Tern Upper Jacket and Associated Riser Sections

Decommissioning Programmes



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LIST OF ABBREVIATIONS

Abbreviation	Explanation	
AWMP	Active Waste Management Plan	
BEIS	Department of Business, Energy & Industrial Strategy (now the Department for Energy Security and Net Zero (DESNZ))	
CoP	Cessation of Production	
DP	Decommissioning Programme	
EA	Environmental Appraisal	
E&P	Exploration and Production	
ES	Environmental Statement	
EU	European Union	
FPAL	First Point Assessment Limited	
FPSO	Floating Production Storage and Offtake (Installation)	
HLV	Heavy Lift Vessel	
ICES	International Council for the Exploration of the Sea	
INTOG	Innovation and Targeted Oil and Gas	
IPR	Interim Pipeline Regime	
JLS	Jacket Lift System	
JNCC	Joint Nature Conservation Committee	
LAT	Lowest Astronomical Tide	
MARPOL	International Convention for the Prevention of Pollution from Ships	
NNS	Northern North Sea	
NORM	Naturally Occurring Radioactive Material	
NSTA	North Sea Transition Authority (Previously the OGA)	
OEUK	Offshore Energies UK	
OGA	Oil and Gas Authority (Now the NSTA)	
OPEP	Oil Pollution Emergency Plan	
OPPC	Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations 2005	
OPEX	Operational Expense	
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning	
OSPAR	Oslo Paris Convention	
S29	Section 29 of the Petroleum Act 1998	
SAC	Special Area of Conservation	
SLV	Single Lift Vessel	
SSIV	Sub Sea Isolation Valve	
SOPEP	Shipboard Oil Pollution Emergency Plan	
TAQA	TAQA Bratani Limited	
Те	Tonnes	



Abbreviation	Explanation
UJ	Upper Jacket
UK	United Kingdom
UKCS	United Kingdom Continental Shelf
WBS	Work Breakdown Structure
WDP#	Well Decommissioning Phase in accordance with OEUK Guidance
WLGP	Western Leg Gas Pipeline



1 EXECUTIVE SUMMARY

1.1 Decommissioning Programmes

This document contains five Decommissioning Programmes (DPs), one for the Tern Upper Jacket and four for the associated pipeline and umbilical riser sections.

The Upper Jacket consists of the platform's sub-structure from the topside cut height at around 11 m above Lowest Astronomical Tide (LAT) to the cut depth approximately 132 m below LAT, which is circa 35m above the seabed. See Figure 1.1. This section of the sub-structure is referred to as the "Upper Jacket" throughout this document. The lower section of the sub-structure is referred to as the "Footings". The Footings and associated riser sections will be covered by a separate DP and supporting documents to be submitted to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) in due course. The platform topsides are covered by a DP that was approved in Q4 2020 [1].

The Tern platform is located in Block 210/25a in the UK Northern North Sea. The field was discovered in May 1975. The platform was installed in 1988 and production started in February 1989.

A CoP (Cessation of Production) application for Tern was accepted by the Oil and Gas Authority (OGA) in 2019 and Tern ceased production in March 2024.

These decommissioning programmes for the Tern Upper Jacket and associated riser sections are supported by an Environmental Appraisal see Section 4 and technical assessments [2][3]. Early decommissioning planning commenced in 2020. Tern decommissioning will start in 2024 at the earliest. TAQA expects completion of Tern decommissioning by 2030 and submission of the close out report in 2031.

1.2 Requirement for Decommissioning Programmes

In accordance with the Petroleum Act 1998, the Tern installation Section 29 notice holders listed in Table 1-2 are applying to OPRED for approval to decommission the Tern Upper Jacket detailed in Sections 2.1, 2.2 and 3.1 of this document. Appendix 2 presents Section 29 Holders' Letters of Support for the proposed Decommissioning Programmes.

In conjunction with stakeholder and regulatory consultation, these Decommissioning Programmes are submitted in compliance with national regulations and international obligations and OPRED guidelines. These Decommissioning Programmes are for an anticipated ~ 8-year schedule, beginning in 2024.



1.3 Introduction

The Tern platform is a fixed Installation that serves as an attended drilling and production facility for the Tern Field. The installation is located in licence block 210/25a in the UKCS East Shetland Basin.

The Tern platform was installed in 1988 it is located in 167 m water depth and comprises an eight-legged steel sub-structure, a module support frame (MSF) and modular topsides. The sub-structure is secured to the seabed by thirty two foundation piles, eight at each of the corner legs: A1, B1, A4, B4. The piles are 2.13m diameter steel tubes that are driven to an average depth of 46.5 m. The corner legs (A1, B1, A4, B4) measure 6 m in diameter at the base. The Footings footprint at seabed level is 90 m by 70 m. The plan area at the top of the sub-structure is 71 m by 27 m. The sub-structure was originally barge launched, upended, and sunk to the seabed in a controlled fashion using the buoyancy of the sub-structure legs and ancillary ballast tanks. It was then anchored using the piles at the corner legs. Each pile is grouted into a pile sleeve. The pile sleeves are integral parts of the sub-structure by reversing the launch and installation processes. The overall installed weight of the entire sub-structure is estimated as 20,500 Te, excluding marine growth, piles, and grout. The sub-structure is therefore a candidate for derogation under OSPAR decision 98/3.

The Upper Jacket and associated riser sections covered by these Decommissioning Programmes have an estimated lift weight of \approx 14,800 Te including marine growth. The Upper Jacket extends from the topside cut height at around 11 m above LAT to a cut depth of approximately 132 m below LAT. The exact cut depth will be determined following detailed engineering considering technical constraints such as: substructure design, in particular the "K" bracing and cutting technology and safety impacts. Once the exact planned cut depth is known, OPRED will be advised. The cut depths of individual members achieved in practice may vary from the planned depth by one or two meters. OPRED will be advised of the precise cut depths achieved following Upper Jacket removal.

Tern ceased production in Q1 2024.

Four subsea developments have utilised the Tern facilities during the life of the field. Kestrel, Falcon, Cladhan and Hudson, all of which are operated by TAQA. These facilities will be the subjects of separate Decommissioning Programmes. These subsea installations ceased production in Q1 2024.

Produced oil from the Tern, Hudson, Kestrel, Falcon and Cladhan fields is exported from the Tern installation to North Cormorant through a 16 inch subsea pipeline, and then via the Brent Oil Pipeline System to Sullom Voe. Separated gas is distributed between the Tern, Hudson, Kestrel, Falcon and Cladhan facilities as fuel gas and lift gas, with any excess being exported via an eight inch subsea pipeline to North Cormorant. Alignment of CoP dates across these fields ensured that removal of the Tern installation did not strand any reserves.

The Western Leg Gas Pipeline (WLGP), which provides a fuel source for the Tern platform, ends at the Tern Subsea Isolation Valve (SSIV). The decommissioning of Tern, along with TAQA's other NNS platforms which are connected to the WLGP will impact the pipeline configuration and third party users of the pipeline system. TAQA has engaged the WLGP Operator to initiate discussion over feasible disconnection options. TAQA also engaged with the Western Isles floating production installation Operator to agree arrangements with regards to this service, as Western Isles tied into the Tern SSIV structure.

The pipeline and umbilical riser sections that are attached to the Upper Jacket will be removed with the Upper Jacket.



TAQA has carried out an assessment [3] that confirms that removal of the Upper Jacket will not preclude subsequent decommissioning of the sub-structure Footings since, following removal of the Upper Jacket the Footings have sufficient inherent structural integrity to allow a variety of decommissioning options utilising a range of decommissioning vessels and methodologies to be considered.

The Tern Topsides will be removed under a separate DP that was approved in November 2020 [1], and the Consent to Locate for the installation will be appropriately modified following topsides removal. During the period after Topsides removal, but before Upper Jacket removal, aids to navigation will be maintained on the sub-structure to mitigate risk to other sea users. The aids to navigation will be in accordance with the revised consent to locate for the installation. The selection and operation of the aids to navigation will take cognisance of guidance from relevant technical bodies including the Northern Lighthouse Board regarding the characteristics, monitoring and maintenance of the aids to navigation.

Separate Decommissioning Programmes covering the Tern Footings, and associated pipeline and umbilical riser sections will be submitted at a later stage, in line with TAQA's wider northern North Sea decommissioning plans. Section 3.1 describes the boundaries of the Decommissioning Programmes contained in this document in detail.

Two of the jacket legs, B1 and B4, are used as diesel storage tanks and leg A1 is used as a non-toxic base oil storage tank. The diesel and non-toxic base oil tanks will have been drained and cleaned as part of the platform de-energisation process well in advance of Upper Jacket removal. The diesel and base oil tanks will not be cut through during Upper Jacket removal. However, small residual quantities of diesel and base oil may remain in the tanks that could be discharged during Upper Jacket removal. Prior to Upper Jacket removal operations commencing TAQA will apply for an oil discharge permit under the Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations (OPPC) to cover potential residual diesel or base oil discharges. Legs A2, A3, B2 and B3 are used as potable water storage tanks. See Figure 1.1. The potable water tanks will be cut through during Upper Jacket removal.

There is a drill cuttings pile at the base of the Tern sub-structure as shown in Figure 1.1. The cuttings pile is outside the scope of these Decommissioning Programmes. The Tern Footings and Associated Riser Sections Decommissioning Programmes will address the cuttings pile.





Figure 1.1: Tern Overview



1.4 Overview of Installation Being Decommissioned

1.4.1 Installation

Table 1-1: Installation to be Decommissioned				
Field:	Tern	Production Type (Oil/Gas/Condensate):	Oil/Gas/Condensate	
Water Depth:	167 m	UKCS Block:	Tern 210/25a	
Distance to Median (km):	47 km	Distance from Nearest UK Coastline (km):	103 km	
Surface Installation				
Number:	Туре:	Total Upper Jacket Weight (Te):		
1	Fixed Large Steel Jacket	≈14,800 Te*		

*Including marine growth

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

1.4.2 Pipeline and Umbilical Riser Sections

The pipeline, and umbilical riser sections listed below will be removed as part of the Upper Jacket. The riser sections will be cut at the top and bottom of the Upper Jacket at approximately 11 m above LAT and 127 m below LAT respectively. TAQA is the Operator of these pipeline, and umbilical, risers. TAQA will consult the S29 notice holders for these facilities and keep them informed of decommissioning plans and progress. The Section 29 Notice Holders for the various pipeline and umbilical risers are listed in Table 1-3, Table 1-4, Table 1-5 and Table 1-6.

- Rigid Pipeline Riser Sections
 - PL1317 Tern to Otter 16" water injection pipeline
 - PL477 Tern to North Cormorant 16" oil production export pipeline
 - o PL478 Tern to North Cormorant 8" gas production export pipeline
- Flexible Pipeline Riser Sections in J Tubes
 - o PL1018A, Hudson to Tern 10" production pipeline 1 riser
 - \circ $\,$ PL1019A, Hudson to Tern 10" production pipeline 2 riser $\,$
 - o PL1020A Hudson to Tern 8" production/test pipeline riser
 - PL1021 Tern to Hudson 8" water injection pipeline riser (Pipeline number is PL1021A)
 - o PL1022 Tern to Hudson 6" gas pipeline riser
 - o PL1851 Kestrel/Falcon to Tern 8" production pipeline riser
 - PL1852Tern to Kestrel/Falcon 4" gas lift pipeline riser
 - o PL3572 Cladhan to Tern 10" production pipeline riser



- PL3573 Tern to Cladhan 4" gas lift pipeline riser
- PL3574 Tern to Cladhan 10" water injection pipeline riser
- Umbilical Riser Sections in J tubes
 - PLU6450 Tern to Hudson chemical/control umbilical riser (This riser comprises umbilical cores that were previously individually numbered PL1023.15, PL1023.16, PL1023.17, PL1023.20, PL1023.21, PL1023.22, PL1023.23, PL1023.24, and PL1023.25. The Pipeline Works Authorisation (PWA) for these cores has been revised to renumber them to PLU6450. The S29 notice for the PL1023.## cores has been revised to note this change, but the S29 notice still applies to the original PL1023.## pipeline numbers).
 - PLU1854 Tern to Kestrel control umbilical riser
 - o PLU3575 Tern to Cladhan control umbilical riser
 - o PLU3577 Tern to Cladhan SSIV control umbilical riser

The pipeline riser sections and power cables will be in an appropriately isolated, de-energised and cleaned state prior to Tern topsides decommissioning. Umbilicals containing oil based hydraulic fluids will be flushed, water based hydraulic fluids may be discharged under a permit when the umbilicals are cut.

The risers will be severed at or below the Upper Jacket cut depth approximately 132 m below LAT. The upper sections of the rigid risers and J tubes will be removed with the Upper Jacket.

The Pipeline Works Authorisations will be amended as necessary to reflect the pipeline, and umbilical as left status. The jacket footings associated riser sections, and subsea sections of the pipelines and umbilicals, will be covered by further Decommissioning Programmes.

Table 1-3: S29 Notice Holders; PL1851, PL1852, PLU1854 Risers				
Section 29 Notice Holders	Registration Number	Equity Interest (%)		
TAQA Bratani Limited	05975475	100		
Shell U.K. Limited	00140141	0		
Esso Exploration and Production UK Limited	00207426	0		

Table 1-4: S29 Notice Holders; PL1317, PL477, PL478 Risers				
Section 29 Notice Holders	Registration Number	Equity Interest (%)		
TAQA Bratani Limited	05975475	100		
Shell U.K. Limited	00140141	0		
Esso Exploration and Production UK Limited	00207426	0		



Table 1-5: S29 Notice Holders; PL1018A, PL1019A, PL1020A, PL1021A, PL1022, PLU6450 Risers (S29 Notice refers to previous PLU6450 pipeline numbers PL1023.15, PL1023.16, PL1023.17,

PL1023.20, PL1023.21, PL1023.22, PL1023.23, PL1023.24, and PL1023.25).					
Section 29 Notice Holders	Registration Number	Equity Interest (%)			
DANA Petroleum (E&P) Limited	02294746	47.5			
TAQA Bratani Limited	05975475	26.73			
NEO Energy (UKCS) Limited	02669936	25.77			
Apache Beryl I Limited	FC005975	0			
Enterprise Oil U.K. Limited	02290358	0			
Esso Exploration and Production UK Limited	00207426	0			
Shell U.K. Limited	00140141	0			
TAQA Bratani LNS Limited	06230540	0			

Table 1-6: S29 Notice Holders; PL3572, PL3573, PL3574, PLU3575, PLU3577 Risers

Section 29 Notice Holders	Registration Number	Equity Interest (%)
TAQA Bratani Limited	05975475	64.5
Waldorf CNS (I) Limited	SC278868	33.5
ONE-DYAS UK Limited	03531783	2
MOL Magyar Olaj-Es Gazipari Reszvenytarsasag	HU10625790	0
ONE-Dyas B.V.	NL33211110	0
Petrotal Corp.	CA35359NC	0
TAQA International B.V.	NL34260937	0
Waldorf Energy Partners Limited	11957078	0



1.5 Summary of Proposed Decommissioning Programmes

Table 1-7: Summary of Decommi	ssioning Programmes
Proposed Decommissioning Solution	Reason for Selection
Upper Jacket	
Removal of the Tern Upper Jacket between approximately 11 m above LAT and 132 m below LAT. Recovered material will be returned to shore for recycling or disposal. (Well conductors will be cut at an appropriate depth of 132 m below LAT or deeper, to facilitate Upper Jacket removal).	Removal of the Tern Upper Jacket between approximately 11 m above LAT and 132 m below LAT complies with OSPAR Decision 98/3 and Regulatory requirements.
Rigid Pipeline Riser Sections	
The rigid pipeline risers were installed with the Tern sub-structure and the upper sections of these risers will be removed as part of the Upper Jacket. The cut elevations of the risers will be aligned with the Upper Jacket cut elevations at approximately 10 m above LAT and 132 m below LAT.	Removal of the Tern rigid risers with the Upper Jacket to approximately 11 m above LAT and 132 m below LAT complies with OSPAR Decision 98/3 and Regulatory requirements.
Flexible Riser & Umbilical Sections	
There are ten flexible risers, and four umbilicals installed in J tubes, which are part of the Tern sub- structure. The upper sections of the J Tubes, flexible risers, and umbilical risers will be removed with the Upper Jacket. The J tubes cut depth will be aligned with the Upper Jacket cut depth at 132 m below LAT or deeper.	Removal of the Tern J tubes flexible risers and umbilical risers with the Upper Jacket to approximately 132 m below LAT complies with OSPAR Decision 98/3 and Regulatory requirements.



Table 1-7: Summary of Decommissioning Programmes					
Proposed Decommissioning Solution Reason for Selection					
Conductors					
The well conductors may be removed as part of the Topsides decommissioning scope or as part of the Upper Jacket decommissioning scope. Irrespective, the conductors will be cut above the seabed, at approximately the same elevation as the Upper Jacket of 132 m below LAT, or deeper, at the lowest practicable height that does not disturb the cuttings pile. The sections that are removed will be transported to shore for recycling.	Partial removal of the conductors to approximately 132 m below LAT complies with OSPAR Decision 98/3 and Regulatory requirements.				

Interdependencies

Decommissioning the Tern Upper Jacket will not directly impact any pipelines or installations as there will be no operational facilities connected to the Tern Upper Jacket following topsides decommissioning.

The Western Leg Gas Pipeline (WLGP), which provides a fuel source for the Tern platform, ends at the Tern Subsea Isolation Valve (SSIV). The decommissioning of Tern, along with TAQA's other NNS platforms which are connected to the WLGP will impact the pipeline configuration and third party users of the pipeline system. TAQA has engaged the WLGP Operator to initiate discussion over feasible disconnection options. TAQA has also engaged with the Western Isles floating production installation Operator to agree future arrangements with regards to this service, as Western Isles ties into the Tern SSIV structure.

The Hudson, Cladhan and Kestrel / Falcon subsea installations all produced via the Tern platform. These subsea installations ceased production at the same time as Tern. Cessation of production and decommissioning at Tern will therefore not strand any economic reserves.

TAQA will liaise with the relevant riser S29 notice holders regarding the riser sections that will be removed with the Upper Jacket.

The Upper Jacket decommissioning solution will not preclude any feasible future proposals for decommissioning the Footings and associated riser sections.





1.6 Field Location Including Field Layout and Adjacent Facilities

Figure 1.2: Tern Field Location in UKCS

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Table 1-8: Adjacent Facilities							
Owner	Owner Name Type Distance / Direction Information Status						
TAQA Bratani Limited	Otter Water Injection Pipeline	16" Pipeline PL1317	Tern to Otter	Water Injection	Out of use pending Decommissioning		
TAQA Bratani Limited	North Cormorant Gas Pipeline	8" Pipeline PL478	Tern to North Cormorant	Gas Import/Export line	Out of use pending Decommissioning		
TAQA Bratani Limited	North Cormorant Oil Pipeline	16" Pipeline PL477	Tern to North Cormorant	Oil Export line	Out of use pending Decommissioning		
TAQA Bratani Limited	Eider Water Injection Pipeline	12" Pipeline PL476	Tern to Eider	Water Injection line	Disused / IPR		
Dana Petroleum (E&P) Ltd	Western Isles FPSO	Production Facility	11.2 km west south west of Tern	Floating production installation	Out of use pending Decommissioning		
Dana Petroleum (E&P) Ltd	Western Isles Gas Pipeline	6" Pipeline PL3186	Tern to Western Isles	Gas Import/Export line	Out of use pending Decommissioning		
TAQA Bratani Limited	Hudson	Subsea Wells	10.2 km west of Tern	Production / Water Injection	Out of use pending Decommissioning		
TAQA Bratani Limited	Hudson Production Pipeline	10" Pipeline PL1018A	Tern to Hudson	Production	Out of use pending Decommissioning		
TAQA Bratani Limited	Hudson	10" Pipeline PL1019A	Hudson to Tern	Production	Out of use pending Decommissioning		
TAQA Bratani Limited	Hudson	8" Pipeline PL1020A	Hudson to Tern	Production / Test	Out of use pending Decommissioning		
TAQA Bratani Limited	Hudson	Umbilical PLU6450	Tern to Hudson	Chemical Umbilical	Out of use pending Decommissioning		
TAQA Bratani Limited	Hudson	8" Pipeline PL1021A	Tern to Hudson	Water Injection	Out of use pending Decommissioning		
TAQA Bratani Limited	Falcon	Subsea Well	7.1 km north east of Tern	Production	Out of use pending Decommissioning		
TAQA Bratani Limited	Falcon	8" Pipeline PL2765	7.1 km north east of Tern	Production	Out of use pending Decommissioning		



Table 1-8: Adjacent Facilities					
Owner	Name	Туре	Distance / Direction	Information	Status
TAQA Bratani Limited	Falcon	4" Pipeline PL2766	7.1 km north east of Tern	Gas Lift	Disused / IPR
TAQA Bratani Limited	Falcon	Umbilical PLU2767	7.1 km north east of Tern	Control Umbilical	Disused / IPR
TAQA Bratani Limited	Kestrel	Subsea Wells	7.6 km north east of Tern	Water Injection / Production	Out of use pending Decommissioning
TAQA Bratani Limited	Kestrel	8" Pipeline PL1851	Kestrel to Tern	Production	Out of use pending Decommissioning
TAQA Bratani Limited	Kestrel	4" Pipeline PL1852	Kestrel to Tern	Gas Lift	Disused / IPR
TAQA Bratani Limited	Kestrel	8" Pipeline PL1317JKEU- W1	Tern to Kestrel	Water Injection Flowline	Out of use pending Decommissioning
TAQA Bratani Limited	Cladhan	Subsea Wells	15.8 km south west of Tern	Water Injection / Production	Out of use pending Decommissioning
TAQA Bratani Limited	Cladhan	10" Pipeline PL3572	Tern to Cladhan	Production	Out of use pending Decommissioning
TAQA Bratani Limited	Cladhan		Cladhan to Tern	Gas Lift	Out of use pending Decommissioning
TAQA Bratani Limited	Cladhan		Cladhan to Tern	Control Umbilical	Out of use pending Decommissioning
TAQA Bratani Limited	Cladhan		Cladhan to Tern	Water Injection	Out of use pending Decommissioning

Impacts of Decommissioning

These Decommissioning Programmes cover the Tern Upper Jacket and associated riser sections. The TAQA operated Hudson, Cladhan and Kestrel / Falcon subsea installations that tie back to Tern ceased production at the same time as the platform. Therefore, removing the facilities in the scope of these Decommissioning Programmes will have no impact on the operation TAQA's other facilities in the area. Similarly, while there are a number of third party installations in the area, none of these are physically connected to the Tern platform, nor are they reliant in any way on the continuous presence of the Tern Upper Jacket. Therefore, the decommissioning proposals in this document will have no impact on any third-party infrastructure.



1.7 Industrial Implications

TAQA developed the Tern Upper Jacket decommissioning contract and procurement strategy, on behalf of the Section 29 Notice Holders. TAQA has, and will continue to:

- Publish Tern Upper Jacket decommissioning project information, including the high-level project schedule, on the TAQA decommissioning <u>website</u>:
- In the event of further contract awards for Tern Upper Jacket decommissioning, TAQA will
 publish project information and contact details on the NSTA (North Sea Transition Authority)
 Pathfinder <u>website</u>:
- Engage with the NSTA and the decommissioning supply chain on any future issues relating to the Tern Upper Jacket and Associated Riser Sections Decommissioning Programmes and schedule:
- Use the FPAL database as the primary source for establishing tender lists for any future contracts and purchases with a value of £250,000 or more.



2 DESCRIPTION OF ITEMS TO BE DECOMMISSIONED

2.1 Installation: Upper Jacket

Table 2-1: Jacket Information					
		Location		Upper Jacket	
Name	Facility Type			Total Estimated Recovered Weight (Te)	No. of Legs
		WGS84	61º 16' 33.642" N 00º 55' 10.189" E		
Tern (Upper Jacket)	Fixed Steel	WGS84 Decimal Minute	61° 16.561'N 00° 55.170'E	≈ 14,800*	8

*Including marine growth

See Figure 2.1.





Figure 2.1: Tern Installation



2.2 Pipeline and Umbilical Riser Sections

The Tern Upper Jacket supports pipeline, and umbilical riser sections. Portions of the risers and pipelines outwith the Upper Jacket, i.e. attached to the Footings or on the seabed, are beyond the scope of these decommissioning programmes.

Section 1.4.2 lists the pipeline, and umbilical riser sections which are attached to the Upper Jacket and will be removed with it. The risers will be cut at the Upper Jacket cut elevations at approximately 11 m above LAT and 127 m below LAT. The risers may be cut at a depth greater than 127 m below LAT if it is practicable to do so. Irrespective, the risers will be cut at a depth that avoids disturbance of the drill cuttings pile at the base of the sub-structure.

2.3 Wells

There are no wells in the scope of these Decommissioning Programmes. The Tern wells are described in the Tern Topsides Decommissioning Programme [1].

2.4 Drill Cuttings

There are no drill cuttings in the scope of these Decommissioning Programmes. The Tern Footings and Associated Riser Sections Decommissioning Programmes will address the drill cuttings.

2.5 Inventory Estimates

The approximate amounts of materials that make-up the Tern Upper Jacket have been evaluated. These estimates will be refined during detailed engineering and the quantities of materials coming ashore will be tracked through the dismantling phase of the project to confirm overall quantities and the proportions that go to reuse, recycle and disposal.

A summary of the material inventories for the Tern Upper Jacket is presented in Table 2-2 and in Figure 2.2.

Table 2-2: Material Inventory					
Material	Weight Te	% Of Total			
Ferrous Metal	≈ 12,845	≈ 86.8			
Hazardous Material / NORM	≈ 15	≈ 0.1			
Other Non-Hazardous (Including Marine Growth)	≈ 1,940	≈ 13.1			
Concrete	0	0			
Total	≈ 14,800	≈ 100			





Figure 2.2: Material Inventory

This estimate includes the total weight of all material present, including allowances for marine growth and additional material added since the original installation of the platform. The quantity of marine growth is estimated to be approximately 700 Te. This is accounted for as part of the "Other Non-Hazardous" category. The Upper Jacket weight is inclusive of an estimated 15 Te of hazardous waste. This is limited to paint and its presence only extends through the splash zone to a depth of approximately 8 m below LAT.



3 REMOVAL AND DISPOSAL METHODS

The reuse of an installation or its constituent parts is the preferred decommissioning option. TAQA carried out a review of options for reusing the Tern platform, including the Upper Jacket, and concluded there are no technically viable reuse options.

The majority of the Tern Upper Jacket is steel, which will be recovered and recycled. The small proportion of materials remaining after recycling will be disposed of appropriately in accordance with TAQA policies and the relevant regulatory requirements.

3.1 Upper Jacket Decommissioning Overview

The Tern sub-structure is located in 167 m of water and its full height is 178 m. The Tern Upper Jacket will be removed between around 11 m above LAT and approximately 132 m below LAT which is 35 m above the seabed, see Figure 2.1 and Figure 3.1 below. TAQA will inform OPRED when the exact cut elevations are determined.



Figure 3.1: Tern Sub-structure



Two of the jacket legs, B1 and B4, form diesel storage tanks that extend from -105 m LAT to +11 m LAT. Leg A1 forms a base oil storage tank that extends from -70 m LAT to +11 m LAT. The volume of each diesel tank is approximately 670 m³, the volume of the base oil tank is approximately 360 m³. See Figure 1.1. Since the Upper Jacket will be cut at -132 m LAT the bases of the diesel and base oil leg tanks will not be cut through during Upper Jacket removal. The diesel tanks and base oil tank will have been drained and cleaned as part of the platform de-energisation process well in advance of the Upper Jacket removal. There may be small residual volumes of diesel and base oil remaining in the tanks after draining and cleaning that could be discharged during Upper Jacket removal. Prior to Upper Jacket removal operations commencing TAQA will apply for an oil discharge permit under the Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations (OPPC) to cover potential residual diesel and base oil discharges. These discharges will be fully assessed in the relevant permit applications.

The water tanks in Legs A2, A3, B2 and B3 extend from approximately -156 m LAT to around +10 m LAT. The volume of each tank is approximately 650 m^3 . The water tanks will be cut through when the upper jacket is removed. See Figure 1.1.

The cut depth at 132 m below LAT was determined following detailed engineering considering technical constraints including structural design, cross bracing configuration and cutting technology.

- The structural design influences the cut depth as the Upper Jacket must retain sufficient structural integrity to allow it to be lifted and handled safely. Additionally, there are risers and J tubes within the Upper Jacket that must be supported during removal. Therefore, the locations of the supports also influence the selected cut depth. Finally, the available lift system's load limits and hook height influence the Upper Jacket lift.
- 2. The cross-bracing configuration is part of the structural design, but also influences cut depth as only locations where there is sufficient room between bracings to allow Remotely Operated Vehicle (ROV) and cutting tool access are suitable for cuts.
- 3. The cutting technology constraint is related to the cross bracing configuration constraint. The technology used and the size of the tool required to make the cuts in the sub-structure members determines where it can fit between the cross braces and effectively dictates locations where cuts may be made.

The configuration of the cross bracings and the access requirements for cuttings tools were the main drivers for the selected cut depth. The selection also considered safety and environmental constraints. The weight of the Upper Jacket is approximately 14,800 Te. This weight includes an allowance for the weight of the risers, which will be partly removed with the Upper Jacket.

TAQA conducted studies on removal techniques for its NNS steel piled jackets Upper Jackets and Footings [2][3] in accordance with OSPAR 98/3. These considered options for removal of the Upper Jacket and Footings. These options included removing the Upper Jacket and Footings as a single structure and removing the Upper Jacket and Footings separately. Removing the Upper Jacket and Footings as a single structure presents a number of technical constraints and challenges;

- 1. The Upper Jacket and Footings are so tall that if they were lifted as one piece it would not be possible to lift them clear of the water and onto a barge in an upright orientation.
- 2. Transporting the Upper Jacket and Footings in one piece on its side on a barge or other vessel is not possible as the structure cannot support its self-weight in this orientation and there is a risk of the structure collapsing during transportation or unloading.
- 3. Transporting the Upper Jacket and Footings in one piece hanging on a crane vessel's hooks is approaches the limit of the largest available crane vessel's capacity.



4. The Upper Jacket and Footings cannot be lifted onto a quayside in one piece due to the height of the structure and limits on crane vessel lift heights. Therefore, the jacket would have to be set down in inshore waters and dismantled in pieces using a crane vessel.

Therefore, TAQA concluded that in all conceptual scenarios for removal of the Upper Jacket and Footings, the separation of the Upper Jacket from the Footings would be a pre-requisite for any potential Footings decommissioning methodology [2]. TAQA conducted a further study to determine if removal of the Upper Jacket would preclude potential Footings decommissioning options [3]. The study concluded that removal of the Upper Jacket will not prejudice Footings decommissioning, and that a delay of the order of years or decades between the removal of the Upper Jacket and potential decommissioning of the Footings would not impact the Footings' mechanical strength to an extent that would preclude their decommissioning. The removal of the Upper Jacket will be carried out such that it does not preclude the potential future decommissioning of the Footings, since following removal of the Upper Jacket the Footings have sufficient inherent structural integrity to allow a variety of decommissioning options utilising a range of decommissioning vessels and methodologies to be considered.

Following Upper Jacket removal, TAQA will conduct an as left survey of the Footings, to confirm that Upper Jacket removal is in accordance with the DP. TAQA will notify the presence of the Footings to other sea users through the FishSAFE mapping and bulletin system and via inclusion on Admiralty charts. The Consent to Locate for the Tern platform will be modified following Upper Jacket removal. The modified Consent to Locate will remain in place until final decommissioning of the installation, which will occur when the platform footings are removed, or when derogation is granted for the footings to be decommissioned in situ. Following complete field decommissioning, a post removal monitoring scheme will be agreed with OPRED by TAQA. This will typically include an independent verification of the seabed, two environmental baseline surveys, at least two pipeline surveys, and two surveys of the Tern platform location.

The Footings and drill cuttings pile are shown in Figure 3.2. The Footings and associated riser sections will be the subject of separate Decommissioning Programmes that will also address the fate of the cuttings pile. The Tern substructure is a candidate for derogation under OSPAR 98/3. If derogation is granted, the Footings, associated riser sections and cuttings pile may be left in situ.

The recovered Upper Jacket and associated riser sections will be returned to shore for recycling or disposal. TAQA will select a recycling and disposal facility appropriately considering safety, environmental, socio-economic, availability and cost factors. If a dismantling yard outside the UK is selected, TAQA will comply with the trans-frontier waste regulatory regime pertaining at that time. Notwithstanding, TAQA will inform OPRED of the selected removal method and disposal route.





Figure 3.2: Tern Footings

3.2 Upper Jacket Removal Methods

TAQA has conducted various studies [2] on removal techniques for the complete removal of its NNS steel piled jackets, Upper Jackets and Footings in accordance with OSPAR 98/3. Due to the complexities of the Footings, all current proven technologies require removal of the Upper Jacket separately from the Footings. The removal of the Upper Jacket will be carried out such that it does not preclude the possible future decommissioning of the Footings [3].

The removal methods considered by TAQA for the Tern Upper Jacket are listed in Table 3-1 below:



Table 3-1: Upper Jacket Proposed Removal Methods				
 HLV (Semi-submersible crane vessel) ⊠ SLV ⊠ Other ⊠ (Dual HLV) 				
Method	Description			
Removal by SLV	Removal of the Tern Upper Jacket could be achieved by cutting at approximately 132 m below LAT and utilising the SLV Pioneering Spirit's JLS (Jacket Lift System). The JLS would lift and rotate the jacket and transport it to shore. The vessel's size prevents it entering most ports. Therefore, the vessel would transit to a nearshore location and offload the Upper Jacket onto a barge. The barge would then transport the Upper Jacket to shore for recycling and disposal.			
Removal by HLV	Removal of the Tern Upper Jacket to a depth of 132 m below LAT could be achieved by an HLV cutting the Upper Jacket into two sections. Each section height would be determined by the HLV's ability to transfer the lift to the quayside directly, avoiding the requirement for a transfer barge. The HLV would transport each section to shore for recycling and disposal			
Removal by dual HLVs	Removal of the Tern Upper Jacket could be achieved by cutting at approximately 132 m below LAT and recovering the Upper Jacket in sections, each by twin HLVs working in tandem to conduct a "quad lift" and transfer to barge. The barge would then be towed to an onshore facility for recycling and disposal of the recovered jacket.			
Proposed removal method and disposal route	The recovered section of the Upper Jacket and associated riser sections will be taken ashore for recycling and disposal. TAQA has selected a removal contractor following a tender evaluation process that considered safety, environmental, technical, and socio-economic factors. TAQA will select removal methods and disposal routes in collaboration with the removal contractor. OPRED will be informed once the removal method and recycling and disposal routes have been selected.			



3.3 Waste Streams

Table 3-2: Waste Stream Management Methods			
Waste Stream	Removal and Disposal Method		
Carbon Steel	Carbon steel will be recycled		
Hazardous Material / NORM	Hazardous material, including NORM, will be recovered to shore and disposed of under appropriate permits and in accordance with relevant regulations and guidance.		
Other Non – Hazardous (Including Marine Growth)	Non-ferrous metals – principally material from sacrificial anodes will be recycled. Marine Growth – some marine growth may be removed offshore to allow cutting and lifting activities; the remainder will be taken ashore for recycling/disposal under appropriate permits.		
Onshore Dismantling Sites	Appropriate licenced sites will be selected for onshore dismantling, recycling, and disposal. TAQA will ensure that the removal contractor has a proven track record and waste stream management throughout the deconstruction process. TAQA will carry out audits on disposal yards to provide assurance that they are compliant with legislation. Once an onshore dismantling site has been selected OPRED will be advised.		

Table 3-3: Inventory Disposition						
Waste Stream	Total Inventory Tonnage	Planned Tonnage to Shore	Planned Left in situ			
Upper Jacket	14,800 Te	14,800 Te	0 Te			

Recovered material will be landed ashore between 2025 and 2028. It is not possible to fully define the available recycling and waste disposal sites and treatment options, which will be determined through a competitive tendering process. Therefore, the following is a summary of the general waste disposal strategy. Percentages shown relate to the weight of material which is expected to be recovered to shore.

On removal and where practical, TAQA will ensure the principles of the waste hierarchy will be met in the handling of materials from the Tern Upper Jacket decommissioning to maximize the amount of material which can be reused or recycled.

Preventing waste is the most preferred option. This will be achieved through reducing consumption and using resources efficiently. TAQA will comply with the Duty of Care requirements under the UK Waste Regulations and The Environmental Protection (Duty of Care) (Scotland) Regulations 2014. The project will follow industry good practice at all stages of reuse, recycling, and disposal.

The project will target options at the top of the waste hierarchy. Based on the current materials breakdown, TAQA aims to recycle around 95 % of the waste generated from these programmes. The possibility for the recovered material to be contaminated by marine growth, hydrocarbons, paints, etc. may limit the recovered material that can be successfully recycled.



Waste management activities will be conducted in full compliance with all relevant legislation and regulatory controls. Disposal to landfill will be the option of last resort when there are no other options and the environmental disadvantages of alternatives to landfill outweigh any benefits. For example, alternatives to landfill may involve additional transportation mileage or additional waste treatment, emissions, or discharge impacts.

TAQA recognises that there will be large quantities of material returned to shore for recycling or disposal. Regardless of the ultimate destination there will be sufficient notice provided to ensure that there is suitable capacity for processing landed material, taking cognisance of destination handling capacity and availability, and to allow all applicable regulatory bodies, stakeholders, and contractors to be engaged appropriately.



4 ENVIRONMENTAL APPRAISAL OVERVIEW

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The Environmental Appraisal (EA) considered the potential for significant environmental effects as a result of interactions between the proposed decommissioning activities and sensitive environmental receptors. It has been prepared in accordance with BEIS Decommissioning Guidelines [4], and Decom North Sea EA Guidelines [5].

The environmental sensitivities around the Tern platform are summarised in Table 4-1. The environmental assessment has not identified any significant environmental effects as a result of activities described within these Decommissioning Programmes. The rationale behind the assessments that there are no significant impacts are presented in Table 4-2. However, TAQA is committed to implement appropriate environmental management measures to further reduce the potential for environmental effects. These management measures are summarised in Table 4-3.

Table 4-1: Environmental Sensitivities				
Environmental Receptor	Main Features			
Environmental Receptor	Main FeaturesThere are no Nature Conservation Marine Protected Areas (NCMPAs), Special Protection Areas (SPAs), Special Areas of Conservation (SACs) or Demonstration and Research Marine Protected Areas (DRMPAs) within 40 km of Tern. The closest designated site is the Pobie Bank Reef SAC, located approximately 72 km southwest of the Tern decommissioning area.The ocean quahog is listed by OSPAR as a threatened and/or declining species and is also listed as a Scottish Priority Marine Feature; records of this species occur over large areas of the central and northern North Sea. From site-specific survey work conducted, a single specimen was observed at one station in 2019, 280 m southeast of the Tern Platform. Seapens and burrowing megafauna were also identified during this survey. No other features of conservation interest, such as stony or biogenic reefs, have been recorded within the vicinity of the proposed			
	decommissioning activities. A review of the data from the survey area surrounding Tern			
	species, including but not limited to, the Annex I Habitat "Submarine structures made by leaking gases".			

4.1 Environmental Sensitivities (Summary)



Table 4-1: Environmental Sensitivities			
Environmental Receptor	Main Features		
Seabed	The Tern platform is located at a water depth of 167 m. Current speeds are low and the combined energy at the seabed from wave and tide action is also low. Survey work shows that the seabed sediments present are slightly gravelly muddy sand. This is consistent with mapped information which classifies this region of the North Sea as the European Nature Information System (EUNIS) broadscale habitat A5.27 offshore circalittoral sand. Invertebrate communities living within the sediments were found to have variable dominating species of annelids and polychaete worms. Taxa identified across the Tern survey area are broadly similar to those encountered previously in the NNS. A single specimen of the clam species known as ocean quahog (<i>Arctica islandica</i>) was identified during survey work in 2019. Seapens and burrowing megafauna were also identified during this survey.		
Fish and Shellfish	The Tern field lies within known spawning grounds for cod, haddock, Norway pout, sandeel, saithe and whiting. Of these species, two (sandeels and herring) use the seabed directly for spawning. Norway pout and cod have been recorded as having high intensity spawning in the vicinity of Tern. The area is also a nursery ground for anglerfish, blue whiting, European hake, haddock, herring, ling, mackerel, Norway pout, sandeel, spurdog, and whiting. Blue whiting is the only species with a high nursery intensity ground in the Tern area.		
Fisheries	The Tern Field is located in International Council for the Exploration of the Sea (ICES) rectangle 51F0. This region is primarily targeted for demersal species, with some minor shellfish and pelagic fishing occurring therein. Annual fishery landings by live weight and value are considered low for shellfish and pelagic fisheries and moderate for demersal fisheries in comparison to other areas of the North Sea. Fishing effort has remained relatively low within this region for the last five fishing years and is dominated by bottom-towed demersal fishing gears. Fishing effort generally peaks between April and June within ICES Rectangle 51F0.		
Marine Mammals	Harbour porpoise (Phocoena hocoena), Atlantic white-sided dolphin (Lagenorhynchus obliquidens) and minke whale (Balaenoptera acutorostrata) were the most abundant species recorded in the survey block covering the Tern Decommissioning area. These species are Scottish Priority Marine Features (PMFs) and European Protected Species (EPS). The harbour porpoise is also protected under Annex II of the EU Habitats Directive (92/43/EEC as amended by 97/62/EC). Both grey and harbour seal densities are known to be low 104 km offshore. Around Tern densities are predicted to be between 0 and 1 seals per 25 km ² for both species, which is considered low.		
Onshore Communities	Onshore communities are potentially sensitive to disturbance from cleaning, dismantling and disposal activities. TAQA will select onshore decommissioning facilities that comply with all regulatory requirements to ensure that potential impacts are appropriately controlled.		



Table 4-1: Environmental Sensitivities			
Environmental Receptor	Main Features		
	The proposed decommissioning operations are located in a well- developed area for oil and gas extraction. There are no operational offshore wind farms in the vicinity of the project area. However, the project area is close to areas identified under the Innovation and Targeted Oil and Gas (INTOG) wind energy scheme. INTOG area NE-b lies approximately 15 km southeast of Tern and INTOG area NE-a lies approximately 27 km northwest of Tern. In addition to the INTOG areas, the NE1 ScotWind area lies approximately 96 km south-southwest of Tern.		
Other Users of the Sea	Apart from pipelines and umbilicals associated with the Tern Field, there are no other pipelines, umbilicals or power cables in the vicinity, no designated military practice and exercise areas nearby. The closest wreck is Transcend (a motor fishing vessel) located within Block 211/21, approximately 6 km to the east of Block 210/25. The closest wreck is Transcend (a motor fishing vessel) located within Block 211/21, approximately 6 km to the east of Block 211/21, approximately 6 km to the east of Block 211/21, approximately 6 km to the east of Block 211/21, approximately 6 km to the east of Block 211/21, approximately 6 km to the east of Block 210/25.		
	Shipping density in the NNS in the vicinity of the proposed decommissioning activities is low. Between 50-100 vessels transit through Block 210/25 annually.		
Atmosphere	The primary source of atmospheric emissions will be from vessel activity during decommissioning activities.		

4.2 Potential Environmental Impacts and their Management

A review of potentially significant environmental and social interactions has been completed and, considering the mitigation measures that will be built into the project activities, there is expected to be no significant impact on receptors from Tern Upper Jacket decommissioning.

Given the remote offshore location of the Tern field, there is no potential for Tern Upper Jacket decommissioning to impact any European or nationally designated protected sites. The Environmental Appraisal has considered the Scottish National Marine Plan adopted by the Scottish Government to help ensure sustainable development of the marine area. TAQA considers that the proposed decommissioning activities are in alignment with its objectives and policies.

Therefore, based on the findings of the Environmental Appraisal including the identification and subsequent application of appropriate mitigation measures, and project management according to TAQA's Health, Safety, Security and Environment Policy and Environmental Management System (EMS), it is considered that the proposed Tern Upper Jacket decommissioning activities do not pose any significant threat of impact to environmental or societal receptors within the UKCS. Summaries of the bases for this determination are given in Table 4-2.

Notwithstanding, TAQA is committed will apply the management measures set out in Table 4-3 to ensure that decommissioning activities at Tern represent good practice and reduce further any potential environmental impacts.



Table 4-2: Environmental Impact Screening Summary			
Impact	Further Assessment	Rationale	
Emissions to Air	No	 Majority of emissions relate to vessel time, or the recycling of material returned to shore which will be limited in duration. The estimated CO₂ emissions generated by the decommissioning activities is 24,033 Te. This is based on four vessels working offshore for a total of approximately 90 vessel days, and onshore deconstruction, material transport and material recycling. The total CO₂ emissions equate to less than 14% of the operational emissions emitted by the Tern asset during 2022 and approximately 0.17% of the total UKCS oil and gas emissions in 2022 (14,300,000 Te; OEUK, 2023). Considering the above, atmospheric emissions do not warrant further assessment 	
Disturbance to the Seabed	No	 Planned use of dynamically positioned vessels therefore no direct seabed interaction associated with the decommissioning. Cutting will be carried out using abrasive water jet or diamond wire. Both techniques will generate swarf, and abrasive water jet will release spent abrasive media. Any swarf, abrasive media, marine growth, etc. that falls to the seabed will fall within a footprint that extends some 15 m from the base of the Jacket. Any such discharges are unlikely to cause significant disturbance to the seabed or cuttings pile. Following award of contract and selection of cutting methodology, any such disturbances will be quantified and assessed in the Marine Licence application submitted in support of the execution of Upper Jacket removal. On this basis, no further assessment need be undertaken. 	
Physical Presence of Vessels in Relation to Other Users of the Sea	No	 Limited in duration Similar vessels to those currently deployed for oil and gas installation, operation, and decommissioning activities. Vessel activity focussed within the existing 500 m safety zone and will not occupy "new" areas. Other sea users will be notified in advance of and subsequent to operations. The decommissioning of the Tern Upper Jacket is estimated to require up to four vessels, however these would not all be on location at the same time (max of three at any one time) Considering the above, temporary presence of vessels does not need further assessment. 	



Table 4-2: Environmental Impact Screening Summary			
Impact	Further Assessment	Rationale	
Physical presence of infrastructure decommissioned in situ in relation to other sea users	No	• The decommissioning of the Upper Jacket will not result in any material left in situ. However, the Jacket Footings will remain in situ. The Footings and associated riser sections will be the subject of subsequent Decommissioning Programmes.	
		On this basis, no further assessment need be undertaken.	
Physical presence of Footings following removal of the 500 m safety zone but prior to the footings DP approval in relation to other sea users	No	 Once the Upper Jacket is removed, there will be no aids to navigation in place to alert other sea users to the presence of the Jacket Footings. This issue will be addressed in a variation to the Consent to Locate for the installation. This change potentially leads to an increase in the risk to other sea users. To mitigate the risk TAQA will advise the relevant bodies of changes to the installation to facilitate updates to Admiralty charts and the FishSAFE system to notify other sea users of the presence of the Jacket Footings. These mitigation measures will be addressed in the application to vary the Consent to Locate. 	
		On this basis, no further assessment need be undertaken.	



Table 4-2: Environmental Impact Screening Summary			
Impact	Further Assessment	Rationale	
		• Discharges from vessels are typically well- controlled activities that are regulated through vessel and machinery design, management, and operational procedures.	
		• The potable water storage tanks located in the legs will be cut through during removal activities. This may lead to the discharge of potable water to sea. Given the benign nature of potable water, these discharges will not have any adverse environmental impact.	
Discharges to Sea	No	 The storage tanks for diesel in legs B1 and B4 and base oil in leg A1 will not be cut through during removal activities. However, there may be small residual quantities of diesel and base oil discharged during Upper Jacket removal. These discharges are expected to be negligible as the tanks will have been emptied and cleaned as part of preparation activities. Prior to Upper Jacket removal operations commencing, TAQA will apply for an oil discharge permit under the Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations (OPPC) to cover any residual diesel discharges. These potential discharges will be fully assessed in the relevant permit applications. 	
		 Any marine growth present on the Upper Jacket will be removed prior to cutting but will be limited to the cut location and lift points. This will be fully assessed in the relevant environmental permit applications. Marine growth remaining on the Upper Jacket will be removed onshore. Considering the above, discharges to sea 	
		resulting from any vessel and Upper Jacket removal activity should not be assessed further.	



Table 4-2: Environmental Impact Screening Summary			
Impact	Further Assessment	Rationale	
Underwater Noise Emissions	No	 Aside from vessel noise and Upper Jacket cutting activities, there will be no other noise generating activities. Vessel presence and cutting activities will be limited in duration. The project is not located within an area protected for marine mammals. With industry-standard mitigation measures and JNCC guidance, EAs for offshore oil and gas decommissioning projects typically show no injury, or significant disturbance associated with these projects. The cutting technique is likely to be diamond wire, or possibly abrasive water jet. Department of Energy Security & Net Zero guidance states that "Sound radiated from the diamond wire cutting of a conductor or abrasive water jets is not easily discernible above the background noise." On this basis, underwater noise assessment does not need assessed further. 	
Resource Use	No	 Limited raw materials required (largely restricted to fuel use). The estimated total energy usage for the decommissioning activities is 268,244 GJ. Material will be returned to shore as a result of project activities, expectation is to reuse or recycle c.95 % of this returned material. There may be instances where infrastructure returned to shore is contaminated and cannot be recycled, but the weight and volume of such material is not expected to result in substantial landfill use. Considering the above, resource use does not warrant further assessment. The waste to be brought to shore will be managed in line with TAQA's Waste 	
Waste	No	Management Strategy and the Waste Hierarchy, as part of the project AWMP, using approved waste contractors and in liaison with the relevant Regulators. On this basis, no further assessment of waste is necessary.	



Table 4-2: Environmental Impact Screening Summary			
Impact	Further Assessment	Rationale	
Unplanned Events	No	 The OPEP in place for the Tern platform will be revised as necessary to cover decommissioning. SOPEPs will be in place for vessels used in decommissioning operations. Emergency response procedures will be in place for the Tern installation and decommissioning vessels during decommissioning operations. Wells will be abandoned to OEUK WDP2 [6] prior to Upper jacket removal. Therefore, the reservoir will be fully isolated from the surface to prevent any release of reservoir fluids. (TAQA may apply for derogation to leave the Tern platform footings in place. If derogation is granted the wells will be abandoned at "AB2 Derogated" status, in accordance with NSTA guidance, corresponding to OEUK WDP2 status [6]. If derogation is not granted, the wells will be abandoned at AB3 status according to [7], corresponding to OEUK WDP3 status [6]). Considering the above, potential unplanned events during decommissioning activities do not warrant further assessment. 	



Table 4-2: Environmental Impact Screening Summary				
Impact	Further Assessment	Rationale		
		All nesting birds and nesting activities are protected from damage by conservation legislation. Under the Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2017 – (OMR 17), it is an offence to:		
Wild Birds		• take, damage, or destroy the nest of any wild bird while that nest is in use or being built, or		
	No	• take or destroy an egg of any wild bird. TAQA has in place a proactive Seabird Management Strategy, which is managed continuously. This includes a suite of remedial strategies that can be used, if required, to prevent birds from nesting.		
		Part of the strategy includes conducting independent annual nesting bird surveys on each of TAQA's offshore platforms. Since 2021 there has been no evidence of nesting birds on Tern. In addition, monthly surveys are conducted on the platform by trained personnel to provide a summary of bird activity and presence throughout the year. Again, this has not identified any nesting birds.		
		Prior to disembarkation, an asset specific survey will be undertaken to identify those areas of higher risk of nesting birds and appropriate deterrent measures will be put in place.		
		In addition to the ongoing annual surveys, a dedicated survey will be conducted prior to the arrival of the HLV in the field to re-confirm there remains no nesting birds.		
		In the event nesting birds are encountered, TAQA will engage with OPRED to agree any necessary licensing obligations at that time. This may include application for a disturbance licence.		
		Considering the above, the potential impacts on seabirds and seabird nests do not warrant further assessment in this EA.		



Table 4-3: Environmental Impact Management			
Impact	Management		
Emissions to Air	Vessel management in accordance with TAQA's marine procedures. Minimal vessel use/movement. Engine maintenance.		
Disturbance to the Seabed	Dynamically positioned vessels will be used; therefore, no anchoring will take place. A post-decommissioning seabed verification will be conducted using non-intrusive methods.		
Physical Presence of Vessels in Relation to Other Users of the Sea	Minimal vessel use. Notification to Mariners.		
Physical presence of infrastructure decommissioned in	None of the equipment within scope of these Decommissioning Programmes will be left in situ.		
situ in relation to other sea users	The sub-structure Footings that remain after decommissioning will be included in the FishSAFE mapping and bulletin systems and marked on Admiralty charts.		
Discharges to Sea	MARPOL compliance. Bilge management procedures. Vessel audit procedures. Contractor management procedures. Emptying and cleaning of B1 and B4 diesel oil tanks and A1 base oil tank prior to Upper Jacket removal, compliance with regulatory requirements including discharge permit for any residual diesel or base oil.		
Underwater Noise Emissions	There will be no noise generating activities apart from vessel use and underwater cutting. Vessel noise during the cutting process will mask cutting noise. Notwithstanding, vessel use and cutting durations will be minimised where possible. Currently, there are no plans to use explosives. However, should the use of explosives be necessary TAQA will complete appropriate evaluations and consultations prior to their use.		
Waste	Adherence to the Waste Hierarchy. Waste Management Strategy and Active Waste Management Plan.		
Unplanned Events	OPEP in place for operations. SOPEP on all vessels. Navigational warnings in place. Contractor management and communication. Lifting operations management of risk. Dropped object risk assessments		
Wild Birds	Management of wild birds in the vicinity of the Upper Jacket is achieved through the TAQA wild birds management strategy.		



5 INTERESTED PARTY CONSULTATIONS

TAQA consulted a wide range of interested parties during the decommissioning planning stages, preparation of the environmental statements, and compilation of these Decommissioning Programmes. These are summarised as:

Table 5-1: Summary of Stakeholder Comments			
Statutory Consultees			
Who	Comment	Response	
Scottish Fisherman's Federation (SFF) National Federation of Fisherman's Organisations (NFFO) Northern Irish Fish Producers Organisation (NIFPO) Global Marine Services (GMS) North Sea			
Transition Authority (NSTA)			
Other Consultees			
Who	Comment	Response	
Public			



6 PROGRAMME MANAGEMENT

6.1 Project Management and Verification

A TAQA Project Management team will be appointed to manage the selected Tern Upper Jacket removal contractor. TAQA health, environment and safety management principals will govern hazard identification, risk management and operational controls. Where possible the work will be coordinated with due regard to interfaces with other operators' oil and gas assets in the NNS and with other users of the sea. The TAQA Project Management team will control and manage the progress all permits, licences, authorisations, notices, consents, and consultations required as part of this process. Any changes in detail to the offshore removal programme will be discussed and agreed with OPRED.

6.2 Post Decommissioning as Left Status

Following the removal of the Tern Upper Jacket, TAQA will conduct an as left survey of the Footings, to confirm that Upper Jacket removal is in accordance with the approved DPs. The presence of the Footings that remain after the removal of the Upper Jacket will be addressed in a variation to the Consent to Locate and included in the FishSAFE mapping and bulletin systems and marked on Admiralty Charts and notices to mariners as required.

Following complete field decommissioning, an independent verification of the seabed will be performed, and TAQA will conduct two environmental baseline surveys, at least two pipeline surveys, and two surveys of the seabed at the Tern platform location.

6.3 Schedule

The main milestones in the Tern Upper Jacket decommissioning process were, or are anticipated to be:

•	Cessation of production:	Q1 2024
•	Platform topsides / Upper Jacket removal:	2025-2028
•	Tern Upper Jacket removal as left survey:	2029-2030
•	Post removal survey	Post 2029

This schedule may change to maximise economic recovery, or to exploit opportunities to minimise decommissioning impacts by combining activities into campaigns, or by combining Tern decommissioning operations with third-party decommissioning. The Tern Upper Jacket decommissioning schedule is shown below in Figure 6.1.

	2024	2025	2026	2027	2028	2029	2030	2031
Engineering								
Upper Jacket Removal								
Upper Jacket Disposal								
Site Monitoring								
Close Out Report Submission								

KEY:

Planned Activity Window

Note: Actual execution windows will be subject to contractor portfolio and market capacity, and removal may be accelerated.

Figure 6.1: Tern Decommissioning Schedule



6.4 Long Term Facilities Management

The planned decommissioning of the Tern field will take place over an extended period. Throughout this period the asset and the seabed will be in various stages of decommissioning and remediation. At all times, the facilities will be maintained to a standard that enables completion of the programme safely and in compliance with regulations and TAQA's corporate standards.

TAQA will communicate the presence of the Tern Footings through the FishSAFE mapping and bulletin systems and by providing details of the facilities to the UK Hydrographic Office for inclusion on Admiralty charts as appropriate. TAQA will also amend the Tern Consent to Locate to reflect the installation's revised configuration following Upper Jacket removal.

Following complete field decommissioning, an independent verification of the seabed will be performed, and TAQA will conduct two environmental baseline surveys, at least two pipeline surveys, and two surveys of the seabed at the Tern platform location.

6.5 Costs

Table 6-1: Provisional Decommissioning Programmes Costs						
Item	Estimated Cost (£m)					
WBS 1 – Operator Project Management						
WBS 2 – Post CoP OPEX						
WBS 3 – Well Abandonment						
WBS 4 – Facilities & Pipelines Permanent Isolation & Cleaning						
WBS 5 – Topsides Preparation						
WBS 6 – Topsides Removal	Provided to OPRED in confidence					
WBS 7 – Substructure Removal						
WBS 8 – Onshore Recycling						
WBS 9 – Subsea Infrastructure						
WBS 10 – Site Remediation						
WBS 11 – Monitoring						

6.6 Close Out

In accordance with the OPRED guidelines, a close out report will be submitted to OPRED within twelve months of the completion of the offshore decommissioning scope and disposal. Any variances from the approved Decommissioning Programmes will be described and explained in the close out report.

6.7 Post Decommissioning Monitoring and Evaluation

Following the full decommissioning of the Tern field, TAQA will carry out two post decommissioning baseline environmental surveys. The surveys will focus on chemical and physical disturbances of the decommissioned area and be compared with pre decommissioning surveys.

TAQA will also commission an independent verification of the seabed. In addition, TAQA will also conduct at least two pipeline surveys, and two surveys of the Tern platform location.

TAQA will forward a copy of all the survey results to OPRED. After the survey results have been sent to OPRED and reviewed, a post monitoring survey schedule will be agreed by both parties taking account of ongoing liability, and the status and findings of previous surveys. The schedule will apply a risk-based approach to the frequency and scope of further surveys.



6.8 Management of Residual Liability

The Footings and associated riser sections that are left in place following the completion of the Upper Jacket and Associated Riser Sections Decommissioning Programmes will remain the property and responsibility of the Tern S29 notice holders and will be subject to separate Decommissioning Programmes. TAQA will also amend the Tern Consent to Locate to reflect the installation's revised configuration following Upper Jacket removal.

The Tern Operator recognises that the parties to these Tern Upper Jacket and Associated Riser Sections Decommissioning Programmes will continue, post completion of the programme, to retain ownership of, and residual liability for any infrastructure left in place.

The presence of the Tern sub-structure Footings will be communicated and published through the FishSAFE electronic hazard charting system and associated bulletins and by marking the structures on Admiralty charts as appropriate.

TAQA will engage with OPRED on all future legacy and liability matters and relating to the Tern facilities.



7 SUPPORTING DOCUMENTS

- [1] TAQA, Tern Topside Decommissioning Programme, TB-TEADEC01-X-AD-0001-000
- [2] TAQA, Eider Sub-structure Removal Options Structural Assessment, 77-AEIA0288-S-RE-0001-000
- [3] Xodus, Impact of Upper Jacket Removal on Subsequent Footings Removal, A-302504-S00-TECH-002
- [4] Department for Business Energy & Industrial Strategy, Guidance Notes: Decommissioning of Offshore Oil & Gas Installations and Pipelines, November 2018
- [5] Decom North Sea, Environmental Appraisal Guidelines, 2017
- [6] OEUK Well Decommissioning Guidelines, Issue 7 November 2022
- [7] NSTA, UKCS Well Applications and Consents Guidance, July 2022



8 APPENDICES

Appendix 1 Public Notice



Appendix 2 Section 29 Holders' Letter of Support



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