Alba Northern Platform Topsides Decommissioning Programme

Consultation draft

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ITHACA ENERGY

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TABLE OF ABBREVIATIONS

Abbreviation	Explanation
~	Approximately
AB	Deprecated term 'Abandoned' but included in Table 2.2.1 to indicate extent to which wells have been decommissioned (Phase 1, Phase 2, etc.)
Al	Aluminium
ANP	Alba Northern Platform
AXS	Alba Extreme South
BAT	best available technique
BEP	best environmental practice
BLP	Bridge Linked Platform (Britannia, refer Figure 1.6.2)
CEFAS	The Centre for Environment, Fisheries & Aquaculture Science
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide equivalent
CoCC	Committee on Climate Change (used in section 7)
CoP	Cessation of Production
DP(s)	Decommissioning Programme(s)
EMT	Environmental Management Team (OPRED)
FASP	Forties Alpha Satellite Platform (refer Figure 1.6.2)
FSJ	Fixed Steel Jacket (used in Table 1.6.1)
FSU	Floating Storage Unit
GHG	Green House Gas
GMG	Global Marine Group (Statutory Consultee)
GWP	Global Warming Potential
GWP_{100}	Global Warming Potential over a 100-year period
HSE	Health and Safety Executive
ICES	International Council for the Exploration of the Seas
INST	Installation (used in "contents list")
IoP	The Institute of Petroleum
Ithaca	Ithaca Oil and Gas Limited
JNCC	Joint Nature Conservation Committee
kgf	Kilogramme force
MAT	Master Application Template
mm	Millimetre
MTe	million metric tonnes
n/a	Not available
NCMPA	Nature Conservation Marine Protected Area

Abbreviation	Explanation
NEO	New European Offshore
NFFO	National Federation of Fishermen's Organisations (Statutory Consultee)
NIFPO	Northern Ireland Fish Producer's Organisation (Statutory Consultee)
NO_2	Nitrogen Dioxide
nom	nominal
NO_x	Nitrous Oxides
NORM	Naturally Occurring Radioactive Material
NSTA	North Sea Transition Authority
OEUK	Offshore Energies UK (formerly Oil and Gas UK)
OPEP	Oil Pollution Emergency Plan
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
OSPAR	Oslo-Paris Convention (The Convention for the Protection of the Marine Environment of the North-East Atlantic (the 'OSPAR Convention')
P/L	Pipeline (used in "contents list")
PLE	Pipeline End (refer Figure 1.6.2)
PLEM	Pipeline End Manifold (towhead)
PMF	Priority Marine Features
SAC	Special Area of Conservation
SAT	Subsidiary Application Template
SFF	Scottish Fishermen's Federation (Statutory Consultee)
SOSI	Seabird Oil Sensitivity Index
SO_x	Sulphur Oxides
Te	Metric tonne (1,000 kgf)
TFSW	Trans Frontier Shipment of Waste
T.O.S.	Top of Steel
UKCS	United Kingdom Continental Shelf
VOC	Volatile Organic Compound
WONS	Well Operations Notification System

1. EXECUTIVE SUMMARY

1.1 Decommissioning Programme

This document includes one Decommissioning Programme (DP) for the Alba Northern Platform (ANP) topsides.

The rest of the infrastructure associated with the wider Alba field is not being decommissioned at this time and will be included within separate DP(s) to be submitted by Ithaca. The remaining jacket and pipeline infrastructure covered by notices under Section 29 of the Petroleum Act 1998 will be subject to DPs, Comparative Assessment and an Environmental Appraisal to be submitted at a later date. Removal of the topsides will not preclude available decommissioning options for the Alba Northern jacket or the remaining Alba infrastructure.

Although the removal of the Alba Northern topsides is being treated in this document as a standalone project, Ithaca will continue to explore cost saving synergies with other projects.

1.2 Requirement for Decommissioning Programme

Installations: In accordance with the Petroleum Act 1998, Ithaca Oil and Gas Limited (Ithaca) as operator of the Alba field, and the Section 29 notice holders (Table 1.4.2), are applying to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) to obtain approval for decommissioning the Alba Northern topsides as detailed in Section 1.4.1 of this document. Letters of support from the Section 29 notice holders will be included in the Appendix following public and statutory consultation.

In conjunction with public, stakeholder and regulatory consultation, the DP contained herein is submitted in compliance with national and international regulations and OPRED guidance notes [12]. Subject to contractual agreements, removal of the ANP topsides is planned for some time between mid-2028 and end 2032. The schedule outlined in this document shows a more complete picture including the well decommissioning activities that commenced in 2023, and the onshore disposal activity. A schedule is included in Figure 6.3.1.

1.3 Introduction

Discovered in 1984 and located in block 16/26a on the United Kingdom Continental Shelf, Alba is a heavy oil field and was one of the first shallow Eocene reservoirs to be successfully developed in the North Sea. ANP was installed in 1993 with first oil was achieved in January 1994.

The Alba field lies about 210 km north-east of Aberdeen, Scotland, in the UK Central North Sea, in water depths of ~138 m.

The field facilities include a fixed steel platform, the ANP, and a Floating Storage Unit (FSU), the first to be purpose-built for the UK sector of the North Sea. The field was further developed in 2001 through the addition of the Alba Extreme South (AXS) subsea production centre supported by the Sadie water injection drill centre.

Alba crude oil is offloaded from the stern of the FSU to a shuttle tanker before being transported to refineries in northwest Europe. Alba gas is used for ANP fuel and the ANP itself is also connected by a 4 km long gas pipeline to the Britannia platform.

As the caissons, risers and umbilicals will be fixed to the jacket, they will remain in place for decommissioning at a later stage, although sections that interface between the jacket and topsides will be cleaned and removed to allow removal of the topsides. As the risers and umbilicals will remain fixed to the jacket, these will not drop to the seabed when disconnected from the topsides. While the topsides remains in place any diesel in the two diesel storage tanks in the jacket legs A1 and A2 will be drained and returned to shore for re-use or disposal. The diesel tank will also be cleaned should it be safe to do so. The methods to be used

will be agreed beforehand with the EMT Environmental Inspectorate.

Future production from the Alba field will no longer be economically viable and so the Alba facilities and infrastructure will need to be decommissioned. The economics and timing of Cessation of Production (CoP) are currently being evaluated with field partners and NSTA and once the wells have been decommissioned ANP topsides will no longer be required and can be removed.

This DP explains the principles of the removal activities for the ANP topsides. It has not been deemed necessary to prepare a comparative assessment in support of this DP. The environmental impacts associated with the work in this DP have been assessed and detailed within Section 4 and environmental permit applications will be submitted via the Portal system as appropriate.

1.4 Overview

1.4.1 Installation

Table 1.4.1: Installation being decommissioned				
Field(s)	Alba		**Production type**	Oil
Water depth (m)	~138m		**UKCS Block**	16/26a
Surface installations			**Number of Wells**	
Number	**Type**	**Mass (Te)**	**Platform**	**Subsea**
1	Topsides	17,543	31	n/a
Distance to median			**Distance from nearest UK coastline**	
39.6 km			~216km NE of Aberdeen	

Table 1.4.2: Section 29 Notice Holders – installation(s)		
Section 29 Notice Holder	**Registration Number**	**Equity Interest (%)**
Arco British Limited, LLC	FC005677	0%
Chrysaor (U.K.) Lambda Limited	SF000910	0%
Chrysaor Petroleum Limited	01247477	0%
EnQuest Energy Limited	01019698	0%
EnQuest Heather Limited	02748866	8.00%
EnQuest NWO Limited	08497436	0%
EnQuest Production Limited	01019831	0%
EQ Petroleum Sabah Ltd	07211014	0%
Equinor UK Limited	01285743	0%
Fina Petroleum Development Limited	00740632	0%
Ithaca Oil and Gas Limited	01546623	36.67%
Mitsui E&P UK Limited	07652477	0%
NEO Energy (SNS) Limited	SC291165	0%
NEO Energy Petroleum Limited	03288689	17.00%
Spirit Energy Resources Limited	02855151	12.65%
Waldorf Production UK PLC	05030838	25.68%

1.5 Summary of proposed Decommissioning Programme

Table 1.5.1: Summary of Decommissioning Programme	
Proposed decommissioning solution	**Reason for selection**
1. Topsides	
Complete removal and recycle. The ANP topsides will be removed and recovered to shore for reuse, recycling or disposal as appropriate, unless alternative re-use options are found to be viable and more appropriate. Cleaned equipment refurbished for re-use where possible. Equipment that cannot be reused will be recycled or subject to disposal routes as appropriate. All relevant environmental permits and applications will be submitted as required for the work associated with removal of the topsides.	Complies with mandatory requirements and maximises opportunity for reuse or recycling or materials.
2. Wells	
All wells will be decommissioned to comply with the HSE "Offshore Installations and Wells (Design and Construction, etc.) Regulations 1996" and in accordance with the latest version of the Offshore Energies UK Well Decommissioning Guidelines. The wells will be decommissioned using the platform-based facilities possibly supplemented by temporary equipment.	Meets the NSTA and HSE regulatory requirements.
3. Interdependencies	
An investigation into potential alternative use for the Alba Northern platform is currently underway, although it is unlikely that alternative reuse options will be found to be economically viable. Due to timescales of decommissioning separate DPs will be submitted for the ANP jacket and wider Alba field subsea installations and pipeline infrastructure. The drill cuttings will be considered at this time. No third party infrastructure will be disturbed as a result of the decommissioning proposals.	

Figure 1.5.1: ANP view on south-west corner

Figure 1.5.2: ANP view on south face

Figure 1.5.3: ANP view on east face

Figure 1.5.4: ANP view on north-east corner

Figure 1.5.5: ANP view on west face

1.6 Field Location including field layout and adjacent facilities

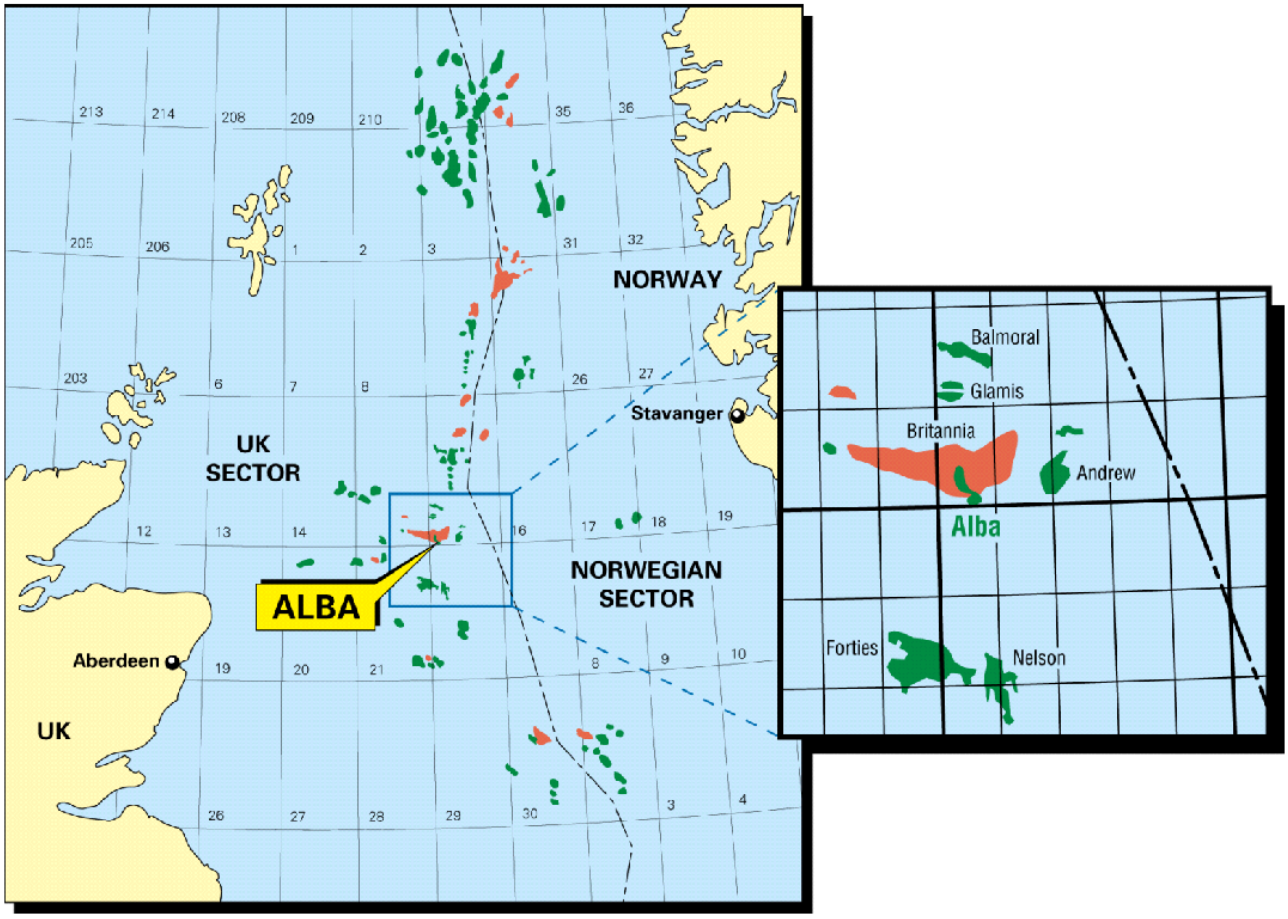
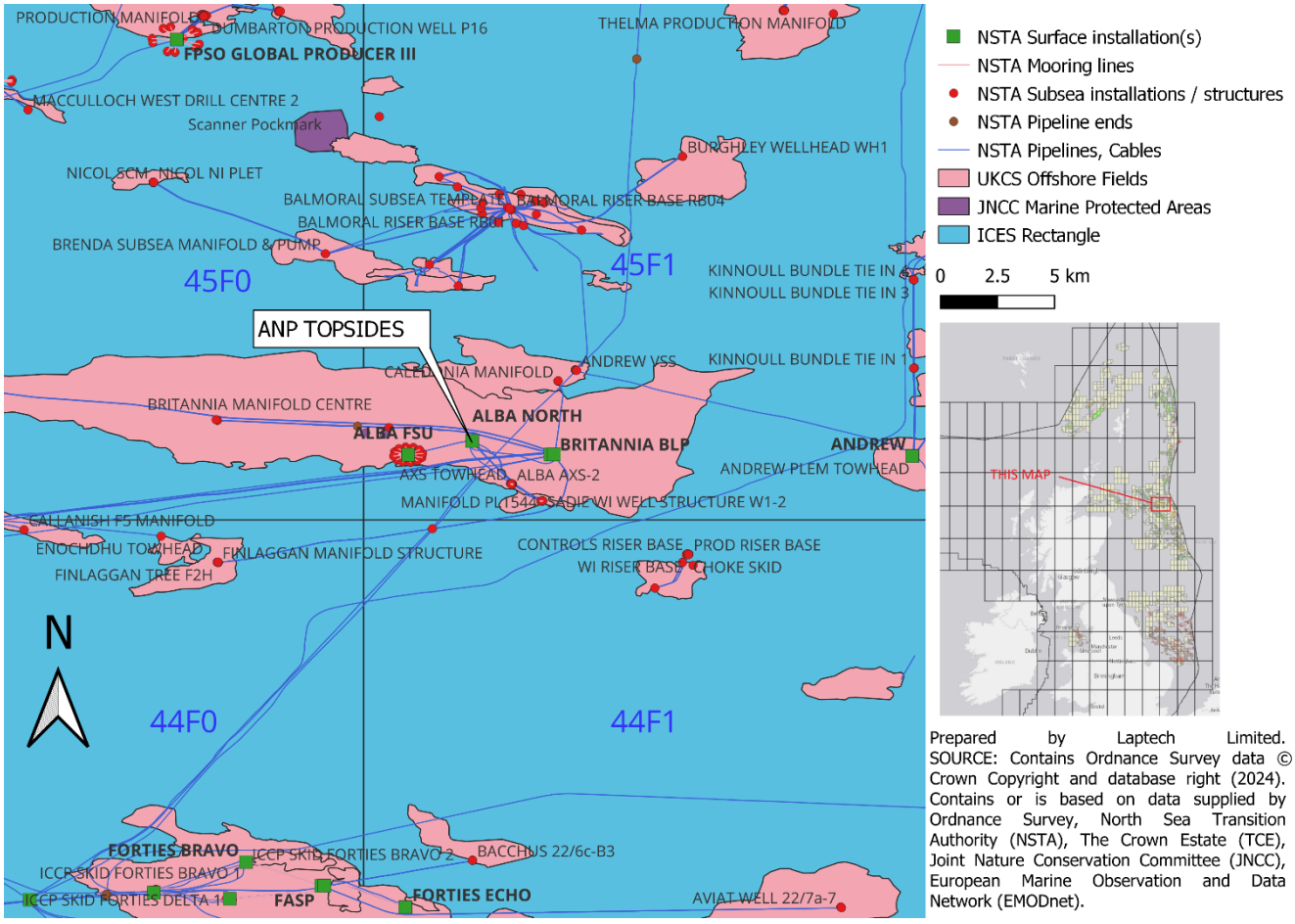


Figure 1.6.1: Location of Alba installations and infrastructure in UKCS



Prepared by Laptech Limited. SOURCE: Contains Ordnance Survey data © Crown Copyright and database right (2024). Contains or is based on data supplied by Ordnance Survey, North Sea Transition Authority (NSTA), The Crown Estate (TCE), Joint Nature Conservation Committee (JNCC), European Marine Observation and Data Network (EMODnet).

Figure 1.6.2: Installations and infrastructure local to Alba in UKCS

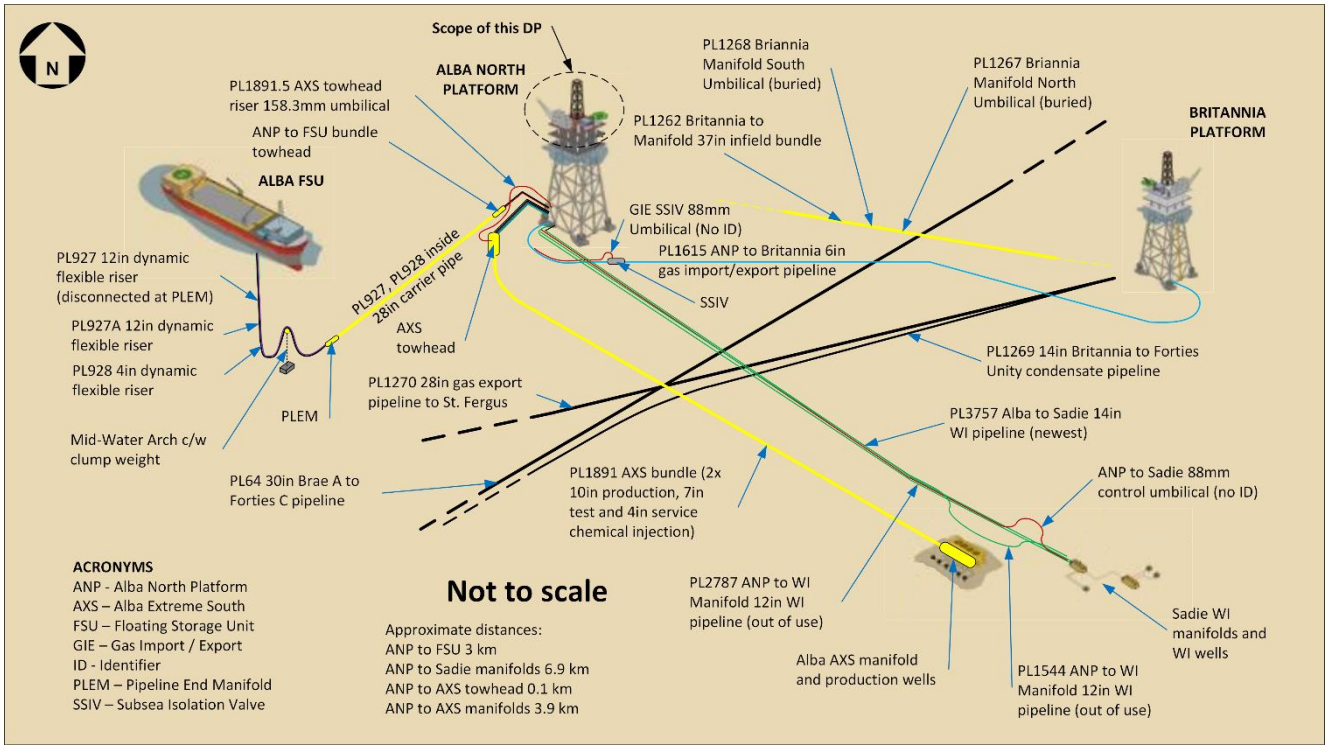


Figure 1.6.3: Alba field installations and infrastructure (not to scale)

1.6.1 Adjacent facilities

Table 1.6.1: Adjacent facilities					
Owner / Operator	**Name**	**Type**	**Direction & Distance from ANP**	**Information**	**Status**
Ithaca Oil and Gas Limited	Alba FSU	FSU	WSW, 2.99 km		Operational
	ANP to FSU towhead	Bundle towhead	W, 0.09 km		Operational
	ANP to FSU PLEM	Bundle towhead	WSW, 2.72 km		Operational
	AXS towhead	Towhead	SE, 3.89 km		Operational
	AXS 2 manifold	Manifold	SE, 3.93 km		Operational
	Sadie 1 manifold	Manifold	SE, 5.76 km		Operational
	Sadie 2 manifold	Manifold	SE, 5.78 km		Operational
	Sadie 3 manifold	Manifold	SE, 5.75 km		Operational
Harbour Energy PLC	Britannia platform	FSJ	E, 3.64 km		Operational
BP Exploration Company Limited	Andrew platform	FSJ	E, 18.8 km		Operational
Impacts of decommissioning proposals					
There are no direct impacts on adjacent facilities from the decommissioning works associated with the ANP topsides.					

1.7 Industrial implications

The ANP topsides DP will be managed by Ithaca to ensure safe and efficient delivery of the various elements of the decommissioning scope. The intention is to make efficient use of the supply chain to generate value through the application of knowledge, innovation and technology, explore collaboration opportunities and to employ best practice in the management of the supply chain to deliver a cost effective and reliable service. Where appropriate existing framework agreements may be used for decommissioning activities.

2. DESCRIPTION OF ITEMS TO BE DECOMMISSIONED

2.1 Part of ANP installation: Topsides

Table 2.1.1: Surface facilities information					
Name	Facility type	Location		Part of installation	
		WGS84 Decimal	WGS84 Decimal Minute	Mass (Te)	No of modules
Alba Northern	Topsides	58.059983° N 1.081097° E	58°3.5990' N 1°4.8658' E	17,543	1 (integrated deck)

2.2 Wells

Table 2.2.1: Well Information			
Well ID	Designation	Status	Category of well
16/26-A70	Oil Production	In service	PL-4-4-3
16/26-A36Y	Oil Production	Shut in	PL-3-4-3
16/26-A48W	Oil Production	Shut in	PL-4-4-3
16/26-A49Y	Oil Production	In service	PL-4-4-3
16/26-A42	Oil Production	Shut in	PL-4-4-3
16/26-A55Z	Oil Production	In service	PL-4-4-4
16/26-A4X	Water Injection	Shut in	PL-3-4-4
16/26-A33Y	Oil Production	Shut in	PL-4-4-3
16/26-A64Z	Water Injection	In service	PL-4-4-3
16/26-A29Y	Oil Production	Shut in	PL-4-3-3
16/26-A69	Oil Production	Shut in	PL-4-4-4
16/26-A50Z	Oil Production	In service	PL-4-4-3
16/26-A63	Oil Production	Decommissioned, AB1	PL-4-4-4
16/26-A59Y	Oil Production	Decommissioned, AB1	PL-4-4-4
16/26-A72X	Oil Production	In service	PL-4-4-4
16/26-A67Z	Oil Production	Shut in	PL-4-4-3
16/26-A56Y	Oil Production	Shut in	PL-4-4-4
16/26-A32Y	Oil Production	Shut in	PL-3-3-4
16/26-A46W	Oil Production	In service	PL-4-3-3
16/26-A44Y	Oil Production	Shut in	PL-4-3-3
16/26-A52Y	Oil Production	Shut in	PL-4-3-3
16/26-A10	Water Injection	Shut in	PL-4-3-4
16/26-A66Z	Oil Production	Shut in	PL-4-3-3
16/26-A53T	Oil Production	Shut in	PL-3-4-3
16/26-A60	Water Injection	Shut in	PL-4-4-3
16/26-A31	Water Injection	Shut in	PL-4-3-4
16/26-A22Z	Water Injection	In service	PL-4-3-4
16/26-A73Y	Oil Production	Shut in	PL-4-3-4
16/26-A61Z	Oil Production	Shut in	PL-4-4-3
16/26-A71Z	Oil Production	In service	PL-4-4-3
16/26-A16T	Oil Production	In service	PL-4-4-3

NOTES

1. For details of well categorisation please refer the latest version of the OEUK Guidelines for the Decommissioning of Wells.
2. The well decommissioning activities include the removal of conductors to an elevation that will be discussed and agreed with OPRED.

2.3 Inventory estimate

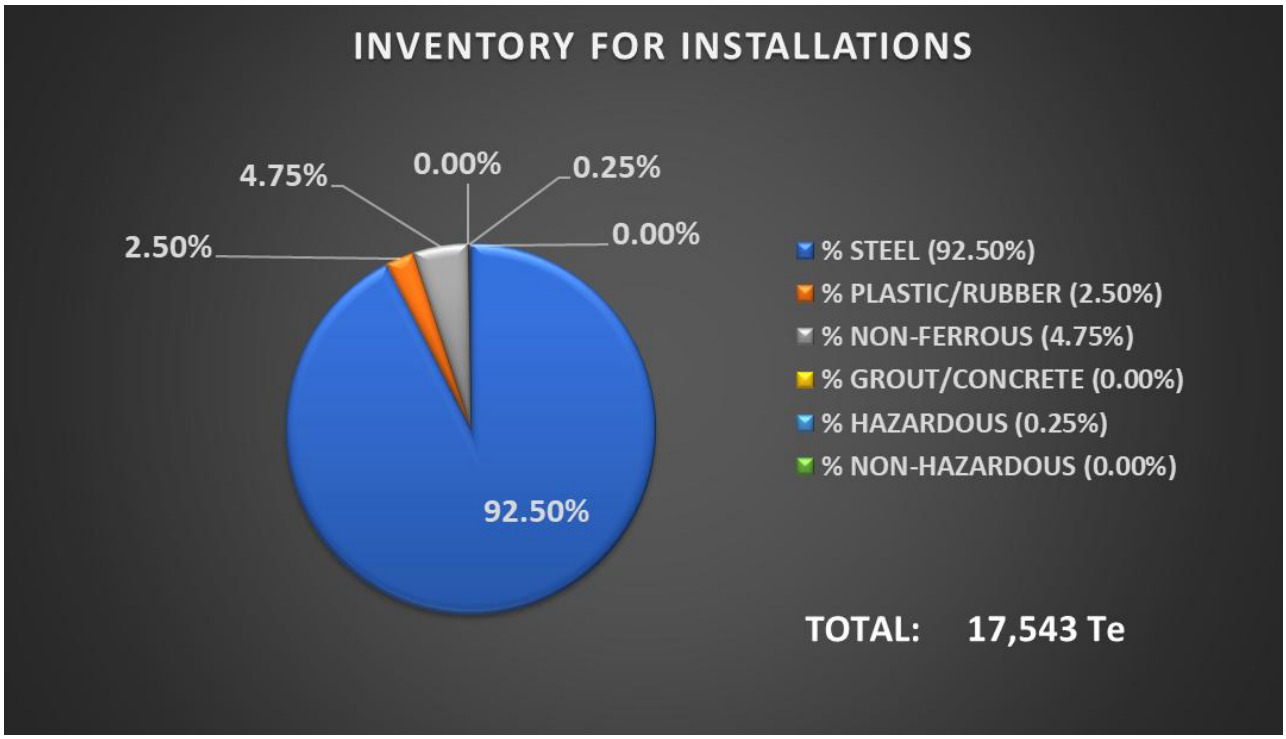


Figure 2.3.1: Inventory of installations (ANP topsides)

3. REMOVAL AND DISPOSAL METHODS

Waste will be dealt with in accordance with the Waste Framework Directive. The re-use of an installation, or parts thereof, is first in the order of preferred decommissioning options and such options are currently under investigation. Waste generated during decommissioning will be segregated by type and periodically transported to shore in an auditable manner through licensed waste contractors. Metals account for the greatest proportion of the materials inventory and these are recyclable.

Geographic locations of potential disposal yard options may require the consideration of Trans Frontier Shipment of Waste (TFSW), including hazardous materials. Early engagement with the relevant waste regulatory authorities will ensure that any issues with TFSW are addressed.

Removal activities will be performed using available techniques and methods will be in line with current guidance and best available techniques (BAT) and best environmental practice (BEP).

3.1 Topsides' decommissioning

The ANP topside production and utility facilities are contained within the large integrated deck and deck extensions supported by a conventional eight leg jacket. Drilling services are located within separate drilling modules that are located on the integrated deck. The drilling derrick and substructure is a self-contained structure that sits on the skid rails located over the well-bay area of the integrated deck. The self-contained accommodation module is also located on the integrated deck and has direct access to the central control room, helideck and lifeboats. Accommodation facilities accommodate up to 144 personnel. The flare boom is attached to the north end of the integrated deck and supports the High Pressure and Low Pressure flare lines.

ANP is equipped with process facilities for separation of produced fluids, compression of gas for fuel, water injection and produced water clean-up equipment.

The platform is complete with all necessary power generation and required utility systems.

The layout of the ANP topsides is shown in various plot plans presented in Figure 3.1.1, Figure 3.1.2, Figure 3.1.3, Figure 3.1.4 and Figure 3.1.5 below.

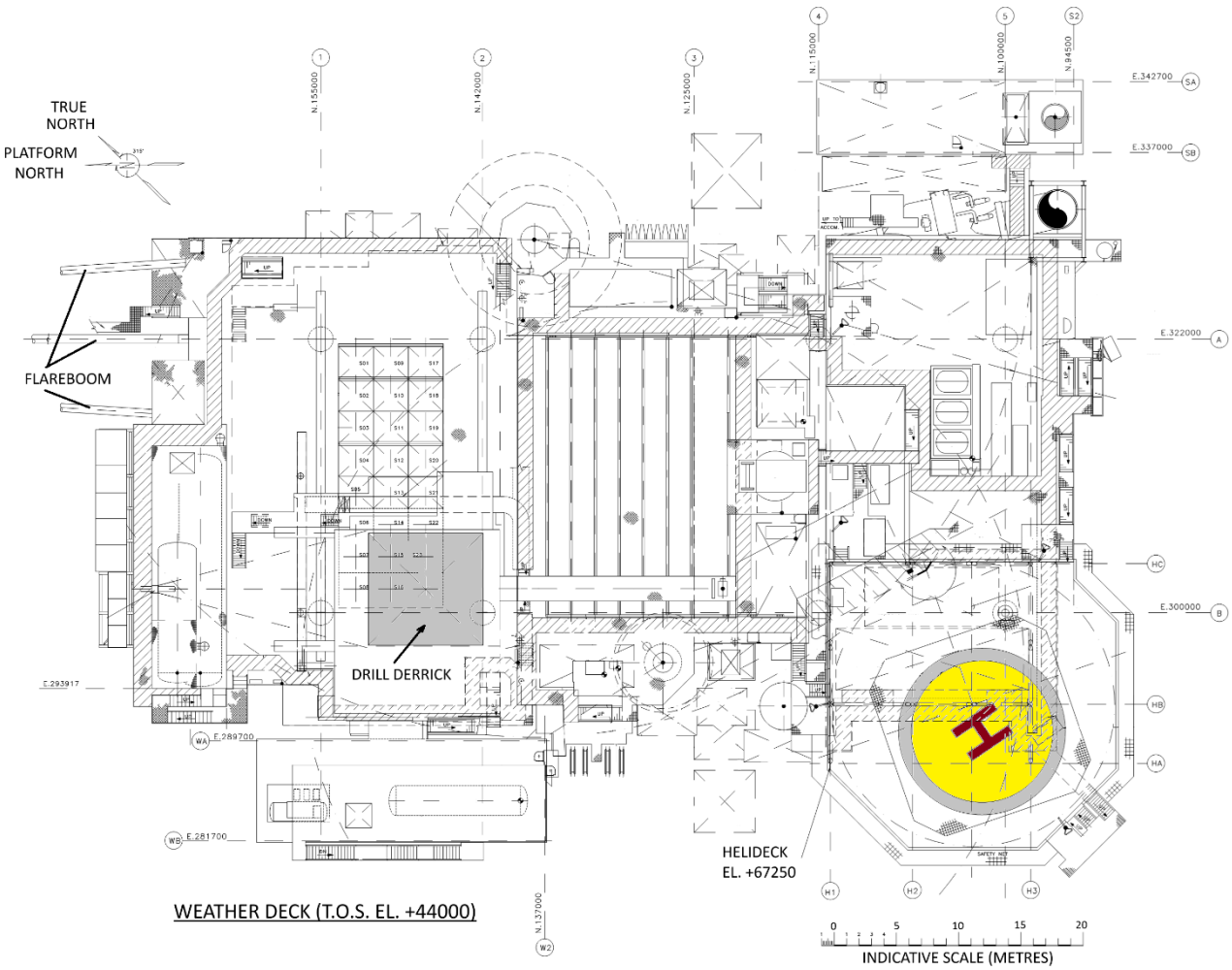


Figure 3.1.1: ANP Weather Deck T.O.S. EL. +44000

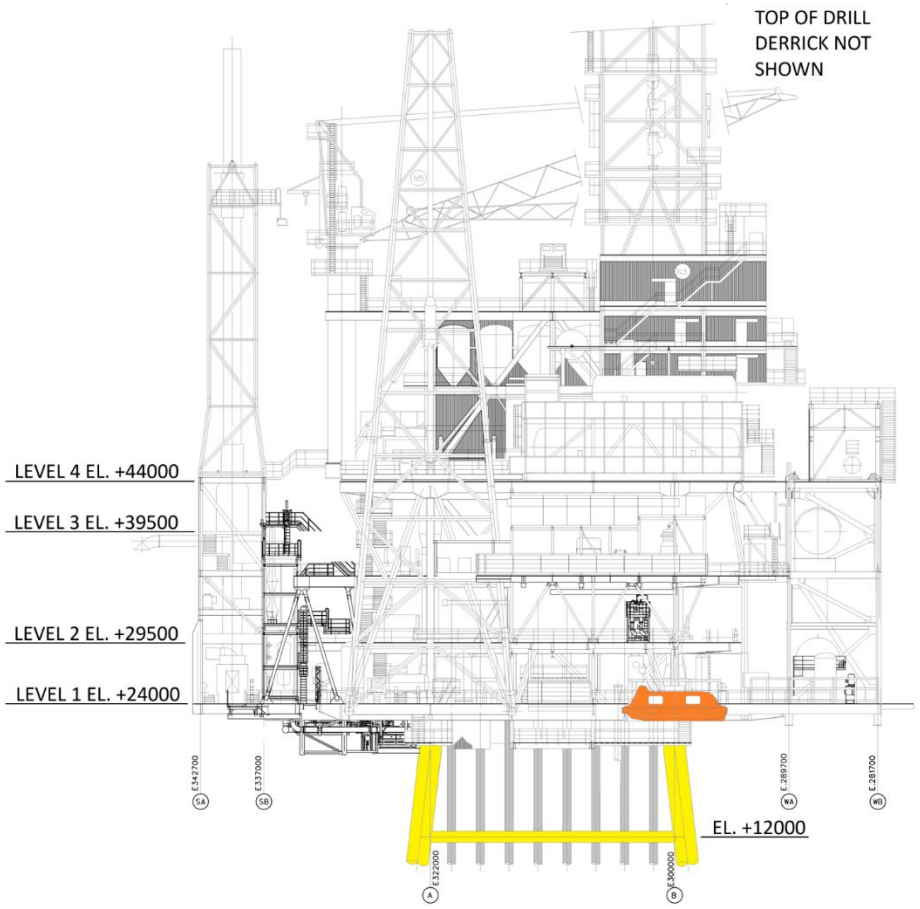


Figure 3.1.2: ANP view on north face

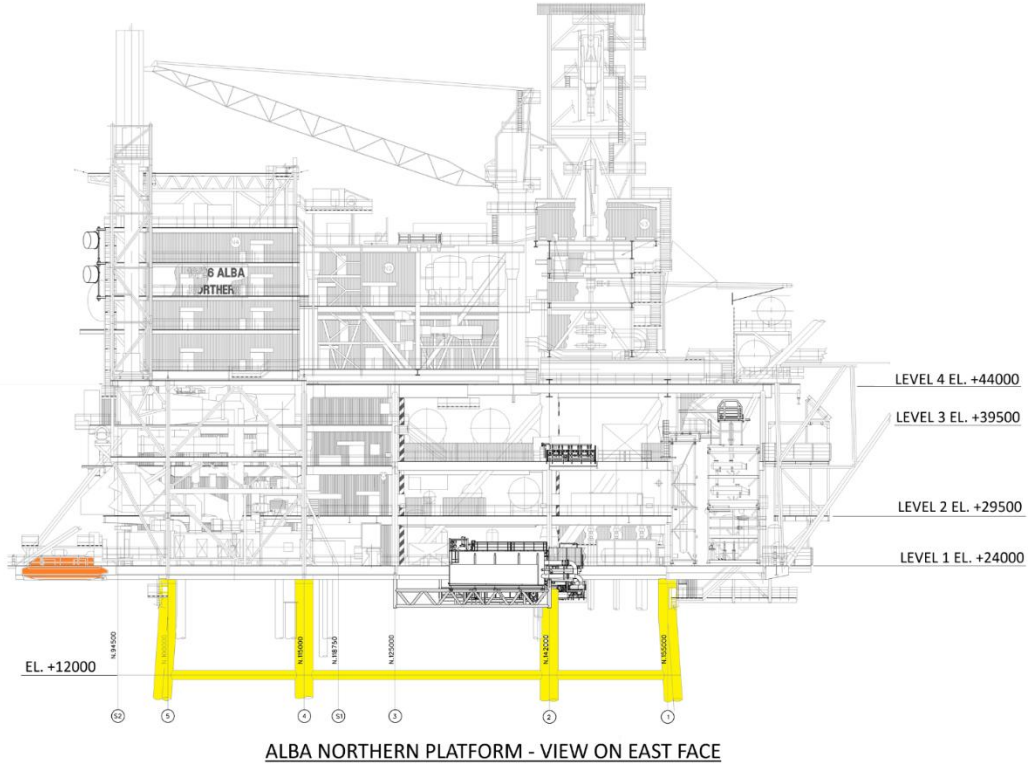


Figure 3.1.3: ANP view on east face

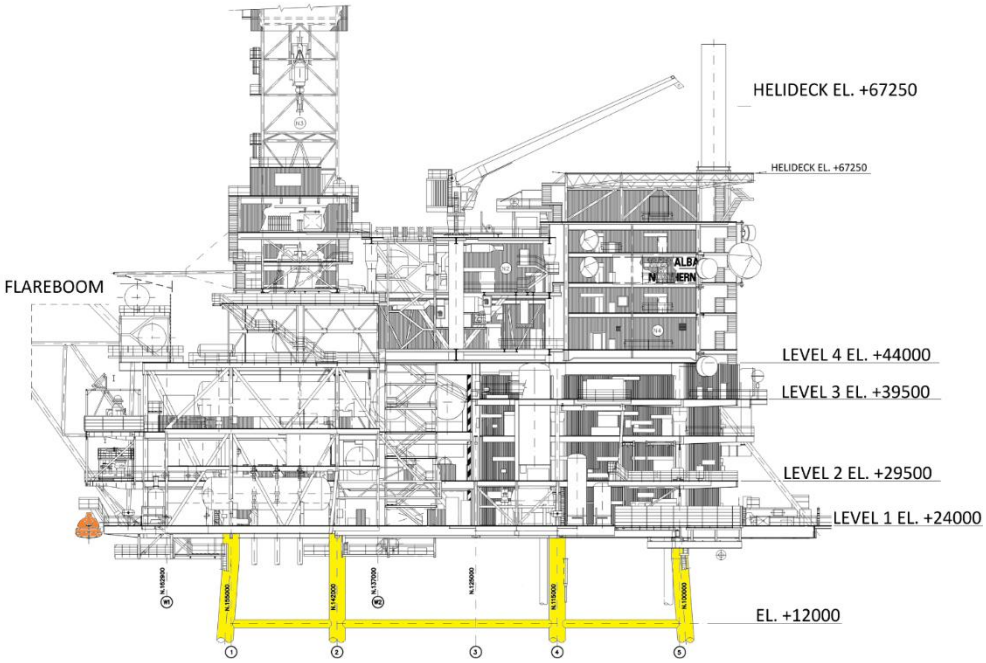


Figure 3.1.4: ANP view on west face

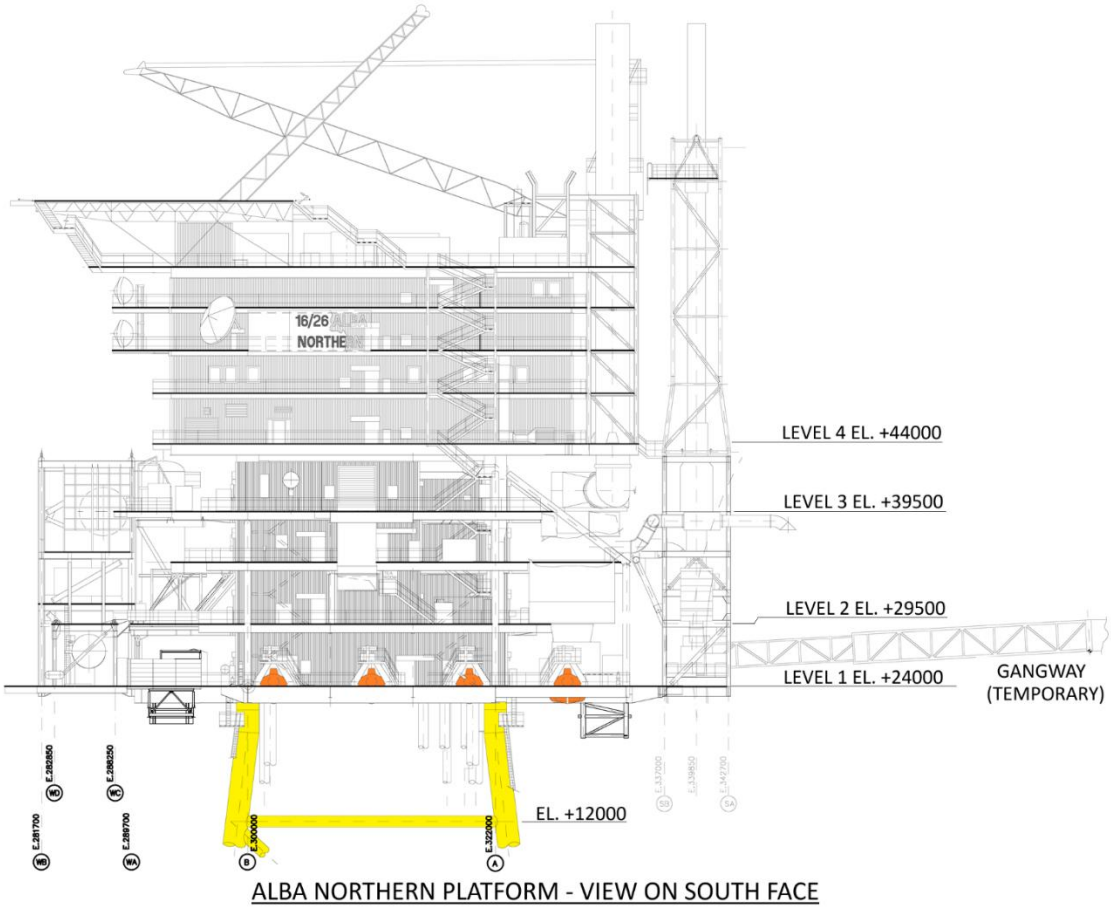


Figure 3.1.5: ANP view on south face

Preparation and cleaning: The methods that will be used to vent and purge the ANP topsides prior to removal to shore are summarised in Table 3.1.1.

Table 3.1.1: Cleaning of ANP topsides for removal		
Waste type	**Composition of waste**	**Disposal route**
Hydrocarbons	Process fluids	Will be flushed, purged with nitrogen and vented to be rendered liquid free. This will be done under the applicable MAT and SAT permit submissions.
Production and drilling chemicals	Proprietary bulk chemicals used for production and drilling	Equipment will be drained, flushed and cleaned. Residual effluent will be transported to shore for appropriate use, recycling and disposal.
Produced solids	Sand, NORM	Any pipeline debris captured in filter packages will be taken to shore for disposal. Any solids remaining in vessels will be removed and disposed of during the dismantlement of topsides onshore. Produced solids may be processed offshore prior to removal of topsides, or processed onshore. The presence of NORM found during the cleaning activities will be identified with appropriate measures taken for its management.
Diesel	Bunkered diesel fuel	While the topsides remains in place bunkered diesel topsides and in the jacket (legs A1 and A2, (refer Figure 3.1.6, Figure 3.1.7 below) will be drained and returned to shore for re-use or disposal. The methods to be used will be agreed beforehand with EMT Environmental Inspectorate.
Lubricating oils	Lubricants used for equipment e.g., gearboxes, pumps, pedestal compressors etc.	Lubricating oils will be drained and returned to shore for re-use or disposal.

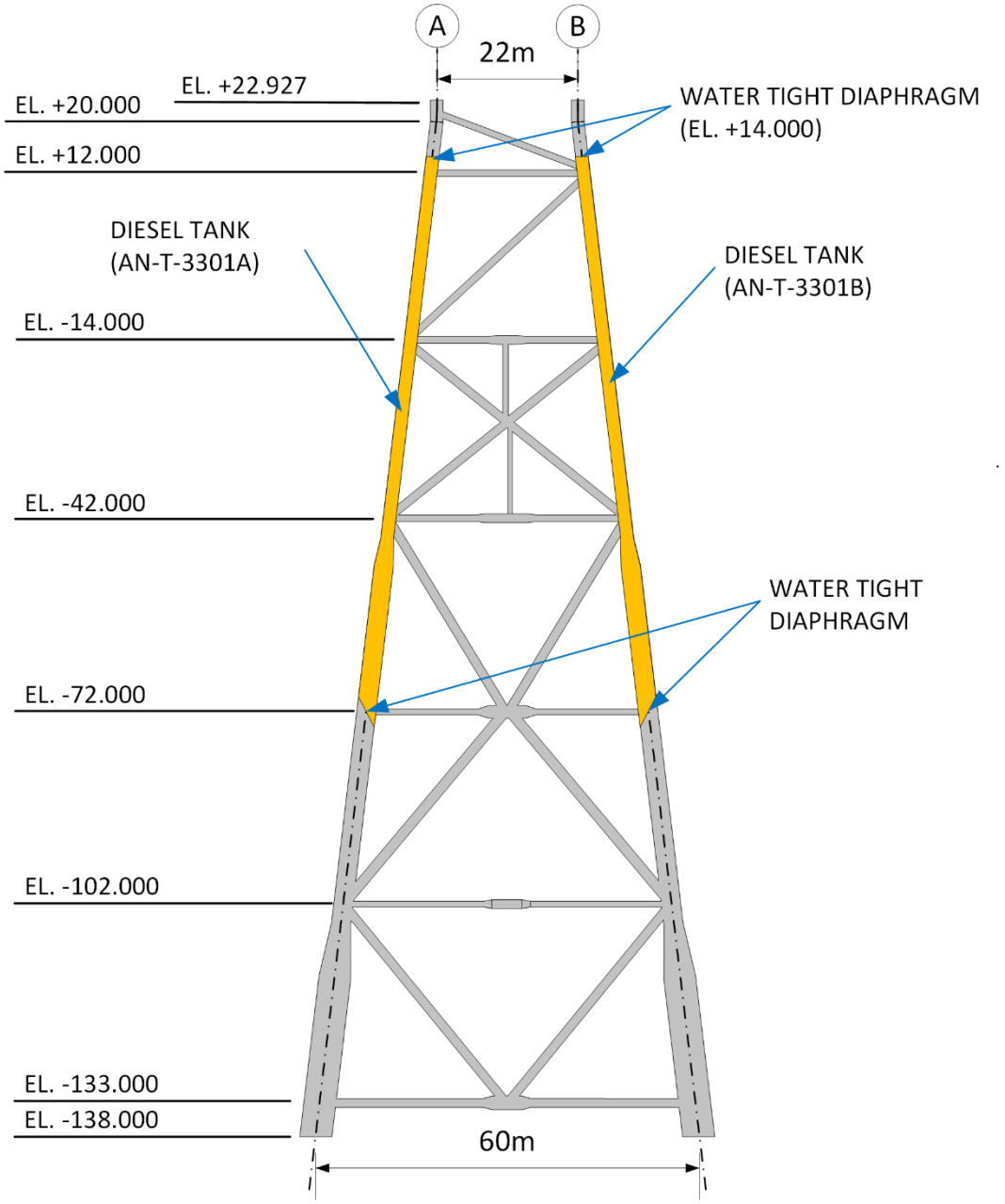


Figure 3.1.6: ANP jacket frame 1 showing diesel tanks

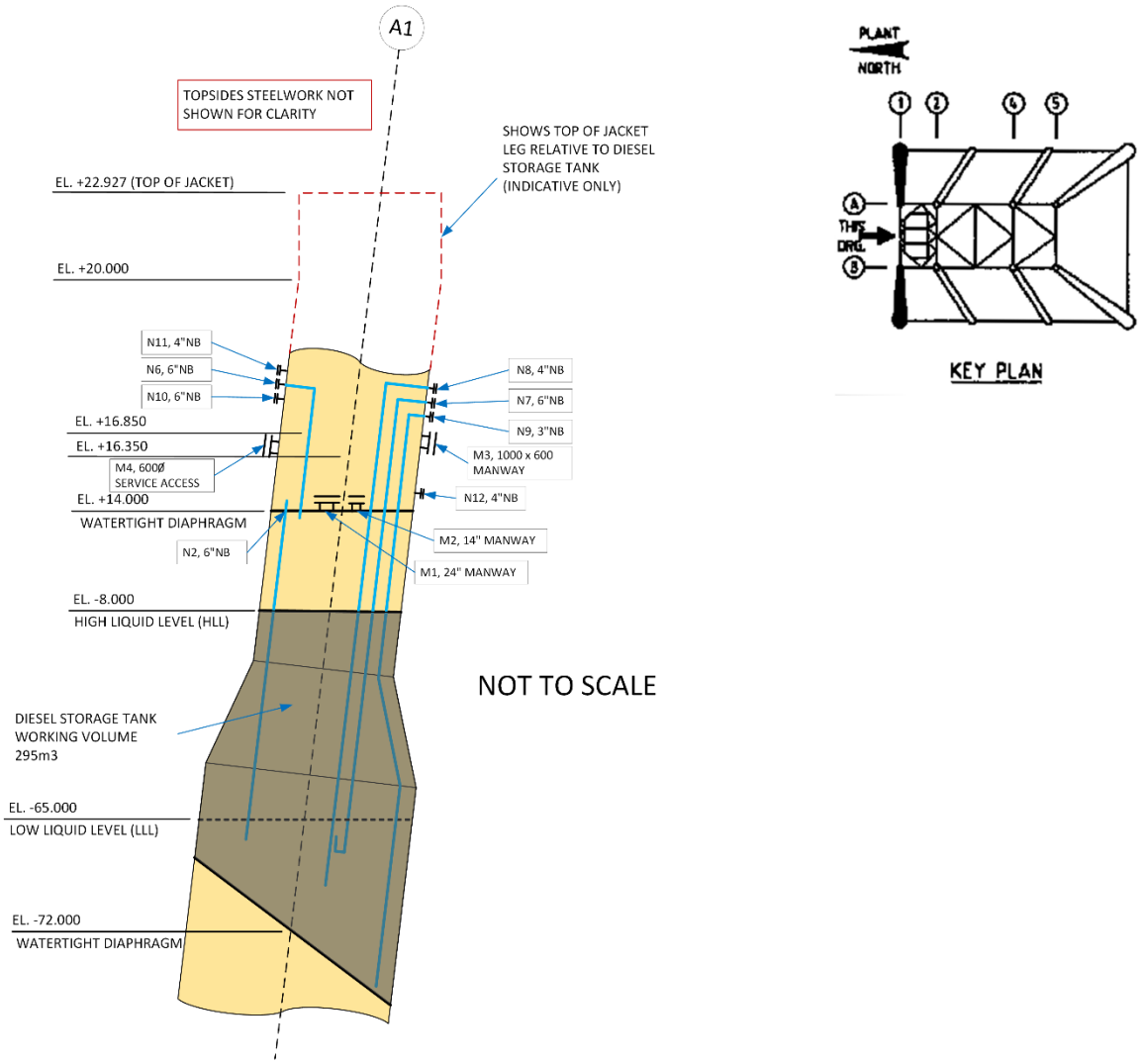


Figure 3.1.7: ANP diesel tank details (Leg A1, Leg B1 similar)

Table 3.1.2: ANP topsides removal method	
1) Single Lift Vessel ☑; 2) Semi-Submersible Crane Vessel ☑; 3) Hybrid ☑; 4) Piece small ☑; 5) Other ☐	
Method	**Description**
Single lift removal by SLV/SSCV	Removal of topsides as complete unit by a single lift vessel or possibly SSCV and transported to an onshore decommissioning facility to be broken up for reuse, recycling or disposal
Modular removal by SSCV	Removal of the topsides modules and supporting structures by semi-submersible crane vessel. The resulting material would then be taken to an onshore decommissioning facility to be broken up for reuse, recycling or disposal
Piece small	Breaking up the topsides offshore using manual labour or mechanical excavators fitted with hydraulic shears etc. Materials would be transported to shore by ship or barge and sorted at an onshore decommissioning facility.
Other - Hybrid	Hybrid options of piece small and SSCV cut and lift may be feasible and would likely depend on the type of crane vessel being used.
Proposed removal method and disposal route	**Removal of topsides followed by recovery to shore for reuse, recycling, and final disposal to landfill as per Table 4.2.1. The topsides will be separated from the jacket at an elevation between EL. +13.000 and EL.+22.000. A final decision on the decommissioning method will be made following a feed study and commercial tendering process. OPRED will be informed of the outcome of the tendering process.**

3.2 Well decommissioning

Table 3.2.1: Well Decommissioning
The ANP platform hosts several wells as listed in Table 2.2.1. All wells will be decommissioned in accordance with latest version of the OEUK Well Decommissioning Guidelines. A Master Application Template (MAT) and the supporting Subsidiary Application Template (SAT) will be submitted in support of works carried out. An application to decommission the wells will be made via the online Well Operations Notification System (WONS) on the NSTA Energy Portal. Well decommissioning will be scheduled in accordance with the outline schedule presented in section 6.3.

3.3 Waste streams

3.3.1 Waste Stream Management Methods

Table 3.3.1: Waste stream management methods	
Waste Stream	**Removal and disposal method**
Bulk liquids	Bulk and residual hydrocarbons will be removed from topsides, although small quantities of residues may remain. Any closed systems will be identified and managed before the topsides is removed. Further cleaning and decontamination will take place onshore prior to re-use or recycling. The risers will be flushed and left filled with seawater as appropriate prior to being disconnected at the ends. Any residual fluids from within these pipelines will be released to marine environment under permit. Further cleaning and decontamination will take place onshore prior to reuse, recycling or disposal.
NORM	Based on production records to date, NORM can be expected. As a precaution, tests for NORM will be undertaken offshore and any NORM encountered will be dealt with and disposed of in accordance with guidelines and company policies and any permit requirements.
Asbestos	Given the age of the facility it is likely that there will be asbestos. Any such material found will be dealt with and disposed of in accordance with guidelines and company policies.
Original paint coating	The presence of lead-based paints will be identified as these may give off toxic fumes or dust if flame-cutting, grinding or blasting is used so appropriate safety measures will be taken. Painted items will be disposed of with consideration given to any toxic components.
Other hazardous	Discharge of cleaning chemicals offshore will be managed under appropriate permits. Other hazardous

Table 3.3.1: Waste stream management methods	
Waste Stream	**Removal and disposal method**
wastes	wastes will be recovered to shore and disposed of according to guidelines, company policies and permit requirements.
Onshore dismantling sites	Appropriate licensed sites will be selected. Dismantling site 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. If a non-UK yard is selected, appropriate Trans-frontier Shipment of Waste licences will be used.

Table 3.3.2: Inventory disposition			
Inventory	**Total inventory (Te)**	**Planned tonnage to shore (Te)**	**Planned left *in situ* (Te)**
ANP topsides	17,543	17,543	0

Table 3.3.3: Re-use, recycle & disposal aspirations for recovered material			
Inventory	**Re-use**	**Recycle**	**Disposal (e.g., Landfill)**
ANP topsides	<5%	>95%	<5%

4. ENVIRONMENTAL APPRAISAL

4.1 Environmental sensitivities

The key environmental sensitivities in the project area are summarised in Table 4.1.1. Except where referenced, the data have been obtained from various historical survey reports dated between 1992 and 2014. Environmental baseline surveys are planned for 2024, and the data obtained will be used to inform the various permits required for decommissioning operations; this survey scope has also been designed to obtain a good understanding of the OSPAR threatened and declining habitat 'Seapens and burrowing megafauna communities' in the Alba field area.

Table 4.1.1: Environmental and societal sensitivities

Environmental receptor	Main features
Physical environment	**Wind:** The central north sea is a harsh operating environment that exhibits a strong seasonality. The most severe winter months are November through February and the calmest summer months are May through August. While November through February are most severe on a day-to-day basis, early- and late-season storms can cause severe events during the autumn and spring months. Prevailing winds in winter are north easterly wind speeds that are typically 10 to 11 m/s but can reach over 24 m/s in storms. In summer the prevailing winds are from the south east, typically 6 to 7 m/s. **Waves:** The seasonal variations in sea states closely mimic those of the winds that generate them. In winter, typical significant wave heights (H_s) can be in the region of 3 m, but can reach over 8 m in severe storms. In summer typical Hs is in the range 1.5 m to 2 m. **Currents:** Currents in the central North Sea are driven primarily by tides, and tides in the Alba area are semi-diurnal (two high and two low tides per day). Tides exhibit a strong spring-neap cycle over the course of an approximate 28 day lunar cycle. In the Alba area tides are typically 0.15 m/s but in extreme winter storms currents can reach almost 0.45 m/s.
Bathymetry and seabed sediments	Water depth at Alba is approximately 138 m. The seabed in the area is relatively flat, with a few inflexions where the profile crosses existing pipelines. Seabed features include, occasional boulders, seabed scars and occasional seabed depressions. Sediment types across the Alba area range from clay to very fine sands which is typical of the area.
Fish, spawning and nursery Areas	The Alba field is located in ICES rectangle 45F1. **Spawning areas:** cod (Jan-April) mackerel (May-Aug), Norway pout (Jan-April), *Nephrops* (Jan-Dec); the three fish species (cod, maceral and Norway pout are listed as Scottish Priority Marine Features (PMF). **Nursery areas:** anglerfish, cod, European hake, herring, ling, spotted ray, spurdog, whiting, mackerel, haddock, Norway Pout, blue whiting, sandeel and *Nephrops* [2],[5]. The spawning and nursery area features are dynamic and likely to show some degree of spatial and temporal variability.
Conservation species	Alba is located within a known area for the feature 'submarine structures made by leaking gases' associated with pockmarks, however no notable structures (i.e. carbonate structures) have been recorded at/around Alba. The surface of pockmarks in the vicinity of the Alba field area are comparable with the surrounding soft sediments and are not associated with areas of enhanced biological activity. None of the Alba infrastructure is located within or near a designated conservation area. The seabed within the survey areas display characteristic features of the OSPAR (2010) listed 'Sea pens and burrowing megafauna communities habitat' and this this habitat is expected to be present in the Alba area as it is widespread within the Fladen Ground to the north of Alba.
Conservation designations	The closest designated conservation site is the Scanner pockmark Special area of Conservation (SAC) area, ~24km to the north of Alba, designated for the habitat 'Submarine structures made by leaking gases', and the closest Nature Conservation Marine Protected Area (NCMPA) is the Norwegian Boundary and Sediment Plain (34km), designated for *Arctica islandica* aggregations (including sands and gravels as their supporting habitat). *Arctica islandica* is a low/limited mobile species found predominantly on sublittoral sediments, buried (or part buried) in sand and muddy sand. All other designated sites are >60km away from Alba.

Table 4.1.1: Environmental and societal sensitivities	
Benthic environment	Situated at the edge of the Fladen Ground, the Alba area supports a *Thyasira*-foraminiferan community typical for the area. The macrofauna corresponds well the group characterised by the polychaetes *Heteromastus* sp., *Lumbrineris gracilis* and *Phylo* (*Orbinia*) *norvegica*, the amphipod *Eriopisa elongata* and the *Thyasira* sp bivalve complex. The Central Fladen Ground NCMPA is ~120km NW of Alba. The faunal composition described during the 1991 (ANP) baseline survey was characterised by the polychaetes *Levinsenia gracilis*, *Heteromastus filiformis* and *Paramphinome jeffreysii*, [6]. In contrast, the 2000 [7] survey showed marked faunal modification at stations closest to the ANP, while stations further away were highly diverse and within ranges observed during the baseline survey. Stations closest to the ANP (within 200m to the north and 50m east) were impoverished. Species composition at these stations were dominated by pollutant tolerant species such as the polychaetes *Capitella capitata* and *Ophryotrocha* spp. Stations at 500m from ANP were dominated by the indicator species *P. jeffreysii* and *T. sarsi*, while species typical of background sediments were also relatively abundant, suggesting that the fauna at these stations was intermediate between the highly modified fauna within 100-200m of ANP and the undisturbed fauna at stations 800m and beyond; the OGUK (2007) survey of 2005 of stations north of ANP indicated similar faunal compositions. Several species of infauna commonly associated with the habitat 'Seapens and burrowing megafauna in circalittoral fine mud' were present including *Thyasira equalis*, *Nephtys hystricis* and *Terebellides stroemi*. The seapen *Virgularia mirabilis* was recorded in low numbers from stations 800m from ANP, while individual *Pennatula phosphorea* were recorded in samples at 800m, 2,500m and 5,000m from ANP.
Marine mammals	Five species of marine mammals are considered regular visitors to the Alba area [13], harbour porpoise, minke whale, killer whale, white-beaked dolphin and white-sided dolphin, the first of these, considered the most widespread and frequently encountered, occurring regularly throughout most of the year. The Alba area is located within the SCANS survey stratum NS-G (previously stratum Q in SCANS III) and from the most recent data (SCANS IV [9]), only harbour porpoise (density of animals = 1.0398), minke whale (0.1051) and white-beaked dolphin (0.0103), were recorded within the stratum.
Seabirds	The Alba area can be considered of relatively low importance to seabirds in the context of the North Sea as a whole. This is related to the distance from breeding colonies, and the availability of prey; the closest landfall is ~180km from Alba, and only a few species with known breeding colonies on the north east coast of Scotland/Northern Isles (i.e. northern fulmar, northern gannet, European storm petrel, great skua) have a mean maximum foraging range during the breeding season in excess of 180km and may be present in the area during this time. Species present offshore varies seasonally and given the distance from the coast, birds present will predominately be those transiting through the area during migration, non-breeding juveniles and post-breeding dispersion from colonies. The Seabird Oil Sensitivity Index (SOSI) [14] has been used in conjunction with JNCC [11] guidance to determine seabird sensitivity within the Alba area (Block 16/26). Six of the twelve months as are low sensitivity, with four of the remaining months classed as low, based on the adjacent month method, leaving two months (Nov and Dec) for which there is no (adjacent month or adjacent block) data coverage. There is a greater awareness of offshore installations being used by nesting seabirds, particularly black-legged kittiwakes, although other species such as razorbill and common guillemot have also been recorded. To date, no nesting activity has been recorded at Alba, however, Ithaca will be developing a bird management plan to support the decommissioning of the Alba facilities (topsides (current DP) and upper jacket (separate DP).
Commercial fishing	The Alba field is located in ICES rectangle 45F1 and targeted mainly for shellfish and demersal species, with pelagic landings typically very low. In 2022, the contribution from this ICES rectangle were relatively small, accounting for 0.3% (weight – tonnes) and 0.7% (value) of the UK total. Fisheries effort data has shown that Feb/March can experience high effort, with the summer months also favoured; effort has increased significantly over the last two years, which may reflect lower effort during 2020 related to the global COVID pandemic. However, effort is low in comparison to the wider area, and ICES 45F1 only accounts for around 1% of the UK total; it should also be noted that effort will not be uniform across the rectangle. Trawls (particularly bottom trawls) and seine nets are the predominant types of fishing gear used.

Table 4.1.1: Environmental and societal sensitivities	
Other offshore industries	Alba is in the north of the central North Sea oil and gas development area with several fields nearby. There are no operational or under construction wind farm developments in the Alba area and the closest carbon licence (CS012) is >15km away. The closest Innovation and Targeted Oil and Gas (INTOG) wind leasing round areas INTOG Area 8, is >17km away. Alba is not located within a Ministry of Defence practice and exercise area, the nearest of these being area D613A >50km away. There are no telecommunication cables within the Block; the nearest cable is the TAMPNET CNSFTC cable which lies >25km to the south.

4.2 Potential environmental impacts and their management

There will be some planned environmental impacts arising from the removal of the ANP topsides. Long-term environmental impacts from the decommissioning operations are expected to be low. Incremental cumulative impacts and trans-boundary effects associated with the planned decommissioning operations are also expected to be low.

Ithaca understands the importance of minimising potential for environmental impact in line with safety and technical feasibility issues and will consider how engineering decisions reached for the removal of the ANP topsides can be made to limit the impact accordingly. Where design decisions cannot alone do this, Ithaca will develop measures to limit the extent of any potential impact. It is acknowledged that environmental permits and approvals will be required.

Table 4.2.1: Environmental impact management		
Activity	**Main impacts**	**Mitigations**
Topsides removal	Decommissioning of the topsides will require cutting of the structure above sea level and lifting activities using large lift vessels that for operations such as this are kept on location using Dynamic Positioning systems that operate with redundancy. The principal impacts from planned activities will include: • physical presence of vessels and equipment; • atmospheric emissions from vessel power generation; • underwater noise from vessels; • noise from cutting operations; • discharges to sea from vessels (e.g. residues from topsides_; • generation of waste materials. Risks of residual impact may include: • Disturbance to nesting birds • Physical presence of ANP jacket remaining after topsides removal Accidental impact may include: • disturbance to the seabed from dropped objects; • accidental releases of hydrocarbons or chemicals to the marine environment.	The impacts associated with the topsides decommissioning operations are expected to be short-term, localised and of low significance provided the proposed mitigation measures are in place. Activities will be planned to be executed as efficiently as possible, minimising cutting to reduce potential noise impacts. The contractors' capability, processes and procedures will be subject to audit and evaluation as part of the selection process. Vessels will be audited as part of selection and premobilisation and marine assurance standards will be adhered to. Cleaning and flushing of the topsides and diesel storage tanks in the legs in preparation for removal will remove hydrocarbons as far as possible to reduce the risk of releases to sea. Vessels will be managed to minimise durations and on-board operational practices will address fuel efficiency, noise management, and minimise waste. Vessels that use dynamic positioning will be used in preference to vessels requiring anchors. However, in the unlikely event that the vessels require to be anchored, anchoring procedures will be developed. If anchors/mooring system is to be used, these will extend outside the ANP 500m zone, with a mooring analyses undertaken and relevant notifications (i.e. notice to mariners) made. Risk assessments will be undertaken for the work at key stages throughout planning and execution. A Bird Management Plan will be developed, to manage the potential risk of seabirds nesting on the ANP; note, to date, no seabirds have nested on the installation.

Table 4.2.1: Environmental impact management		
Activity	**Main impacts**	**Mitigations**
		Following removal of the ANP topsides there may be a period of time before the jacket is removed. During this time, the top of the jacket will remain above sea level. Throughout this phase of decommissioning the existing 500m zone will remain in place and the ANP Consent to Locate will be revised to reflect the change to the installation. In addition, appropriate navigational aids will be fitted, and the jacket logged in FishSAFE with Kingfisher notified. As part of the OPEP, specialist oil spill management and response services as required, will be in place, to minimise impacts from potential releases to the marine environment. The waste hierarchy will be followed and only if other options are not possible will waste material be sent to landfill. Ithaca will monitor the performance of the contractors throughout operational activities.

4.3 Atmospheric emissions

Concerns regarding climate change has prompted increasing stakeholder concern regarding the anthropogenic impacts on the environment such as atmospheric emissions and the potential contribution of these greenhouse gas (GHG) emissions to climate change.

The quantification and impact assessment of the atmospheric emissions associated with the proposed ANP topsides removal activities, is presented in this section of the DP. The only source of atmospheric emissions relating to the decommissioning of the Alba topsides is from power generation associated with vessels used for the decommissioning activities.

The GHG of concern is CO_2 as it constitutes both the largest component of global combustion emissions (generally ~80% of total GHG emissions) and has a long atmospheric residence time.

On a local scale, emissions such as sulphur oxides (SO_x), nitrogen oxides (NO_x/NO_2) and carbon monoxide (CO) may affect air quality. While such emissions may be assessed against any local air quality guidelines to understand the potential magnitude of impact on human health and the environment, air quality effects relating to human health are essentially precluded due to the distance from Alba to shore (~180km).

4.3.1 Description and quantification of impacts

Total vessel fuel usage has been calculated based on the estimated number of days on location (Table 4.3.1). Emissions of relevant gas species have been estimated, using standard Environmental and Emissions Monitoring System (EEMS) conversion factors [3] and the Global Warming Potentials (GWP) values from [8] (Table 4.3.2). These have been used to estimate CO_2 equivalent (CO_2e.) emissions (Table 4.3.2), which are based on the radiative forcing effect of each GHG species relative to CO_2 and the atmospheric residence time of each gas. The GWP factor therefore changes depending on the "time horizon" considered. For the purposes of this assessment, a 100-year time-horizon has been used, in line with its adoption by the United Nations Framework Convention on Climate Change and use in the Kyoto protocol. GWP factors for CO have previously been calculated as 1.9 at 100 years, and as for the NO_x factor is considered highly uncertain. Therefore, these are not calculated. GWP for SO_2 and VOCs have also not been calculated due to the greater uncertainty surrounding factors for these.

Table 4.3.1: ANP topsides removal vessel activity			
Activity	**Vessel**	**Duration (vessel days)**	**Fuel use (Te)**
Removal of ANP topsides	SLV/SSCV	53	2,560
Cargo barge (not self-propelled) accompanied by 2x tugs (provisional: the cargo barge and tugs may not be required)	ET	Σ=125	2,558
	TOTAL	**178**	**5,118**

NOTES

1. Refer Table 3.1.2. Method used for removal of topsides will be subject to contractual agreements. Quantity of fuel is either based on [10] or project estimates.
2. Vessel days include mobilisation, demobilisation, transits to and from port and in-field working days and are included in the activities for removing the ANP topsides.

Table 4.3.2: Environmental impact – pollutants due to vessel activity using CO_2e								
Fuel (Te):	**5,118**	**CO_2**	**CO**	**NOx**	**N_2O**	**SO_2**	**CH_4**	**VOC**
Factor for GWG emissions (Te) per Te of fuel [10]:		**3.17**	**0.0157**	**0.059**	**0.00022**	**0.012**	**0.00018**	**0.0024**
Sub-total (Te) for each gas		16,222	80.34	301.93	1.13	61.41	0.92	12.28
GWP factor [8]:		**1**	**1.9**	*n/a*	**273**	**n/a**	**29.8**	*n/a*
CO_2e: (sub-total x GWP factor):		*16,222*	*n/a*	*n/a*	*307.4*	*n/a*	27.5	*n/a*
CO_2e (TOTAL):		***16,557***	*Attributed to vessel activity, based on CO_2e factors [8].*					

For context, in 2022, UK shipping emissions were 12MTeCO_2e [1] which is equivalent to 3% of UK GHG emissions (406.2MTeCO_2e) from all sources in 2022 [4]. The vessel activity associated with the DP contained herein are the equivalent of 0.138% of UK shipping emissions in 2022, or less than 0.005% of UK total GHG emissions in 2022.

5. INTERESTED PARTY CONSULTATIONS

5.1 Consultation Summary

Table 5.1.1: Summary of Stakeholder Comments		
Who	**Comment**	**Response**
INFORMAL CONSULTATIONS		
NIFPO	This part of the table will be completed following any informal discussions with Statutory Consultees.	This part of the table will be completed following any informal discussions with Statutory Consultees.
NFFO		
SFF		
Section 29 Holders		
STATUTORY CONSULTATIONS		
GMG	This part of the table will be completed following the formal Statutory Consultation.	This part of the table will be completed following the formal Statutory Consultation.
NFFO		
SFF		
NIFPO		
NSTA		
PUBLIC CONSULTATION		
Public		

6. PROGRAMME MANAGEMENT

6.1 Project management and verification

An Ithaca project management team will manage the operations of competent contractors selected for all decommissioning activities. The team will ensure the decommissioning is executed safely, in accordance with legislation and Ithaca's Health and Safety principles. In the unlikely event that changes to the DP are required, they will be discussed with OPRED with any necessary approvals sought.

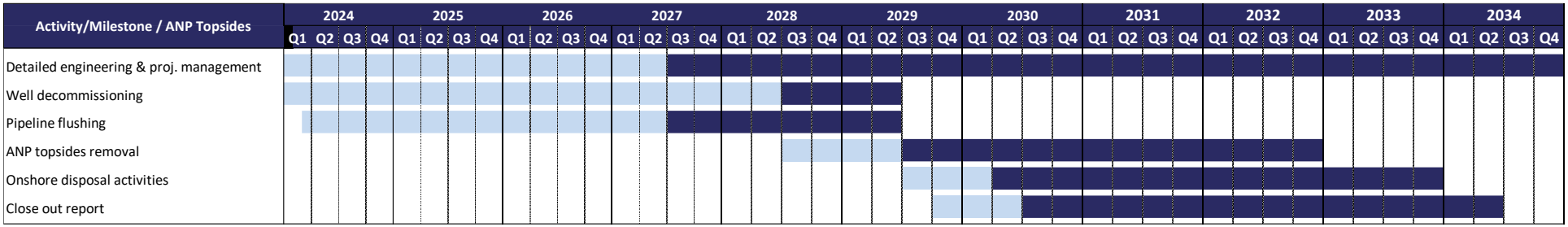
6.2 Post-decommissioning debris clearance and verification

The DP addresses removal of the ANP topsides. Post-decommissioning debris surveys and verification of a clear seabed will be described in the subsequent jacket and pipeline infrastructure DPs.

6.3 Schedule

A proposed schedule is provided in Figure 6.3.1. The activities are subject to the acceptance of the DP presented in this document and any unavoidable constraints (e.g. vessel availability) that may be encountered while executing the decommissioning activities. Therefore, activity schedule windows have been included to account for this uncertainty.

The commencement of offshore decommissioning activities will depend on commercial agreements and commitments.



Notes / Key

Earliest potential activity

Activity window to allow commercial flexibility associated with the decommissioning activities

1. Close out report within 1 year of completion of offshore activities.

Figure 6.3.1: Gantt chart of project plan

6.4 Costs

Decommissioning costs will be provided separately to OPRED and NSTA.

6.5 Close out

After the ANP topsides have been removed, OPRED will be notified and a decommissioning close out report will be submitted within 12 months of completion of the offshore scope.

6.6 Post-decommissioning monitoring and evaluation

Following removal of the ANP topsides there may be a period of time before the jacket is removed. During this time, the top of the jacket will remain above sea level. Throughout this phase of decommissioning the existing 500m zone will remain in place and the ANP Consent to Locate will be revised to reflect the change to the installation. In addition, appropriate navigational aids will be fitted, and the jacket logged in FishSAFE with Kingfisher notified.

Upon completion of the topsides removal activities the jacket will remain where it is until it is decommissioned. During this period, the jacket integrity will continue to be monitored as per the company jacket inspection & monitoring strategy. It will be furnished with a temporary Aid to Navigation. The system will be developed in consultation with the Northern Lighthouse Board.

Ithaca will develop maintenance and monitoring procedures that will include remote monitoring, periodic maintenance and testing in compliance with the ANP Consent to Locate. The design, manufacture, installation and maintenance of the navigational aids will be assured via an independent verification scheme and will be further defined in the Safety Case. As there remains the potential for seabirds to nest upon the remaining jacket structure, monitoring for this will also be included in a bird management plan that will be developed as part of the decommissioning preparatory works.

Residual liability for the jacket will remain with the Section 29 notice holders identified in section 1.4. Unless agreed otherwise in advance with OPRED, Ithaca will remain the focal point for such matters, such as any change in ownership, for example.

Once the wider Alba area has been decommissioned the requirement for legacy and liability management will be described in more detail in the final close out report.

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APPENDIX A PUBLIC NOTICES

APPENDIX B CORRESPONDENCE WITH STATUTORY CONSULTEES

APPENDIX C LETTERS OF SUPPORT