



Kilmar Decommissioning Programmes



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Terms and Abbreviations

Abbreviation	Explanation
AIS	Automatic Identification System
CA	Comparative Assessment
CCSU	Carbon Capture Storage Utilisation
COP	Cessation of Production
DCR	Design and Construction Regulations
DESNZ	Department for Energy Security & Net Zero
DP	Decommissioning Programmes
EA	Environmental Appraisal
ESDV	Emergency Shut Down Valve
EUL	Energiean UK Limited
EUNIS	European Nature Information System
GMG	Global Marine Group
Goose necks	Term used to describe the pipe bends that lift the pipelines from seabed to riser connection flanges ~2m above the seabed
HCF	Hydrocarbon Free
K1	Well 1 (43/22a-K1w)
K2	Well 2 (43/22a-K2x)

K3	Well 3 (43/22a-K3)
HSE	Health and Safety Executive
ICES	International Council for the Exploration of the Seas
JNCC	Joint Nature Conservation Committee
JUWB	Jack-Up Work Barge
KM	Kilometre
LSA	Low Specific Activity
LV	Lift Vessel
M	Metres
M ²	Meters Squared
M ³	Meters Cubed
MAT	Master Application Template
MCV	Monohull Crane Vessel
MCZ	Marine Conservation Zone
MBES	Multi Beam Echo Sounder (survey equipment)
MEG	Monoethylene Glycol
MPA	Marine Protected Area
N/A	Not Applicable
NFFO	National Federation of Fishermen's Organisations
NIFPO	Northern Ireland Fish Producers Organisation
NORM	Naturally Occurring Radioactive Material
NSTA	North Sea Transition Authority
NUI	Normally Unattended Installation
OEUK	Offshore Energies United Kingdom
OPRED	Offshore Petroleum Regulator for Environment & Decommissioning
OSPAR	Oslo and Paris Convention
P & A	Plug and Abandonment
PL	Pipeline
PON	Petroleum Operations Notice
PUK	Perenco (UK) Limited
PWA	Pipeline Works Authorisation
SAC	Special Area of Conservation
SAT	Subsidiary Application Template
SCAP	Supply Chain Action Plan



SLV	Sheer Leg Vessels
SEAL	Sheerwater and Elgin Pipeline
SFF	Scottish Fishing Federation
SNS	Southern North Sea
SoW	Scope of Work
SPA	Special Protected Area
SSCV	Semi-Submersible Crane Vessel
Te	Tonne
SSS	Side Scan Sonar (survey equipment)
THC	Total Hydrocarbon Content
Trent	43/24 Installation
UKCS	UK Continental Shelf
UTM	Universal Transverse Mercator
WGS84	World Geodetic System 1984
WONS	Wells Operations Notification System
WPRL	Waldorf Petroleum Resources Limited
"	Inch, 25.4millimetres

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1 Executive Summary

1.1 Combined Decommissioning Programmes

This document contains two decommissioning programmes for each set of associated notices served under section 29 of the Petroleum Act 1998.

The decommissioning programmes are for:

- Kilmar field, small steel platform; topside, jacket and piles
- Two Kilmar pipelines, PL2162 & PL2163
- The Kilmar and Garrow risers within the Kilmar jacket

1.2 Requirement for Decommissioning Programmes

Installation:

In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Kilmar installation (see Table 1.2) are applying to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) to obtain approval for decommissioning the installation detailed in Section 2.1 and 2.2 of this programme. (See also Section 8 - S29 holder letters of support).

Following public, stakeholder and regulatory consultation, this decommissioning programme is submitted without derogation and in full compliance with Department for Energy Security & Net Zero (DESNZ) guidelines.

Pipelines:

In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Kilmar pipelines (see Table 1.4) are applying to the OPRED to obtain approval for decommissioning the pipelines detailed in Section 2.3 of this programme. (See also Section 8 – S29 holder letters of support).

In accordance with Regulation 14 of the Pipeline Safety Regulations 1996, notification to the Health and Safety Executive (HSE) of the decommissioning of the pipelines and submission of the required variations to the Pipeline Works Authorisation to carry out the pipelines cleaning and disconnection activities will be made.

The schedule outlined in this document is for a 5 year decommissioning project plan due to begin from 2024.

1.3 Introduction

The Kilmar field is in the Southern Basin of the UKCS, block 43/22a, Licence P683.

The Field Operator is Energean UK Limited (EUL). The appointed Installation and Pipelines Operator is ODE Asset Management. The appointed Wells Operator is Exceed Torridon Limited.

The field was discovered in 1992 by appraisal well 43/22-1 and confirmed in 1994 by a second appraisal well 43/22-2. Three producing wells have been drilled to develop the Kilmar Field. The two suspended appraisal wells 43/22-1 and 43/22-2 were re-entered and side tracked in 2006, production wells 43/22a-K1w (K1) and 43/22a-K2x (K2) respectively, a third new production well 43/22a-K3 (K3) was drilled in 2007.

Prior to drilling the production wells a small steel platform, designated as a Normally Unattended Installation (NUI), was installed in 2005. It comprises of a fixed steel jacket weighing 1,425 tonnes which is in 54.8m of water and single topside weighing 450 tonnes. It is located 94km offshore to the East northeast of the nearest landfall at Flamborough Head off the UK coastline and 95km to the West south west of the median line between the UK and Dutch sectors of the North Sea.

A 12” gas export pipeline (PL2162) and piggybacked 3” service pipeline (PL2163) were laid 21.26 km to the Perenco UK Limited (PUK) Trent (43/24) host platform. Gas is then further exported via the Esmond Transmission System (ETS) pipeline to the Bacton Gas Terminal (BGT).

Production first commenced in 2006 with gas production gradually declining until PUK closed the Kilmar export route at Trent in June 2020. Subsequently Kilmar was placed in Hydrocarbon Safe (HCS) status whilst applying for Cessation of Production (CoP) to the NSTA. Kilmar CoP date is 2nd June 2020.

Following public, stakeholder and regulatory consultation, the decommissioning programmes are submitted without derogation and in full compliance with DESNZ guidelines. The decommissioning programmes explain the principles of the removal activities and is supported by an Environmental Appraisal (EA) and Comparative Assessment (CA).

1.4 Overview of Installations and Pipelines Being Decommissioned

1.4.1 Installation

Table 1.1: Installation Being Decommissioned			
Field	Kilmar	Production Type	Gas
Water Depth (m)	54.8	UKCS block	43/22a
Distance to median (km)	95	Distance from nearest UK coastline (km)	94
Surface Installation			
Number	Type	Topside Weight (Te)	Jacket Weight (Te)
1	Fixed steel jacket	450	1,425
Platform Wells		Well Designations	
3		43/22a-K1w, 43/22a-K2x, 43/22a-K3	

Table 1.2: Installation Section 29 Notice Holders Details		
Section 29 Notice Holders	Registration Number	Equity Interest (%)
Waldorf Petroleum Resources Limited	03949599	17%
Energean UK Ltd	06683599	68%
RockRose (UKCS3) Limited	04620801	15%
Waldorf Energy Partners Limited	11957078	0%
Alpha Petroleum (UK) Holdings Limited	08774092	0%
Energean PLC	10758801	0%
Sojitz Corporation	JP000031469JPN	0%
Viaro Energy Limited	12471979	0%

1.4.2 Pipelines

Table 1.3: Pipelines Being Decommissioned

Number of Pipelines (Details given in Table 2.2)	2
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Table 1.4: Pipelines Section 29 Notice Holders Details

Kilmar pipelines		
Section 29 Notice Holders	Registration Number	Equity Interest (%)
Waldorf Petroleum Resources Limited	03949599	17%
Energean UK Ltd	06683599	68%
RockRose (UKCS3) Limited	04620801	15%
Waldorf Energy Partners Limited	11957078	0%
Alpha Petroleum (UK) Holdings Limited	08774092	0%
Energean PLC	10758801	0%
Sojitz Corporation	JP000031469JPN	0%
Viaro Energy Limited	12471979	0%
Garrow risers and pipelines within the Kilmar 500m zone		
Waldorf Petroleum Resources Limited	03949599	17%
Energean UK Ltd	06683599	68%
RockRose (UKCS3) Limited	04620801	15%
Waldorf Energy Partners Limited	11957078	0%
Alpha Petroleum (UK) Holdings Limited	08774092	0%
Energean PLC	10758801	0%
Sojitz Corporation	JP000031469JPN	0%
Viaro Energy Limited	12471979	0%

1.5 Summary of Proposed Decommissioning Programmes

Table 1.5: Summary of Decommissioning Programmes

Proposed Decommissioning Solution	Reason for Selection
1. Topside	
<p>Complete removal and re-use or recycle.</p> <p>The topside will be made hydrocarbon free, removed by a lift vessel and returned to shore.</p> <p>Re-use followed by recycle and then landfill will be the prioritised options for the topside.</p>	<p>Complies with OSPAR requirements and DESNZ guidelines and maximises recycling of materials.</p>

2. Substructures – Jacket

Complete removal and re-use or recycle.

Jacket will be removed and dismantled at an onshore location. Re-use followed by recycle will be the prioritised options.

Jacket skirt piles will be severed at least 3.0m below the seabed. Top sections will be returned to shore with the jacket. If any practical difficulties are encountered EUL will consult OPRED.

Leaves a clear seabed, removes a potential obstruction to fishing operations and maximises recycling of materials, to comply with OSPAR requirements and DESNZ guidance.

3. Pipelines (buried sections)

Pipelines flushed and cleaned and left buried in situ.

Cleaning methodology not yet defined but it is likely the 3" service pipeline will be flushed through with seawater into the Garrow 8" export pipeline. The Kilmar and Garrow export pipelines will then be flushed with seawater at velocity from Trent with up to two pipeline volumes and the contents disposed of down a Garrow well.

Pipelines are fully buried >0.6m below the natural seabed level (see Appendix 9.2 for example depth of burial graphs). The Comparative Assessment concludes minimal seabed disturbance, lower energy usage and reduced risk to personnel is the practicable solution compared to complete removal. No pipeline exposures have been seen in the operational life of the pipelines which have remained buried. Minimal seabed movement has been seen which is not sufficient to expose buried pipelines.

4. Pipeline spools / pipeline platform approaches and stabilisation features

Surface laid tie-in spools/pipeline sections at the platform approaches and their pipeline stabilisation features (mattresses and grout bags) removed, returned to shore, and recycled. If any practical difficulties are encountered EUL will consult OPRED.

Pipeline sections and pipeline stabilisation features (mattresses and grout bags) under rock dump to remain in situ.

A single Mattress at each cut end may also remain to prevent a snagging hazard if the cut end is exposed and not easily covered by the existing rock dump. The mattresses will be moved, the pipelines cut, and any remaining mat will be level with seabed and overtrawlable.

To leave, as far as reasonably practicable, a clear seabed to comply with OSPAR requirements and DESNZ guidance.

CA has concluded that rock dumped trench transition sections should remain in situ.

Current condition does not prevent others from using the seabed and is not a hazard. Recovery of rock is impracticable and redistribution to allow underlying pipeline recovery may create snagging hazards over a wider seabed area.

A full leave in situ of the mattress sections would not maximise a return to clear seabed post decommissioning.

5. Wells

P&A in accordance with HSE 'Offshore Installations and Wells Design and Construction Regulations 1996', 'Offshore Energies UK Guidelines and licence conditions for the Suspension and Abandonment of wells Issue 7, November 2022', and compliant with the relevant WONS applications. Any problems encountered the relevant authority will be consulted.

Conductors will be cut a minimum of 3m below the natural seabed level. If any practical difficulties are encountered EUL will consult OPRED.

Meets HSE regulatory requirements and is in accordance with OEUK and NSTA guidelines and licence conditions.

6. Interdependencies



At the Trent installation the Kilmar pipelines will be decommissioned up to the first riser elbow flanges approximately 2m above seabed. The Kilmar risers on the Trent platform are owned by PUK who will decommission them as part of the Trent decommissioning programme. The Kilmar pipeline tie-in spools and associated mattresses within the Trent 500m safety zone will be decommissioned as part of EUL Kilmar decommissioning programmes.

The Garrow risers (PL 2160 and PL2161) on the Kilmar Installation and the Garrow pipeline tie-in spools and associated mattresses within the Kilmar 500m safety zone will be decommissioned at the same time as the EUL Kilmar decommissioning programmes. The Kilmar and Garrow facilities have the same Section 29 Notice Holders.

A 36" SEAL pipeline (PL1570) crosses under the Kilmar pipelines 5.3 km from the Kilmar platform. The pipeline is owned by TotalEnergies Offshore UK Limited and is not affected by Kilmar decommissioning.

There are no other third party pipeline or cable crossings.

1.6 Field Location Including Field Layout and Adjacent Facilities

Figure 1.1 Field Location in UKCS Quadrant 43

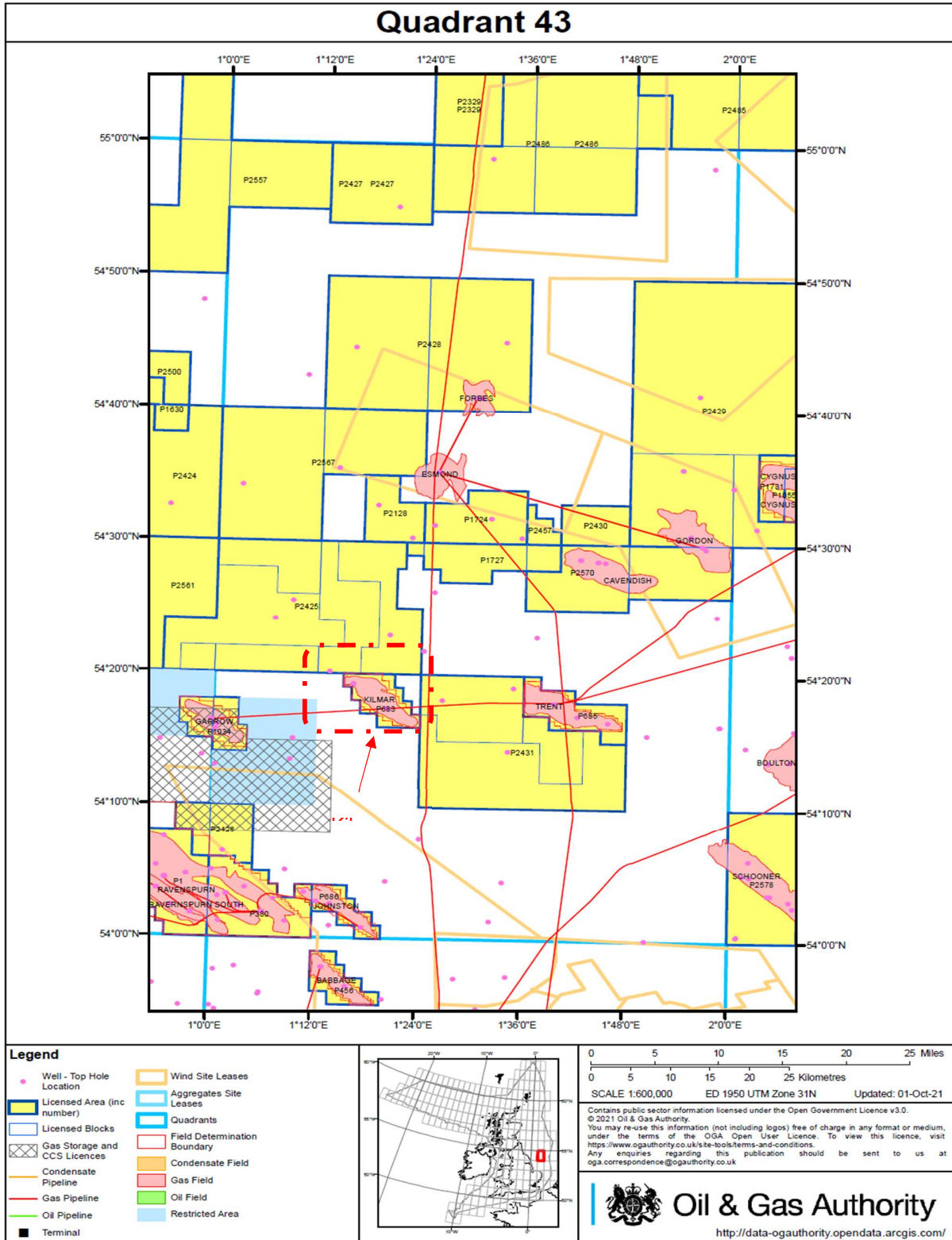


Figure 1.2 Schematic Field Layout Map

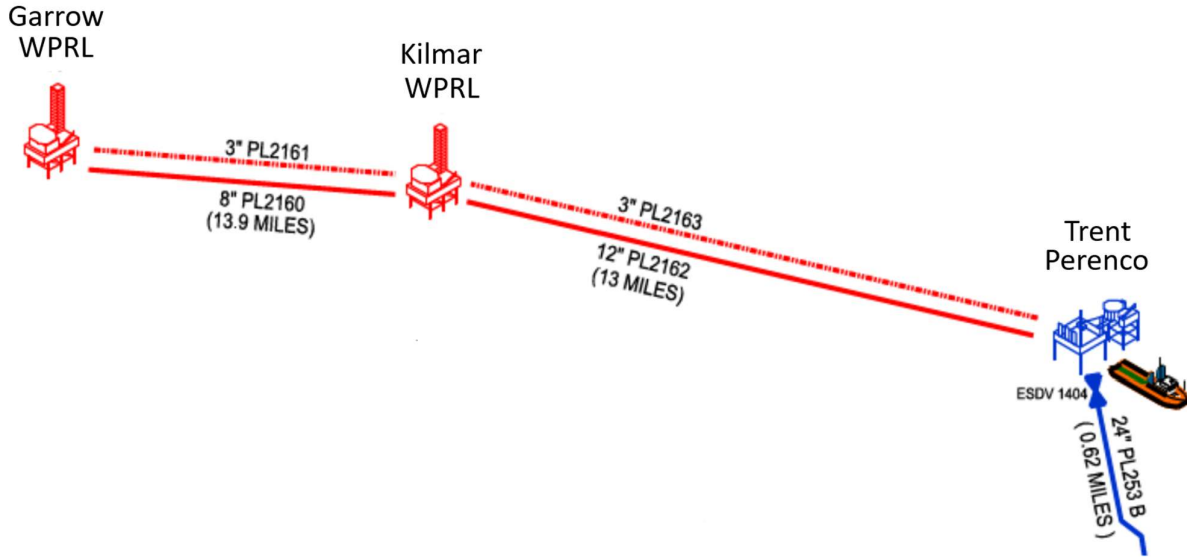


Figure 1.3 Marine Protected Areas Surrounding Kilmar

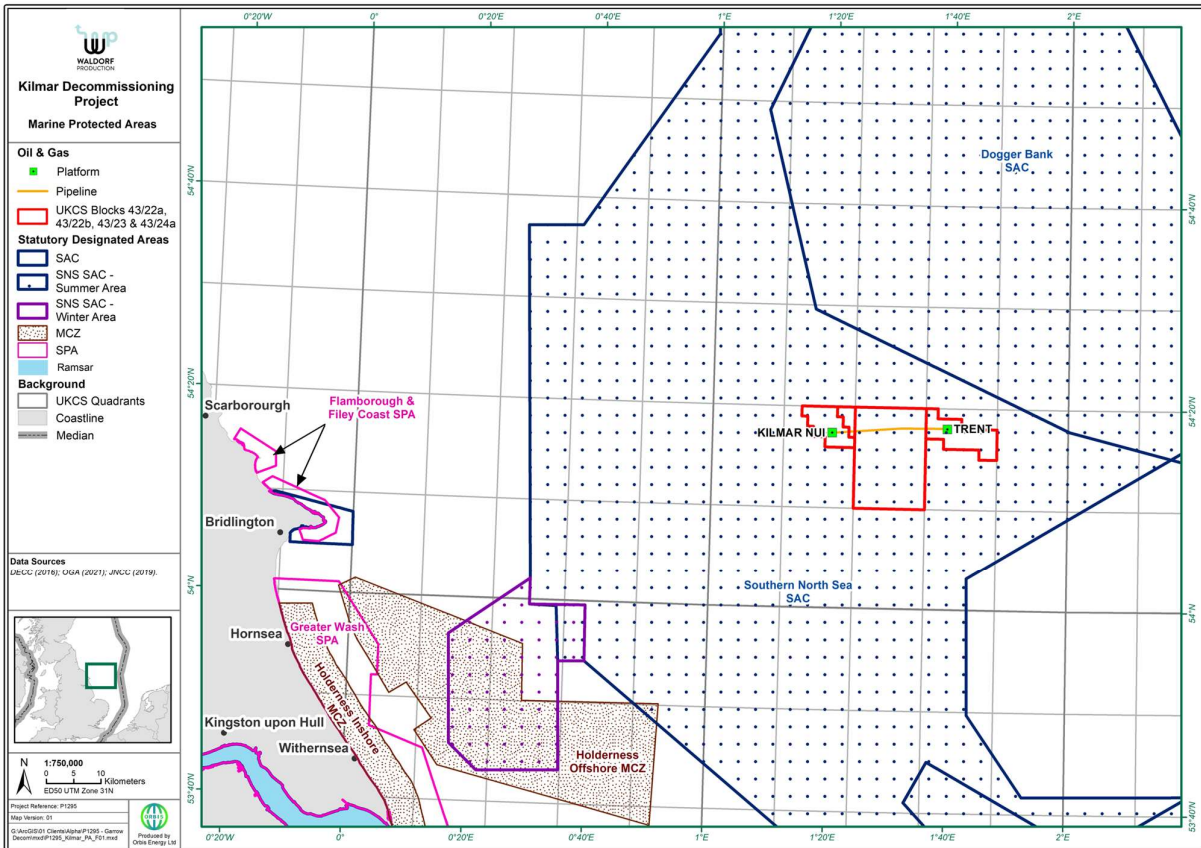


Figure 1.4 Field Location and Adjacent Facilities

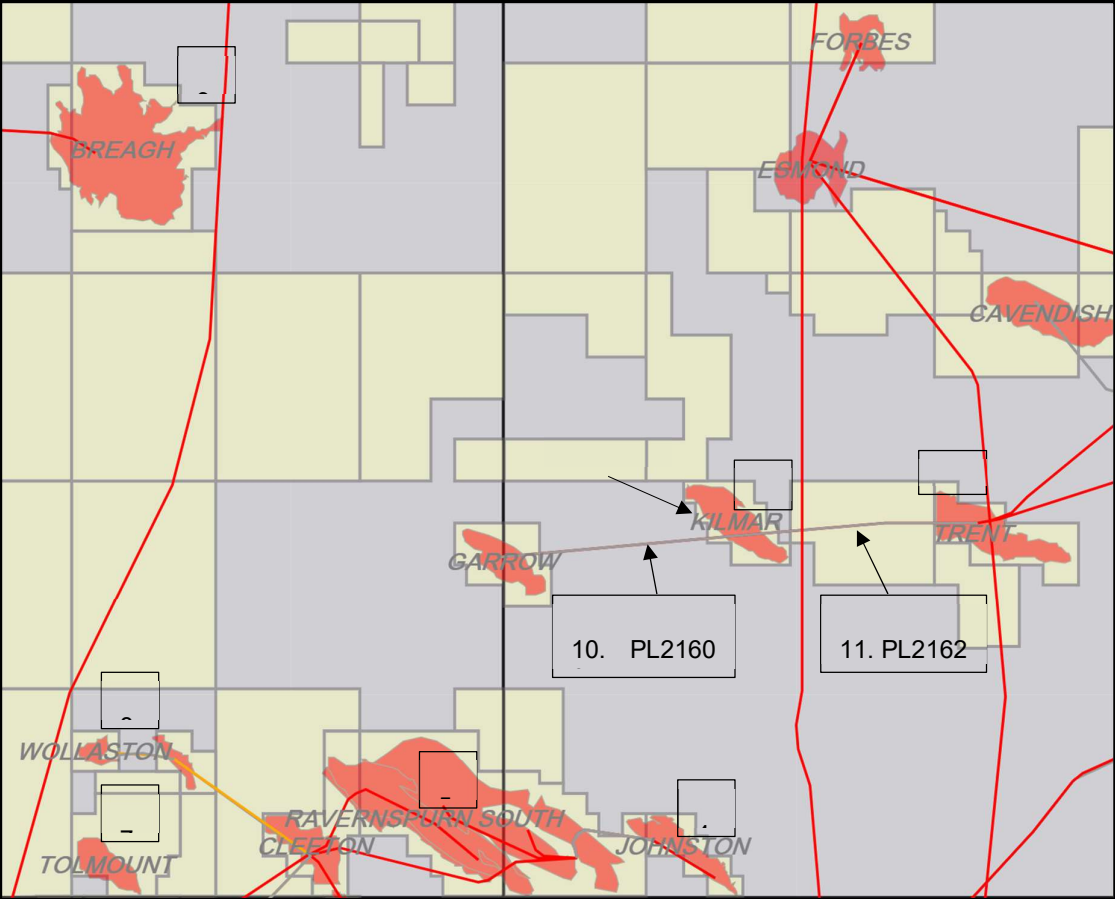


Figure 1.5 Kilmar Export route to shore

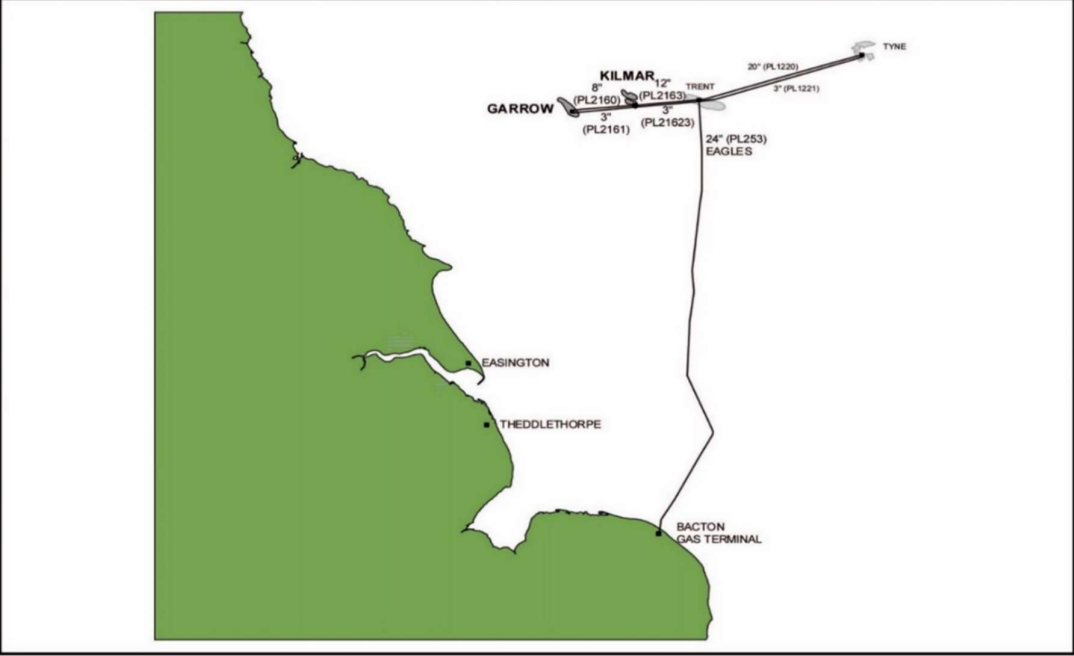



Table 1.6: Adjacent Facilities

Ref	Operator	Name	Type	Distance/ Direction	Information	Status
1	Energiean UK Limited	Garrow	Platform	22km West, 275°	EUL Installation	Non Operational and shut-in
2	Perenco UK Limited	Trent	Platforms	21km East, 87°	Third party installation	Non Operational and shut-in
3	NEO Energy Petroleum Limited	Babbage	Platform	37km South, 191°	Third party installation	Operational
4	Premier Oil E&P UK EU Limited	Johnston	Subsea wells	29km South, 191°	Third party installation	Operational
5	Perenco UK Limited	Ravenspur n	Platforms	32km South Southwest, 207°	Third party installation	Operational
6	Perenco UK Limited	Whittle	Subsea well	55km Southwest, 249°	Third party installation	Operational
7	ODE Asset Management Limited	Tolmount	Platform	63km Southwest, 244°	Third party installation	Operational
8	Perenco UK Limited	Wollaston	Subsea well	62km Southwest, 252°	Third party subsea installation	Operational
9	INEOS E&P (UK) Limited	Breagh	Platform	68km Northwest, 300°	Third party installation	Operational
10	ODE Asset management *	Garrow Pipelines, PL2160 / PL2161	Pipeline s	Between Garrow and Kilmar	PL2160: 22km 8" gas export pipeline PL2161: 22km 3" service pipeline	Non-operational
11	ODE Asset management *	Kilmar Pipelines, PL2162 / PL2163	Pipeline s	Between Kilmar and Trent	PL2162: 21km 12" gas export pipeline PL2163: 21km 3" service pipeline	Non-operational
12	TotalEnergies Offshore UK Limited	SEAL Pipeline, PL1570	Pipeline	Between Shearwater / Elgin-Franklin and Bacton	PL1570: 474km 34" gas export pipeline	Operational

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* Energean UK Ltd will take over as pipeline operator in Q4 2024 and will be pipeline operator through the decommissioning phase and post decommissioning life.

At the Trent installation the Kilmar pipelines will be decommissioned up to the first riser elbow flanges approximately 2m above seabed. The Kilmar risers on the Trent platform are owned by PUK who will decommission them as part of the Trent decommissioning programme. The Kilmar pipeline tie-in spools and associated mattresses within the Trent 500m safety zone will be decommissioned as part of EUL Kilmar decommissioning programmes.

The Garrow risers on the Kilmar Installation and the Garrow pipeline tie-in spools and associated mattresses within the Kilmar 500m safety zone will be decommissioned at the same time as the EUL Kilmar decommissioning programmes. The Kilmar and Garrow facilities have the same Section 29 Notice Holders.

A 36" SEAL pipeline (PL1570) crosses under the Kilmar pipelines 5.3 km from the Kilmar platform. The pipeline is owned by TotalEnergies Offshore UK Limited and is not affected by Kilmar decommissioning.

There are no other impacts.

1.7 Industrial Implications

It is the intention to develop a contract and procurement strategy that will result in a safe, efficient, and cost-effective execution of the decommissioning works. Where appropriate, existing framework agreements will be used for decommissioning scope. EUL will aim to reduce costs by combining scope with other Operators should the opportunity arise.

EUL has submitted the Supply Chain Action Plan (SCAP) to NSTA which outlines the Kilmar decommissioning project activities in relation to its supply chain. This is to derive maximum value, reduce expenditure and demonstrate EUL and its partners WPRL and RockRose are well positioned to deliver their Decommissioning Programme commitments. The SCAP outlines how EUL intends to contribute towards Total Value Added through fair and open engagement with its chosen supply chains, through a robust 'Invitation To Tender' (ITT), assessment process and evaluation process.

EUL have identified the intention to complete the work using vessel(s) within the Decommissioning Programmes. The vessel(s) will be identified at a later date.

2 Description of Items to be Decommissioned

2.1 Installations: Surface Facilities

Table 2.1: Surface Facilities Information								
Name	Facility Type	Location WGS84 Decimal Minute	Topside		Jacket			
			Weight (Te)	No. of modules	Weight (Te)	No. of legs	No. of piles	Weight of piles (Te)
Kilmar Installation	Small steel platform	54° 17' 26.22"N 01° 20' 10.35"E	450	1	1,425	4	8	762

2.2 Pipelines Including Stabilisation Features

Gas was exported from Kilmar to Trent via PL2162. Monoethylene Glycol (MEG) for hydrate and corrosion inhibition was supplied from Trent via PL2163 pipeline. PL2163 was installed simultaneously to the larger PL2162 pipeline into the same protection trench for the majority of the route. The two only separate at the final approaches to the Trent and Kilmar platforms but both are protected by the same concrete mattresses.

Based upon the original as backfilled surveys and operational life interim general inspection surveys it can be concluded that the full length of pipelines are currently buried to a depth well in excess of 0.6m and normally between 1.4m and 1.8m deep with the exception of the Pipeline approaches at the platform ends and at the SEAL crossing location. Full details of the pipelines protection can be found in the 'Kilmar pipelines (PL2162 and PL2163) Decommissioning Options Comparative Assessment WPRL_TORS_PMGT_025 document.

Table 2.2: Pipeline Information					
Pipeline Number	Description	Diameter and PWA Consented Length	Material	Burial Status	Pipeline Status
PL2162	Gas export pipeline conveying unprocessed natural gas from Kilmar Platform ESDV to Trent Platform ESDV	12" diameter, 21.26 km long	API 5L X65 steel pipe with 3-Layer Polypropylene	Trenched and buried 1.4m – 1.8m below the seabed up to the tie-in spools*	Non-operational
PL2163	Service pipeline conveying MEG and corrosion inhibitor from Trent Platform ESDV to Kilmar Platform ESDV	3" diameter, 21.26 km long	API 5L X65 steel pipe with 3-Layer Polypropylene	Trenched and buried 1.4m – 1.8m below the seabed up to the tie-in spools*	Non-operational

* Approximately 97.6% of the route is trenched with 1.6% surface laid at the platform approaches and at the SEAL crossing. The remainder of the pipelines are in the jacket risers and topsides pipe sections. Of the surface laid sections ~45% is mattress protected and ~55% is rock dump protected. In total <1.9% of the route is rock protected either within or outside the trenched sections.

Table 2.3: Pipeline Stabilisation Features				
Stabilisation Feature	Total Number	Weight (Te)	Location(s)	Exposed/Buried/Condition
Concrete mattresses	29	Various: ≈6.2 Te each	Along PL2162 and PL2163. 14 within the Kilmar 500m safety zone. 13 within the Trent 500m safety zone. 2 at the SEAL pipeline crossing, under rock dump in-between the SEAL & Kilmar pipelines	Exposed at the platform approaches with 2 partially rock dumped at the trench transitions
Grout bags	≈200	25kg each	Various around the concrete mattresses	Majority at the riser goose necks, others occasionally around the concrete mattresses. Some buried below mats/pipelines and some exposed
Rock Dump (Kilmar)	1 location	≈850 Te	1 location. 100m of rock stabilisation through trench transition zone. Rock berms typically 8m wide	Exposed
Rock Dump (Trent)	1 location	≈850 Te	1 location. 100m of rock stabilisation through trench transition zone. Rock berms typically 8m wide	Exposed
Rock Dump (SEAL crossing)	1 location	~2650 Te	~193m of rock stabilisation over the crossing location	Exposed

2.3 Wells Information

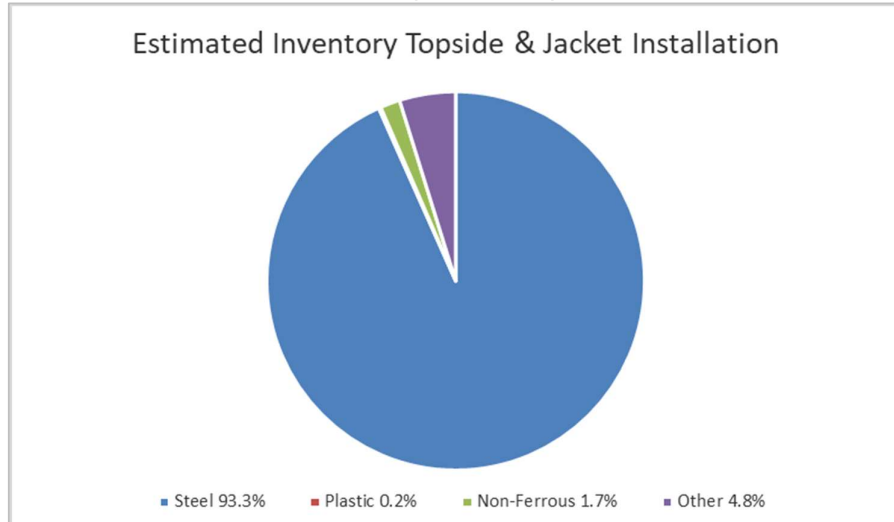
Table 2.4: Well Information			
Platform Wells	Designation	Status	Category of Well
43/22a-K1w	Gas Production	Shut-in	PL 3-3-3
43/22a-K2x	Gas Production	Shut-in	PL 3-3-3
43/22a-K3	Gas Production	Shut-in	PL 3-3-3

2.4 Drill Cuttings

WPRL as previous field operator has carried out seabed sampling in 2023. Analysis of the samples taken from Station ST05, located 125 m SE of the Kilmar NUI, found evidence of low levels of a low toxicity oil-based mud (THC of 5.3 µg/g compared to the Oslo and Paris Commission (OSPAR) 50 µg/g ecological effects threshold). Higher levels of zinc (323 µg/g), barium (112 µg/g), mercury (0.4 µg/g), and lead (17.3 µg/g) were also found at this station, most likely due to drilling related inputs or operational activities. There was no evidence, however, of this affecting the macrofaunal communities present. No evidence of drill cuttings were found at the platform location or any other of the sample stations and concentration of all remaining metals were below their respective ERL values (OSPAR, 2014) at all stations.

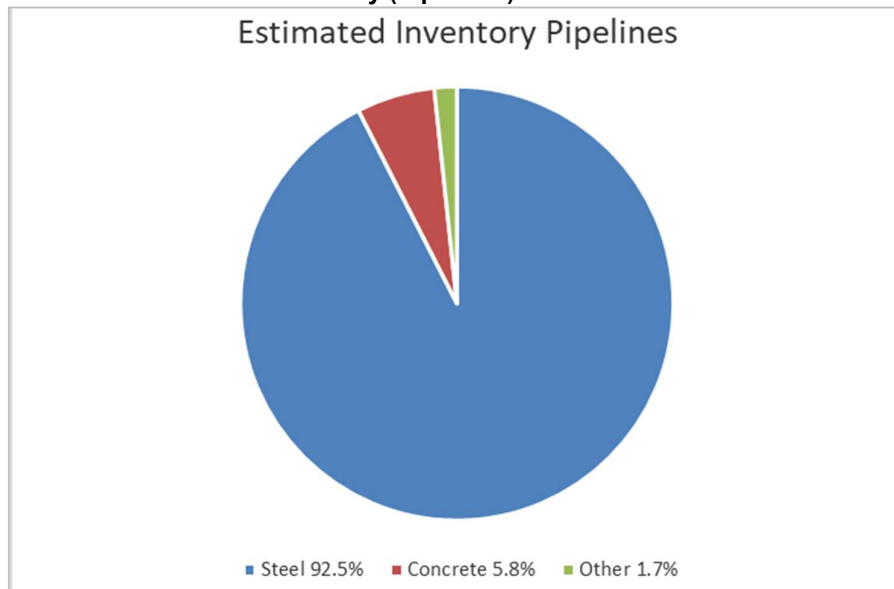
2.5 Inventory Estimates

Figure 2.1: Pie Chart of Estimated Inventories (Installation)



Total Topside & Jacket weight 1,875 Te

Figure 2.2: Pie Chart of Estimated Inventory (Pipelines)



Total Pipelines weight 3,102 Te.

Note: Includes the weights of tie-in spools, anodes, mattresses and grout bags, but excludes rock cover.

Note: Refer to the EA, Section 7, for further information on inventories remaining and their environmental impact.

3 Removal and Disposal Methods

Waste will be dealt with in accordance with the Waste Framework Directive 2008/98/EC. The reuse of an installation or pipelines (or parts thereof) is first in the order of preferred decommissioning options, followed by recycling, recover other value and landfill if no alternative is available. Waste generated during decommissioning will be segregated by type and transported to shore in an auditable manner to a disposal yard/dismantling site and recycled through licensed waste contractors in accordance with regulations. Waste disposed of outside of the United Kingdom will be in accordance with the Transfrontier Shipment of Waste Regulations 2007. Steel and other recyclable metal are estimated to account for the greatest proportion of the materials inventory. A decision has yet to be made about disposal routes, if taken out with the UK, Transfrontier Shipment of Waste Regulations will be adhered to. Reference EA, section 3.5, for further information on waste.

Re-use / alternative uses for the Kilmar facilities were examined including using the pipeline as part of another project infrastructure, the use of one of the wells for CCSU monitoring, use of the platform as a bird sanctuary and relocation of the jacket and/or topside facilities, however, none of these were deemed viable.

The platform equipment inventory will be assessed for use as spares for partner group's asset portfolio.

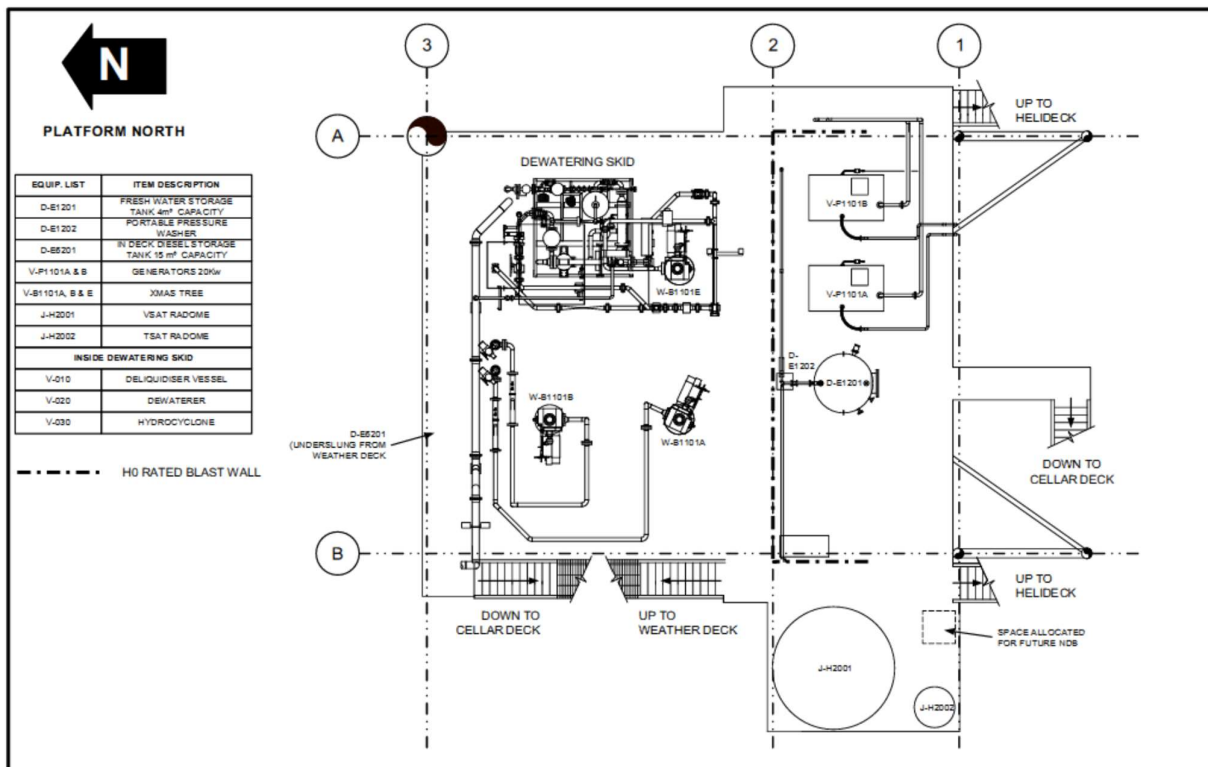
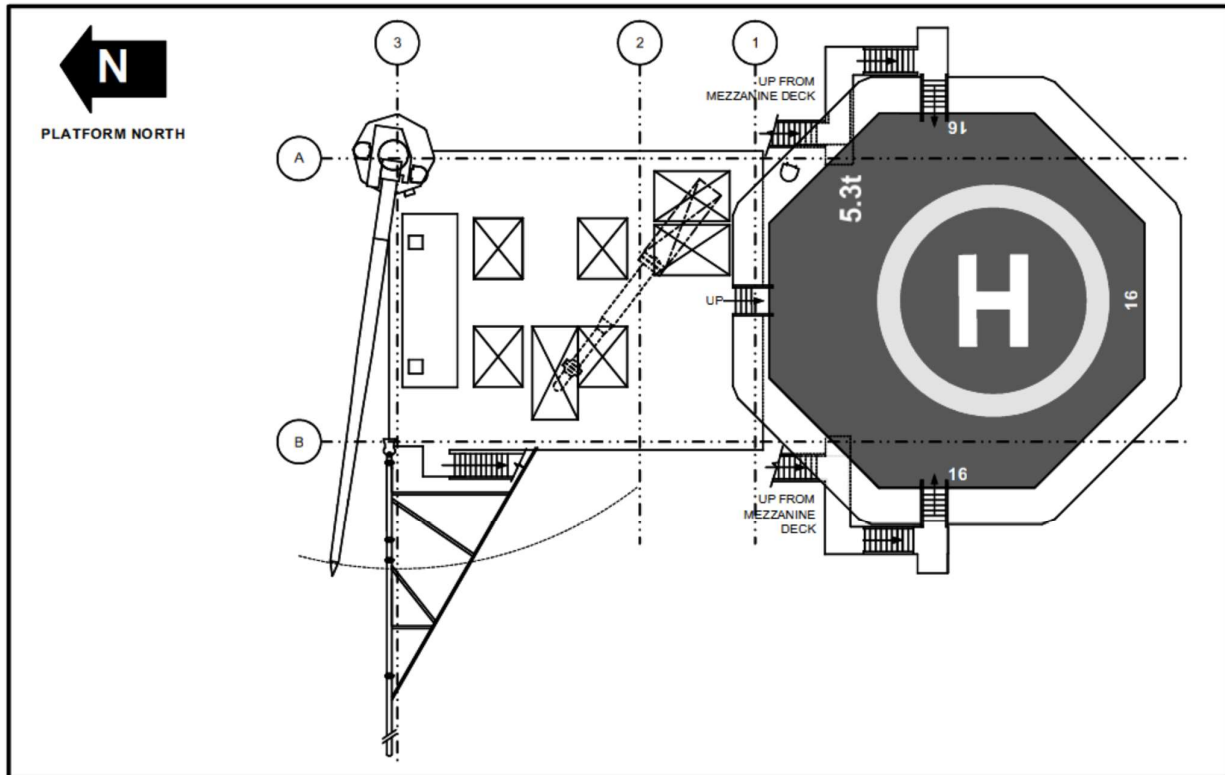
3.1 Topside

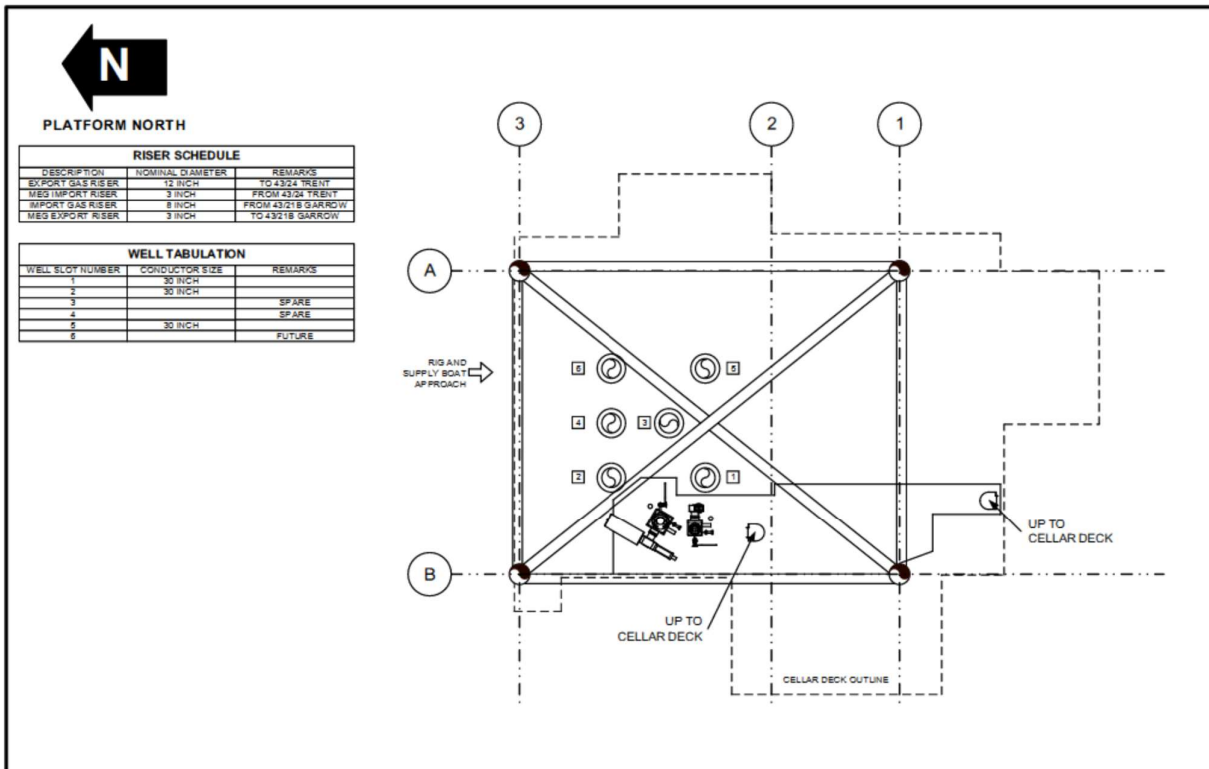
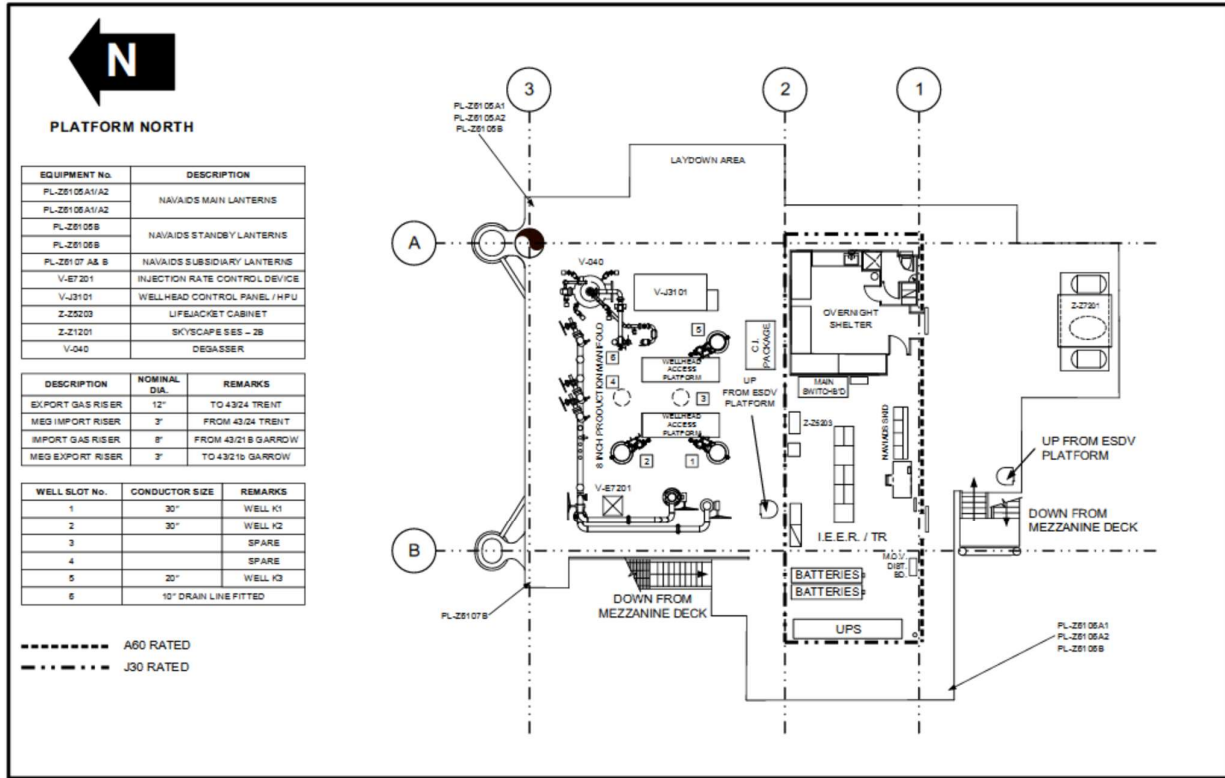
3.1.1 Topside Decommissioning Overview

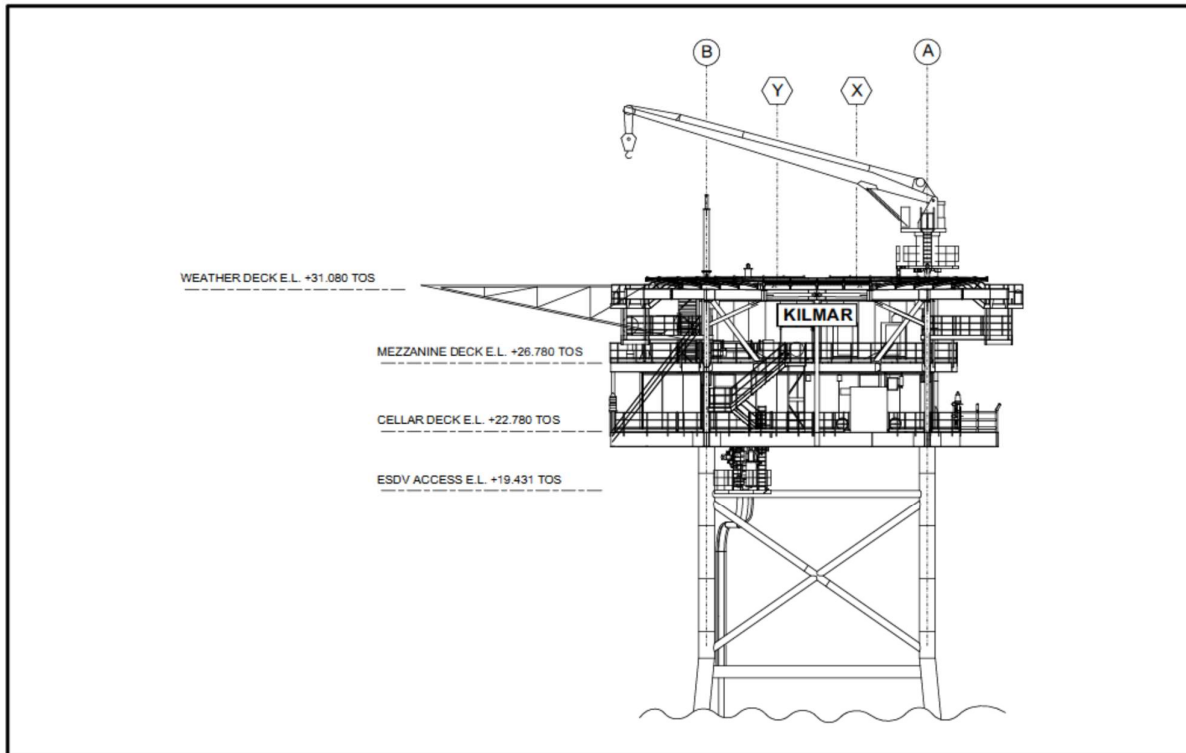
Topside Description:

The Kilmar topside structure comprises three levels with an ESDV deck underneath, weighs 450 Te and the primary structure measures 12.75m x 24.5m x 8.3m high. The lower level is the Cellar Deck and has the three wellheads, wellhead control panel, Local Equipment Room, Temporary Refuge, and where Garrow gas is imported, and Kilmar / Garrow gas combined is exported. The Mezzanine Deck has the Christmas trees, generators, and freshwater tank. The Main Deck has a diesel tank integrated within the steel framework, crane, vent boom and cantilevered helideck.

Figures 3.1: Drawings of the Topside







3.1.2 Preparation/Cleaning:

Table 3.1: Cleaning of the Topside for Removal

Waste Type	Composition of Waste	Disposal Route
Onboard hydrocarbons	Process fluids, fuels, and lubricants	Flushed clean and either injected into platform wells or drained to tote tanks for transport and appropriate disposal onshore.
Other hazardous materials	NORM, LSA Scale, any radioactive material, instruments containing heavy metals, batteries	Some of these materials may be present and if identified will be transported onshore for re-use/disposal by appropriate methods. NORM will be disposed of in accordance with the appropriate permits. In the event that a Transfrontier Shipment of Waste (TFSW) permit is required, EUL will liaise with the relevant Waste Authority and ensure all relevant permits/consents are in place.
Original paint coating		Kilmar has no lead-based paint or Chromium (VI) paint. Appropriate safety measures will be taken dealing with all coatings.

3.1.3 Removal Methods:

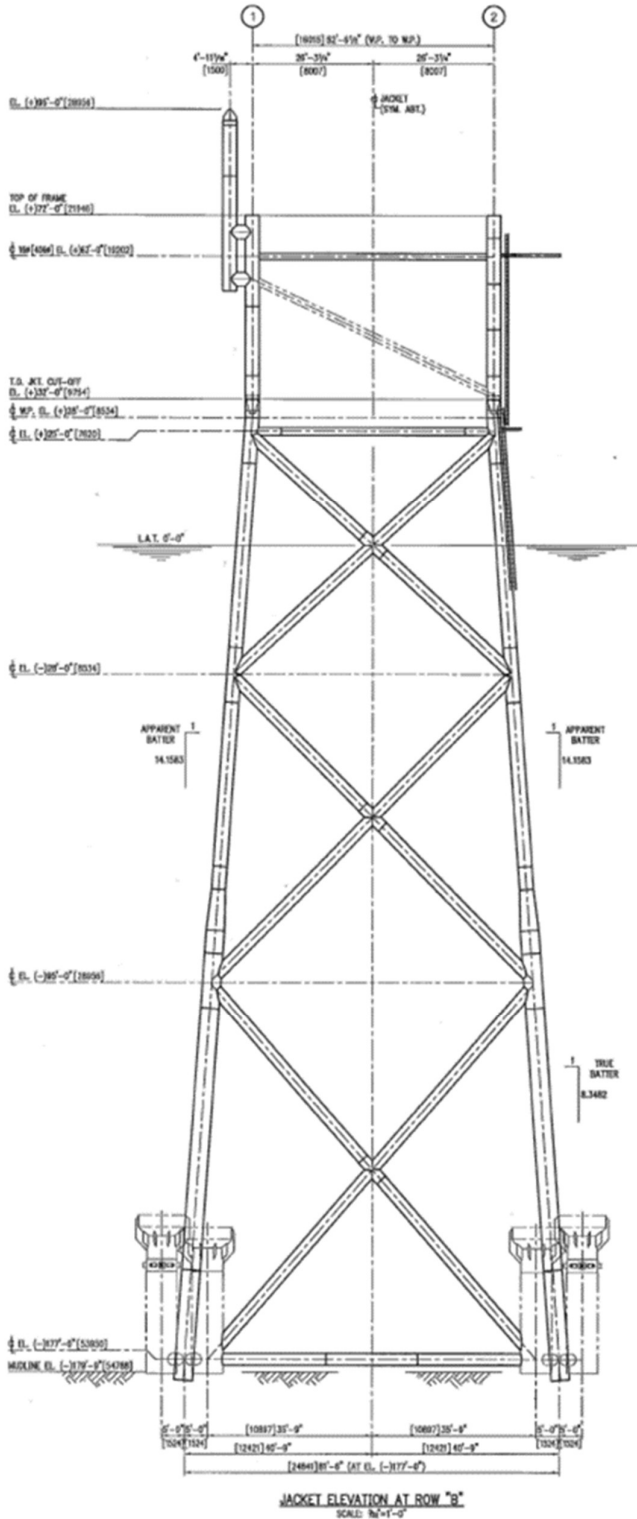
Table 3.2: Topside Removal Methods	
1) Semi-Submersible Crane Vessel <input checked="" type="checkbox"/> 2) Monohull Crane Vessel <input checked="" type="checkbox"/> 3) Shear Leg Vessel <input checked="" type="checkbox"/> 4) Jack up Work barge <input checked="" type="checkbox"/> 5) Piece small or large <input checked="" type="checkbox"/> 6) Complete with jacket <input checked="" type="checkbox"/>	
Method	Description
Single lift removal along with jacket using SSCV/MCV/SLV	Removal of topside and jacket as a complete unit followed by recovery to shore for re-use, recycling, and disposal as appropriate.
Single lift removal using SSCV/MCV/SLV/JUWB	Removal of topside as a single unit followed by recovery to shore for re-use, recycling, disposal as appropriate.
Piece-small or piece large removal using JUWB	Removal of topside in a series of smaller sub-units making use of the JUWB used for the well decommissioning activities, followed by recovery to shore for a programme of re-use, recycling or disposal as appropriate.
Proposed removal method and disposal route	<p>Removal of topside followed by recovery to shore for re-use, recycling, and final disposal to landfill as appropriate.</p> <p>A final decision on the decommissioning method will be made following a commercial tendering process and OPRED will be notified. It is likely the topside removal will be a reverse of the installation, a single lift of the topside.</p> <p>The preferred options will be to prepare Kilmar topside for lift, then a) collaborate with other decommissioning or installation projects to share costs, and / or b) to engage in dialogue with lift vessel owners and closely monitor for opportunities where a lift vessel has unplanned availability in the vicinity and can at short notice remove the Kilmar topside. These solutions could involve any of the lift vessel types.</p>

3.2 Jacket

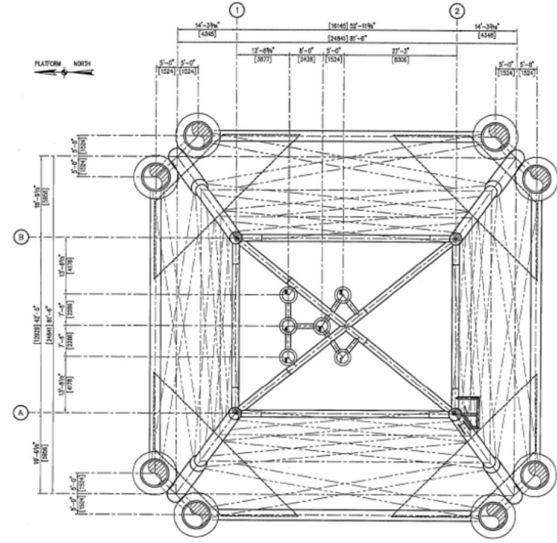
3.2.1 Jacket Decommissioning Overview

The jacket weighs approximately 1425Te which excludes the weight of the eight piles, marine growth and lifting appurtenances. The jacket has an 8" gas import riser, 12" gas export riser, 3" MEG import riser, and 3" MEG export riser. It is likely the jacket removal will be a reverse of its installation, two lifts. With the topside removed the piles will be internally cut 3.0m or greater below the seabed, slings attached, the jacket lifted and returned to shore for recycling. If any practical difficulties are encountered EUL will consult OPRED.

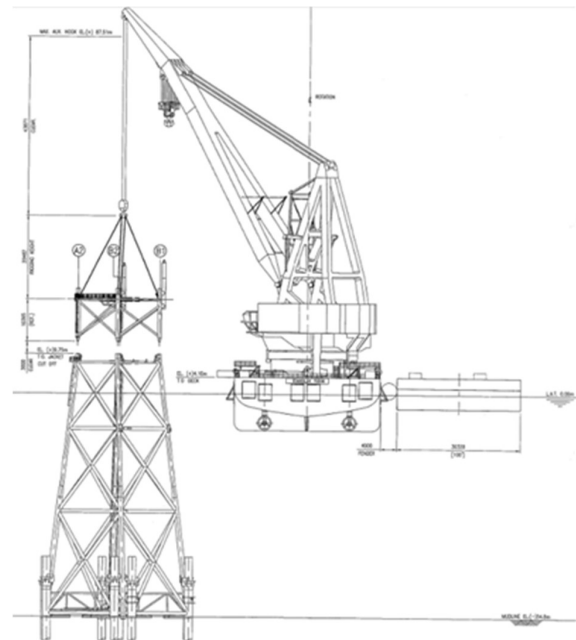
Figure 3.2: Drawings of the Jacket



Side Elevation



Plan View



Jacket in two sections

3.2.2 Jacket Removal Methods

Table 3.3: Jacket Removal Methods	
1) Semi-Submersible Crane Vessel 2) Monohull Crane Vessel 3) Shear Leg Vessel 4) Jack up Work barge 5) Piece small or large 6) Complete with jacket	
Method	Description
Single lift removal along with topside using SSCV/MCV/SLV	Removal of topside and jacket as a complete unit followed by recovery to shore for re-use, recycling, and disposal as appropriate.
Single lift or double lift removal using SSCV/MCV/SLV/JUWB	Removal of jacket as a single unit followed by recovery to shore for re-use, recycling, disposal as appropriate.
Piece-small or piece large removal using JUWB	Removal of jacket in a series of smaller sub-units, followed by recovery to shore for re-use, recycling or disposal as appropriate.
Proposed removal method and disposal route	<p>Removal of the jacket, piles cut 3m below the natural seabed level, followed by recovery to shore for re-use, recycling, and final disposal to landfill as appropriate.</p> <p>A final decision on the decommissioning method will be made following a commercial tendering process and OPRED notified. It is likely the jacket removal will be a reverse of the installation, two lifts of the jacket.</p> <p>The preferred options will be to prepare Kilmar jacket for lift, then a) collaborate with other decommissioning or installation projects to share costs, and /or b) to engage in dialogue with lift vessel owners and closely monitor for opportunities where a lift vessel has unplanned availability in the vicinity and can at short notice remove the Kilmar jacket. These solutions could involve any of the lift vessel types.</p>

3.3 Pipelines

Decommissioning Options:

*** Key to Options:**

- | | | |
|-----------------------------|---------------------------|-----------------------------|
| 1) Remove - reverse reeling | 2) Remove - Reverse S lay | 3) Trench and bury |
| 4) Remedial removal | 5) Remedial trenching | 6) Partial Removal |
| 7) Leave in place | 8) Cut and lift | 9) Removal of tie-in spools |

Table 3.4: Pipelines Decommissioning Options			
Pipeline	Condition of line/group (Surface laid/trenched/buried/spanning)	Whole or part of pipeline/group	Decommissioning options considered
PL2162, PL2163	Trenched, buried	Whole of pipelines	1& 2 (ref Option 3 of the CA Full removal of pipelines by reverse reeling/S Lay and Cut and Lift methods), 6, 8, & 9 (Ref Option 2 of the CA Partial removal of pipeline) and 7 (Ref Option 1 of the CA Leave Full Pipeline in situ)

Note: The above Options key is taken from the Decommissioning Programme streamlined template and the option numbers are not the same as those used in the supporting Kilmar Comparative Assessment (CA) document. The option numbering and descriptions used in the CA are described in section 5 of that document.

Comparative Assessment Method:

The options were assessed using the BEIS Decommissioning Guidance Notes and project specific guidelines developed for a detailed assessment workshop.

A two-stage process was implemented with an early option screening assessment to narrow options to a manageable number followed by a detailed comparative assessment of selected options was adopted.

Stage 1: Option screening

A list of potential decommissioning options was developed for each pipeline which included options for full recovery of all infrastructure, leave all infrastructure in situ options and several partial removal options of specific elements. In a desktop exercise each of these options were then evaluated against safety, environmental, technical, societal, and economic categories, and considerations. They were then identified within each category as either an acceptable solution, a solution that may be acceptable with appropriate actions or control measures or an unacceptable option. Each option was then reviewed across all categories to establish whether the option should be selected for a more detailed comparative assessment. The outcome of this desktop exercise was then peer reviewed by an independent subsea expert and was shared with OPRED to ensure agreement that all potentially viable options were considered as part of the stage 2 detailed assessment.

Stage 2: Detailed assessment

Following development and approval of a Terms of Reference document a workshop with available stakeholders and EUL and partners decommissioning project team members was held. This, along with pre workshop reading material and post workshop sharing of the output result worksheets ensured all relevant parties' input to the assessment was captured.

The options and sub options considered in the detailed assessment were full leave in situ (option 1), partial removal option to recover the surface laid and mattress protected pipeline sections within the platform 500m zones but leaving in situ rock dumped sections (option 2b) and an almost full removal option to recover the full pipeline systems with the exception of the rock dumped sections (option 3a).

The workshop team rated the impact of the selected options with a further review against safety, environmental, technical, societal, and economic categories. Subcategories were reviewed and allocated a red, green, or amber rating code for each option in line with a pre-prepared guide table. Once the impacts for all subcategories were allocated the workshop attendees assigned an overall rating for each Category. A high, mid, or low certainty was also allocated to the degree of definition of the methods to be used, status of the infrastructure, equipment required, public opinion perception and any hazards.

A final colour rating to each option/sub option in line with the below table was then allocated.

Final rating options

Preferred solution	
Broadly acceptable	
Tolerable not preferred	
In tolerable, not acceptable	

Outcome of Comparative Assessment:

Full details of the ratings can be reviewed in the referenced WPRL_TORS_PMGT_025 Kilmar Pipelines Decommissioning Options Comparative Assessment document. The below is a summary of the recommendations.

As a result of the assessment, it is recommended that for both the PL2162 pipeline and the PL2163 pipeline that a partial removal option is adopted where the majority of the pipelines are left in situ. At the platform ends the mattresses covering the pipelines shall be removed up until the point where the pipelines are rock dumped. The protection mattresses covering the tie-in spools shall also be recovered. The pipelines at the SEAL crossing location are rock dumped with >0.5m of rock cover and the recommendation is to also leave these sections of pipelines in situ. There are high safety concerns associated with activities to excavate and recover the pipelines over the 'live' SEAL pipelines, hence the recommendation to leave in situ.

Table 3.5: Outcome of Comparative Assessment		
Pipeline or Group (as per PWA)	Recommended Option	Justification
PL2162, PL2163	Option 2b in the CA reference options (Comparable to Option 9, 'removal of tie in spools' in section 3.3 'Decommissioning Options' considered)	Majority of the pipelines already trenched and buried to >0.6m or rock dumped, stable seabed, no snagging hazards, or likely exposures of pipelines over time predicted.

3.4 Pipeline Stabilisation Features

Table 3.6: Pipeline Stabilisation Features			
Stabilisation feature(s)	Number	Option	Disposal Route (if applicable)
Concrete mattresses at Kilmar (Kilmar mattresses only. Garrow mattresses are detailed in Garrow DP)	14	<p>Full recovery of all exposed and not buried to 0.6m below the seabed. Those covered with rock dump are to be left in situ.</p> <p>It is intended that 14 exposed or partially exposed mattresses will be recovered to shore. It is also intended to remove the pipelines underneath each recovered mattress.</p> <p>A single mattress may remain to prevent a snagging hazard if the cut end is exposed and not easily covered by the existing rock dump. The mattress will be moved, the pipelines cut, and then the mattress replaced over the cut end. Any remaining mat will be flush with seabed and overtrawlable. If the mattress is not used it will be recovered to shore.</p> <p>In the event of practical difficulties during the removal execution, OPRED will be consulted, and an alternative method of decommissioning will be examined through a comparative assessment.</p>	Return to shore for reuse / recycling / disposal
Concrete mattresses at Trent (Kilmar mattresses only)	13	<p>Full recovery of all exposed and not buried to 0.6m below the seabed. Those covered with rock dump are to be left in situ.</p> <p>It is intended that 13 exposed or partially exposed mattresses will be recovered to shore. It is also intended to remove the pipelines underneath each recovered mattress.</p> <p>A single mattress may remain to prevent a snagging hazard if the cut end is exposed and not easily covered by the existing rock dump. The mattress will be moved, the pipelines cut, and then the mattress replaced over the cut end. Any remaining mat will be flush with seabed and overtrawlable. If the mattress is not used it will be recovered to shore.</p>	Return to shore for reuse / recycling / disposal

		In the event of practical difficulties during the removal execution, OPRED will be consulted, and an alternative method of decommissioning will be examined through a comparative assessment.	
Concrete mattresses at the SEAL pipeline crossing	2	The mattresses provide physical separation between the SEAL and Kilmar pipelines and are buried under protective rock dump.	N/A
Grout bags	≈200 around the concrete mattresses	Leave in situ if buried 0.6m below the seabed. Full recovery if not buried or in the vicinity whilst mattresses are being recovered.	Return to shore for reuse / recycling / disposal
Rock Dump (Kilmar and pipeline)	1 location, ≈850 tonnes	Leave in situ.	N/A
Rock Dump (Trent and pipeline)	1 location, ≈850 tonnes	Leave in situ.	N/A
Rock Dump (SEAL crossing)	1 location ~2650 Te	Leave in Situ	N/A

3.5 Wells

Table 3.7: Well Plug and Abandonment

<p>The wells which remain to be abandoned, as listed in Section 2.3 (Table 2.4) will be plugged and abandoned in accordance with:</p> <ul style="list-style-type: none"> • OEUK Well Decommissioning Guidelines – Issue 7 – November 2022 • OEUK Guidelines on Qualification of Materials for the Abandonment of Wells – Issue 2 - 2015 • Design and Construction Regulations (DCR) 2015 <p>A Well Intervention Master Application Template (WIA MAT) and supporting Subsidiary Application Template (SATs) will be submitted via the DESNZ UK Energy Portal to gain consent to carry out the works.</p> <p>An application to decommission the wells will be made through WONS.</p>
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3.6 Waste Streams

Table 3.8 Waste Stream Management Methods

Waste Streams	Removal and Disposal method
Bulk liquids	<p>Hydrocarbons will be removed from the topside and shipped to shore in accordance with maritime transportation guidelines. Further cleaning will take place onshore prior to re-use or recycling.</p> <p>Contaminated seawater will be disposed of down a Kilmar well or cleaned offshore and discharged to sea under the relevant permits. If disposal is not practicable offshore, then contaminated seawater will be removed from the topside and shipped to shore in accordance with maritime transportation guidelines. Further cleaning will take place onshore prior to re-use or recycling.</p>

Marine growth	Marine growth will be removed by high pressure cleaning offshore, only where necessary and practicable, with the majority of marine growth removed onshore. It is estimated there will be 100 Te of marine growth.
NORM/LSA Scale	Tests for NORM/LSA scale will be undertaken offshore by the Radiation Protection Supervisor and any encountered will be dealt with and disposed of in accordance with guidelines and under appropriate permit.
Other hazardous wastes	Will be recovered to shore and disposed of in accordance with guidelines and under appropriate permit. There is no asbestos on the facility.
Onshore Dismantling sites	Appropriate licensed sites will be selected. Facility chosen by removal contractor must demonstrate proven disposal track record and waste stream management throughout the deconstruction process and demonstrate their ability to deliver re-use and recycling options.

Table 3.9: Inventory Disposition			
	Total Inventory Tonnage	Planned tonnage to shore	Planned tonnage left in situ
Installations			
Topside	450	450	0
Jacket	1,425	1,425	0
Piles	762	321	441 (57.9%). Piles >3m below the mudline will remain.
Pipelines including stabilisation features			
Pipelines*	2,853	0	2,853 (100%)
Tie-in spools and mat covered pipeline sections @ Kilmar (includes anodes)	13	13	0
Tie-in spools and mat covered pipeline sections @ Trent (includes anodes)	13	13	0
Mattresses Kilmar	86.8	80.6	6.2 (7.1%). Potentially 1 mattress to cover the exposed pipeline end following severance.
Mattresses Trent	80.6	74.4	6.2 (7.7%). Potentially 1 mattress to cover the exposed pipeline end following severance.
Mattress pipeline crossing	12.4	0	12.4 (100%)
Grout bags	5	3	2 (40%)

All recovered material will be transported onshore for re-use, recycling, or disposal.

* Pipelines weight differs from the pipeline pie chart weight (3,102 Te) as it excludes tie-in spools, anodes, mattresses, grout bags.

4 Environmental Appraisal Overview

4.1 Environmental Sensitivities (Summary)

The environmental sensitivities in the area in which the decommissioning activities will take place are summarised in Table 4.1. Further details are available in the Environmental Appraisal report. THC from the pre decommissioning Environmental Baseline Survey across the survey area was low (average 3.1 ppm), with all sample stations broadly comparable to, or lower than the mean background value for the SNS (UKOOA, 2001). All THC values were below the Oslo and Paris Commission (OSPAR) 50 ppm ecological effects threshold.

Table 4.1: Environmental Sensitivities	
Environmental Receptor	Main Features
Conservation interests	<p>The Kilmar infrastructure is located within the boundary of the SNS SAC, designated for the protection of harbour porpoises. The next closest MPA is the Dogger Bank SAC, designated for the protection of the Annex I sandbanks which are slightly covered by seawater all the time, is located approximately 19km to the north-east of the Kilmar platform at its closest point.</p> <p>The 2023 pre-decommissioning survey at Kilmar identified 'Subtidal sands and gravel' as a potential sensitive habitat in the survey area. There was no evidence of biogenic or rocky reefs within the survey area. Reef forming taxa were not observed in the macrofaunal data.</p>
Seabed	<p>Surface sediments in the vicinity of the Kilmar platform are dominated by the sand fraction, with a low total organic carbon content and varying proportion of fines. The mean bioavailable metals concentrations in the sediments were comparable to, or lower than, the SNS mean background concentrations and Strategic Environmental Assessment of the Mature Areas of the Offshore North Sea (SEA2) Area 1 data and were therefore considered to be characteristic of the wider region. One station, ST05 (125m SE of the platform) displayed evidence of a low toxicity oil based mud and had marginally higher concentrations of all metals, although there was no evidence of this effecting macrofaunal communities. Along the pipeline route the seabed is also predominately sandy with loose sand in the upper metre, lying on dense silty sand.</p> <p>The sediment type identified during the 2023 pre-decommissioning survey has been classified as the EUNIS biotope complex 'Faunal communities in Atlantic offshore circalittoral sand' (MD521), which is included within the UK Biodiversity Action Plan priority habitat and habitat Features of Conservation Interest (FOCI) 'subtidal sands and gravels'. Benthic epifauna was generally sparsely distributed and consisted of starfish <i>Asterias rubens</i>, <i>Astropecten irregularis</i> and <i>Luidia sarsii</i> and hermit crabs (Paguridae). Analysis of sediment macrofauna from the 2023 survey found that the macrofaunal community was relatively homogenous across the survey area. The most dominant taxa were echinoderms, annelids and molluscs. The taxa encountered in the current survey were considered representative of a background SNS community.</p>
Fish	<p>Species likely to spawn within the vicinity of the Kilmar infrastructure include cod, herring, lemon sole, mackerel, <i>Nephrops</i>, plaice (high intensity spawning ground), sandeel (high intensity spawning ground), sole, sprat and whiting. The location is also likely to be a nursery ground for anglerfish (white monkfish), blue whiting, cod, European hake, herring, <i>Nephrops</i> lemon sole, ling, mackerel, sandeels, sprat, spurdog and whiting (high intensity nursery). Juvenile fish more likely to be found in the area include herring, horse mackerel and haddock.</p>

Fisheries	<p>The Kilmar infrastructure is located within ICES Rectangles 37F1. Fishing effort within ICES Rectangle 37F1 is low, with an average of 63 days fished per year between 2018 and 2022. Fishing effort is highest in May and August, but a decreasing trend has been seen between 2018 and 2022. The mean annual fish landings (by weight) between 2018 and 2022 was 310 tonnes, with a mean value of £579,152. The annual value (£) of fisheries in ICES Rectangle 37F1 has decreased substantially between 2018 and 2022. Landings data demonstrate that catches within the time frame (by weight) are largely composed of shellfish (69%), followed by demersal species (31%). The most frequently caught species are crabs (702 tonnes), sandeels (235 tonnes) and whelks (178 tonnes).</p>
Marine Mammals	<p>Harbour porpoise and white-beaked dolphin are considered to be regularly occurring in the SNS and both species have been observed in the vicinity of the Kilmar infrastructure. Minke whale is also a frequent seasonal visitor. The Kilmar platform is located within the northern two thirds of the SNS SAC which is recognised as important for harbour porpoises during the summer season (April to September). The at-sea distribution of grey seal and harbour seal in the vicinity of the Kilmar infrastructure is moderate to high (between 0.00501-0.05% of the population per 25 km²) and low (< 0.001 % of the population per 25 km²), respectively.</p>
Birds	<p>The offshore waters of the SNS are visited by seabirds, mainly for feeding purposes in and around the shallow sandbanks. The most abundant species present are guillemot in the breeding season, kittiwake over winter, and guillemot during the post breeding dispersal period. The following species have previously been recorded as present on the Kilmar platform: 6 x herring gulls in March 2023; 3 x herring gulls in February 2023; 40 x herring gull in September 2022; 200 x gulls, 100 x kittiwake, 2 x sparrow hawk, 1 x kestrel in August 2022; 20 x herring gull and 5 x kittiwakes in June 2022 and 5 x herring gull in March 2022. No nests were observed during any of these visits.</p>
Onshore Communities	<p>Onshore communities are potentially sensitive to disturbance from cleaning, dismantling and disposal activities. Appropriate licenced sites will be selected. Facility chosen by removal contractor must demonstrate proven disposal track record and waste stream management throughout the deconstruction process and demonstrate their ability to deliver re-use and recycling options.</p>
Other Users of the Sea	<p>Shipping activity is relatively low in the vicinity of the Kilmar infrastructure, predominantly comprised of cargo ships and offshore support vessels.</p> <p>The Kilmar field is located within a mature gas province with a comprehensive network of typically unmanned installations, larger processing hubs and associated interfield and export pipelines.</p> <p>The closest windfarm to the Kilmar platform is the Hornsea Project Four (Operator: Ørsted) which is in the consented stage, located approximately 12 km to the south west of the Kilmar NUI. The operational Hornsea Project Two wind farm turbine area (Operator: Ørsted Hornsea) is located approximately 32 km south of the Kilmar platform. Additionally, the operational windfarm is the Hornsea Project One (Operator: Ørsted) is located approximately 43 km southeast from the Kilmar platform and 39km from the Kilmar pipelines at its nearest point. The Dogger Bank Southwest and Southeast sites (Operator: RWE Renewables) located 30 km north and 34 km northeast respectively of the Kilmar platform are in the pre-planning application phase. The consented Dogger Bank export cable is located 45 km northwest to the north of the Kilmar NUI at its closest point.</p> <p>UKCS Blocks 43/22, and 43/24 lie within the Endurance Carbon Capture and Storage (CCS) licence which is owned by BP Exploration Operating Company Limited. The Kilmar and Trent infrastructure additionally lies within a carbon storage licence area offered for application (SNS Area 1). The Trent platform and Kilmar pipelines lie within CS006, a current UKCS License Block.</p> <p>The Kilmar infrastructure lies with a Ministry of Defence Royal Airforce Practice and Exercise Area.</p>

Atmosphere	Atmospheric emissions will be produced during the proposed Kilmar decommissioning activities as a result of the fuel consumed by offshore vessels, diesel-powered equipment and generators. It is predicted that these emissions will only result in localised and short term impacts on air quality, with prevailing metocean conditions expected to lead to the rapid dispersion and dilution of the emissions. The contribution to UKCS and global atmospheric emissions will be negligible.
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4.2 Potential Environmental Impacts and Their Management

An initial screening of the potential impacts to environmental and societal receptors from the proposed Kilmar decommissioning activities concluded that the only aspects considered to be potentially significant and therefore requiring further assessment were physical presence, seabed disturbance and underwater noise. However, following further assessment and upon implementation of the identified mitigation measures, the Environmental Appraisal report concluded that no significant residual effects are predicted to occur as a result of the proposed Kilmar decommissioning activities, with the majority of impacts being localised and temporary in nature.

Environmental Impact Assessment Summary:

Table 4.2: Environmental Impact Management

Activity	Main Impacts	Management
Topside Removal	<p>The physical presence of the Kilmar platform, particularly if it enters a Lighthouse Mode phase, has the potential to provide nesting habitat to breeding seabirds, which forage in the SNS. There is no history of nesting seabirds on the platform; however, the presence of nesting seabirds during the breeding season in future years cannot be ruled out. However, the removal of the Kilmar topside has the potential to result in significant impacts to seabirds nesting on the platform, if present in future years, through disturbance by operational movement and noise. Once the chicks start hatching in June they are particularly vulnerable to human disturbance that may spook them from the nest, resulting in them falling or being pushed to sea.</p> <p>The vessels required for the removal of the topside will be present on location within the existing 500 m safety exclusion zone surrounding the Kilmar platform. This zone is clearly marked on navigation charts and has been in place for a number of years. If an anchored lift vessel (LV) is used to remove the topside, the anchor lines are likely to extend outside the exclusion zone, although this should not present a significant hazard to shipping or fishing vessels as they are unlikely to transit immediately adjacent to an existing exclusion zone. Residual effects on other sea users resulting from the physical presence of vessels on location at Kilmar and transiting to / from site are therefore negligible.</p> <p>Underwater noise generated from vessel operations (e.g. use of propellers / dynamic positioning thrusters) has the potential to result in behavioural disturbance to marine mammals and fish. However, the area of disturbance will be localised and any impacts will be temporary in nature and not significant, particularly relative to the underwater noise generated by existing levels of vessel traffic in the wider SNS area.</p>	<p>Installation of nesting bird deterrents will be considered when the preparatory work is being undertaken to discourage birds from nesting on the platform, if it enters the Lighthouse Mode phase.</p> <p>EUL will continue to check for the presence of nesting birds on scheduled routine visits to the Kilmar platform, noting there is not a history of nesting birds on the platform. If the topside is to be removed during the breeding season, data will be reviewed to confirm the absence of nesting birds and, if considered necessary, the platform will be checked by a qualified ornithologist prior to removal. If nesting birds are observed, OPRED will be consulted to ascertain if it is possible for a Wild Birds Licence to be granted to allow the works to go ahead.</p> <p>If any other decommissioning activity (e.g. preparatory works) is to be undertaken on the topside during the breeding season, the platform will be checked for nesting birds prior to commencing work. OPRED will be informed of the results and, if necessary, a Wild Birds Licence applied for. In the event nesting birds are observed, EUL currently propose to erect signage in the area advising offshore personnel of the nests and personnel will be briefed on instructions to minimise possible disturbance to the juveniles and attending adults. The nests will also be monitored on a daily basis to record bird presence and activity.</p> <p>Where required, Consent to Locate permits will be in place, existing collision risk management plans will be reviewed and notifications of the proposed decommissioning activities will be made to regular users of the area via Notices to Mariners, NAVTEX/NAVAREA warnings and Kingfisher bulletins.</p> <p>If the jacket is removed in a separate campaign to the topside, a solar navaid / foghorn will be installed to warn other sea users of its presence.</p>

<p>Jacket</p>	<p>The vessels required for the removal of the jacket will be present on location within the existing 500 m safety exclusion zone surrounding the Kilmar platform. This zone is clearly marked on navigation charts and has been in place for a number of years. If an anchored LV is used to remove the jacket, the anchor lines are likely to extend outside the exclusion zone, although this should not present a significant hazard to shipping or fishing vessels as they are unlikely to transit immediately adjacent to an existing exclusion zone. Residual effects on other sea users resulting from the physical presence of vessels on location at Kilmar and transiting to / from site are therefore negligible. In addition, once the Kilmar platform has been removed, the 500 m safety exclusion zone surrounding the platform will be withdrawn. This will result in a positive impact as an area of circa 0.79 km² will be made available to other sea users.</p> <p>Physical disturbance of the seabed resulting from the removal of the jacket, temporarily placing materials and equipment on the seabed and anchoring of the LV is likely to cause displacement or mortality of benthic species, such as sessile organisms, that are unable to move out of the impacted area. However, species in highly dynamic, tidally influenced areas such as those found in the shallow waters of the SNS, are generally tolerant of physical disturbance.</p> <p>Underwater noise generated from vessel operations (e.g. use of propellers / dynamic positioning thrusters) has the potential to result in behavioural disturbance to marine mammals and fish. However, the area of disturbance will be localised and any impacts will be temporary in nature and not significant, particularly relative to the underwater noise generated by existing levels of vessel traffic in the wider SNS area. Underwater noise emissions from cutting tools are unlikely to result in sufficient levels of noise to cause significant disturbance to marine fauna.</p>	<p>Where required, Consent to Locate permits will be in place, existing collision risk management plans will be reviewed and notifications of the proposed decommissioning activities will be made to regular users of the area via Notices to Mariners, NAVTEX/NAVAREA warnings and Kingfisher bulletins.</p> <p>Jacket legs will be cut internally, to avoid seabed disturbance from external excavation.</p> <p>Operations will be planned to reduce vessel movements and minimise the overall duration of the project.</p> <p>Where vessels are required to hold position for extended durations, jack-up or moored vessel will be used in favour of DP vessels.</p>
<p>Decommissioning Pipelines & Stabilisation Features</p>	<p>The seabed will be physically disturbed by the cutting of pipeline ends and removal of surface laid pipeline sections / tie-in spools, including mattresses and grout bags at the approaches to the Kilmar and Trent platforms. Physical disturbance of the seabed can cause displacement or mortality of benthic species, such as sessile organisms, that are unable to move out of the impacted area. However, due to the transient nature of the operations, it is expected that recovery of the affected areas will be relatively rapid once the proposed activities have been completed. Of note, is that the fauna found in the vicinity of Kilmar are robust infauna that are adapted to frequent disturbances and natural fluctuations in sediment loading and resuspension.</p> <p>Retrieval of mattresses and grout bags at the approaches to the Kilmar and Kilmar platforms will result in hard / coarse substratum habitats being</p>	<p>Operations will be planned to reduce vessel movements and minimise the overall duration of the project.</p> <p>Internal cutting techniques will be utilised where possible, which do not produce any significant noise emissions.</p> <p>Where internal cuts are not possible, external cuts will be via mechanical methods as they produce significantly less noise than of abrasive methods.</p> <p>No new mattresses, grout bags or rock dump will be placed on the seabed.</p>

<p>replaced by sediment habitats, more typical of this area of the SNS. As a result, there will be localised changes in benthic communities from epifaunal species that can colonise hard substrata to those that favour of soft sandy sediments.</p> <p>There will be a legacy impact from the stabilisation material which will be decommissioned in situ, including the redeployment of any material required to protect the cut ends of the pipelines, if required. The hard substrate represents a permanent change to the natural habitat type and associated fauna present; however, the scale of the impact is negligible considering the very large extent of sandy seabed available in the SNS.</p> <p>There is a risk of fishing gear snagging on infrastructure that is being decommissioned in situ. To minimise this risk, EUL is proposing to remove any exposed subsea infrastructure. The majority of the pipelines are currently buried to a depth well in excess of 0.6 m and no pipeline exposures have been seen in any of the operational surveys. The rock which has been deposited along the pipelines, including at the SEAL pipeline crossing, is very stable and there has been no migration due to seabed currents or fishing activity over the area. The pipelines will also be left in situ in a flooded condition, so no upward movement is expected. As such, the residual risk to commercial fishing from the legacy of infrastructure decommissioned in situ is not considered to be significant.</p> <p>Underwater noise generated from vessel operations (e.g. use of propellers / dynamic positioning thrusters) has the potential to result in behavioural disturbance to marine mammals and fish. However, the area of disturbance will be localised and any impacts will be temporary in nature and not significant, particularly relative to the underwater noise generated by existing levels of vessel traffic in the wider SNS area. Underwater noise emissions from cutting tools are unlikely to result in sufficient levels of noise to cause significant disturbance to marine fauna.</p>	<p>Details of any infrastructure decommissioned in situ will be publicised through Notices to Mariners and marked on navigation and fisheries charts.</p> <p>A post-decommissioning monitoring programme covering the pipelines and associated stabilisation features remaining in situ will be agreed with OPRED, if necessary.</p>
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5 Interested Party Consultations

Consultations Summary:

Table 5.1: Summary of Stakeholder Comments		
Who	Comment	Response
Statutory Consultations		
National Federation of Fishermen's Organisations	<p>NFFO's view on non-intrusive post decom surveys is that they prefer full overtrawl trials with bottom gear only (no nets involved so no risk of damage to nets). This is not in agreement with JNCC's view and ongoing discussions with JNCC/ OPRED are continuing. Some incidents of post decom snagging after non-intrusive surveys have been noted. SFF mainly use static gear in the area but some French trawlers have been seen in the area.</p> <p>The windfarm activity (in particular Hornsea) has pushed fishing activity further north into the ICES rectangle 37F1 (near Kilmar) over the last few years so the same static gear is now used in a smaller area.</p> <p>NFFO were in agreement that based on burial depths for the pipelines and stable nature of the seabed that a leave in situ solution will provide least impact solution to fishing industry.</p>	<p>Final seabed clearance verification methodology to be agreed with OPRED.</p> <p>Kilmar decom will provide greater area available to fishing industry.</p> <p>NFFO have been involved in the CA process.</p>
Scottish Fishermen's Federation	SFF have been consulted and are content given the geographical location of Kilmar to let NFFO consult with regards to any fishing interaction with the decommissioning activities.	N/A
Northern Ireland Fish Producer's Organisation Limited	NiFPO have been consulted and are content given the geographical location of Kilmar to let NFFO consult with regards to any fishing interaction with the decommissioning activities.	N/A
Global Marine Group	GMG have confirmed there are no cables within 50km of the decommissioning works.	
Informal Stakeholder Consultations		
Joint Nature Conservation Committee	<p>Stated that they see the Kilmar decommissioning project as a potential net benefit project in terms of benthic impacts.</p> <p>Would like to see the survey data being used to avoid an overtrawl survey later on, whereas the fishing industry may argue for it.</p> <p>JNCC would be interested to see if any signs of natural material influx (sand, marine growth, etc) is occurring over the rock berms.</p> <p>JNCC / WPRL agreed noise levels generated in this type of decom operations are generally of low level so do not see any real cumulative effect with other operations or developments that may have activities in the near area and timeframe.</p>	<p>NFFO view is that rock berms can be left in place as higher %age of fishing activity is with static gear that is not impacted by rock berms.</p> <p>Final seabed clearance verification methodology to be agreed with OPRED.</p> <p>Red-throated diver are most at risk of disturbance if vessels were transiting to / from Hull, Great Yarmouth or</p>



	<p>The technology for rock dump removal is not yet mature enough for it to be a realistic viable decom option. High environmental impacts would be associated if current equipment/techniques were used to remove all rock.</p>	<p>Lowestoft. Therefore, to minimise disturbance, EUL proposes to implement the following mitigation measures:</p> <ul style="list-style-type: none">• Restricting, to the extent possible, vessel movements within the Greater Wash SPA to existing navigation routes when transiting to / from the Kilmar location especially in winter months;• Maintaining direct transit routes;• Avoiding over-revving of engines;• Briefing vessel crew on the purpose and implications of vessel management practices within the Greater Wash SPA. <p>JNCC have been involved in the CA process.</p>
Public	To be included after consultation	

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6 Programme Management

6.1 Project Management and Verification

An EUL Project Management team will manage suitable Contractors for decommissioning activities and the removal of the installation. The team will ensure the decommissioning is executed safely, in accordance with legislation and EUL Health and Safety principles. Where possible the work will be coordinated with other decommissioning operations in the SNS. The team will monitor and track the process of consents and the consultations required as part of this process. Any changes in detail to the offshore removal programme will be discussed and agreed with OPRED.

6.2 Monitoring of the Facilities in Lighthouse Mode

EUL preference is to remove the topsides and jacket in a single campaign immediately following well plug and abandonment / platform HCF, negating the requirement for the topside and jacket to be left in Lighthouse Mode and thus removing ongoing OPEX costs. This strategy is not always the most cost efficient or possible due to Contractors plans. Current indications are the platform will be in LHM for no more than 1 year. Until a removal contract is awarded, all options are considered.

If it is chosen to put the Kilmar facilities into Lighthouse Mode for a period, monitoring of the facilities Aids to Navigation will be carried out onshore via the Automatic Identification System (AIS). No maintenance of the facilities is planned whilst in Lighthouse Mode however the platform will be subject to visual surveys to ensure the integrity of the facilities is maintained until removal. The structural condition of the installation has been confirmed, there are no integrity concerns, and the installation can remain safely in LHM for >5 years or longer with continued inspections. Once the platform is in LHM the risk category of the installation can be reduced thus extending the inspection frequency. During the HCF campaign integrity inspections will be carried out to give the longest possible frequency ~3 to 5 years between inspection which will be determined based on findings and risk assessment.

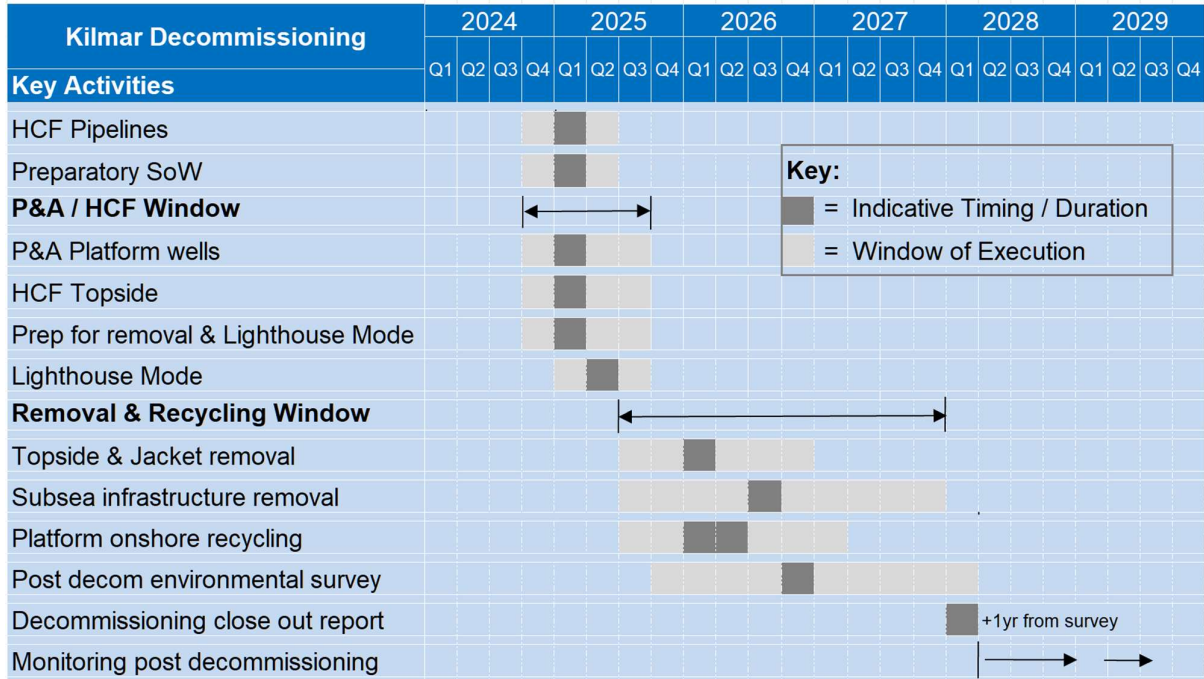
6.3 Post-Decommissioning Debris Clearance and Verification

A post decommissioning site survey will be carried out around the Kilmar platform 500m radius and a (*minimum*) 100m corridor (*50m either side*) along each existing pipeline route where decommissioning activities have taken place to identify any oil and gas related debris. Any seabed debris related to offshore oil and gas activities will be recovered for onshore disposal or recycling in line with existing disposal methods. Verification of seabed clearance will be provided to OPRED following decommissioning activities. This will be included in the Close Out Report and sent to the Seabed Data Centre (*Offshore Installations*) at the Hydrographic Office.

6.4 Schedule

The Project Plan is subject to approval of the decommissioning programmes and unavoidable constraints such as Contractor availability. OPRED will be informed of dates of activity in advance, when known.

Figure 6.1: Project Plan



6.5 Costs

Decommissioning costs are provided separately to OPRED and NSTA.

Table 6.1: Provisional Decommissioning Programmes costs	
Item	Estimated Cost (£m)
Project Management	Provided to OPRED & NSTA
Facility Running/Owner	Provided to OPRED & NSTA
Well Abandonment	Provided to OPRED & NSTA
Making Safe	Provided to OPRED & NSTA
Topside Preparation	Provided to OPRED & NSTA
Topside Removal	Provided to OPRED & NSTA
Substructure Removal	Provided to OPRED & NSTA
Subsea Infrastructure	Provided to OPRED & NSTA
Onshore Recycling and Disposal	Provided to OPRED & NSTA
Site Remediation	Provided to OPRED & NSTA
Monitoring	Provided to OPRED & NSTA
TOTAL	Provided to OPRED & NSTA

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6.6 Close Out

In accordance with the DESNZ guidelines, a close out report will be submitted to OPRED within 1 year of the completion of the offshore decommissioning scope including debris clearance, verification of seabed clearance and the results of the post-decommissioning environmental survey. The report will detail the outcomes of surveys as well as explain any major variances from the programme.

6.7 Post-Decommissioning Monitoring and Evaluation

A post-decommissioning environmental seabed survey will be carried out around the platform in similar locations to the pre decommissioning Environmental Baseline Survey. The survey report will be reviewed and compared with the pre-decommissioning survey. A MBES and SSS survey of the full pipeline route covering a corridor 50m either side of the pipeline route will be completed which will also cover a 500m radius of the platform site. A risk-based post monitoring survey regime will be proposed by EUL which will be agreed with OPRED.

7 Supporting Documents

Table 7.1: Supporting Documents	
Document Number	Title
WPRL_TORS_PMGT_025	Kilmar Pipelines Decommissioning Options Comparative Assessment
WPRL_TORS_PMGT_027	Kilmar Environmental Appraisal Report

8 S29 Holder Letters of Support

Hold, to be included

9 Appendix

9.1 Copy of Public Notice

Hold, to be included

9.2 Depth of Burial Graphs

Figures A1 – A3 below provide snapshots along the pipeline routes of burial data and comparisons with the original burial data and the latest operational inspection survey (2022). Interim seabed surveys between 2005 and 2016 show very similar comparisons. More detailed discussion narrative is also available within the supporting Comparative Assessment document.

Figure A.1 2005 As backfilled survey chart extract (KP 3.7 – KP 5.2)

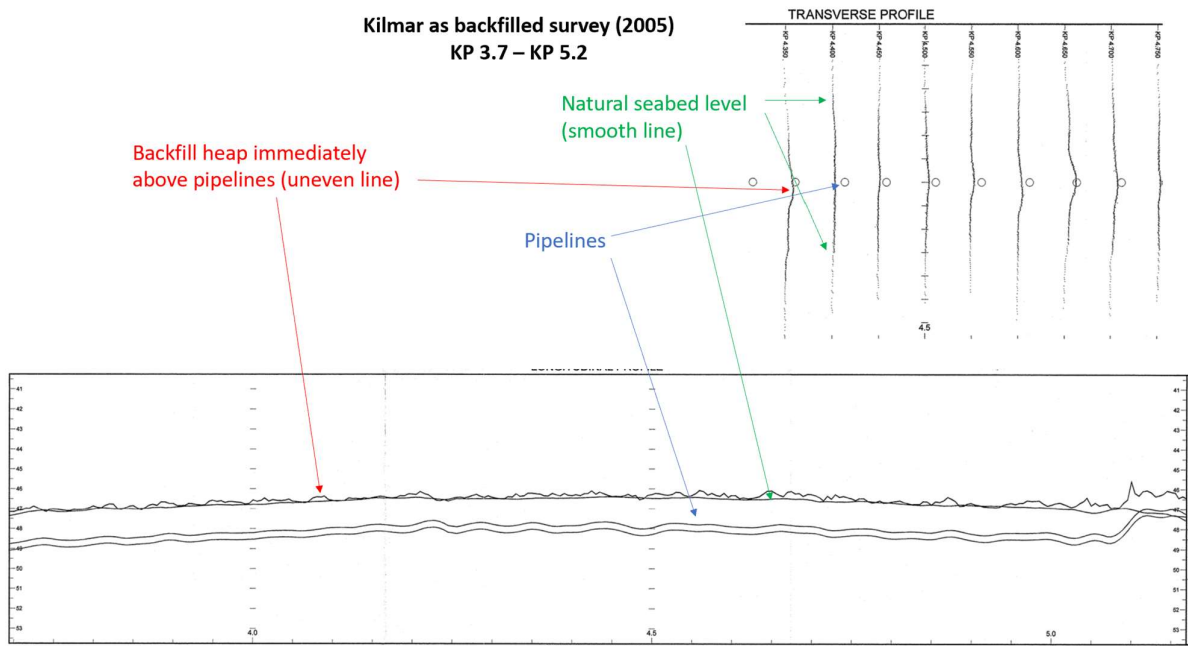


Figure A.2 As backfilled chart and interim operational survey profiles (KP 3.75 – KP 5.15)

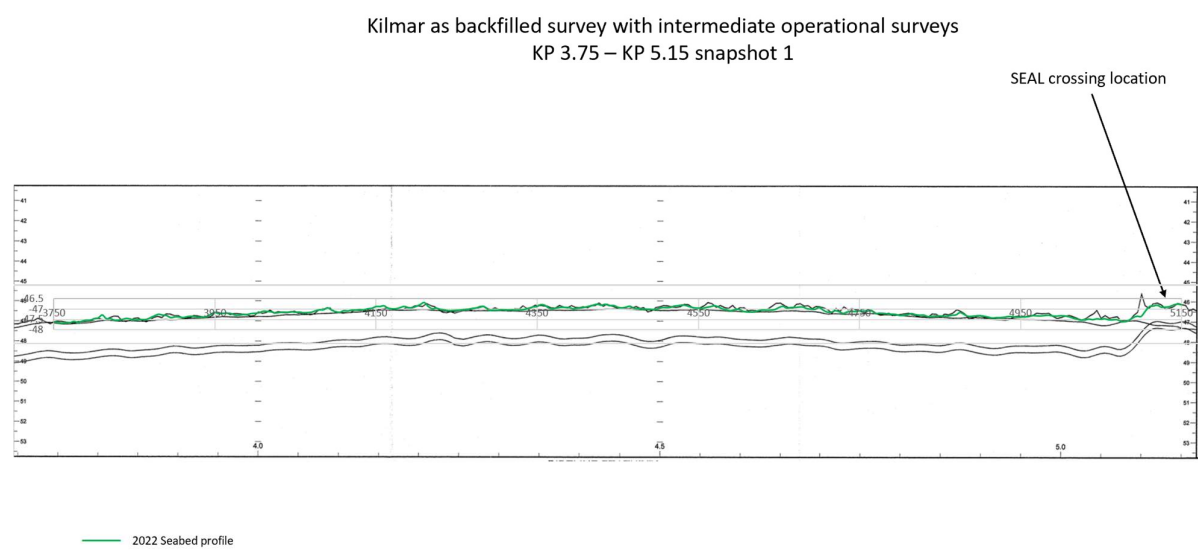


Figure A.3 As backfilled chart and interim operational survey profiles (KP 13.35 – KP 14.75)

Kilmar as backfilled survey with intermediate operational surveys
 KP 13.35 – KP 14.75 snapshot 2

