

# Decommissioning Programmes

*Draft for Consultation*


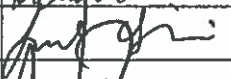



## Anglia Field

Normally Unattended Platform Topsides, Jacket, Subsea Installations and Associated Pipelines

**Document Control**

**Approvals**

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## 1. Table of Terms and Abbreviations

Terms and Abbreviations	Explanation
CA	Comparative Assessment
COP	Cessation of Production
CPUK	ConocoPhillips
CSV	Construction Support Vessel
DCR	Design and Construction Regulations 1996
DSV	Diving Support Vessel
EHC	Electro/Hydraulic/Control Umbilical
EIA	Environmental Impact Assessment (Environmental Statement)
ES	Environmental Statement
EPIC	EPIC International Limited
GMS	Global Marine Systems Limited
HLV	Heavy lift Vessel
HSE	Health and Safety Executive
IPR	Interim Pipeline Regime
LAT	Lowest Astronomical Tide
LIS	Left in Situ
LOGGS	Lincolnshire Offshore Gas Gathering System
LSA	Low Specific Activity
MEG	Mono-ethylene Glycol
MODU	Mobile Offshore Drilling Unit
MPA	Marine Protected Areas
NFFO	National Federation of Fishermen's Organisations
NIFPO	Northern Ireland Fish Producer's Organisation
NORM	Naturally Occurring Radioactive Material
NUI	Normally Unattended Installation
OGA	Oil and Gas Authority
OGUK	Oil & Gas United Kingdom
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
OSPAR	Oslo and Paris Convention

Terms & Abbreviations	Explanation
OIW	Oil in Water
"P and A"	Plug and Abandon
PETS	Portal Environmental Tracking System
PMT	Project Management Team
PON	Petroleum Operations Notice
PWA	Pipeline Works Authorisation
SFF	Scottish Fishermen's Federation
SAC	Special Areas of Conservation
SCI	Site of Community Importance
SPA	Special Protection Areas
SSM	Sub Sea Manifold
te	Tonne
UKCS	United Kingdom Continental Shelf
WBM	Water Based Mud

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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:

- 2 Anglia Field Installations
- 4 Anglia Field Pipelines

### 1.2 Requirement for Decommissioning Programmes

In conjunction with public, stakeholder and regulatory consultation, the decommissioning programmes are submitted in compliance with national and international regulations and OPRED guidelines. The schedule outlined in this document is for a 7-year decommissioning project plan due to begin in 2019.

#### Installations:

In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Anglia Field installations (see Table 1.2) are applying to the Department for Business, Energy and Industrial Strategy to obtain approval for decommissioning the installations detailed in Section 2.1 and 2.2 of this programme (See also Section 8 - Partner Letters of Support).

#### Pipelines:

In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Anglia Field pipelines (see Table 1.4) are applying to the Department for Business, Energy and Industrial Strategy to obtain approval for decommissioning the pipelines detailed in Section 2.3 of this programme. (See also Section 8 – Partner Letters of Support).

### 1.3 Introduction

Anglia is a Gas prospect lying in blocks 48/18b and 48/19b of the UK sector of the Southern North Sea and was proven by the drilling and testing of the 48/18b-1 well in 1972. Anglia lies approximately 25km west of the CUK operated LOGGS PP facility and approximately 55km from the UK mainland. The field was first developed with a three-legged fixed normally unattended installation (NUI) platform Anglia 'A'. In 1993 two additional subsea wells were added, Anglia West (B). Cessation of Production notification was submitted on 26th November 2015 and approved on the 16<sup>th</sup> May 2016, by the Oil & Gas Authority.

The facilities in the Anglia Field comprise the Anglia 'A' Normally Unattended Installation (NUI), supporting 6 platform wells and Anglia West (B) subsea manifold and associated subsea equipment, to tie-in 2 production wells via an 8" production pipeline (including a 5km control umbilical) 5km from the Anglia 'A' in 22.5m and 31m water depth respectively. It was designed and operated to produce and treat gas from the reservoir and transport to the LOGGS facility via a 12" production pipeline (including a 3" methanol pipeline piggy backed to the production line), for onward delivery to the onshore terminal at Theddlethorpe.

Following public, stakeholder and regulatory consultation the decommissioning programmes will be submitted, without derogation and in full compliance with OPRED guidelines. The decommissioning programmes explain the principles of the removal activities and are supported by an environmental

impact assessment. The decommissioning programmes for the pipelines, risers and umbilical are supported by a comparative assessment.

#### 1.4 Overview of Installations/Pipelines Being Decommissioned

##### 1.4.1 Installations

Table 1.1: Installations Being Decommissioned			
Field:	Anglia	Production Type (Oil/Gas)	Gas
Water Depth (m)	22.5m	UKCS block	48/18b and 48/19b
Surface Installations			
Number	Type	Topsides Weight (Te)	Jacket Weight (Te)
1	NUI	870	1088***
Subsea Installations		Number of Wells	
Number	Type	Platform	Subsea
1	Manifold Structure including protection frame, piles, piping & control modules	6	2 + 3 phase 1 abandoned*
Drill Cuttings piles		Distance to median	Distance from nearest UK coastline
Number of Piles	Total Estimated volume m <sup>3</sup> )	km	km
0	Cuttings naturally dispersed**	95	55

\*Although not on Section 29 notice, included for information.

\*\*Natural dispersion due to turbidity of currents in the area.

\*\*\* Jacket weight (Te) includes weight of piles.

Table 1.2 Installations Section 29 Notice Holders Details			
Section 29 Notice Holders	Registration Number	Equity Interest (%)	Notes
ITHACA ENERGY (UK) LIMITED	SC272009	30.000%	
DANA PETROLEUM (E & P) LIMITED	02294746	25.000%	
INEOS UK SNS LIMITED	01021338	12.2%	
FIRST OIL EXPRO LIMITED*	01021486	32.8%	
ITHACA ENERGY LIMITED	330077NC	0%	
DANA PETROLEUM LIMITED	03456891	0%	
INEOS UK (E & P) HOLDINGS LIMITED	SC200459	0%	
FIRST OIL SNS LIMITED (Dissolved June 2016)	00986309	0%	Exited
NEPTUNE E & P UKCS LIMITED	03386464	0%	Exited -GDF Britain Ltd is a previous name

#### 1.4.2 Pipelines

Table 1.3: Pipelines Being Decommissioned		
Number of Pipelines / Umbilical's	3/1	(See Table 2.3)

Table 1.4 Pipelines Section 29 Notice Holders Details			
Section 29 Notice Holders	Registration Number	Equity Interest (%)	Notes
ITHACA ENERGY (UK) LIMITED	SC272009	30.000%	
DANA PETROLEUM (E & P) LIMITED	02294746	25.000%	
INEOS UK SNS LIMITED	01021338	12.2%	
FIRST OIL EXPRO LIMITED*	01021486	32.8%	
ITHACA ENERGY LIMITED	330077NC	0%	
DANA PETROLEUM LIMITED	03456891	0%	
INEOS UK (E & P) HOLDINGS LIMITED	SC200459	0%	

Table 1.4 Pipelines Section 29 Notice Holders Details			
<b>PL854 (from, and including, the Anglia 'A' ESDV to and including the riser tie in spool flange (LOGGS end)) and PL855 (from, and including, the riser tie in spool flange to and including the Anglia 'A' valve</b>			
Section 29 Notice Holders	Registration Number	Equity Interest (%)	Notes
FIRST OIL SNS LIMITED (Dissolved June 2016)	00986309	0%	Exited
NEPTUNE E & P UKCS LIMITED	03386464	0%	Exited -GDF Britain Ltd is a previous name

*\*First Oil Expro Limited are going through administration. First Oil's 32.8 % share of Anglia field decommissioning costs are ring fenced under the Anglia Field Decommissioning Security Agreement. These funds are currently held in trust and will be utilised to perform and complete all Anglia field decommissioning work/obligations.*

*PL854 and PL855 are now split pipelines partly owned by ConocoPhillips.*

## 1.5 Summary of Proposed Decommissioning Programmes

Table 1.5: Summary of Decommissioning Programmes		
Selected Option	Reason for Selection	Proposed Decommissioning Solution <sup>1</sup>
<b>Topsides</b>		
Complete removal for recycling	Complies with OSPAR requirements and OPRED guidelines and maximises recycling of materials	Topsides facilities have been flushed to remove hydrocarbons < 10mg/l. Topsides will be separated from the jacket by cutting the legs below the cellar deck and lifting the topsides structure clear of the jacket and placing on a barge for transportation onshore for recycling.
<b>2. Jacket</b>		
Complete removal for recycling	Complies with OSPAR requirements and OPRED guidelines and maximises	Piles cut at 3m below seabed and Jacket and piles removed in a single lift with HLV/Barge and transported onshore for recycling.

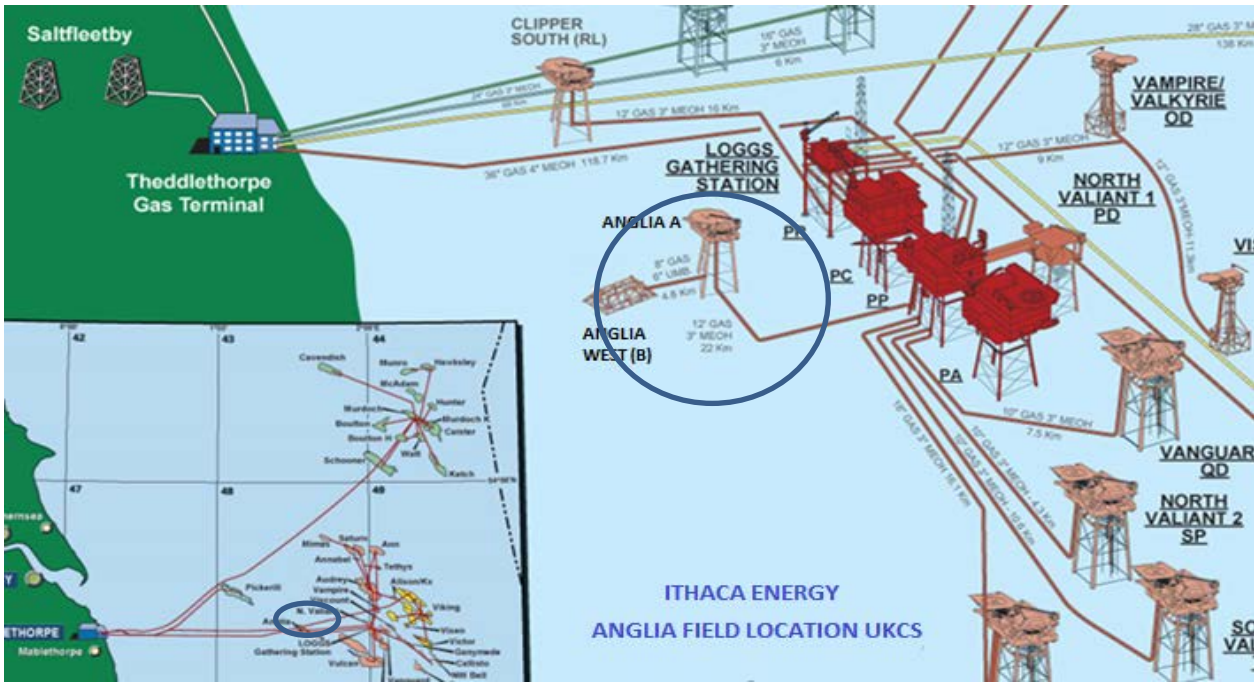
Table 1.5: Summary of Decommissioning Programmes		
Selected Option	Reason for Selection	Proposed Decommissioning Solution <sup>1</sup>
	recycling of materials	
<b>3. Subsea Installations</b>		
Complete removal for recycling.	To remove all seabed structures and leave a clean seabed. Complies with OSPAR requirements	Manifold structure including protection frame, piping and control modules to be disconnected and completely removed including piles which will be cut at 3m below seabed. Either by CSV or crane vessel with barge and transported onshore for recycling.

Table 1.5: Summary of Decommissioning Programmes		
Selected Option	Reason for Selection	Proposed Decommissioning Solution
<b>4. Pipelines, Flowlines &amp; Umbilical</b>		
<p>Pipelines will remain in-situ. All tie-in spools for the 8" import line, 12" export line and 3" Methanol line will be completely removed.</p> <p>Complete removal of the 6" multicore umbilical line. All returned onshore for recycling.</p>	<p>Complies with OSPAR requirements and OPRED guidelines and maximises recycling of materials</p>	<p>Pipelines will be disconnected, and the cut ends buried &gt; 1m; all spools will be removed by DSV or CSV and returned onshore for recycling. The 6" umbilical will be removed entirely except for the section under the pipeline crossing. It is intended that the concrete protection mattresses will also be recovered to shore, however in the event of practical difficulties OPRED will be consulted and the comparative assessment resubmitted.</p>
<b>5. Wells</b>		
<p>Abandon Wells in accordance with "Oil and Gas UK" guidelines on Well Decommissioning – Issue 6 – June 2018".</p>	<p>Complies with HSE and OGA guidelines</p>	<p>Anglia wells including previously suspended wells will be plugged and abandoned using a drill rig/ship. A PON5, Marine Licence and PETS will also be submitted to OPRED and OGA for approval to abandon the wells.</p>
<b>6. Drill Cuttings</b>		
<p>Leave in place to degrade naturally</p>	<p>Drill cuttings are below the OSPAR 2005/6 threshold</p>	<p>Natural dispersion of drill cuttings due to turbidity of currents in the area has occurred and any remaining cuttings will be left undisturbed on seabed.</p> <p>Note: All the 30" conductors were driven into the seabed using spud mud/seawater sweeps. As with the 30" conductor installations, the 26" holes sections were drilled using spud mud and seawater sweeps. The 17 1/2" and 12 ¼ sections were drilled mainly with low toxicity oil based mud (LTOBM). The reservoir sections 8 1/2" and 6" were drilled using either low toxicity oil based mud or water based mud (WBM).</p>
<b>7. Interdependencies</b>		
<p>Platform can only be removed post well plug and abandonment and pipeline disconnection.</p> <p>Manifold and associated wellheads can only be removed after the wells are plugged and abandoned and the tie-in spools, EHC bundles and pipelines disconnected.</p> <p>Associated piles can be cut with minimal disturbance to the sea bed. Small amounts of sediment may have to be displaced to allow pile cutting.</p>		

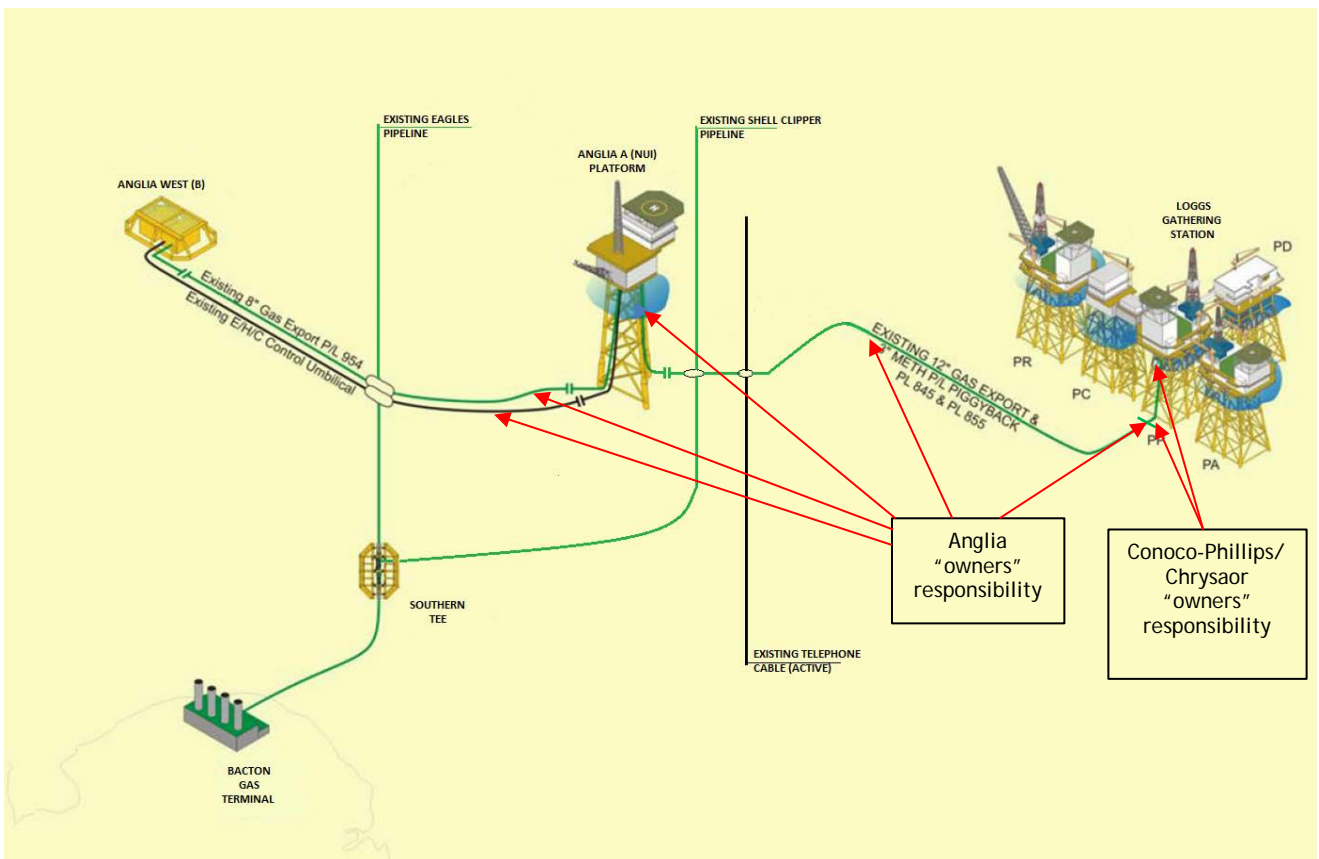
**Note:** Various permits and consents will be required for the decommissioning activities, e.g. chemical permits. These will be applied for in due course and at the appropriate time, with approvals sought prior to the commencement of any offshore decommissioning activity.

**1.6 Field Location Including Field Layout and Adjacent Facilities**

**Figure 1.1: Anglia Field Location in UKCS**



**Figure 1.2: Anglia Field Layout**





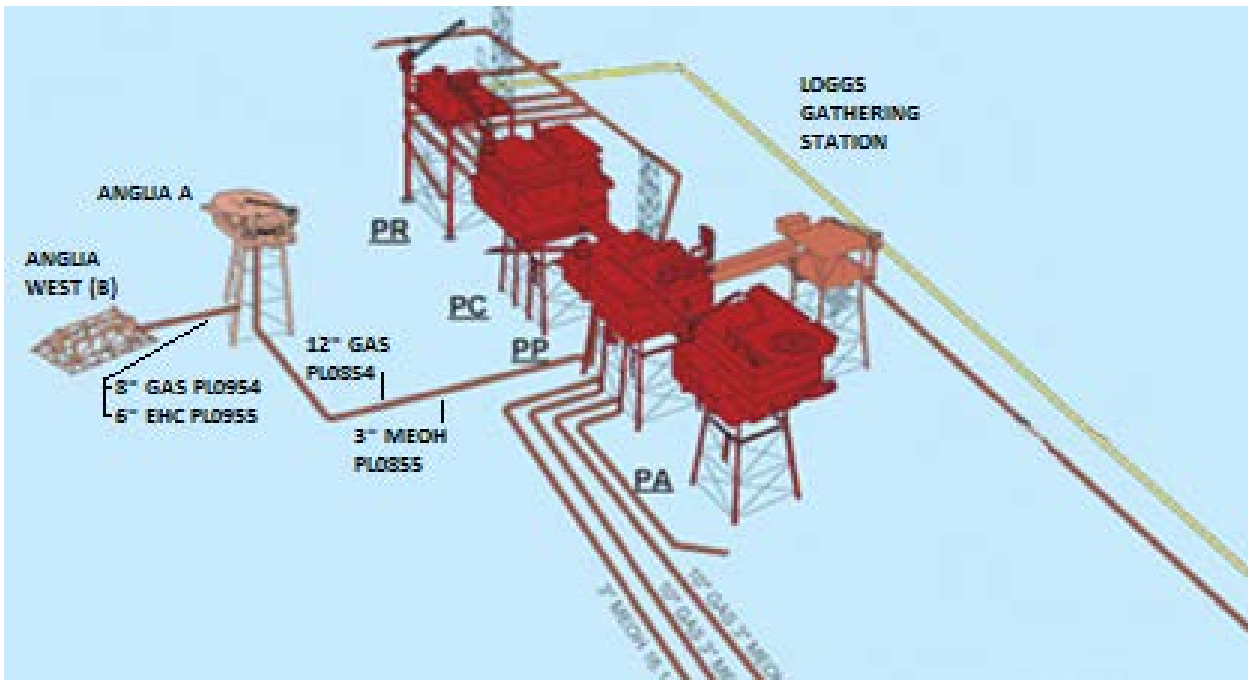
**Table 1.6 Adjacent Facilities**

Owner	Name	Type	Distance/Direction	Information	Status
CPUK	LOGGS	Fixed bridge linked Steel Platforms	24km East	Gas Gathering Station	Ceased Production

**Impacts of Decommissioning Proposals**

Anglia pipelines and EHC umbilical cross over main gas pipelines and redundant telephone cables. Ithaca worked closely with the LOGGS operator – CPUK to complete cleaning of the gas export line and have agreed to continue discussions and keep each other apprised of activities in the area should any potential collaboration opportunities arise.

**Figure 1.3: Adjacent Facilities**



**1.7 Industrial Implications**

The work to decommission the Anglia Field installations and pipelines will be completed using the most effective combination of Diving Support Vessel (DSV), Construction Support Vessel (CSV) or HL crane barge. Well plug and abandonment operations will be completed using a jack up drilling rig.

It is Ithaca’s intention to use existing framework agreements for the decommissioning of the subsea installations and stabilisation features. Ithaca will also seek to combine Anglia decommissioning activities with other development or decommissioning works should the opportunity be available. The decommissioning schedule contains contingency to provide flexibility within the programmes.

## 2. Description of Items to be Decommissioned

### 2.1 Surface Installations Facilities – Anglia ‘A’

Table 2.1: Surface Facilities Information									
Name	Facility Type	Location		Topsides/Facilities		Jacket (if applicable)			
				Weight (Te)	No of modules	Weight (Te)	Number of legs	Number of piles	Weight of piles (Te)
Anglia ‘A’	Fixed platform	WGS84 Decimal	53.368° 1.652°	870	1	1008	3	4	80
		WGS84 Decimal Minute	53°22.057’N 1°39.100’E						

### 2.2 Subsea Installations including Stabilisation Features

Table 2.2: Subsea Installations and Stabilisation Features					
Subsea installations including Stabilisation Features	Number	Size/Weight (te)	Location		Comments/Status
Anglia West (B) Manifold including protection frame, control & Piping modules and piles	1	110	WGS84 Decimal	53.372° 1.579°	The Manifold will be disconnected and recovered in a single lift. This will be removed and returned onshore for re-use or recycling.  Manifold production lines flushed with treated seawater to <10mg/l OIW Hydraulic hoses retain HW540E water based hydraulic fluid. Chemical umbilical hoses flushed with 50/50 Pot water Meg mix.
			WGS84 Decimal Minute	53° 22.322’N 1°34.752’E	
Concrete Mats	0				
Grout/Sand bags	0				
Formwork	0				
FronD Mats	21	1.7	Anglia		
Deposited Rock	0				

**Figure 2.1 Anglia**

**Wellhead Platform**



**Figure 2.2 Anglia West (B) Subsea Manifold**



### 2.3 Pipelines Including Stabilisation Features

Table 2.3: Pipeline/Flowline/Umbilical Information									
Description	Pipeline Number (as per PWA)	Diameter (inches)	Length (km)	Description of Component Parts	Product Conveyed	From – To End Points	Burial Status	Pipeline Status	Current Content
Production Pipeline	PL954	8"	4.9	8" Steel Pipeline	Gas	Anglia West (B) Subsea Manifold To Anglia 'A'	Trenched and Buried	IPR	Seawater
EHC Umbilical	PL955	6"	4.9	6" multi core flexible umbilical	Hydraulic oil/ Methanol	Anglia 'A' To Anglia West (B) Subsea Manifold	Trenched and Buried	IPR	Inhibited seawater/ Hydraulic oil
Production Pipeline	PL854	12"	23.7	12" Steel Pipeline	Gas	Anglia 'A' (ESDV) valve To LOGGS PP Platform (Riser Tie in spool flange)	Trenched and Buried	Flushed and filled with seawater	Seawater
Methanol Pipeline	PL855	3"	23.7	3" Steel Pipeline	Methanol	Anglia 'A' (ESDV valve) To LOGGS PP platform (Riser Tie in spool flange)	Trenched and Buried	Flushed and filled with seawater	Seawater

**Note:**

- 1 PL 854 (from, and not including, the riser tie in spool flange (LOGGS PP platform end) to and including the LOGGS PP platform ESDV ) and PL855 (from, and including ,the LOGGS PP platform ESDV to and including the riser tie in spool flange) are owned by ConocoPhillips and BP and as such will be covered in a separate Decommissioning Programme.

**Table 2.4: Subsea Pipeline Stabilisation Features**

Stabilisation Feature	Total Number	Weight (Te)	Locations	Exposed/Buried/Condition
Concrete mattresses	187	8 Te each 1496Te	At riser base and manifold end of pipelines and at pipeline crossings.	Exposed
Grout bags	160	3.2 Te each 512 Te	12" tie in spools, 8" tie in spool and umbilical ends	Exposed
Sand bags	n/a		n/a	n/a
Formwork	n/a	n/a	n/a	n/a
Froned Mats	85	8 Te each 680 Te	12" tie in spools, 8" tie in spool and umbilical ends.	Exposed
Deposited Rock	15	45,592	At riser base and manifold end of pipelines and at pipeline crossings.	Exposed
Dog Houses. (Concrete protection structures)	46	5 Te each 230 Te	12" tie in spools, 8" tie in spool and umbilical ends	Exposed

## 2.4 Wells

Table 2.5 Well Information			
Platform Wells	Designation	Status	Category of Well
48/19b-A1Z	Gas Production	Shut in	PL 3-3-3
48/19b-A2	Gas Production	Shut in	PL 3-3-3
48/19b-A6Z	Gas Production	Shut in	PL 3-4-3
48/19b-A7	Gas Production	Shut in	PL 3-3-3
48/19b-A9	Gas Production	Shut in	PL 3-3-3
48/19b-A10/A10z (Dual lateral)	Gas Production	Shut in	PL 3-3-3
48/19b-7	Sidetracked to 48/19b-A1Z	Abandoned Ph1	PL 0-3-3
48/19b-A3	Sidetracked to 48/19b-A3Z	Abandoned Ph1	PL 0-3-3
48/19b-A3Z	Sidetracked to 48/19b-A10	Abandoned Ph 1	PL 0-3-3
48/19b-A4	Sidetracked to 48/19b-A6	Abandoned Ph 1	PL 0-3-3
48/19b-A5	Sidetracked to 48/19b-A7	Abandoned Ph 1	PL 0-3-3
49/19b-A6	Sidetracked to 48/19b-A6Z	Abandoned Ph 1	PL 0-3-3
48/19b-A8	Sidetracked to 48/19b-A8z	Abandoned Ph 1	PL 0-3-3
48/19b-A8Z	Sidetracked to 48/19b-A8Y	Abandoned Ph 1	PL 0-3-3
48/19b-A8Y	Sidetracked to 48/19b-A8X	Abandoned Ph1	PL 0-3-3
48/19b-A8X	Sidetracked to 48/19b-A9	Abandoned Ph1	PL 0-3-3
Subsea Wells	Designation	Status	Category of Well
48/18b-9	Gas Production	Shut in	SS 3-3-3
48/18b-B2	Gas Production	Shut in	SS 3-3-3
48/18b-6z	Appraisal	Abandoned Ph1	SS 0-1-1
48/18b-13	Appraisal	Abandoned Ph1	SS 0-1-1
48/19b-8	Appraisal	Abandoned Ph1	SS 0-1-1

Category of well is aligned with OGUK Guidelines for the Suspension or Abandonment of Wells, Issue 6 June 2018

## 2.5 Drill Cuttings

(See Section 3.7 for further information)

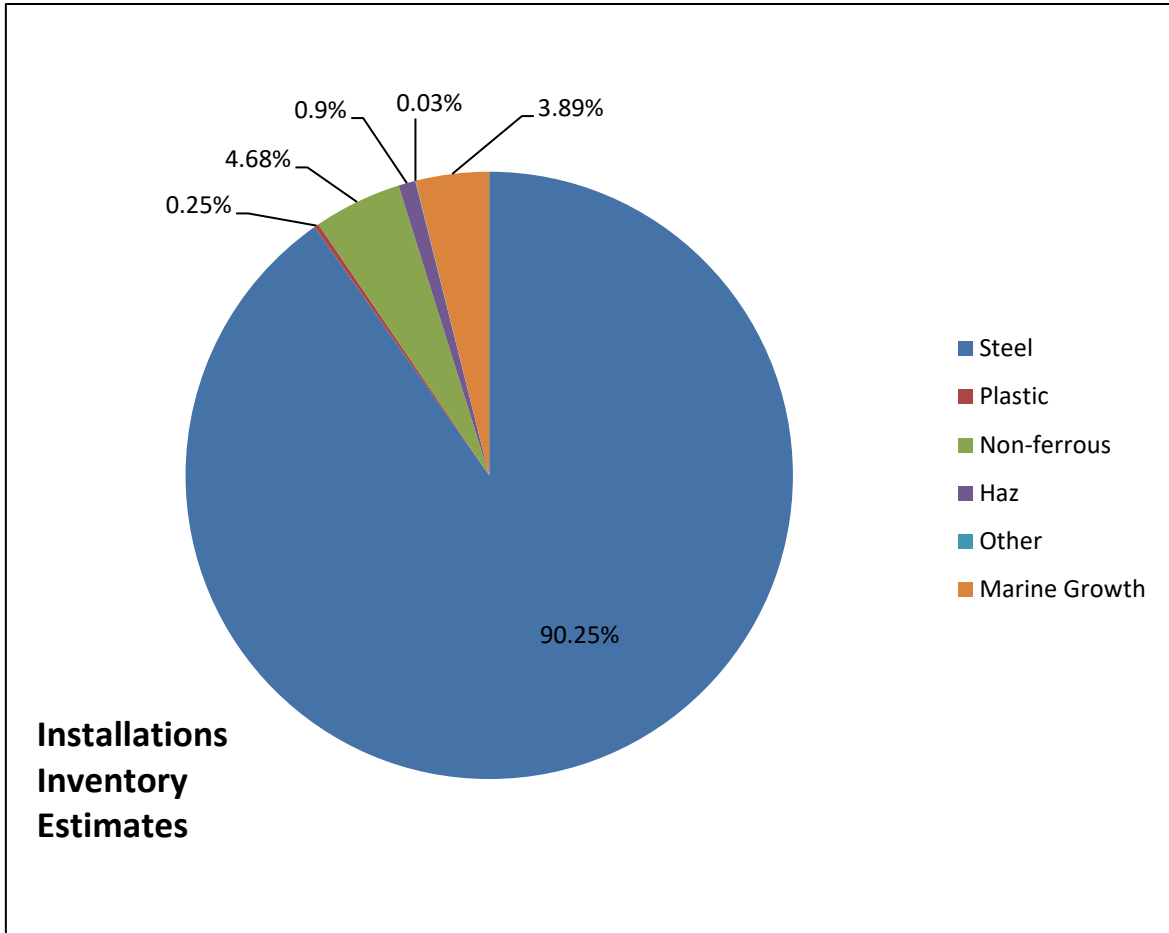
Note: Seabed survey 2018 showed no evidence of cutting piles still being in place, it is believed that the tidal flow combined with the currents within the area have caused the piles to dissipate in the period since wells were drilled.

## 2.6 Inventory Estimates

Please refer to section 3.5 in the Environmental Statement (1) for information on the material inventory.

Table 2.6 Installations Inventory Estimates			
Material	Mass (te)	Material	Mass (te)
Steel	2550	Rubber	0.5
Aluminium	28.45	PCB's	0
Stainless Steel	62.64	Residual oils	0
Copper	6.76	Other	0.75
Lead	10	Paint	20
Zinc	4.46	Marine growth	110
Plastics	6.95	Mercury	Trace
Rockwool	0.12	Hazardous	25.64
		<b>Total</b>	<b>2826.27</b>

Figure 2.6.1 Pie Chart of Installations Inventory Estimates



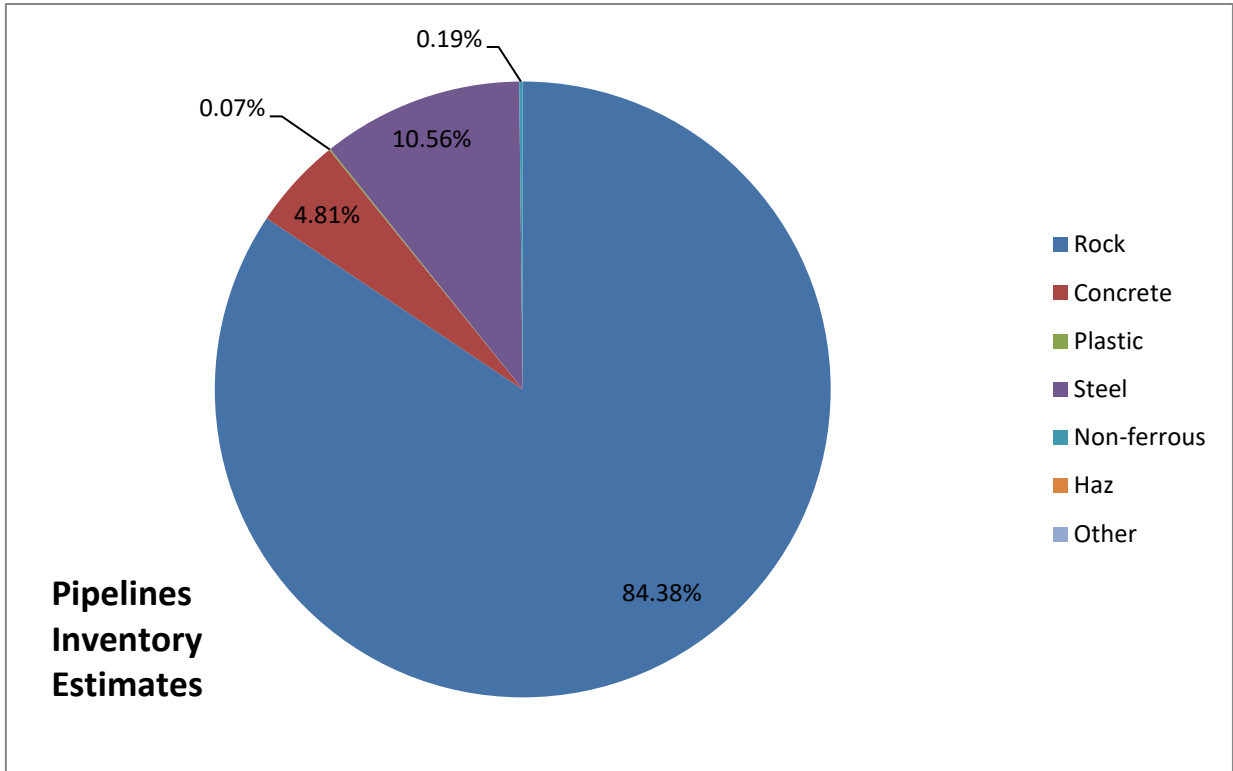
Total Tonnage 2826.27 (Te)

\* Ref: \_See Ithaca Anglia Decommissioning Environmental Appraisal Doc No: ITH-ANG-DECOM-EA-001

Table 2.7 Pipelines Inventory Estimates			
Material	Mass (Te)	Material	Mass (Te)
Steel	5704	Rock	45592
Aluminium	73	Concrete	2600
Copper	24	Hazardous	0
Other non-ferrous	3.34	Residual Oil	0.0005
Plastics	32	Paint	0
		<b>Total</b>	<b>54028</b>



**Figure 2.6.2 Pie Chart of Pipelines Inventory Estimates**



**Total Tonnage 54028 Te**

### 3.0 Removal and Disposal Methods

Potential for re-use of the Anglia ‘A’ platform and Anglia West (B) subsea manifold has been reviewed and has been discounted due to the installations being close to end of design life.

Wastes generated during decommissioning will be segregated and recorded by type and transported onshore to licenced waste contractors. Steel and other recyclable metals are estimated to account for the greatest proportion of the materials inventory that will be returned onshore.

In line with the waste hierarchy, the re-use of an installation (or parts thereof) is first in the order of preferred decommissioning options considered.

### 3.1 Topsides Decommissioning Overview

In preparation for COP the topsides production pipework was flushed with treated seawater to <10mg/ml OIW content.

All chemicals and hydraulic fluids were decanted and sent onshore for disposal at a licenced site.

Table 3.1 Cleaning of Topsides for Removal		
Waste Type	Composition of Waste	Disposal Route
On-board Hydrocarbons	Process Fluids	Hydrocarbons were removed during topside isolation and transported onshore to a licenced waste management site for treatment and disposal.
Other Hazardous Materials	Chemicals and Lubricants	Chemicals and lubricants were flushed, decanted and transported onshore to a licenced waste management site for treatment and disposal.  NORM has not been encountered during the cleaning and flushing operations, testing will be undertaken for all future works and if present will be disposed of in accordance with the appropriate permit.
Original paint coating	Testing will be completed for the presence of lead-based paints prior to removal	Painted items will be disposed of onshore at a licensed waste disposal facility with full consideration given to any toxic components.
Asbestos and ceramic fibre	Asbestos is not present on the installation; Ceramic fibre may be present in small quantities	Ceramic fibre will be disposed of via an appropriately licenced waste management contractor

**Removal methods:** the topsides will be completely removed and returned to shore. Possible methods of removal are outlined in Table 3.2.

Table 3.2 Topsides Removal Method	
1) Semi-Submersible Crane vessel <input checked="" type="checkbox"/> ; 2) Mono-hull Crane Vessel <input checked="" type="checkbox"/> ; 3) Sheer 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 of Topsides by HLV (Semi-submersible crane vessel or monohulled crane vessel).	The Topsides module will be separated from the jacket structure by cutting below the main deck level. The complete unit will then be lifted and transported to the onshore disposal yard by Semi -Submersible Crane Vessel, Monohulled Crane Vessel or via a cargo barge for re-use of selected equipment, recycling, break up and /or disposal. A final decision on the decommissioning method will be made following a commercial tendering process.

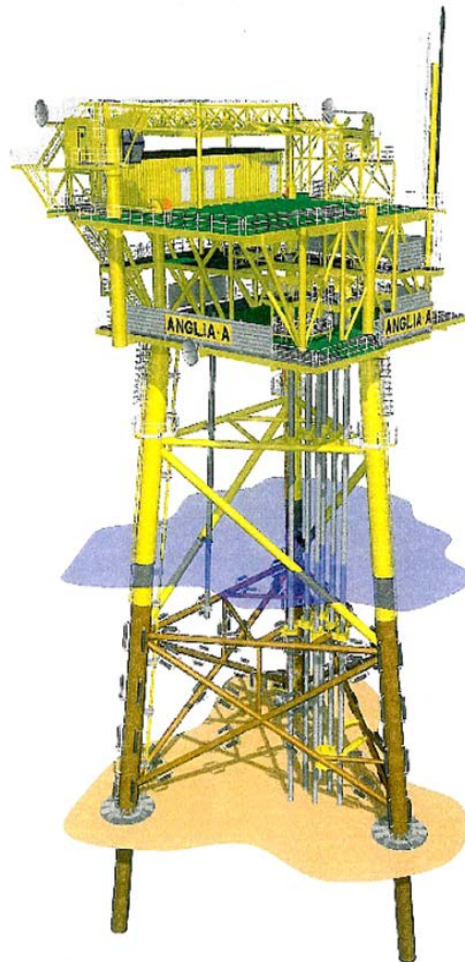
**Figure 3.1 Anglia A Topsides**



### 3.2 Jacket Decommissioning Overview

Table 3.3 Jacket Removal Method	
1) Semi-Submersible Crane vessel <input checked="" type="checkbox"/> ; 2) Monohulled Crane Vessel <input checked="" type="checkbox"/> ; 3) Sheer 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 topsides <input checked="" type="checkbox"/> ;	
Method	Description
Single lift removal of Jacket/Piles by HLV (Semi-submersible crane vessel or monohulled crane vessel).	Removal of jacket and piles, which will be cut 3.0m below seabed and recovered complete with the cut pile sections and transported onshore for disposal/recycling . The removal of the jacket/piles is not expected to result in either large depressions in, or mounds on, the seabed, with only minimum seabed disturbance expected. Refer to section 3 of the EA for full explanation. A final decision on the decommissioning method & disposal route will be made following a commercial tendering process which will include clarity on any trans-frontier shipments of waste issues.

Figure 3.2 Anglia A Jacket



### 3.3 Installations: Subsea and Stabilisation Features

Table 3.4: Installations: Subsea and Stabilisation Features			
Subsea installations and stabilisation features	Number	Option	Disposal Route (if applicable)
Manifold; Piping module & Control module	1	Full recovery	Return to shore for re-use or recycling
Formwork	0		
Froned Mats	21	Full recovery	Return to shore for re-use or recycling
Deposited Rock	0		
Other	0		

### 3.4 Pipelines

#### Decommissioning Options:

- Leave in situ, with no additional work
- P(a) Complete recovery, reverse S lay
- P(b) Complete recovery, cut and lift
- P(c) Leave in situ, with remediation of freespan sections by cut and lift
- P(d) Leave in situ, with remediation of freespan sections by rock placement
- P(e) Leave in situ, with no remediation of freespan sections
- U(a) Complete recovery, reverse reel
- U(b) Leave in situ, with remediation of freespan sections by cut and lift
- U(c) Leave in situ, with remediation of freespan sections by rock placement
- U(d) Leave in situ, with no remediation of freespan sections

Table 3.5: Pipeline or Pipeline Groups Decommissioning Options			
Pipeline or Group (as per PWA)	Condition of line/group (Surface laid/Trenched/ Buried/ Spanning)	Whole or part of pipeline/group	Decommissioning Options considered
PL854	Trenched and buried.	Whole	P(a), P(b), P(c), P(d), P(e)
PL855	Trenched and buried.	Whole	P(a), P(b), P(c), P(d), P(e)
PL954	Trenched and buried.	Whole	P(a), P(b), P(c), P(d), P(e)
PL955	Trenched and buried.	Whole	U(a), U(b), U(c), U(d),

#### Comparative Assessment Method:

Ithaca developed a framework for conducting a Comparative Assessment using qualitative and quantitative data, to evaluate the alternative decommissioning options outlined in table 3.5. This framework draws from OSPAR 98/3 and OPRED’s Decommissioning guidance. A methodology and scoring system was used to assess the relative performance of each of the potential decommissioning options for the pipelines and EHC umbilical, with results presented in the Matrix in Appendix A and discussed in Section 6 of the Anglia Decommissioning Comparative Assessment.

Initially all decommissioning options were considered at a screening meeting to establish potential options to consider for full assessment. The option to leave in situ with no remedial work was discounted during screening as unsuitable as discussed in the CA report.

The assessment workshop objectives were to assess the technical feasibility and risk of major operations failure for all identified decommissioning options for the associated pipelines.

The list in 3.4 above contains the options considered during the multidisciplinary assessment workshop consisting of experienced in house and external participants.

**Outcome of Comparative Assessment:**

Following the above exercise, the table below catalogues the preferred options for the decommissioning of the pipelines.

Table 3.6: Outcomes of Comparative Assessment		
Pipeline Group	Recommended Option*	Justification
PL854	P(e) (leave in situ, with no remediation of freespan sections)	<p>Option P(e) scored best against those other options considered within the Comparative Assessment framework on safety, environmental, technical and societal grounds. PL854 is concrete coated (24km) with a piggybacked methanol line (PL855 – see below). Full removal by reverse S-lay (Pa) has not been technically proven in the North Sea and cut and lift (Pb) is diver intensive in an area of strong currents and therefore carries a high safety risk. PL854 and its associated piggybacked line are trenched and buried to ~1m for the majority of their length. Freespans were identified on the lines in the 2018 pre-decommissioning survey but none were reportable (exceeding 10m length and 0.8m height).</p> <p>Overall, option selection is based on minimum diver time, reduced vessel days, minimum seabed disturbance, no requirement to disconnect at approaches to crossings, minimum material returned to shore and no additional hard substrate for remediation (Pd). A monitoring programme will be agreed with OPRED to confirm lines remain suitably buried and identify any future snagging potential (currently, fishing effort in area is low, primarily carried out using static gear) and requirement for freespan remediation.</p>
PL855	P(e) (leave in situ, with no remediation of freespan sections)	<p>The methanol line PL855 is piggybacked with the export gas pipeline PL854, both trenched and buried (to ~1m) for the majority of their length. Tie-in spools and exposed protective material (mattresses, grout bags, frond mats, dog houses) to be disconnected/removed by DVS/support vessel and returned to shore for recycling (where possible) or disposal. Cut line ends to be reburied using natural backfill. Freespans identified on the lines (2018 pre-decommissioning survey) none measured 10m length and 0.8m height and reportable. Overall, option selection is minimum diver time, reduced vessel days, minimum seabed disturbance, no requirement to disconnect at approaches to crossings, minimum material returned to shore, no additional hard substrate for remediation. Monitoring programme will be agreed with OPRED to confirm lines remain suitably buried and identify any future snagging potential (currently, fishing effort in area is low, carried out using static (e.g. traps) gear) and requirement for freespan remediation.</p>

**Table 3.6: Outcomes of Comparative Assessment**

PL954	P(e) (leave in situ, with no remediation of freespan sections)	Concrete coated (5km) infield gas pipeline; full removal by reverse S-lay (not proven technically in North Sea) or cut and lift (diver intensive in area of strong currents). Line is trenched and buried (~1.3m) along majority of its length. Tie-in spools and exposed protective material (mattresses, grout bags, frond mats, dog houses) to be disconnected/removed by DVS/support vessel and returned to shore for recycling (where possible) or disposal. Cut line ends to be reburied using natural backfill. Freespans identified on the line (2018 pre-decommissioning survey) none measured 10m length and 0.8m height and reportable. Overall, option selection is minimum diver time, reduced vessel days, minimum seabed disturbance, no requirement to disconnect at approaches to crossing, minimum material returned to shore, no additional hard substrate for remediation. Monitoring programme will be agreed with OPRED to confirm lines remain suitably buried and identify any future snagging potential (currently, fishing effort in area is low, carried out using static (e.g. traps) gear) and requirement for freespan remediation.
PL955	U(a) (complete recovery, reverse reel)	Option U(a) scored favourably against those other options considered within the Comparative Assessment framework, particularly on societal grounds in relation to residual liability. The infield (5km) service umbilical is trenched and buried (~0.8m) along the majority of its length, with one crossing present on line. No reportable freespans were identified on the line in the 2018 pre-decommissioning survey (exceeding 10m length and 0.8m height). Analogous to pipeline options P(e), leaving the umbilical <i>in situ</i> with no remediation would result in minimum diver time and seabed disturbance. Removal by reverse reel (U(a)) is technically possible and no pre-excavation is expected. While diver time and seabed disturbance are greater for complete removal, only one crossing requires diver intervention and seabed disturbance will be temporary, with natural infill expected to be relatively quick. Complete removal eliminates the potential for future freespan to form and related future snagging risks.



### 3.5 Pipeline Stabilisation Features

Table 3.7: Pipeline Stabilisation Features			
Stabilisation features	Number	Option	Disposal Route
Concrete mattresses	187	Full recovery. It is intended that the mattresses be recovered to shore, however in the event of practical difficulties OPRED will be consulted and a comparative assessment submitted.	Recover onshore for re-use or recycling.
Grout bags	160	Full recovery. It is intended that the grout bags be recovered to shore, however in the event of practical difficulties OPRED will be consulted and a comparative assessment submitted.	Recover onshore for disposal or recycling.
Sand bags	0	N/A	
Dog Houses	46	Full recovery. It is intended that the dog houses be recovered to shore, however in the event of practical difficulties OPRED will be consulted and a comparative assessment submitted.	Recover onshore for re-use or recycling.
FronD Mats	85	Full recovery. It is intended that the frond mats be recovered to shore, however in the event of practical difficulties OPRED will be consulted and a comparative assessment submitted.	Recover onshore for re-use or recycling.
Deposited Rock	45592 tonnage	Leave in situ	N/A

### 3.6 Wells

Table 3.8: Well Plug and Abandonment
<p>The Anglia Field consists of six platform and two subsea production wells, three exploration and appraisal wells previously drilled that are currently phase 1 abandoned and three other appraisal wells which were previously abandoned.</p> <p>The wells which remain to be abandoned, listed in Section 2.4 (Table 2.5), will be plugged and abandoned in accordance with Oil &amp; Gas UK guidelines on Well Decommissioning – Issue 6 – June 2018. A PON5/Portal Environmental Tracking System (PETS)/Marine Licence application will be submitted in support of any such work that is to be carried out.</p>

### 3.7 Drill Cuttings

Table 3.9 Drill Cuttings Decommissioning Options	
How many drill cuttings piles are present?	0
Tick options examined: <input type="checkbox"/> Remove and re-inject <input checked="" type="checkbox"/> Leave in place <input type="checkbox"/> Cover <input type="checkbox"/> Relocate on seabed                      Remove and treat onshore <input type="checkbox"/> Remove and treat offshore <input type="checkbox"/> Other	
<b>Review of Pile characteristics</b>	<b>None identified</b>
How has the cuttings pile been screened? Desktop exercise	Y
Dates of sampling (if applicable)	N/A
Sampling to be included in pre-decommissioning survey?	N/A
Does it fall below both OSPAR thresholds?	Y
Will the drill cuttings pile have to be displaced to remove the jacket?	N/A
What quantity (m <sup>3</sup> ) would have to be displaced/removed?	N/A
Will the drill cuttings pile have to be displaced to remove any pipelines?	N/A
What quantity (m <sup>3</sup> ) would have to be displaced/removed?	N/A
Have you carried out a Comparative Assessment of options for the Cuttings Pile?	N

Historic cuttings piles are not present at the Anglia A NUI or Anglia West (B), confirmed by the 2018 pre-decommissioning survey. The hydrographic regime in the southern North Sea is such that cuttings are typically redistributed and degraded by natural physical and biological processes.

Note: All the 30" conductors were driven into the seabed using spud mud /seawater sweeps. As with the 30" conductor installations, the 26" holes sections were drilled using spud mud and seawater sweeps. The 17 ½" and 12 ¼" sections were drilled mainly with low toxicity oil based mud (LTOBM). The reservoir sections 8 ½" and 6" were drilled using either low toxicity oil based mud or water based mud (WBM).

### 3.8 Waste Streams

Table 3.10: Waste Stream Management Methods	
Waste Stream	Removal and Disposal Method
<b>Bulk liquids</b>	Subsea system including pipelines, manifold, riser base and risers have been flushed with sea water <10mg/l with the 3" methanol line displaced into the 12" gas pipeline which was then flushed through to the LOGGS facilities where liquids were disposed of to a donor well. Topsides facilities were flushed to bulk containers which were returned onshore to a licensed site for treatment and disposal. Any further cleaning and decontamination identified will take place onshore prior to re-use/recycling.
<b>Marine growth</b>	Removed offshore and disposed of according to guidelines. Residual marine fouling will be removed onshore to appropriately licenced sites and disposed of according to guidelines, company policies and under the appropriate permit.
<b>NORM/LSA Scale</b>	Works undertaken to flush and clean the facilities and pipelines have not identified the presence of NORM. However, NORM/Benzene checks will continue as part of the clean-up/disposal process and any NORM encountered will be dealt with and disposed of in accordance with guidelines.
<b>Asbestos</b>	None present
<b>Other hazardous wastes</b>	Will be recovered onshore to appropriately licenced sites and disposed of according to guidelines, company policies and under the appropriate permit.
<b>Onshore Dismantling sites</b>	Only appropriately licenced sites will be considered as part of the selection process in addition the facility chosen must demonstrate proven track record of waste stream management throughout the deconstruction process. They will also be required to demonstrate their ability to deliver innovative recycling options.

Table 3.11 Inventory Disposition				
Inventory	Region	Total Inventory Tonnage	Planned Tonnage to shore	Planned Left in Situ
Installations	UK	2825	2743	82
Pipelines	UK	54033	1844	52189 *

\*Includes Deposited Rock Te

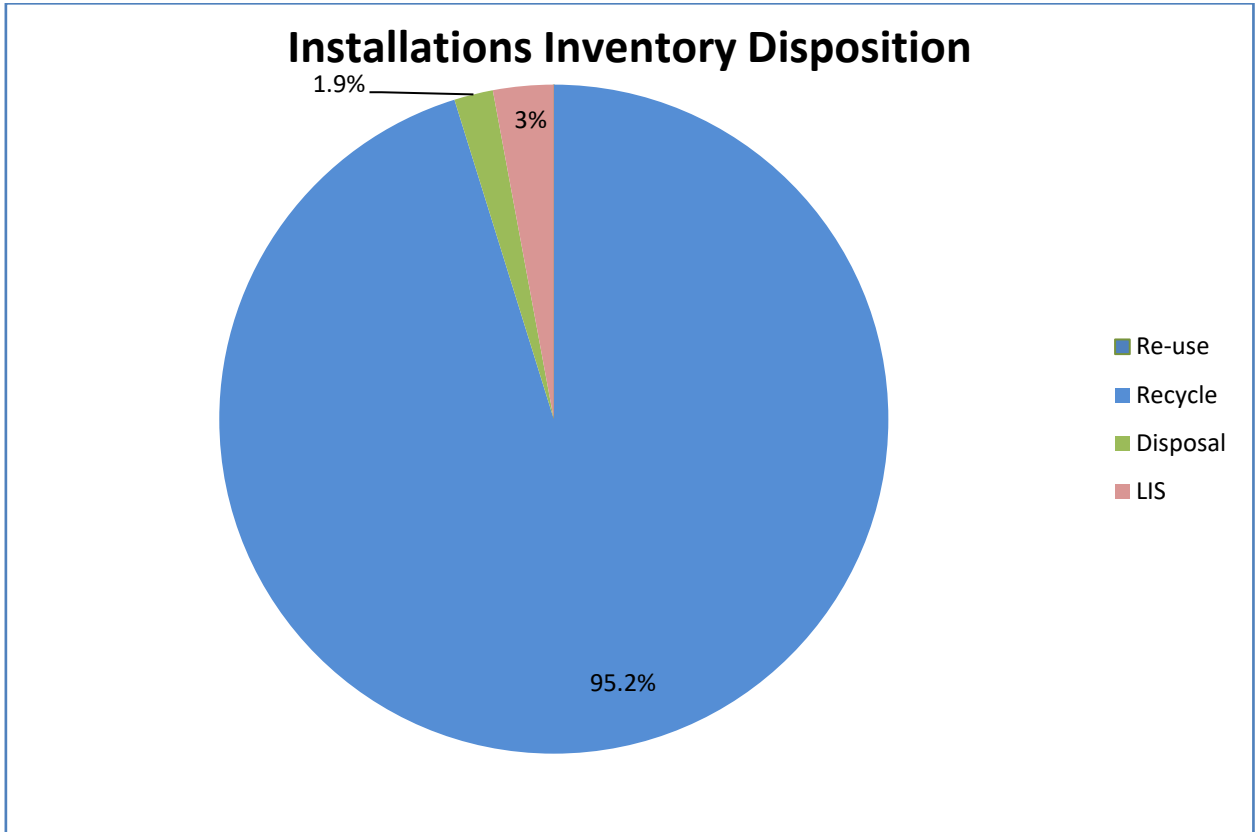
All removed materials will be returned onshore for recycling.

Due to the age of the installation reuse is unlikely for the topsides and jacket, some of the new equipment installed for COP may be reused, and this will be assessed on an item by item basis.

All recovered material will be transported onshore for re-use recycling or disposal. It is not possible to predict the quantity of materials that will be re-used as this will depend entirely on market conditions. The figures in Table 3.12 are best case.

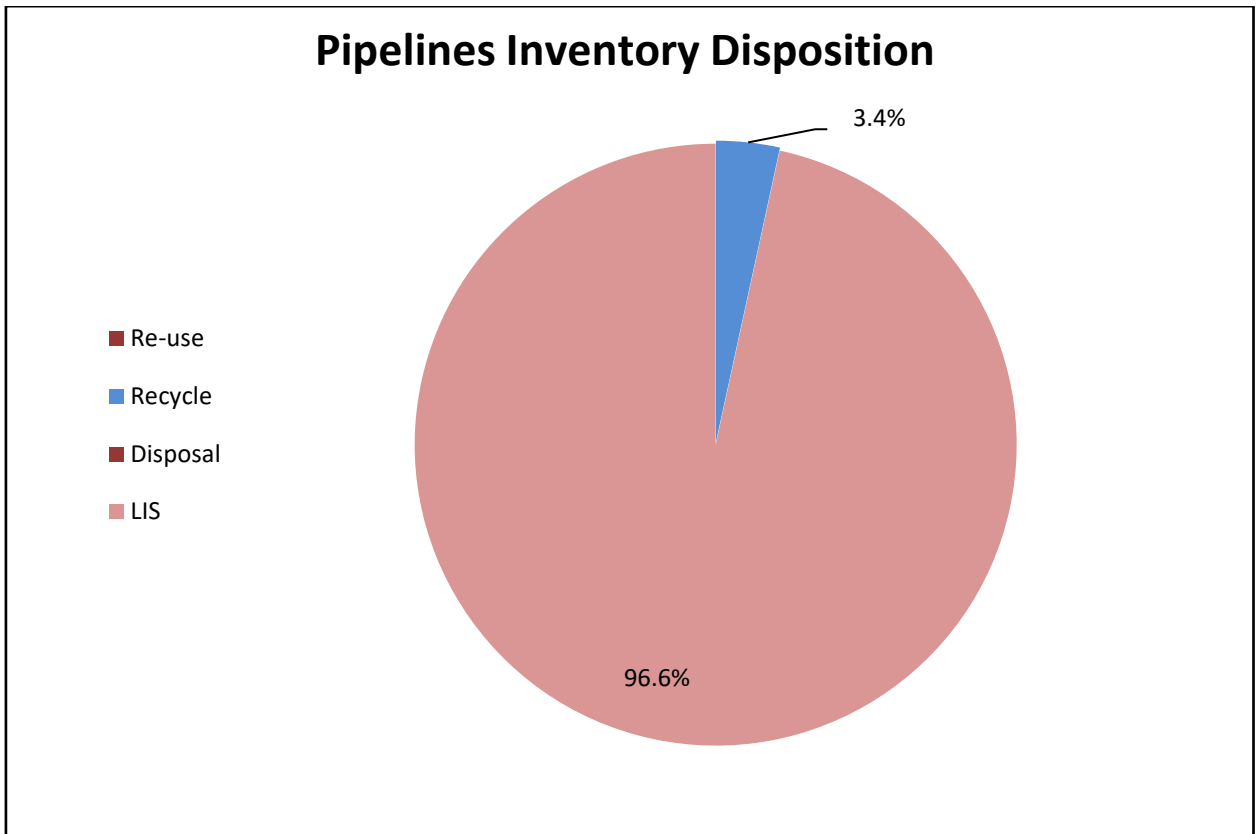
Table 3.12 Re-use, Recycle & Disposal Aspirations for Material Recovered Onshore				
Inventory	Region	Re-use	Recycle	Disposal
Installations	UK (2743 Tonnes)	0	2690	53
Pipelines	UK (54033 Tonnes)	0	1844	0

Figure 3.8.1 Installations Inventory Disposition



Total Tonnage 2825 Te

Figure 3.8.2 Pipelines Inventory Disposition



**Total Tonnage 54033 Te**

#### 4.0 Environmental Impact Assessment (Environmental Statement)

#### 4.1 Environmental Sensitivities (Summary)

Table 4.1: Environmental Sensitivities	
Environmental Receptor	Main Features
Conservation interests	<p>Some Anglia facilities lie within the boundary of the North Norfolk Sandbanks and Saturn Reef (NNSSR) Special Area of Conservation (SAC), qualifying features Annex I habitat sandbanks and Annex I habitat reef, and approximately 18km of the 24km export pipeline lies within the Southern North Sea SAC. Some decommissioning activities will be carried out within the SACs (including potential rock placement for jack-up stabilisation and anchoring of HLV). Impacts are localised to small areas, predominantly within/close to the existing Anglia A NUI 500m safety zone, and the majority are expected to be temporary. Rock use will be a permanent addition, however, if used, quantities will be minimised where safe to do so. Activity will not result in changes to sediment characteristics, with recovery through natural sediment mobility expected to be relatively rapid. The area of physical disturbance within the SAC from Anglia decommissioning activities is small (0.04km<sup>2</sup>), equating to approximately 0.001% of the total (3,603km<sup>2</sup>) SAC area; of this, only 0.002km<sup>2</sup> (0.00006%) pertains to estimated seabed disturbance from contingent rock use. Other offshore SACs are present in the region, but the closest of these to Anglia, the Haisborough, Hammond and Winterton SAC is &gt;30km to the south. Other sites designated along the closest coastline are all of some considerable distance from Anglia. Accidental event, i.e. hydrocarbon spill is unlikely to impact any Natura 2000 site, the simplified processing on Anglia A NUI, along with the pipelines have been cleaned and flushed, any potential spill would be of diesel, which is not persistent and would rapidly evaporate/disperse. The NNSSR SAC is also designated for the presence of the <i>Sabellaria spinulosa</i> reef; surveys of the Anglia area identified none present.</p>
Seabed	<p>Large sandbanks, smaller scale sandwaves and ripples are characteristic of this area and are qualifying features of the NNSSR SAC. Sandwaves (up to ~5m) are present around Anglia and unlike the sandbanks, are more active, flow-transverse features. The sediments of area are circalittoral sand and coarse sediment with isolated boulders and cobbles. The seabed infauna is characterised by polychaetes and amphipods, and epifauna characterised by crabs and brittlestars. A rig site survey/mooring analysis will be carried out prior to siting the jack-up and HLV, these will be located within/close to the existing 500m safety zones. Seabed disturbance will result from rig/HLV use, infrastructure and umbilical removal, but this is considered temporary, with relatively rapid recovery, e.g. spud can depressions from previous rig activity were not evident from the pre-decommissioning survey (Fugro 2018).</p>

**Table 4.1: Environmental Sensitivities**

Environmental Receptor	Main Features																								
Fisheries	<p>Fishing effort in the Anglia area is low. Detailed landing data from 2014-2017 is not available due to issues of confidentiality but landing data from earlier years (2013) showed &gt;98% of the landings and 92% of the value was dominated by shellfish (crab, lobster and whelk), with the remainder of the landings/value made up of predominately demersal species. Most activity is fixed gear. Well plug &amp; abandonment activities will be carried out first, with the rig positioned in/close by to the existing 500m safety zones at Anglia A NUI and Anglia West (B). Once decommissioning activities complete, safety zones will no longer apply. Vessel movements and rig siting will be notified through normal channels and fisheries liaising will continue through the project.</p>																								
Fish	<p>The Anglia infrastructure overlaps or abuts reported spawning grounds of six commercially important fish species (herring, mackerel, whiting, sole, lemon sole and sand eel) and nursery grounds for these and an additional two species (cod and plaice). Well plug &amp; abandonment activities will use a relatively small number and variety of chemicals; discharge of these is not likely to significantly affect fish spawning/nursery grounds. Majority of fish species spawn over wide areas. While it is recognised that vessel and other continuous noise may influence several aspects of fish behaviour, including inducing avoidance and altering swimming speed, direction and schooling behaviour, there is no evidence of mortality or potential mortal injury to fish from ship noise. Given the source level characteristics and the context of similar contributions to the ambient anthropogenic noise spectrum of the area over several decades (i.e. the oil and gas associated installations, vessels and rigs movements in and around the Anglia and southern North Sea area), no injury or significant behavioural disturbance to fish populations is anticipated.</p>																								
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Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec														
1	2	2	3	4	3	2	3	2	1	1	1														
	<p><b>Key:</b> 1 = 1 species spawning, 2 = 2 species spawning, 3= 3 species spawning</p>																								
Marine Mammals	<p>Only a few cetacean species are sighted with regularity in the southern North Sea: harbour porpoise; minke whale and white-beaked dolphin, the most abundant is the harbour porpoise. Other species sighted with occasional to rare frequency include the Atlantic white-sided dolphin, bottlenose dolphin and short-beaked common dolphin. Harbour and grey seals may also be present in the Anglia area, but in low numbers. The primary contributor to underwater noise from the Anglia decommissioning activities will be vessel activity. The increased vessel activity associated with these activities will add to the overall ambient noise in the wider Anglia area; however, source level characteristics are well-below injury criteria for marine mammals. No explosives will be used. Sound from vessels may result in some temporary influence on the behaviour of individual marine mammals within the vicinity of the operations, including harbour porpoise; however, such effects will be short-term and localised and in the context of existing moderate-high levels of shipping activity in the region.</p>																								
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Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec														
	<p><b>Key:</b> Darker colour reflects months when marine mammals most frequently observed</p>																								

**Table 4.1: Environmental Sensitivities**

Environmental Receptor	Main Features																																																				
Onshore Communities	<p>The impact of the disposal of waste from the decommissioning activities on onshore communities would be slightly beneficial as it will contribute to job continuation. However, this is expected to be small as the site used will be an existing site and the volume of waste returned is relatively small.</p>																																																				
Birds	<p>The North Norfolk coast is relatively unimportant for breeding seabirds compared to cliff coasts to the north and does not support the seabird breeding assemblages seen for example at Flamborough Head. The shingle beaches and coastal marshes of the coast do support important breeding populations of terns, with some species qualifying features of designated sites. The typical breeding season foraging ranges for these species means it is unlikely they would be present in and around the Anglia area at that time. This coastal area is important for over-wintering birds and birds on passage, with some areas regularly supporting between 90,000 and 120,000 individuals. The Anglia area is offshore and birds likely to be present are those transiting through the area during migration, and post breeding dispersion from colonies.</p> <p>The Anglia A NUI simplified processing and pipeline systems have been cleaned and left hydrocarbon free and spill prevention and management for diesel from rig will be in place. Any potential spill of diesel, which is not persistent, would rapidly evaporate/disperse.</p> <table border="1" data-bbox="432 1021 1463 1182"> <thead> <tr> <th>Jan</th> <th>Feb</th> <th>Mar</th> <th>Apr</th> <th>May</th> <th>Jun</th> <th>Jul</th> <th>Aug</th> <th>Sep</th> <th>Oct</th> <th>Nov</th> <th>Dec</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2</td> <td>3</td> <td>3</td> <td>5</td> <td>5</td> <td>5</td> <td>3</td> <td>3</td> <td>1</td> <td>1</td> <td>1</td> <td>48/18*</td> </tr> <tr> <td>1</td> <td>1</td> <td>3</td> <td>3</td> <td>3</td> <td>5</td> <td>5</td> <td>3</td> <td>3</td> <td>1</td> <td>1</td> <td>1</td> <td>48/19*</td> </tr> <tr> <td>1</td> <td>1</td> <td>1</td> <td>N</td> <td>3</td> <td>5</td> <td>5</td> <td>5</td> <td>5</td> <td>N</td> <td>1</td> <td>1</td> <td>48/20*</td> </tr> </tbody> </table> <p><b>Key</b> 1=Extremely High. 2= Very High. 3=High. 4= Medium; 5=Low N = No data (Webb et al 2016). Note, where there is no coverage, these are highlighted yellow, if they have numbers marked in red, either Step 1 (adjacent months) or 2 (adjacent blocks) from the JNCC guidance *has been used to help reduce the extent of coverage gaps (JNCC 2017).</p>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		1	2	3	3	5	5	5	3	3	1	1	1	48/18*	1	1	3	3	3	5	5	3	3	1	1	1	48/19*	1	1	1	N	3	5	5	5	5	N	1	1	48/20*
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1	1	1	N	3	5	5	5	5	N	1	1	48/20*																																									
Other Users of the Sea	<p>Fishing effort is discussed under fisheries above.</p> <p>Anglia is located within a mature gas province with a comprehensive network of typically unmanned installations, larger processing hubs and associated interfield and export pipeline/support lines; the Anglia pipeline system is crossed by two export lines to the Bacton terminal; the Anglia export pipeline/piggybacked methanol line is also crossed by an out of service cable. The southern North Sea is also an area of operational, under construction, consented and pre-consented offshore windfarms. Shipping traffic density low (Block 48/18) and high (Blocks 48/19 and 48/20). No traffic separation schemes/IMO routing measures are close to Anglia. The area does not overlap with any Ministry of Defence exercise or practice areas. Well plug &amp; abandonment activities will be carried out first, with the rig positioned in/close by to the existing 500m safety zones at Anglia A NUI and Anglia West (B). Once decommissioning activities complete, safety zones will no longer apply. A vessel traffic survey will be carried out to support consent to locate applications.</p>																																																				



**Table 4.1: Environmental Sensitivities**

Environmental Receptor	Main Features
Atmosphere	Emissions will be generated from fuel combustion on the various vessels involved in the decommissioning, and primarily comprise carbon dioxide (CO <sub>2</sub> ), carbon monoxide (CO), oxides of nitrogen (NO <sub>x</sub> ), sulphur dioxide (SO <sub>2</sub> ), methane (CH <sub>4</sub> ) and volatile organic compounds (VOCs). Although minor, emissions will contribute both to localised and short-term increases in atmospheric pollutants, and to global atmospheric GHG concentrations. In the context of wider UK emissions these effects are considered to be negligible, and there will be a minor positive benefit from the return of recyclable materials to shore which will have a future use and offset the extraction and transport of primary raw materials. Overall effects are considered to be negligible and temporary.

\*JNCC (2017). Using the Seabird Oil Sensitivity Index to inform contingency planning (updated guidance to reduce data coverage gaps).

<http://jncc.defra.gov.uk/PDF/Using%20the%20SOSI%20to%20inform%20contingency%20planning%202017.pdf>

Webb A, Elgie M, Irwin C, Pollock C & Barton C (2016). Sensitivity of offshore seabird concentrations to oil pollution around the United Kingdom. Report to Oil and Gas UK, 102pp.

## 4.2 Potential Environmental Impacts and their Management

### Environmental Impact Assessment Summary:

Although there is expected to be some environmental impact during the decommissioning of the Anglia infrastructure, long term environmental impacts from the decommissioning activities are expected to be negligible. In addition, incremental cumulative impacts and trans-boundary effects associated with the planned decommissioning activities are expected to be negligible. There will be no planned use of explosives during these activities. We acknowledge that there will be a requirement for an environmental protection plan to be produced and submitted to OPRED should this plan change.

Table 4.2: Environmental Impact Management		
Activity	Main Impacts	Management
Topsides removal	Removal of the topsides will cause some localised environmental impact while the lifting and support vessels are active due to noise. This will be a short duration activity.	Removal is a reverse of the installation methodology. Minimal disturbance is caused to the surrounding areas, activities will be planned to be executed as efficiently as possible. Vessels will be managed to minimise the durations required while on board practices will address fuel efficiency, noise and waste management.
Jacket removal	Removal of the jacket and piles will cause some localised environmental impact at the individual pile sites. Vessel noise will also have an impact. The effects are expected to be short term and the seabed and associated ecosystem is expected to recover rapidly once activities are complete. Indents on the seabed are not expected as a result of the removal of Anglia.	Removal is a reverse of the installation methodology. Minimal disturbance is caused to the seabed, activities will be planned to be executed as efficiently as possible. Vessels will be managed to minimise the durations required while on board practices will address fuel efficiency, noise and waste management. In the event of practical difficulties in removing the piles by reverse installation alternative methods of removal will be discussed and agreed with the regulator.
Subsea Installations Removal	Removal of Manifold will cause some localised environmental impact at the individual sites due to lifting, cutting piles and temporary laydown of equipment.	Decommissioning activities will be planned to be executed as efficiently as possible, minimising cutting and disturbance of the seabed in order to reduce the impact on the affected areas. Vessels will be managed to minimise the durations required while on board practices will address fuel efficiency, noise and waste management.

**Table 4.2: Environmental Impact Management**

Activity	Main Impacts	Management
Decommissioning Pipelines	<p>Removal of the pipeline tie-in spools and EHC umbilical ends will have a localised impact on the seabed.</p> <p>Removal of the tie in spools will require temporary laydown on the seabed. Vessel noise will also have an impact. The effects are expected to be short term and the seabed and associated ecosystem is expected to recover rapidly once activities are complete.</p>	<p>Decommissioning activities will be planned to be executed as efficiently as possible, minimising disturbance of the seabed in order to reduce the impact on the affected areas. Vessels will be managed to minimise the durations required while on board practices will address fuel efficiency, noise and waste management.</p>
Decommissioning Stabilisation Features	<p>There will be some localised disturbance of the seabed by relocating mattresses, and dog houses prior to recovery.</p> <p>Impacts will also be noise from the attendant vessels. The effects are expected to be short term and the seabed and associated ecosystem is expected to recover rapidly once activities are complete.</p>	<p>Decommissioning activities will be planned to be executed as efficiently as possible, minimising disturbance of the seabed in order to reduce the impact on the affected areas.</p> <p>Vessels will be managed to minimise the durations required while on board practices will address fuel efficiency, noise and waste management.</p>
Decommissioning Drill Cuttings	<p>None – drill cuttings will remain in place to degrade naturally.</p>	<p>Drill cuttings do not contain any oil and fall below the OSPAR limits.</p>

## 5 Interested Party Consultations

### Consultations Summary:

During the public consultation period, copies of the Decommissioning Programmes and supporting documents will be forwarded to the following Statutory Consultees:

1. The National Federation of Fishermen's Organisations (NFFO);
2. The Scottish Fisherman's Federation (SFF)
3. The Northern Ireland Fish Producers Organisation (NIFPO)
4. Global marine systems Limited (GMS).

Meetings and telephone calls have been held with the above to advise of progress and to provide more detail of the proposals.

Copies of the Decommissioning Programmes and supporting documents will be available for viewing at Ithaca's office at 7-8 Rubislaw Terrace, Aberdeen, AB10 1XE.

A public notice will be published in the Eastern Daily Press and the Times please refer to Appendix A.1 for a copy of the public notice. The public notice gives instructions for representations to be made in writing.

**Table 5.1 Summary of Stakeholder Comments**

Who	Comment	Response
<b>Informal Consultations</b>		
National Federation of Fishermen’s Organisations	Presented outcome of CA and proposed decommissioning methodology	Positive feedback and pleased to see that the area will be accessible for fishing on completion of the decommissioning programmes
Partners	Draft decommissioning programmes shared with partners	Minor comments on content and decommissioning programmes updated.
JNCC	Presented outcome of CA and proposed decommissioning methodology during meeting at Ithaca office	No comments received
OPRED (Environmental Management Team & Offshore Environmental Inspectorate)	Presented outcome of CA and proposed decommissioning methodology during meeting at Ithaca office	No comments received
<b>Statutory Consultations</b>		
Scottish Fishermen’s Federation		
National Federation of Fishermen’s Organisations		
Northern Irish Fish Producers Organisation		
Global Marine Systems Limited		
Public		

## **6 Programme Management**

### **6.1 Project Management and Verification**

A Project Management team will be appointed to manage suitable sub-contractors for the removal of the installations and pipelines. Standard procedures for operational control and hazard identification and management will be used. The Management team will monitor and track the process of permits and 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 Post-Decommissioning Debris Clearance and Verification**

A post decommissioning site survey will be carried out around the 500m radius of installation sites (Anglia A NUI, Anglia West (B) manifold and the approaches to the LOGGS platform, the latter of these to be carried out in consultation with ConocoPhillips) and along a (minimum) 100m (50m either side) corridor along the pipeline/umbilical routes. If it is agreed that an over-trawlability survey is not suitable, alternative methods for post-decommissioning survey will be discussed with the Regulator to agree the survey methods and scope. Any seabed debris related to offshore oil and gas activities will be recovered for onshore disposal or recycling in line with existing disposal methods. This will be followed by a statement of clearance to all relevant governmental departments and non- governmental organisations.

### 6.3 Schedule

Figure 6.1: Gant Chart of Project Plan

Anglia	2016	2017	2018				2019				2020	2021	2022	2023	2024	2025
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4						
CoP Approved	█															
Pipelines Flushed and Seawater Filled			█	█												
Decommissioning Programmes Preparation				█	█	█	█	█	█							
Decommissioning Programmes Approval										█						
Subsea Riser Disconnection at LOGGS										█						
Scope Development (Wells P & A, Topsides & Jacket Removal, Subsea Infrastructure)										█	█	█				
Contract Strategy, Market Engagement, Tender, Contract Award																
Wells P&A															█	
Facilities Removal -Topsides & Jacket															█	
Subsea Equipment Removal																█
Onshore Disposal Windows																█
Post Decommissioning Surveys																█
Close out Report																█

## 6.4 Costs

Table 6.1 – Provisional Decommissioning Programmes Costs	
Item	Estimated Cost (£m)
Topsides and jacket Preparation & Removal	Submitted separately to OPRED
Pipelines Decommissioning	Submitted separately to OPRED
Subsea Installations and Stabilisation Features removal	
Well Abandonment	Submitted separately to OPRED
Continuing Liability – Future Pipeline and Environmental Survey Requirements NB.:Any further post decommissioning surveys will be discussed and agreed with OPRED.	Submitted separately to OPRED
<b>TOTAL</b>	

## 6.5 Close Out

In accordance with the OPRED Guidelines, a close out report will be submitted to OPRED explaining any variations from the Decommissioning Programmes (normally within 12 months of the completion of the offshore decommissioning scope) including debris removal and independent verification of seabed clearance and the first post-decommissioning environmental survey.

## 6.6 Post-Decommissioning Monitoring and Evaluation

A post decommissioning environmental seabed survey, centred on the 500m safety zones at the Anglia “A” and Anglia West (B) locations, and the approaches to LOGGS, in consultation with ConocoPhillips and along the pipeline routes, will be conducted when the decommissioning activity has been concluded. The survey will focus on chemical and physical disturbances resulting from the decommissioning activities and be compared with the pre-decommissioning survey. Results of this survey will be available once the work is complete, with a copy forwarded to OPRED. After the surveys have been sent to OPRED and reviewed, a suitable risk based monitoring programme, taking into consideration the depth of burial of pipeline material left in place, exposed and freespan data from pre and post decommissioning surveys, along with historic data, and potential fisheries impact, will be agreed by both parties.

## 6.7 Management of Residual Liability

A full statement on legacy and liability management will be provided in the close out report.



## 7.0 Supporting Documents

Table 7.1 Supporting Documents	
Document Number	Title
ITH-ANG-DCOM-ENS-001	Environmental Appraisal
ITH-ANG-DCOM-CA-001	Comparative Assessment

## 8.0 Partner Letters of Support

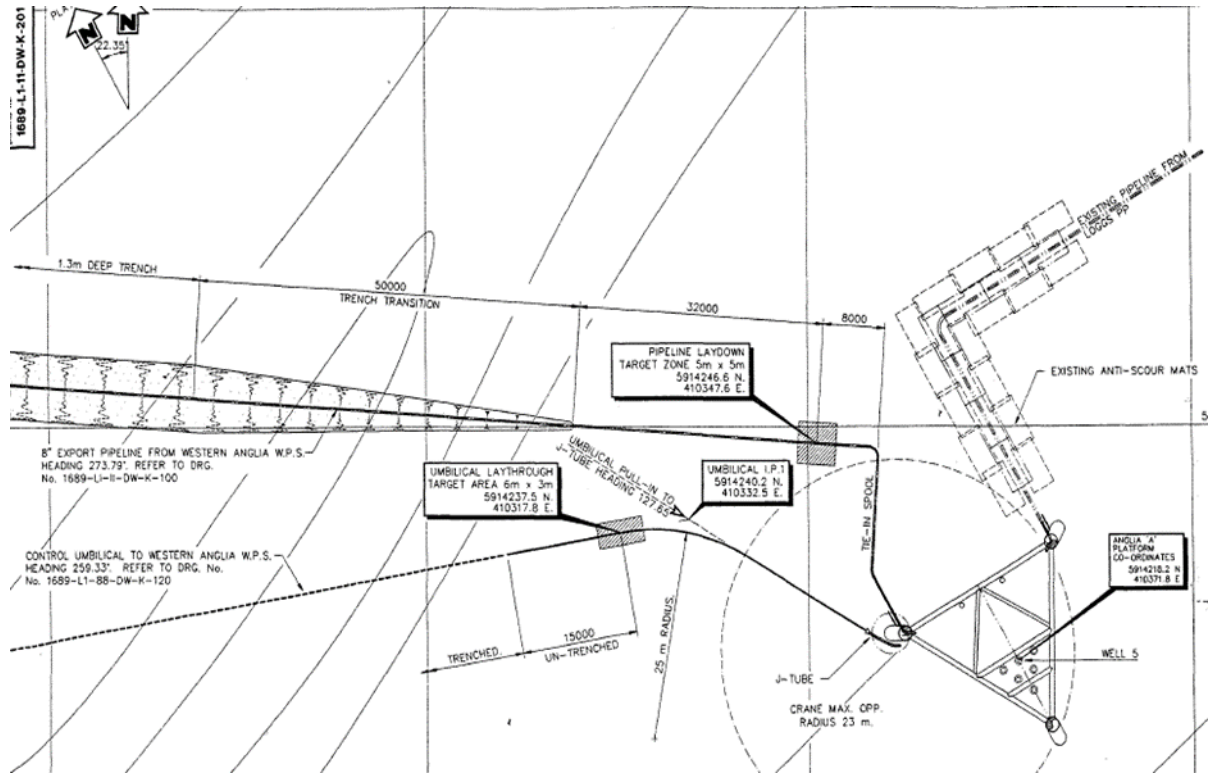
- DANA PETROLEUM (E and P) LIMITED
- INEOS UK (E and P) HOLDINGS LIMITED
- FIRST OIL EXPRO LIMITED (In Administration)

## Appendix A.1 Public Notice

Copies of Public Notices

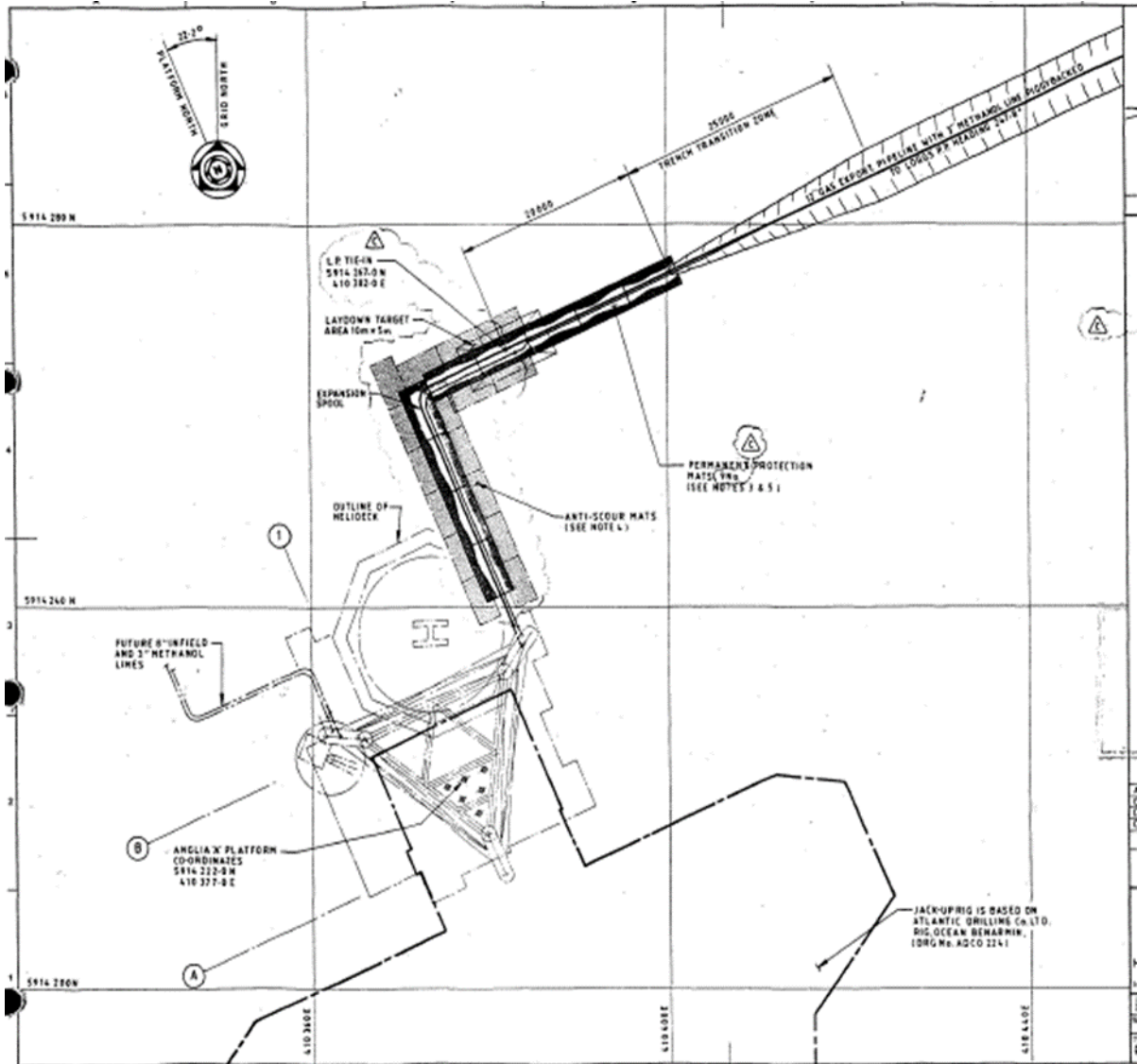
*Will be appended once published*

**Appendix B.1 Anglia Overall Subsea Layout**





**Appendix B.3 LOGGS Pipeline Approaches and Stabilisation Features**



### Appendix C.1 Waste Inventory

Material	Approximate Quantity	Location
ABS Plastic	0.225	Topsides junction boxes
Ac 228	0.000	None
Alloy Steel Inconel	0.200	Pipeline gaskets
Aluminium	1.200	Misc.
Aluminium Bronze	0.000	Non
Americium-241		Potentially present in smoke detectors
Anodes (total)	100	Jacket/MLT/Pipelines
Asbestos Blue	0.000	None
Asbestos White/Brown	0.000	None
Asbestos Total	0.000	None
Batteries NiCad	0.000	Radio equipment
Batteries Lead	10.000	UPS. Nav aids, see lead
Biocides by type (including TBT)	0.000	None
Brass	0.480	Topsides cable glands
Bronze	0.000	None
Buna	0.000	None
Butyl Rubber	0.090	Topsides cable gland shrouds
Carbon Steel	8160	Combined topsides, jacket, piles and subsea installations/pipelines
Cement Powder	0.000	None
Cement/concrete/Rock	48189	Grout bags, mattresses, Deposited Rock and cable clump weight
Ceramics (all types)	0.083	VSD SCR's, HV insulators
CFC/HCFC	0.000	TR HVAC
Chartex/fire protection	5.000	None
Chloro paraffins	0.000	
Chromium	19.356	Well tubing
Copper	30.950	Power and control cables
Copper nickel alloys	1.200	Cable connectors
Cork	0.000	None
Cotton	0.000	None
Diesel	0.000	None
Drill Cutting Residues	0.000	Surveys show dispersal, no recovery planned
EPDM	0.000	None
Ethylene/Polypropylene	0.000	Cables and pipeline insulation
Fire Extinguishers	0.230	Topsides
Fire Foam	0.090	None
Brominated Flame Retardants	0.000	Fire resistant cables
Fluorescent Tubes	0.030	Platform wide/ lighting

Material	Approximate Quantity	Location
Formica	0.010	TR
Glass	0.000	TR
Glycol	0.000	None
Glass Reinforced Plastic (GRP)	0.000	None
Graphite/Charcoal	0.000	None
Gun Metal	0.000	None
Heli-fuel	0.000	None
Hydrocarbons	0.000	See residual
Incoloy	0.000	Pipeline gaskets
Insulation (rockwool)	0.120	TR
Iron (cast)	0.000	None
Lead	0.000	See UPS/Navaid batteries
Marine Growth est. quantities soft/hard	110.000	Jacket structure
Mercury	0.000	Fluorescent tubes, level switches and assumed scale in process pipework
Methanol	0.000	None
NORM Scale	0.000	Process pipework, vessels
Neoprene	0.550	None
Ni-Resist	0.000	None
Nylon	0.000	*
Organotin	0.000	*
Paint	20.000	Paint to be sampled for heavy metals, phthalates, chlorinated paraffin
Pb-210	0.000	N/A
PCB	0.000	N/A
PTFE	0.000	Unknown at this stage
Plastics	6.426	Polyurethane Production pipeline insulation
PVC	0.780	TR Flooring
Radium (Ra-226)	0.000	None
Radium (Ra-228)	0.000	None
Residual HC	0.000	Pipeline flushed 7.63mg/l
Rubber	0.000	*
Sewage	0.000	None
Smoke Detectors	0.000	*
Stainless Steel	62.639	Fibre optic cable
Satellite	0.000	None
Tin	0.000	None
Titanium	0.000	None
Wood	0.180	TR
Zinc	4.456	Anodes
<b>Approximate Total Weight</b>	<b>56725</b>	