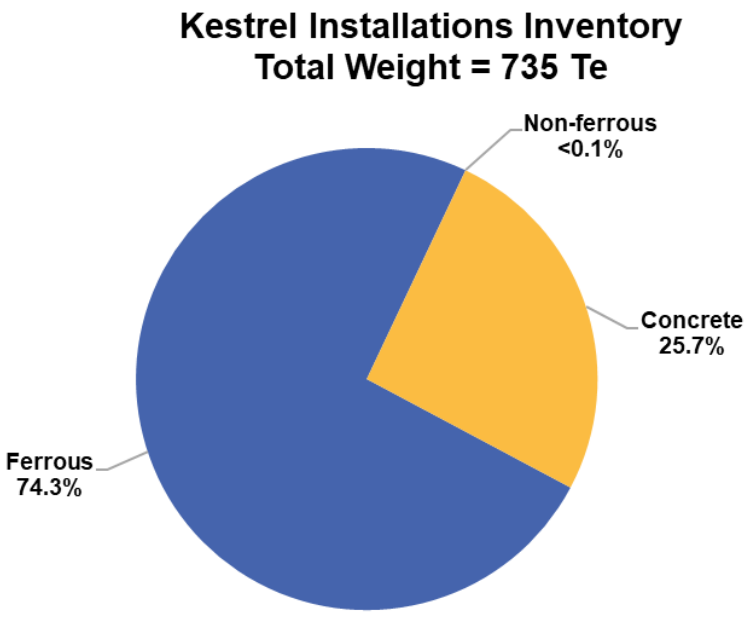

Figure 2-1: Kestrel Subsea Installations Inventory

Table 2-9: Kestrel Pipelines and Stabilisation Materials Inventory		
Material	**Weight (Te)**	**% of Total**
Ferrous metals (all grades)	1,448.7	55.1
Non-ferrous metals (copper, aluminium alloys)	10.0	0.4
Plastics	384.4	14.6
Concrete	764.3	29.1
Grout	8.3	0.3
Hazardous – NORM	2.8	0.1
Hazardous – Residual fluids	8.3	0.3
Total	**2,626.8**	**100.0**

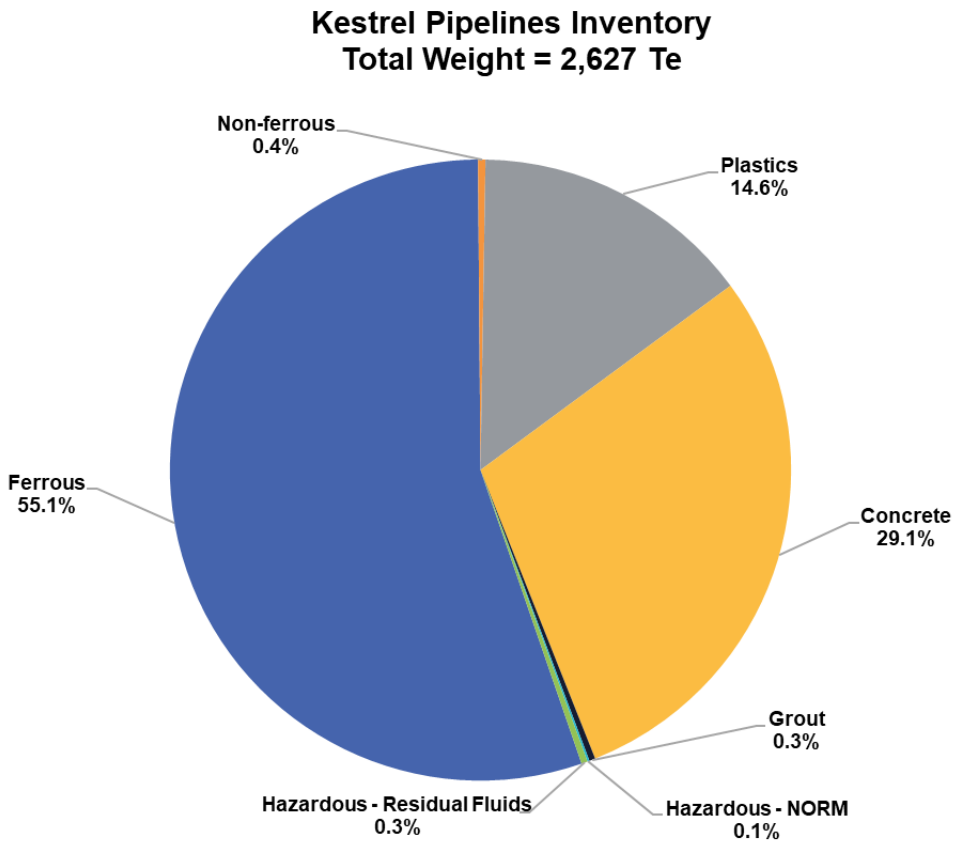

Figure 2-2: Kestrel Pipelines and Stabilisation Materials Inventory

Table 2-10: Falcon Subsea Installations Inventory		
Material	**Weight (Te)**	**% of Total**
Ferrous metals (all grades)	59.1	100.00
Total	59.1	100.00

Table 2-11: Falcon Pipelines and Stabilisation Materials Inventory		
Material	**Weight (Te)**	**% of Total**
Ferrous metals (all grades)	465.8	0.9
Non-ferrous metals (copper, aluminium alloys)	2.2	<0.1
Plastics	119.0	0.2
Concrete (mattresses, cement bags, grouted support)	1,793.5	3.3
Rock cover	51,388.0	95.6
Hazardous – NORM	1.0	<0.1
Hazardous – Residual fluids	2.9	<0.1
Total	**53,772.2**	**100.0**

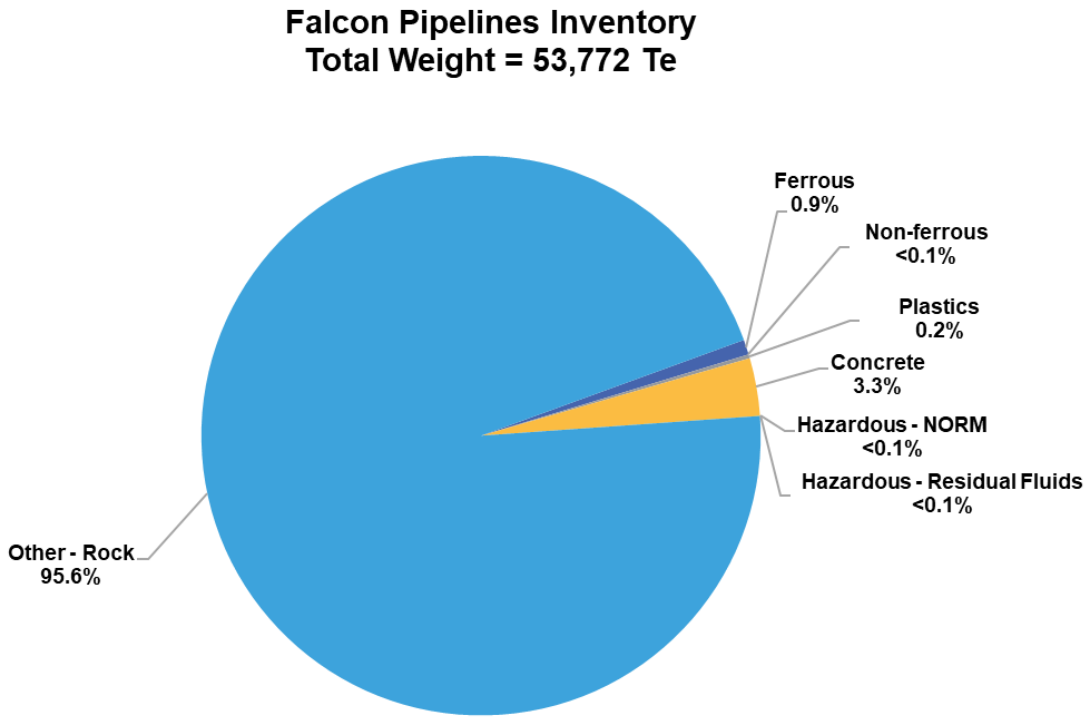

Figure 2-3: Falcon Pipelines and Stabilisation Materials Inventory

3 Removal and Disposal Methods

TAQA will implement an Active Waste Management Plan to identify and quantify available disposal options for waste materials resulting from the decommissioning activities. The plan will detail the disposal route for recovered structures and equipment, and their constituent materials and contents.

Recovered infrastructure will be returned to shore for dismantling and sorting before being transferred to suitably licenced waste facilities. It is the intent that, where possible, materials and equipment will be re-used or recycled. Material management options will take account of the waste hierarchy, with reduction in volume of waste being the preferred option. OPRED will be advised once waste contractors have been selected.

3.1 Subsea Installations

The options considered for the disposal of the subsea installations and the selected disposal route are listed in Table 3-1.

Table 3-1: Subsea Installations

Installation / Feature	No.	Option	Disposal Route
Kestrel Wellheads Flowbases and Xmas Trees	3	Full recovery	Return to shore for reuse or recycling or disposal as appropriate.
Kestrel SSIV	1	Full recovery	Return to shore for reuse or recycling or disposal as appropriate.
Kestrel SDU	1	Full recovery	Return to shore for reuse or recycling or disposal as appropriate.
Kestrel SkoFlo Skid	2	Full recovery	Return to shore for reuse or recycling or disposal as appropriate.
Kestrel Sentry Bollards and Piles	9	Kestrel Sentry Bollards Full recovery. Piles recovered to 3 m below seabed	Return to shore for reuse or recycling or disposal as appropriate.
Falcon Xmas Tree and Wellhead	1	Full recovery	Return to shore for reuse or recycling or disposal as appropriate.

3.2 Pipelines

Table 3-2: Pipeline Decommissioning Options		
Key to Options		
1 – Re-use	2A – Cut and Lift with De-burial	2B – Reverse Installation (reel) without De-burial
2C – Reverse Installation (reel) with De-burial	2D – Reverse Installation (Buoyancy)	2E – Cut, Float & Transport
3A – Rock Placement over entire line	3B – Retrench and Bury entire line	4A – Rock Placement over areas of Spans / Exposure / Shallow Burial
4B – Trench & Bury areas of Spans / Exposure / Shallow Burial	4C – Remove areas of Spans / Exposure / Shallow Burial	4D – Accelerated Decomposition
5 – Remove Line Ends & Remediate Snag Risk	6 – Leave As-is	

Table 3-3: Pipeline or Pipeline Group Decommissioning Options Considered [Note 1]			
Pipeline or Group	**Condition of Line / Group**	**Whole or Part of Pipeline/Group**	**Decommissioning Options Considered**
Group 3: PL1851, PL1852, PLU1854	Flexible flowlines and umbilicals, trenched and buried with areas of rock cover.	Whole group	2B, 4A, 4B, 4C, 5
Group 4: PL2765, PL2766, PLU2767	Flexible pipelines and umbilicals, trenched and rock covered	Whole group	2C, 4A, 4C, 5
Group 10: PL1851, PL1852, PLU1854	Flexible Risers and Riser Umbilicals	Whole group	Full removal[Notes 2 & 3]
Group 12: PL1851, PL1852, PLU1854, PLU1854JP1, PLU1854JP2, PLU2976, PLU2977JP1, PLU2977JP2, PLU2978JW1, PLU2979, , PL2765, PL2766, PLU2767, PL1317JKEU-W1, PLU6295	Spools and jumpers, surface laid	Whole group	Full removal [Note 3]

Notes:

1. Different components (e.g. spools) of the overall pipelines may fall into more than one CA group.
2. The Kestrel risers (and riser section of the umbilical) will be cut at a proposed -132 m and the sections between the Tern Topsides and - 132 m will be removed alongside the Tern Upper Jacket. The remaining sections of the Kestrel risers attached to the Tern footings will be decommissioned as part of the Tern Footings Decommissioning Programme.
3. Sections of surface laid lines in close proximity (within approximately 75 m) to the Tern jacket/sub-structure footings may be left in place if derogation is granted to leave the footings

in place. If derogation is not granted for the footings, then these surface laid portions will be removed.

3.2.1 Comparative Assessment Method:

TAQA conducted a Comparative Assessment (CA) of the decommissioning options for the Kestrel and Falcon facilities [3]. TAQA's strategy for the CA process is aligned with the OEUK Guidelines for Comparative Assessment in Decommissioning Programmes [2] and OPRED Guidance Notes for the Decommissioning of Offshore Oil and Gas Installations and Pipelines [1].

All the infrastructure has been scoped into logical groupings. All feasible decommissioning options for each of the infrastructure groups have been identified, assessed, ranked, and screened, using five assessment criteria: Safety, Environment, Technical, Societal and Economic (to compare the relative merits of each credible decommissioning option for each group of infrastructure).

The assessment criteria are equally weighted to balance and represent the views of each of the stakeholders.

Table 3-4: Outcome of Comparative Assessment [Note 1]

Pipeline or Group	Recommended Option	Justification
Group 3	5 - Remove Line Ends and Remediate Snag Risk	The CA outcome is a significant preference for Option 5. Option 5 is preferred over other options against the Safety, Environment and Technical criterion. It is less preferred against the Societal criteria, however this does not offset the preference against the other criteria. If the Economics criteria is included, the preference for Option 5 remains and hence Option 5 is the recommended decommissioning option for Group 3.
Group 4	5 - Remove Line Ends and Remediate Snag Risk	The CA outcome is a significant preference for Option 5. Option 5 is preferred over other options against the Safety, Environment and Technical criterion. It is less preferred against the Societal criteria, however this does not offset the preference against the other criteria. If the Economics criteria is included, the preference for Option 5 remains and hence Option 5 is the recommended decommissioning option for Group 4.

Notes:

1. Following completion of the comparative assessment, further work was undertaken that identified additional remediation may be required on these lines. As such, TAQA propose the following approach to assess the worst case environmental impact for these pipelines: rock placement to remediate spans, exposures and shallow burial < 20 m long and removal of spans, exposures and shallow burial > 20 m long by cut and lift.

3.3 Pipeline Stabilisation Features

Table 3-5: Pipeline Stabilisation Features Disposal Route			
Stabilisation Features	**Number**	**Option**	**Disposal Route**
Concrete Mattresses	499	Full recovery at end of field life. (If practical difficulties are encountered, TAQA will consult with OPRED to agree an alternative approach).	Returned to shore for recycling or disposal to landfill.
Grout Bags	5,870	Full recovery at end of field life. (If practical difficulties are encountered, TAQA will consult with OPRED to agree an alternative approach)	Returned to shore for recycling or disposal to landfill.
Rock Cover	51,388 (Te)	Ensure overtrawlability and decommission *in situ*	Decommission *in situ*

3.4 Wells

Table 3-6: Wells Decommissioning Options
The Kestrel 211/21a-17z, 211/21a-19, 211/21a-20 and Falcon 210/25a-10z wells will be plugged and abandoned to Phase 3 in alignment with the TAQA 'Well Barrier Standard TUK-11-B-009', and with reference to OEUK Well Decommissioning Guidelines [2]. Operations will be supported by appropriate regulatory applications and submissions.

3.5 Waste Streams

Table 3-7: Materials and Waste Streams

Materials	Removal and Disposal Method
Bulk Liquids	Pipelines and umbilicals were flushed as per agreement with OPRED to facilitate abandonment scopes utilising Tern topsides facilities. Any discharges offshore will be managed, and risk assessed under the existing permitting regime. Any effluent shipped to shore will be treated and disposed of according to relevant regulations and guidance.
Marine Growth	Marine growth is only anticipated on the Kestrel risers at the Tern platform. These risers will form part of the Tern jacket decommissioning scope. Marine growth is not anticipated on any of the other Kestrel and Falcon equipment. If marine growth is present, it will be disposed of in accordance with relevant regulations and guidance, either offshore under marine licence, or onshore.
NORM	Naturally Occurring Radioactive Materials (NORM) is assumed to be present. Monitoring and sampling will be carried out to verify the presence of NORM. If it is identified, it will be contained and treated in accordance with relevant regulations and circumstances.
Asbestos	No asbestos materials are anticipated. However, if asbestos containing materials are found they will be recovered to shore and disposed of appropriately.
Wax	Wax is not anticipated. In the unlikely event that wax is present, it will be disposed of in accordance with relevant regulations and guidance, either offshore under marine licence or permit, or onshore.
Other Hazardous Materials	Any other hazardous materials will be disposed of in accordance with relevant regulations and guidance.
Onshore Dismantling Sites	The removal contractor will use appropriately licenced dismantling, treatment, recycling, and disposal sites (where applicable). TAQA will ensure that the removal contractor and selected sites have proven abilities to manage waste streams throughout the deconstruction process. An Active Waste Management Plan (AWMP) will follow the “reduce, reuse, recycle” paradigm. OPRED will be informed once a suitable site(s) has been selected. TAQA will conduct assurance activities of the site(s) to confirm that they are compliant with applicable legislation .

Table 3-8: Inventory Disposition			
	Total Inventory Tonnage (Te)	**Planned Tonnage to Shore (Te)**	**Planned Tonnage Left *In Situ* (Te)**
Kestrel Subsea Installations	734.6	516.7	217.9 Note1
Falcon Subsea Installations	59.1	59.1	0
Kestrel Pipelines / Umbilicals	2,626.8	1,038.8	1,588 Note 2
Falcon Pipelines / Umbilicals	53,772.2	1,827.6	51,944.6 Note 3

Notes:

1. The Kestrel sentry piles below -3 m will be left *in situ*.
2. The weight of the pipelines left *in situ*.
3. The tabulated weight of material left *in situ* at Falcon consists mainly of rock cover. The weight of the pipelines left *in situ* is also included.

Total inventory weights noted are approximate and include the Xmas trees, wellheads and flowbases and all stabilisation features, including rock cover materials. It is TAQA's intention to maximise re-use or recycling of recovered inventory.

4 Environmental Appraisal Overview

4.1 Environmental Sensitivities

The environmental sensitivities in the Kestrel and Falcon Fields are summarised in Table 4-1. The impacts of decommissioning operations on these sensitivities are listed in Table 4-2.Further details can be found in the supporting Tern Area EA [4].

Table 4-1: Environmental Sensitivities

Environmental Receptor	Main Feature
Conservation Interests	There are no Nature Conservation Marine Protected Areas (NCMPAs), Special Areas of Conservation (SACs) or Special Protection Areas (SPAs) within 40 km of the Kestrel and Falcon facilities. The closest protected site is the Pobie Bank Reef SAC, approximately 72 km west of the Tern platform. With regards to free-swimming fish species, ling, which are a Priority Marine Feature (PMF), were observed within the Falcon Field in 2009. However, it is not deemed to be a high intensity nursery area [4]. Numerous pockmarks which may be classified as 'Submarine structures made by leaking gases' (Annex I Habitat) were identified across the wider Tern Area. However, the lack of Methane-Derived Authigenic Carbonate (MDAC) present in pockmarks identified across the Tern Area indicates that Annex I 'Submarine structures caused by leaking gases' are not present.
Seabed	The water depth within the Kestrel and Falcon Fields ranges from 156 – 164 m below Lowest Astronomical Tide (LAT). The physical seabed characteristics recorded from survey work show sediments across the Tern Area are mostly sandy, with fine sand reported at Kestrel and Falcon. Under the European Nature Information System (EUNIS) habitat classification, the predicted broad-scale seabed type around the Kestrel and Falcon Fields is A5.27 "deep circalittoral sand" which represents offshore (deep) circalittoral habitats with fine sands or non-cohesive muddy sands. This habitat type falls within the broad habitat PMF "offshore sands and gravels". Hydrocarbon concentrations within the wider area surrounding the Kestrel and Falcon Fields infrastructure are generally within expected background levels for the Northern North Sea (NNS) but increase with proximity to infrastructure. The Kestrel and Falcon wells were drilled using Water-Based Mud (WBM) and therefore do not have any associated cuttings contamination.

Table 4-1: Environmental Sensitivities	
Environmental Receptor	**Main Feature**
Fish	The Kestrel Field peak spawning for cod occurs between February and March, haddock between February and April, Norway pout between February and March and saithe between January and February. Cod is the only species with a high intensity spawning in the Kestrel Field. Whiting also spawn in the area at a lower intensity between February and June. The Kestrel Field is a potential nursery ground for blue whiting, European hake, haddock, herring, ling, mackerel, spurdog, whiting and Norway pout. Blue whiting is the only species with a high nursery intensity in the Kestrel Field while other species have a lower nursery intensity. The Falcon Field peak spawning for cod occurs between February and March, haddock occurs between February and April, Norway pout between February and March and saithe between January and February. Whiting also spawn in the area at a lower intensity between February and June). The Falcon Field is a potential nursery ground for anglerfish, blue whiting, European hake, haddock, herring, ling, mackerel, spurdog, whiting and Norway pout. Blue whiting is the only species with a high nursery intensity in the Falcon Field while other species have a lower nursery intensity.
Fisheries	The Kestrel Field is located in International Council for the Exploration of the Sea (ICES) rectangle 51F1 and the Falcon Field is located in ICES rectangle 51F0. These areas are primarily targeted for demersal species, with a negligible contribution from pelagic and shell fisheries in 2022. Fishing effort is dominated by trawl fishing gears. Annual fishery landings by weight and value are considered low to moderate for demersal and low for pelagic fisheries in comparison to other areas of the North Sea.
Marine Mammals	Harbour porpoise, Atlantic white-sided dolphin, minke whale and beaked whale are the most abundant species recorded in the Kestrel and Falcon Fields. The harbour porpoise is by far the most frequently recorded cetacean in the Kestrel and Falcon Fields, which is reflective of these being the most abundant and widely distributed cetaceans in the North Sea. Both grey and harbour seal densities are known to be low in the Kestrel and Falcon Fields, densities are predicted to be between 0 and 0.001% of the British Isles at-sea population per 25 km^2 for both species.
Birds	In the NNS the most numerous species present are likely to be northern fulmar, black-legged kittiwake and common guillemot. The Kestrel and Falcon Fields are located within or in the vicinity of a wider area of aggregation for northern fulmar, northern gannet, European storm petrel, Arctic skua, great skua, black-legged kittiwake, herring gull, Arctic tern, guillemot, razorbill and Atlantic puffin during their breeding season. Seabird sensitivity to oil pollution in the Kestrel and Falcon Fields is considered low throughout the year.

Table 4-1: Environmental Sensitivities	
Environmental Receptor	**Main Feature**
Onshore Communities	Waste generated during decommissioning will be brought to shore and will be managed in line with TAQA's Waste Management Strategy and the Waste Hierarchy, as part of the project AWMP, using approved waste contractors and in liaison with the relevant Regulators. Preventing waste is ultimately the best option, achieved through reducing consumption and using resources more efficiently. However, this is followed by re-use and recycling of goods. If all re-use opportunities have been taken by TAQA, the next preferable option is for recycling of materials. Should NORM be encountered, TAQA will ensure the onshore site(s) are suitably licenced to accept the waste arising from the decommissioning of the subsea infrastructure. All waste will be managed in compliance with relevant waste legislation by a licenced and/or permitted waste management contractor. The selected contractor will be assessed for competence through due diligence and duty of care assurance activities.
Other Users of the Sea	The proposed decommissioning operations will be located in a well-developed area for oil and gas extraction. The closest piece of surface infrastructure is the Tern platform, 5 km south-east of the Kestrel and Falcon facilities. The next closest piece of surface infrastructure is the Eider platform, 8.3 km north-east of the Kestrel facilities and 9.6 km north-east of the Falcon facilities. Shipping density in the Kestrel and Falcon Fields is low, with a localised increase in vessel activity around surface installations including the Tern and Eider platforms, due to the presence of operational and maintenance vessels. The Falcon and Kestrel pipelines cross over PL1317 and PL476. These lines will be removed together with any associated stabilisation features. The removal of these crossing will be managed as part of the execution of Tern Area decommissioning. There are no other third-party cables or pipelines in the vicinity, no designated military practice and exercise areas, no offshore renewable or wind farm activity and no designated or protected wrecks nearby. Kestrel and Falcon Fields are located in proximity of the Innovation and Targeted Oil and Gas (INTOG) search and exclusion areas. INTOG area NE-b is located approximately 9 km southeast of Kestrel, 11 km southeast of Falcon and 15 km southeast of the Tern platform. INTOG area NE-a is located approximately 25 km northwest of Falcon, 27 km northwest of the Tern platform and 29 km northwest of Kestrel.
Atmosphere	The cumulative emissions generated by the activities associated with the decommissioning of the Kestrel and Falcon Fields are small relative to life-time production. Estimated carbon dioxide (CO_2) emissions to be generated by the selected decommissioning options are 20,162 Te, equating to approx. 0.1 % of total UKCS emissions (2023). Most of these emissions are related to offshore operation of vessels (12,236 Te CO_2) and onshore recycling of materials (4,146 Te CO_2).

4.2 Potential Environmental Impacts and their Management

The EA [4] process has considered the potential for significant environmental effects as a result of the decommissioning activities described within this Decommissioning Programme. The appraisal has not identified any significant residual environmental impacts and it is anticipated that any physical, biological, or socio-economic impact during the decommissioning activities will be negligible and short term.

Table 4-2 details the potential environmental impacts and the management and mitigation measures that will be put In place to further reduce the potential for environmental effects.

Table 4-2: Environmental Impacts and Management		
Activity	**Main impacts**	**Management**
Subsea installation removal (including stabilisation materials)	Seabed disturbance impacts from excavation and removal of subsea installations and associated stabilisation materials.	Impacts to the seabed from project activities have been assessed fully in the EA [4]. The following mitigation measures are proposed to minimise impacts: • It is envisaged that all vessels undertaking the decommissioning and removal works would be dynamically positioned vessels. As a result, there will be no direct interaction between vessel positioning and the seabed. • All activities which may lead to seabed disturbance will be planned, managed, and implemented in such a way that disturbance is minimised. • Activities will be risk assessed and permitted under a Marine Licence. • A debris survey will be undertaken at the completion of the decommissioning activities. Any debris identified as resulting from oil and gas activities will be recovered from the seabed where possible. • Any remedial rock cover will be placed by a fall pipe vessel equipped with an underwater camera on the fall pipe. This will ensure accurate placement of the rock and reduce unnecessary spreading of the rock footprint and ensure that minimum safe quantity of rock is used. • Clear seabed verification will ensure there is no residual risk to other sea users. Non-intrusive verification techniques will be considered in the first instance and in agreement with OPRED and fishing industry representative bodies.

Table 4-2: Environmental Impacts and Management		
Activity	**Main impacts**	**Management**
Decommissioning surface laid flowlines (including stabilisation materials)	Seabed disturbance impacts from excavation and removal of surface laid flowlines and associated stabilisation materials.	Impacts to the seabed from project activities have been assessed fully in the EA [4]. The following mitigation measures are proposed to minimise impacts: • Currently it is envisaged that all vessels undertaking the decommissioning and removal works would be dynamically positioned vessels. As a result, there will be no direct interaction between vessel positioning and the seabed. • All activities which may lead to seabed disturbance will be planned, managed, and implemented in such a way that disturbance is minimised. • Activities will be risk assessed and permitted under a Marine Licence. • Careful planning, selection of equipment, management, and implementation of activities. • A debris survey will be undertaken at the completion of the decommissioning activities. Any debris identified as resulting from oil and gas activities will be recovered from the seabed where possible. • Any remedial rock cover will be placed by a fall pipe vessel equipped with an underwater camera on the fall pipe. This will ensure accurate placement of the rock and reduce unnecessary spreading of the rock footprint and ensure that minimum safe quantity of rock is used. • Clear seabed verification will ensure there is no residual risk to other sea users. Non-intrusive verification techniques will be considered in the first instance and in agreement with OPRED and fishing industry representative bodies.

Table 4-2: Environmental Impacts and Management		
Activity	**Main impacts**	**Management**
Decommissioning buried flowlines (including stabilisation materials)	Seabed disturbance impacts from excavation and removal of buried flowlines and associated stabilisation materials. Snagging risk to commercial fisheries associated with pipelines decommissioned *in situ*.	The following mitigation measures are proposed to minimise impacts: • All activities which may lead to seabed disturbance will be planned, managed and implemented in such a way that disturbance is minimised. • Currently it is envisaged that all vessels undertaking the decommissioning and removal works would be dynamically positioned vessels. As a result, there will be no direct interaction between vessel positioning and the seabed. • Activities will be risk assessed and permitted under a Marine Licence. • A debris survey will be undertaken at the completion of the decommissioning activities. Any debris identified as resulting from oil and gas activities will be recovered from the seabed where possible. • Any exposures less than 20 m in length or cut pipeline ends will be rock covered to ensure they are overtrawlable by fishing gear. • Any remedial rock cover will be placed to reduce unnecessary spreading of the rock footprint and ensure the minimum safe quantity of rock is used. • Clear seabed verification will ensure there is no residual risk to other sea users. Non-intrusive verification techniques will be considered in the first instance and in agreement with OPRED and fishing bodies. • Admiralty charts and the FishSAFE system will be updated. • TAQA will monitor the seabed to assess any seabed depressions or clay berms which may present a snag risk. • Post-decommissioning monitoring will be undertaken at a frequency agreed with OPRED.

5 Interested Party Consultations

TAQA consulted a wide range of interested parties during the planning and preparation stages of the Northern North Sea fields subsea comparative assessment process.

The consultees included:

- Scottish Fishermen's Federation (SFF)
- HSE
- Joint Nature Conservation Committee (JNCC)
- North Sea Transition Authority (NSTA)
- Scottish Environment Protection Authority (SEPA)
- TAQA International BV
- Shell
- OPRED Offshore Decommissioning Unit (ODU; Observer)

Workshops and individual consultations with stakeholders were held to describe the CA process, to invite feedback and to understand stakeholders' particular interests regarding the impacts of decommissioning. Following this a comparative assessment report [3] was published documenting the findings from the CA process.

Given that Kestrel and Falcon are NNS subsea fields, the recommendations from this CA have been applied to Kestrel and Falcon [3].

This Decommissioning Programme is still to be considered by the stakeholders. Following completion of the formal Decommissioning Programme consultation process, TAQA will complete Table 5-1 with comments received from stakeholders, and the company's responses.

Table 5.1: Summary of Stakeholder Comments
UK

Stakeholder	Comment	Response
Statutory Consultees		
The National Federation of Fishermen's Organisations (NFFO)		
SFF		
Northern Irish Fish Producers' Organisation (NIFPO)		
Global Marine Systems Limited (GMS)		
NSTA		
Other Stakeholders		
Public		

6 Programme Management

6.1 Project Management and Verification

TAQA, on behalf of the Section 29 Notice Holders, has appointed a project management team to manage the planning and execution of this decommissioning programme. The team will ensure that decommissioning is conducted in accordance with TAQA health, environmental and safety management principles, and relevant legislation. TAQA's management principles will govern operational controls, hazard identification and risk management. The work will be coordinated with due regard to interfaces with other operators' oil and gas assets and with other users of the sea.

TAQA will control and manage the progress of all permits, licences, authorisations, notices, consents, and consultations required. Any significant changes to the decommissioning programmes will be discussed and agreed with OPRED.

6.2 Post-decommissioning Debris Clearance and Verification

A post-decommissioning site survey will be carried out within a 500m radius of the Kestrel and Falcon subsea installations sites and along corridors defined as 50 m either side of each pipeline route. Any oilfield-related seabed debris that is found will be recovered and returned to shore for recycling or appropriate disposal.

Independent verification of the state of the seabed will be obtained by non-intrusive methods, e.g., side-scan SONAR, in the first instance, or trawling within the area around the Kestrel and Falcon facilities as appropriate. Following verification, TAQA will issue a statement of clearance to all relevant governmental departments and non-governmental organisations.

The post-decommissioning survey results will be notified to the UK Fisheries Offshore Oil and Gas Legacy Trust Fund Ltd for inclusion in their FishSAFE system, and to the United Kingdom Hydrographic Office for notification and marking on Admiralty charts and notices to mariners.

6.3 Schedules

6.3.1 Kestrel Schedule

The main milestones in the Kestrel decommissioning process were, or are anticipated to be:

- Cessation of production: Q1 2024
- Well P&A window: 2025 – 2029
- Subsea installation & pipeline removal: 2029 – 2031
- Post removal survey: 2031 – 2032
- Riser removal: TBC[1]

The envisaged Kestrel decommissioning programme is illustrated in Figure 6-1.

[1] The Kestrel risers (and riser section of the umbilical) are attached to the Tern jacket and will be removed in a window to be agreed with TAQA's appointed removal contractor nominally 2026 to 2028.

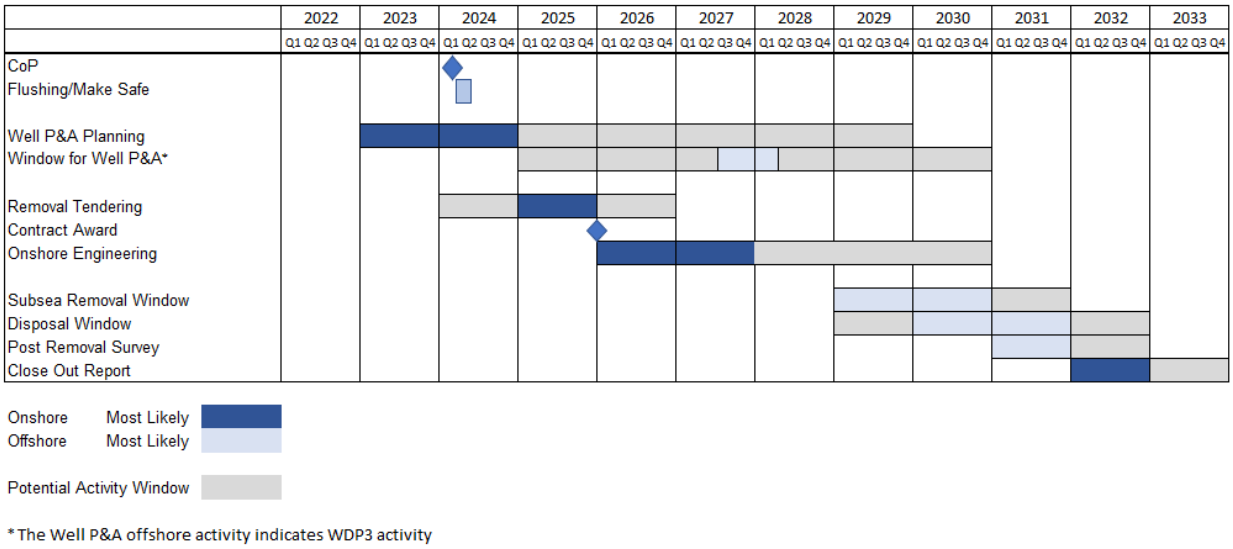

Figure 6-1: Kestrel Decommissioning Schedule

6.3.2 Falcon Schedule

The main milestones in the Falcon decommissioning process were, or are anticipated to be:

- Cessation of production: Q1 2024
- Well P&A window: 2025 – 2029
- Subsea installation & pipeline removal: 2030 – 2032
- Post removal survey: 2032 – 2033

The envisaged Falcon decommissioning programme is illustrated in Figure 6-2.

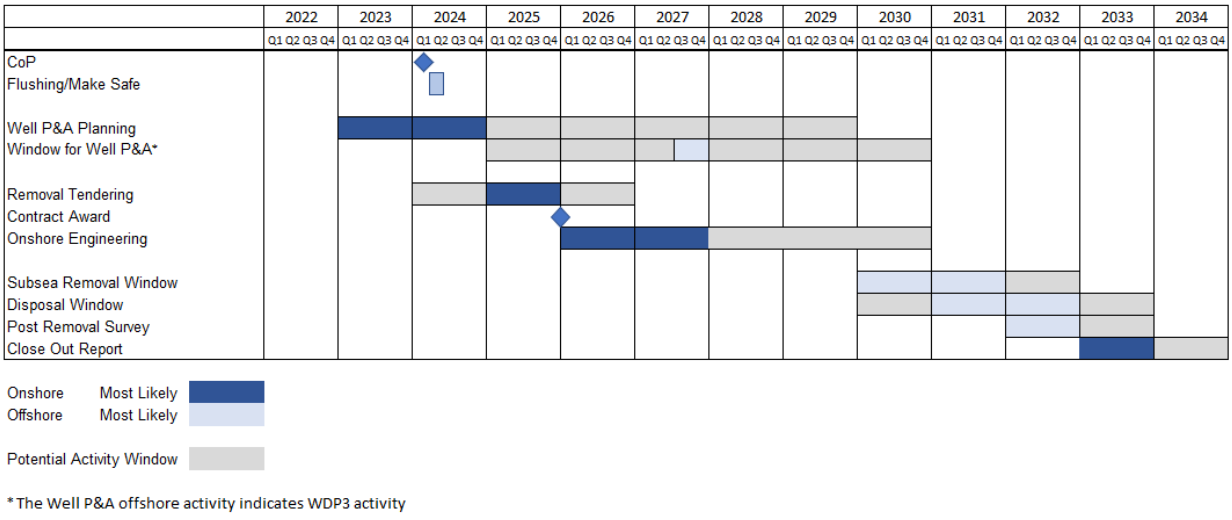

Figure 6-2: Falcon Decommissioning Schedule

6.4 Costs

An overall cost estimate following OEUK Guidelines on Decommissioning Cost Estimation (Issue 3, October 2013) will be provided to OPRED in confidence.

Table 6-1: Provisional Decommissioning Costs

Item	Estimated Cost (£MM)
WBS 1 - Project Management	-
WBS 2 - Post CoP Operational Expenditure (OPEX)	-
WBS 3 - Well Abandonment	-
WBS 4 - Pipelines Cleaning	-
WBS 5 – Subsea Infrastructure Removal	-
WBS 6 – Onshore Recycling	-
WBS 7 – Site remediation	-
WBS 8 - Monitoring	-

6.5 Close Out

A close out report will be submitted to OPRED and posted on the TAQA decommissioning website detailing any variations from the Decommissioning Programme within twelve months of the completion of the offshore decommissioning scopes and disposal, including debris removal, verification of seabed clearance (where applicable) and the first post-decommissioning environmental survey.

6.6 Post-Decommissioning Monitoring and Evaluations

TAQA will carry out a post-decommissioning environmental seabed survey, centred around the sites of the Kestrel and Falcon facilities.

All Kestrel and Falcon sites will be the subject of surveys when decommissioning activity has concluded. A survey of the condition of these areas and the adjacent seabed will also be undertaken at the end of the removal activities. The buried pipelines that are proposed to be decommissioned *in situ*, will be subject to a monitoring programme to be agreed between TAQA and OPRED.

A copy of the survey results will be forwarded to OPRED. After the survey results have been sent to OPRED and reviewed, a post decommissioning survey regime will be agreed between TAQA and OPRED taking account of ongoing liability, the findings of previous surveys, and a risk-based approach to the frequency and scope of subsequent surveys.

6.7 Management of Residual Liability

Any equipment that is left in place will remain the responsibility of the Kestrel and Falcon S29 notice holders.

TAQA recognises that the parties to the programmes will continue to retain residual liability for the infrastructure left in place

TAQA will engage with OPRED on all future legacy and liability matters and requirements relating to the infrastructure left in place.

7 Supporting Documents

[1] Guidance Notes Decommissioning of Offshore Oil and Gas Installations and Pipelines, BEIS, November 2018.

[2] Well Decommissioning Guidelines, OEUK, 2022.

[3] Comparative Assessment Northern North Sea Subsea Assets, Xodus Group, 77IFS-154925-L99-0006-05, Revision A04, July 2024.

[4] Tern Area Environmental Appraisal, Xodus Group, 77IFS-188133-H99-0001-06, Revision A04, July 2024.

[5] Tern Upper Jacket Decommissioning Programme, TAQA, TB-TEADEC01-X-AD-0002-000, Revision A1, April 2023.

8 Section 29 Holders' Letters of Support

Letters of Support will be obtained from the Section 29 Holders on final approval of the Decommissioning Programme, in advance of CoP and full field decommissioning, and will be provided within this section of the Programme.

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