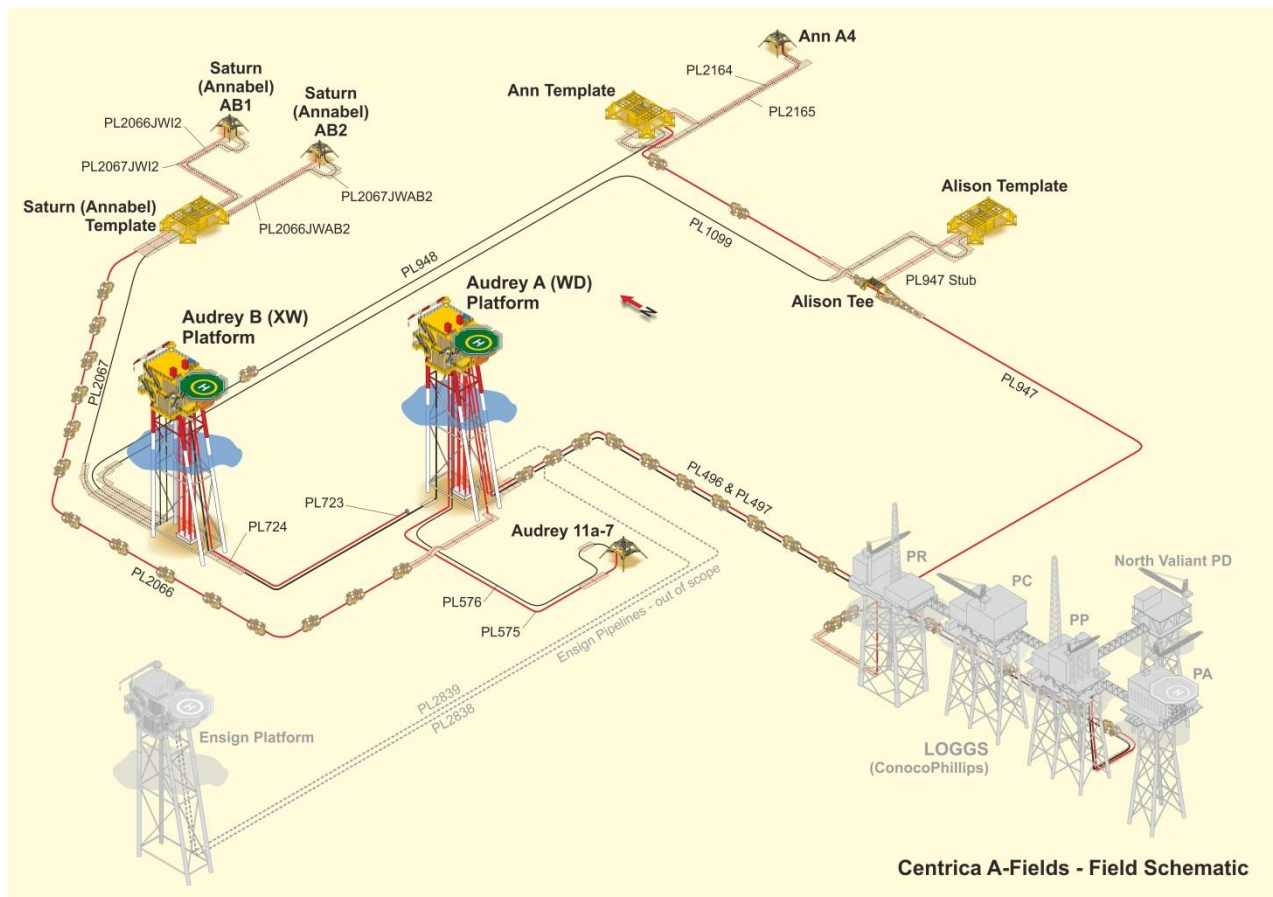


## Ann and Alison Fields Decommissioning Programmes



## DOCUMENT CONTROL

<b>Document ID:</b>		CEU-DCM-SNS0096-REP-0005	
<b>Document Classification:</b>		PUBLIC	
<b>Document Ownership:</b>		Capital Projects	
<b>Date of Document:</b>	21/09/16	<b>Signature</b>	<b>Date</b>
<b>Prepared by:</b>	S. Axon		23/6/17
<b>Reviewed by:</b>	S. Mackenzie W. Black		23/6/17
<b>Approved by:</b>	G. Kabra		23/6/17

## REVISION RECORD

Revision No.	Date of Revision	Reason
A1	17/03/17	Issued for internal review and comment
A2	07/04/17	Issued to BEIS for comment
A3	17/05/17	BEIS comments addressed
A4	20/06/17	Additional comments addressed
A5	23/06/17	Issued for Statutory Consultation

## Distribution List

Company or Organisation	No of Copies
Department for Business, Energy, & Industrial Strategy	1 electronic
GMS, NIFPO, NFFO, SFF	1 each, electronic
Great Yarmouth Community Library	1 hardcopy

<b>TABLE OF CONTENTS</b>			<b>INST</b>	<b>P/L</b>
<b>1</b>	<b>Executive Summary</b>	<b>8</b>	✓	✓
1.1	Combined Decommissioning Programmes	8	✓	✓
1.2	Requirement for Decommissioning Programmes	8	✓	✓
1.3	Introduction	8	✓	✓
1.4	Ann Field – Decommissioning Overview	10	✓	✓
1.5	Alison Field – Decommissioning Overview	11	✓	✓
1.6	Summary of Proposed Decommissioning Programmes	12	✓	✓
1.7	Field Location Including Field Layout and Adjacent Facilities	13	✓	✓
1.8	Industrial Implications	21	✓	✓
<b>2</b>	<b>Description of Items to be Decommissioned</b>	<b>22</b>	✓	✓
2.1	Ann Field	22	✓	✓
2.2	Alison Field	28	✓	✓
<b>3</b>	<b>Removal and Disposal Methods</b>	<b>32</b>	✓	✓
3.1	Topsides	32		
3.2	Jacket(s)	32		
3.3	Subsea Installations and Stabilisation Features	32	✓	
3.4	Pipelines	32		✓
3.5	Pipeline Stabilisation Features	36		✓
3.6	Wells	38	✓	
3.7	Drill Cuttings	39	✓	
3.8	Waste Streams	39	✓	✓
<b>4</b>	<b>Environmental Impact Assessment</b>	<b>41</b>	✓	✓
4.1	Environmental Sensitivities	41	✓	✓
4.2	Potential Environmental Impacts and their Management	44	✓	✓
<b>5</b>	<b>Interested Party Consultations</b>	<b>46</b>	✓	✓
5.1	Consultations Summary	46	✓	✓
<b>6</b>	<b>Programme Management</b>	<b>48</b>	✓	✓
6.1	Project Management and Verification	48	✓	✓
6.2	Post-Decommissioning Debris Clearance and Verification	48	✓	✓
6.3	Schedule	48	✓	✓
6.4	Costs	49	✓	✓
6.5	Close Out	49	✓	✓
6.6	Post-Decommissioning Monitoring and Evaluation	49	✓	✓
<b>7</b>	<b>Supporting Documents</b>	<b>50</b>	✓	✓

## **FIGURES AND TABLES**

Figure 1.1: Field Location in UKCS .....	13
Figure 1.2: Ann & Alison Adjacent Facilities .....	14
Figure 1.3: Overview of Ann Pipeline Approaches.....	15
Figure 1.4: Overview of Alison Pipeline Approaches .....	15
Figure 1.5: Overview of Audrey B (XW) Pipeline Approaches.....	16
Figure 1.6: PL947 Pipeline Approach at LOGGS.....	16
Figure 1.7: Adjacent Facilities.....	20
Figure 2.1: Pie-Chart of estimated inventories (Ann installation).....	26
Figure 2.2: Pie-Chart of estimated inventories (Ann pipelines) excl. rock .....	27
Figure 2.3: Pie-Chart of estimated inventories (Ann pipelines) incl. rock .....	27
Figure 2.4: Pie-Chart of estimated inventories (Alison installation) .....	30
Figure 2.5: Pie-Chart of estimated inventories (Alison pipeline).....	31
Figure 3.1: Overview of pipeline decommissioning proposals.....	37
Figure 6.1: Gantt Chart of Project Plan.....	48
Figure A.1: PL947 burial profile (12” gas export line Ann to LOGGS) .....	51
Figure A.2: PL948 burial profile (umbilical pipeline Audrey B (XW) to Ann) .....	52
Figure A.3: PL1099 burial profile (umbilical pipeline Audrey B (XW) to Alison) .....	53
Table 1.1: Installation Being Decommissioned .....	10
Table 1.2: Installation Section 29 Notice Holders Details.....	10
Table 1.3: Pipelines Being Decommissioned.....	10
Table 1.4: Pipelines Section 29 Notice Holders Details .....	10
Table 1.5: Installation Being Decommissioned .....	11
Table 1.6: Installation Section 29 Notice Holders Details.....	11
Table 1.7: Pipeline Being Decommissioned.....	11
Table 1.8: Pipeline Section 29 Notice Holders Details .....	11
Table 1.9: Summary of Decommissioning Programmes .....	12
Table 1.10: Adjacent Facilities.....	17
Table 2.1: Surface Facilities Information.....	22
Table 2.2: Subsea Installations and Stabilisation Features.....	22
Table 2.3: Pipeline/Flowline/Umbilical Information.....	23
Table 2.4: Subsea Pipeline Stabilisation Features.....	24
Table 2.5: Well Information.....	26
Table 2.6: Drill Cuttings Pile(s) Information.....	26
Table 2.7: Surface Facilities Information.....	28
Table 2.8: Subsea Installations and Stabilisation Features.....	28
Table 2.9: Pipeline/Flowline/Umbilical Information.....	29
Table 2.10: Subsea Pipeline Stabilisation Features.....	29
Table 2.11: Well Information.....	30
Table 2.12: Drill Cuttings Pile(s) Information.....	30
Table 3.1: Subsea Installations and Stabilisation Features.....	32
Table 3.2: Pipeline Decommissioning Options.....	33
Table 3.3: Outcomes of the Comparative Assessment .....	34

Table 3.4: Pipeline Stabilisation Features..... 36

Table 3.5: Well Plug and Abandonment ..... 38

Table 3.6: Waste Stream Management Methods..... 39

Table 3.7: Inventory Disposition ..... 39

Table 3.8: Re-use, Recycle & Disposal Aspirations for Material Recovered to Shore ..... 40

Table 4.1: Environmental Sensitivities ..... 41

Table 4.2: Environmental Impact Management ..... 44

Table 5.1: Summary of Stakeholder Comments ..... 46

Table 6.1: Provisional Decommissioning Programme Costs..... 49

Table 7.1: Supporting Documents ..... 50

**TABLE OF APPENDICES**

Appendix	Description	Page
A	Pipeline Trenching/Burial Profile Graphs	51-53
B	Public Notice & Consultee Correspondence – <b>HOLD</b>	tba

## **TERMS AND ABBREVIATIONS**

<b>ABBREVIATION</b>	<b>EXPLANATION</b>
Ann A4	Single subsea well (A4z) tied back to Ann manifold
Ann Installation	Ann template. The Ann manifold is located inside and protected by the template structure
Alison Installation	Alison template. The Alison manifold is located inside and protected by the template structure
Alison tee piece	Alison product was exported through the main Ann export system (PL947) via spool pieces which are tied into a tee piece on (PL947), the tee piece is protected by a steel frame, concrete blocks and concrete mats
Approach	Initial or final stretch of pipeline (or umbilical) as it leaves its point of origin or reaches its destination
BEIS	Department for Business, Energy, and Industrial Strategy
Centrica	Centrica North Sea Limited
CPUK	ConocoPhillips (U.K.) Limited
Crossing	Pipeline crossing. A higher pipeline number crosses over the top of a pipeline with a lower identification number, so for example, PL1099 crosses over PL947. Typically pipeline crossings might be protected with concrete mattresses and overlain with deposited rock
CSV	Construction Support Vessel
DOB	Depth of Burial
DOC(m)	Depth of cover (depth of sediment above pipe)
DOL(m)	Depth of Lowering (depth to top of pipe from adjacent seabed)
DSV	Diving Support Vessel
GE	Gas Export
HSE	Health and Safety Executive
"	Inch, 25.4millimetres
ITT	Invitation to Tender
JNCC	Joint Nature Conservation Committee
km	Kilometre
LOGGS	Lincolnshire Offshore Gas Gathering System
m	Metre
MAT	Master Application Template
MEG	Monoethylene glycol
mm	Million
n/a	Not applicable
NFFO	National Federation of Fishermen's Organisations
NIFPO	Northern Ireland Fish Producers Organisation
NORM	Naturally Occurring Radioactive Material
NUI	Normally Unattended Installation
OGA	Oil & Gas Authority
OSPAR	Oslo Paris Convention
P&A	Plug and Abandonment
PON	Petroleum Operations Notice
PR	(LOGGS) PR Riser Platform

ABBREVIATION	EXPLANATION
PWA	Pipeline Works Authorisation
SAT	Subsidiary Application Template
SCI	Site(s) of Community Importance
SFF	Scottish Fishermen's Federation
SNS	Southern North Sea
SSW	South South West
SUTU	Subsea Umbilical Termination Unit
tba	To be announced
Te	Tonne
UKCS	United Kingdom Continental Shelf
WGS84	World Geodetic System 1984
WHPS	Wellhead Protection Structure

## 1 EXECUTIVE SUMMARY

### 1.1 Combined Decommissioning Programmes

This document contains four Decommissioning Programmes, one for each set of notices served under Section 29 of the Petroleum Act 1998. The Decommissioning Programmes are:

- The Ann installation (a wellhead template protection structure);
- The four associated pipelines;
- The Alison installation (a wellhead template protection structure);
- The one associated pipeline.

Although decommissioning of the Ann and Alison installations and pipelines is being treated in this document as a standalone project, the operational phase is being carried out as part of a wider decommissioning campaign in the A Fields area (see Figure 1.7). We will also continue to explore cost saving synergies with other projects.

### 1.2 Requirement for Decommissioning Programmes

**Installations:** In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Ann and Alison installations/fields (see Table 1.2 and Table 1.6) are applying to the Department for Business, Energy and Industrial Strategy (BEIS) to obtain approval for decommissioning the installations detailed in Sections 2.1.1, 2.1.2, 2.2.1 and 2.2.2 of this document.

**Pipelines:** In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Ann and Alison pipelines (see Table 1.4 and Table 1.8) are applying to the Department for Business, Energy and Industrial Strategy to obtain approval for decommissioning the pipelines detailed in Sections 2.1.3 and 2.2.3 of this document.

In conjunction with public, stakeholder and regulatory consultation, the Decommissioning Programmes are submitted in compliance with national and international regulations and BEIS Guidance Notes.

The schedule outlined in this document is for a seven year decommissioning project plan with well abandonment activities due to begin in 2017.

### 1.3 Introduction

The Ann field is located in blocks 48/10a and 49/6a, approximately 40km North North-East of the Lincolnshire Offshore Gas Gathering System (LOGGS) complex. It was discovered in 1966 and production started in 1994. The Alison field is located in block 49/11a and started production in 1995. Ann and Alison gas production was via pipeline network PL947 and ties in to a riser on the LOGGS PR platform. The two fields lie approximately 95 miles due East of the mouth of the Humber and 55 miles North East of the North Norfolk coast in water depths of 24-30m.

Ann combines a protected manifold structure with capacity for 3 wells and a remote wellhead with a protective structure (Ann A4). The Ann A4 wellhead protection structure (WHPS) is subject to a separate Decommissioning Programme (ref: CEU-DCM-SNS0096-REP-0001). The remote wellhead is connected via a short 6" production spool piece (PL2164) and a short chemical injection and control jumper (PL2165) to the Ann template. Gas is exported via a 41.8km 12" pipeline (PL947) to the LOGGS PR installation.

The Alison installation is a protected manifold structure with capacity for 3 wells. Gas was exported from Alison via 8" spool pieces connected to a subsea tee piece located on the Ann pipeline (PL947). Ann and Alison subsea installations were remotely controlled from the LOGGS PR via Audrey B (XW). Control and chemical injection were provided from Audrey B (XW) via a 17.6km pipeline (PL948) to the Ann installation and a 15.1km pipeline (PL1099) to the Alison installation.



There has been no commercial flow from the Ann installation since September 2012. Production from Ann A4 was suspended in June 2009, and production from Alison was suspended in February 2010. Production through PL947 is suspended and the line contains process fluids (gas, condensate and water), methanol and corrosion inhibitor.

A cessation of production justification for Ann was approved by the Oil and Gas Authority (OGA) in December 2015, and for Alison in January 2016.

Following public, stakeholder and regulatory consultation, the Decommissioning Programmes will be submitted without derogation and in full compliance with the BEIS Guidance Notes. The Decommissioning Programmes explain the principles of the removal activities and are supported by an environmental impact assessment. The Decommissioning Programmes for the pipelines are also supported by a comparative assessment [2]. Decommissioning proposals for fringed mattresses are also supported by a comparative assessment [2].

## 1.4 Ann Field – Decommissioning Overview

### 1.4.1 Ann Field - Installation

Table 1.1: Installation Being Decommissioned			
<b>Field:</b>	Ann	<b>Production Type</b>	Gas
<b>Water Depth (m)</b>	28m	<b>UKCS block</b>	49/6a & 48/10a
Surface Installation			
<b>Number</b>	<b>Type</b>	<b>Topsides Weight (Te)</b>	<b>Jacket Weight (Te)</b>
None	n/a	n/a	n/a
Subsea Installation		Number of Wells	
<b>Number</b>	<b>Type</b>	<b>Platform</b>	<b>Subsea</b>
1	Subsea Structure	n/a	2 <sup>1</sup>
Drill Cuttings pile		Distance to median	Distance from nearest UK coastline
<b>Number of Piles</b>	<b>Total Estimated Volume (m<sup>3</sup>)</b>	<b>km</b>	<b>km</b>
None	n/a	57km	104km North North East of Bacton

Table 1.2: Installation Section 29 Notice Holders Details		
Section 29 Notice Holders	Registration Number	Equity Interest (%)
Centrica North Sea Limited	04594558	100%
Centrica North Sea Gas Limited	SC182822	0%
Centrica Resources (UK) Limited	06791610	0%
GB Gas Holdings Limited	03186121	0%

### 1.4.2 Ann Field - Pipelines

Table 1.3: Pipelines Being Decommissioned		
<b>Number of Pipelines</b>	4	(See Table 2.3)

Table 1.4: Pipelines Section 29 Notice Holders Details		
Section 29 Notice Holders	Registration Number	Equity Interest (%)
Centrica North Sea Limited	04594558	100%
Centrica North Sea Gas Limited	SC182822	0%
Centrica Resources (UK) Limited	06791610	0%
GB Gas Holdings Limited	03186121	0%

<sup>1</sup> There are three subsea wells in the Ann Field, however only two form part of this Decommissioning Programme. The third well (Ann A4) is referred to in the Ann A4 Decommissioning Programme (ref: CEU-DCM-SNS0096-REP-0001)

## 1.5 Alison Field – Decommissioning Overview

### 1.5.1 Alison Field – Installation

Table 1.5: Installation Being Decommissioned			
<b>Field:</b>	Alison	<b>Production Type</b>	Gas
<b>Water Depth (m)</b>	29m	<b>UKCS block</b>	49/11a
Surface Installations			
<b>Number</b>	<b>Type</b>	<b>Topsides Weight (Te)</b>	<b>Jacket Weight (Te)</b>
None	n/a	n/a	n/a
Subsea Installation		Number of Wells	
<b>Number</b>	<b>Type</b>	<b>Platform</b>	<b>Subsea</b>
1	Subsea Structure	n/a	1 <sup>2</sup>
Drill Cuttings pile		Distance to median	Distance from nearest UK coastline
<b>Number of Piles</b>	<b>Total Estimated Volume (m<sup>3</sup>)</b>	<b>km</b>	<b>km</b>
None	n/a	55km	87km North North East of Bacton

Table 1.6: Installation Section 29 Notice Holders Details		
Section 29 Notice Holders	Registration Number	Equity Interest (%)
Centrica North Sea Limited	04594558	100%
Centrica North Sea Gas Limited	SC182822	0%
Centrica Resources (UK) Limited	06791610	0%
GB Gas Holdings Limited	03186121	0%

### 1.5.2 Alison Field – Pipeline

Table 1.7: Pipeline Being Decommissioned		
<b>Number of Pipelines</b>	1	(See Table 2.9)

Table 1.8: Pipeline Section 29 Notice Holders Details		
Section 29 Notice Holders	Registration Number	Equity Interest (%)
Centrica North Sea Limited	04594558	100%
Centrica North Sea Gas Limited	SC182822	0%
Centrica Resources (UK) Limited	06791610	0%
GB Gas Holdings Limited	03186121	0%

<sup>2</sup> A further well is located within the Alison template, owned by CPUK and does not form part of this Decommissioning Programme.

## 1.6 Summary of Proposed Decommissioning Programmes

Table 1.9: Summary of Decommissioning Programmes		
Selected Option	Reason for Selection	Proposed Decommissioning Solution
<b>1. Toppersides</b>		
n/a	n/a	n/a
<b>2. Jacket(s)/Floating Facility (FPSO etc.)</b>		
n/a	n/a	n/a
<b>3. Subsea Installations</b>		
The Ann and Alison installations will be completely removed from the seabed.	To remove all seabed structures and leave a clear seabed. Complies with OSPAR requirements	Subsea installations including wellheads and production manifolds will be removed from the seabed. Since the seabed is stable near these two installations so we propose to cut the piles 600mm below seabed as this is consistent with a typically acceptable pipeline depth of burial.
<b>4. Pipelines, Flowlines &amp; Umbilicals</b>		
Pipelines will be flushed and left buried <i>in situ</i> .	The pipelines are sufficiently buried and stable, posing no hazard to marine users. Minimal seabed disturbance, lower energy usage, reduced risk to personnel engaged in the activity.	<p>Most of PL947 (12" gas export pipeline) will be left <i>in situ</i> with specific areas of exposed pipeline not buried in deposited rock on the Ann, Alison tee and LOGGS approaches being removed. As the pipeline exits the Ann manifold the 12" pipe spools (13.7m long) will be removed. The pipeline either side of the Alison tee (total approx. 14m) will be completely removed and at LOGGS the exposed sections of pipeline and pipe spools not buried (approx. 43.6m) under deposited rock will be completely removed.</p> <p>PL947 stub (48m long) that connects Alison to PL947 will be completely removed.</p> <p>Most of PL948 (pipeline approx. 4in diameter) will be left <i>in situ</i>. Adjacent to Audrey B (XW) the surface laid section down to transition depth (approx. 32m long) will be completely removed. At Ann, the SUTU and surface laid end of the pipeline top transition depth (114m long) will be completely removed.</p> <p>Notwithstanding detailed engineering, the first half of PL1099 (approx. 8km) will be completely removed. The second half of the pipeline will be left <i>in situ</i> except at Alison, where the SUTU and surface laid end from transition depth to the Alison manifold – including the section that crosses over PL947 (total approx. 160m long) will be completely removed.</p>
Short surface pipelines will be completely removed.	Leaves a clear seabed and removes a potential obstruction to fishing operations.	<p>All surface laid pipelines (including pipe spools and umbilical jumpers) where not covered by deposited rock will be completely removed and recovered to shore for reuse, recycling or final disposal. This covers the following pipelines:</p> <ul style="list-style-type: none"> <li>• PL2164 pipe spools, 128m long;</li> <li>• PL2165 umbilical jumpers, 165m long.</li> </ul>

5. Wells		
The wells will be plugged and abandoned to comply with HSE "Offshore Installations and Wells (Design and Construction, etc.) Regulations 1996" and in accordance with Oil & Gas UK Guidelines for the Abandonment of Wells, Issue 5, July 2015.	Meets BEIS and HSE regulatory requirements.	A Master Application Template (MAT) and the supporting Subsidiary Application Templates (SAT) will be submitted in support of activities carried out. A PON5 will also be submitted to BEIS for application to abandon the wells.
6. Drill Cuttings		
No cutting piles exist at either Ann or Alison.	Cuttings are widely dispersed and fall below OSPAR 2006/5 thresholds.	n/a
7. Interdependencies		
The Ann pipeline is tied into the LOGGS 'PR' platform. The PL947 stub from the Alison manifold is tied into the main PL947 pipeline at the Alison tee. As PL1099 approaches the Alison template it crosses over PL947. Both the Ann and Alison umbilical pipelines originate at the Audrey B (XW) platform.		

## 1.7 Field Location Including Field Layout and Adjacent Facilities

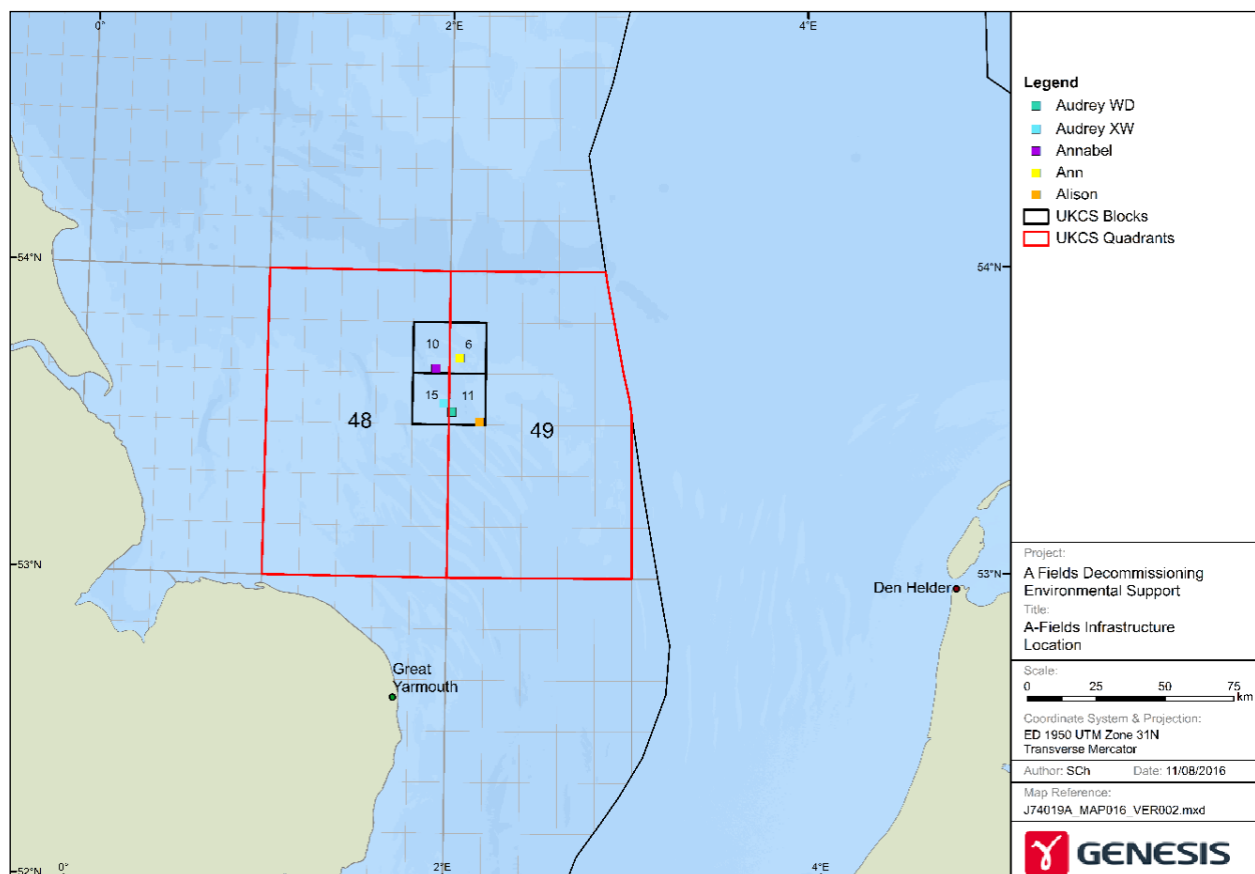


Figure 1.1: Field Location in UKCS

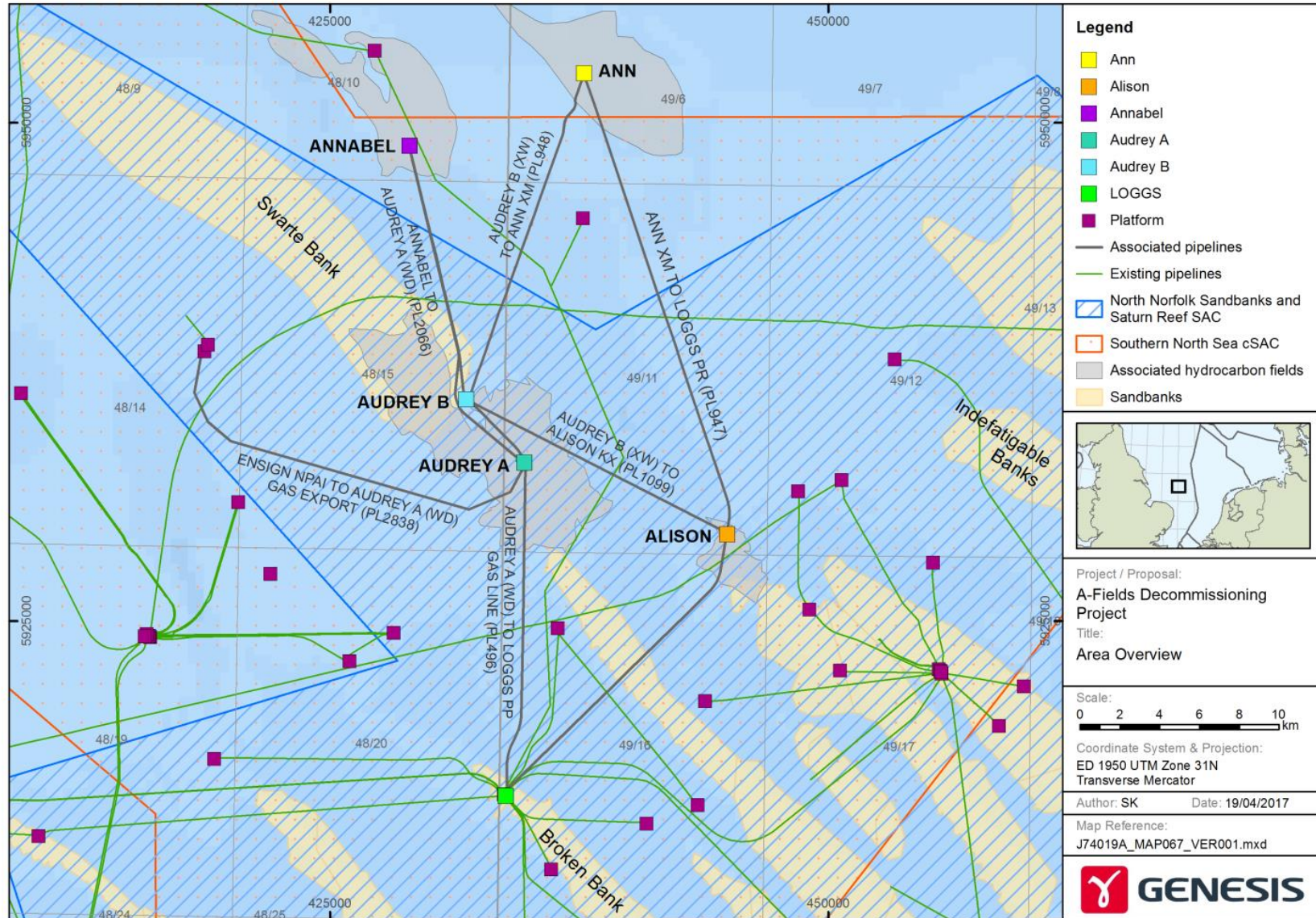


Figure 1.2: Ann & Alison Adjacent Facilities

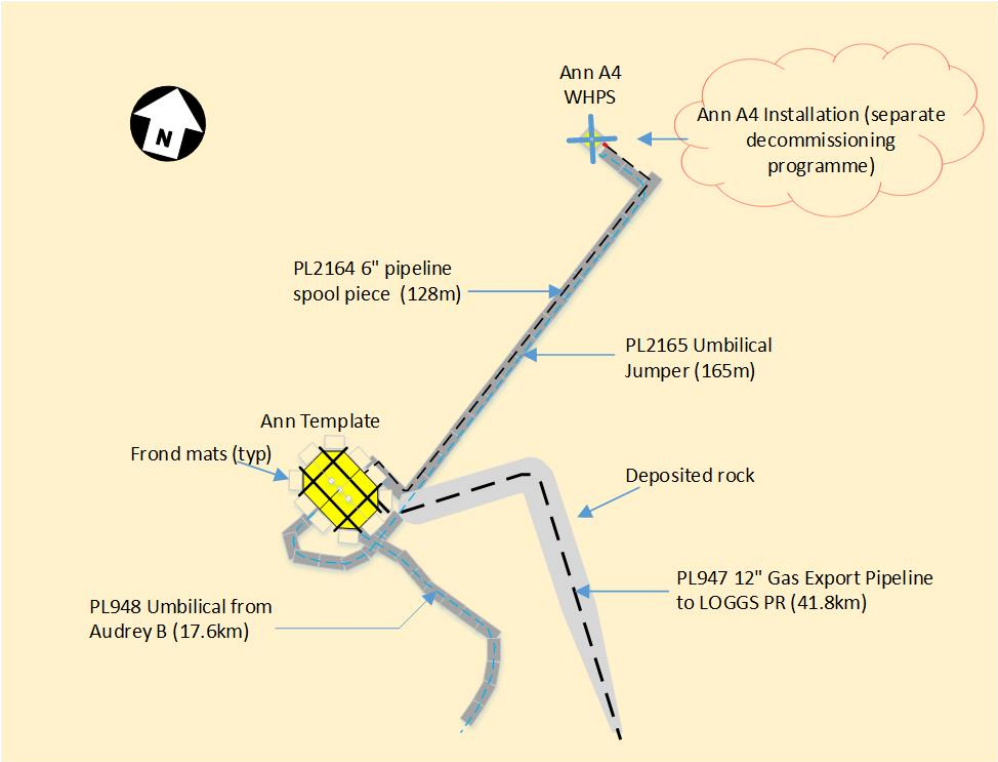


Figure 1.3: Overview of Ann Pipeline Approaches

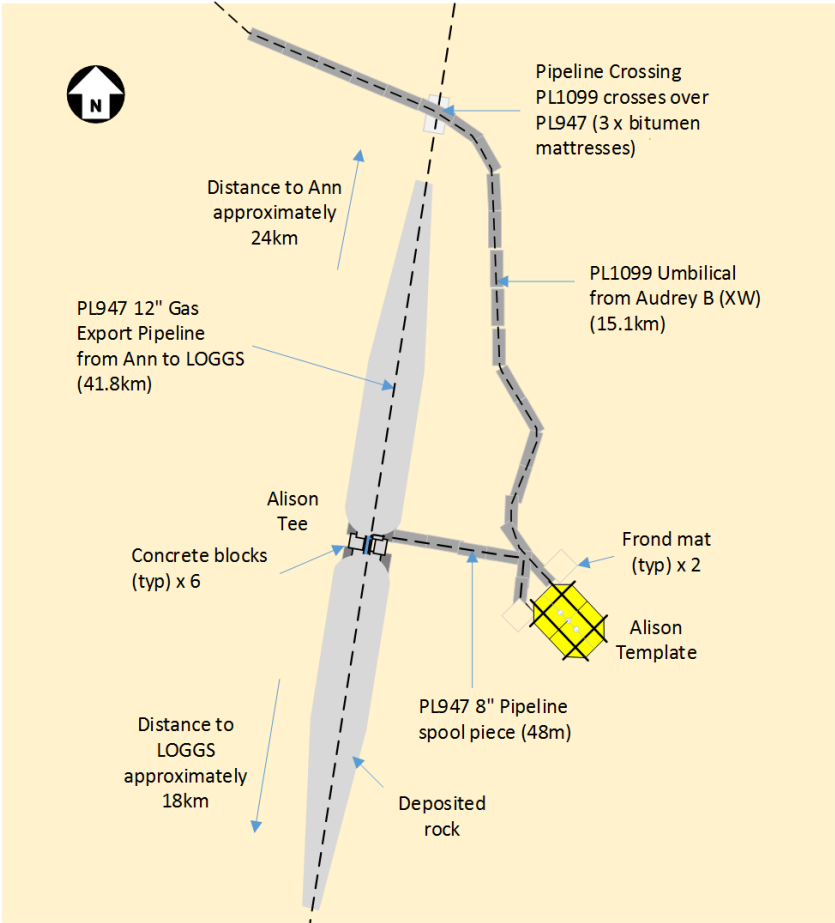
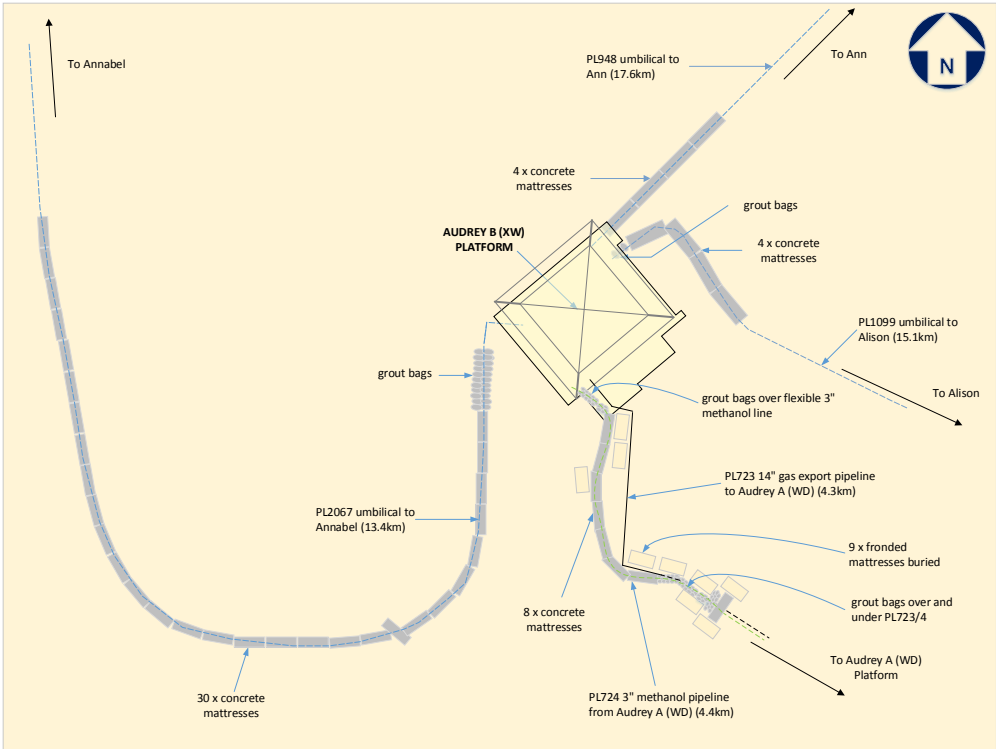
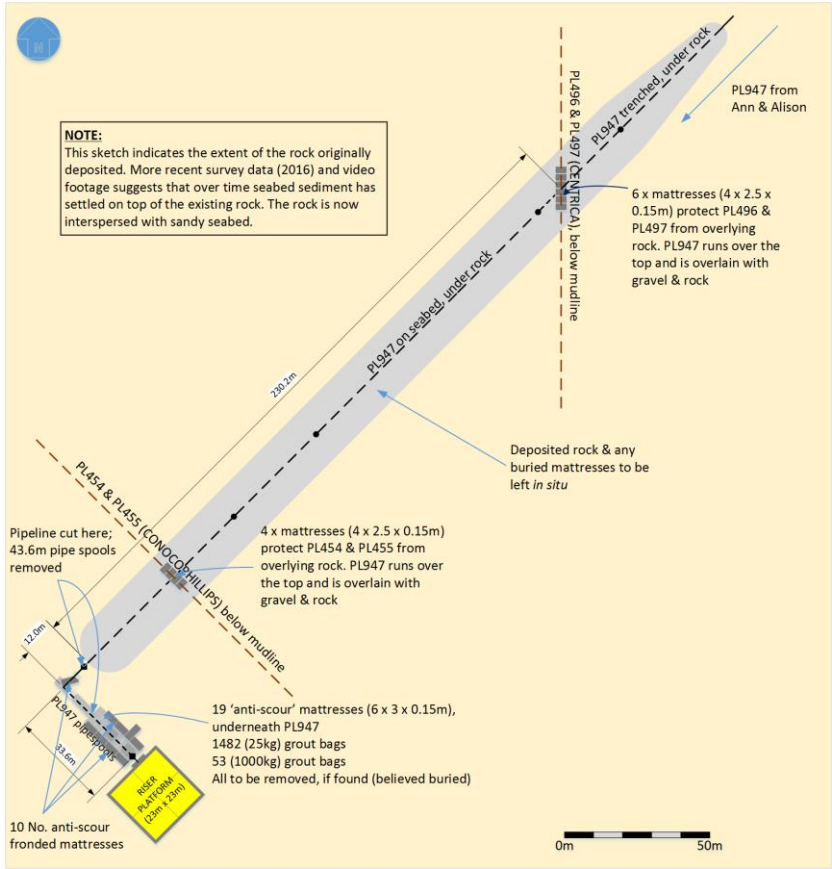


Figure 1.4: Overview of Alison Pipeline Approaches



**Figure 1.5: Overview of Audrey B (XW) Pipeline Approaches**



**Figure 1.6: PL947 Pipeline Approach at LOGGS**



**Table 1.10: Adjacent Facilities<sup>3</sup>**

Owner	Name	Type	Distance/ Direction	Information	Status
<b>Platforms</b>					
Centrica	Audrey A (WD)	NUI	Approx. 19.5km south of Ann installation	Gas export hub for Audrey & Annabel via LOGGS	Operational
Centrica	Audrey B (XW)	NUI	Approx. 17.3km SSW of Ann installation	Provides power, controls and chemicals to Ann & Alison manifolds	Operational
ConocoPhillips	LOGGS PR Riser Platform	Platform	Approx. 36.3km south of Ann installation	Reception for pipeline PL947	Operational

**PL947 Subsea Pipelines Crossings<sup>4</sup>**

Centrica	PL2165 Ann A4 umbilical jumper	Umbilical	Approx. 124m from Ann manifold to Ann A4	PL947 crosses <b>under</b> Ann A4 umbilical jumper (PL2165) at KP0.01. Crossing covered with concrete mattresses	Out of use
BT	Weybourne to ACMI MASTER	Telecoms Cable	from Weybourne to ACMI Master	PL947 crosses <b>over</b> BT Cable at KP6.10. Crossing overlain with rock	Unknown
Shell	PL1967 Carrack gas export	Pipeline	Approx. 44.5km from Carrack QA to Clipper PR	PL947 crosses <b>under</b> Carrack pipelines (PL1967 & PL1968) at KP12.84	Operational
	PL1968 Carrack MEG	Pipeline			Operational
Unknown	Weybourne to Fano	Cable	Weybourne to Fano	Cable cut and removed at approx. KP20.04 during installation of PL947	Out of use
Centrica	PL1099 Alison pipeline	Umbilical	Approx. 15.1km from Audrey B (XW) to Alison manifold	PL947 crosses <b>under</b> Alison umbilical (PL1099) at KP24.13. Crossing covered with concrete mattresses	Out of use
ConocoPhillips	PL27 Viking gas export	Pipeline	Approx. 7.3km from Viking AR to Mablethorpe.	PL947 crosses <b>over</b> Viking pipelines (PL27 & PL161) at KP25.55. Crossing overlain with rock	Out of use
	PL161 Viking methanol	Pipeline			Out of use
Unknown	Mundersley to	Cable	Mundersley to	Cable not identified	Out of use

<sup>3</sup> Adjacent facilities refer to those potentially impacted by the Ann and Alison Decommissioning Programmes.

<sup>4</sup> For pipeline PL947, the Ann Manifold end represents KP0.

**Table 1.10: Adjacent Facilities<sup>3</sup>**

Owner	Name	Type	Distance/ Direction	Information	Status
	Nordeney		Nordeney	during installation of PL947. Expected to be at KP26.25	
ConocoPhillips	PL1962 Viscount gas export	Pipeline	Approx. 11.3km from Viscount VO to Vampire OD	PL947 crosses <b>under</b> Viscount pipelines (PL1962 & PL1963) at KP34.36. Crossing overlain with rock	Operational
ConocoPhillips	PL1963 Viscount Methanol	Pipeline			Operational
Centrica	PL496 Audrey gas export	Pipeline	Approx. 16.4km from Audrey A (WD) to LOGGS	PL947 crosses <b>over</b> Audrey pipelines (PL496 & PL497) at KP41.54. Crossing overlain with rock	Operational
	PL497 Audrey methanol	Pipeline			Operational
ConocoPhillips	PL454 LOGGS gas export	Pipeline	Within LOGGS 500m safety zone LOGGS to Theddlethorpe	PL947 crosses <b>over</b> LOGGS pipelines (PL454 & PL455) at KP41.72. Crossing overlain with rock	Operational
	PL455 LOGGS methanol	Pipeline			Operational
<b>PL948 Subsea Pipelines Crossings<sup>5</sup></b>					
Shell	PL1967 Carrack gas export	Pipeline	Approx. 52.9km from Carrack QA to Clipper PR	PL948 crosses <b>under</b> the Carrack pipelines (PL1967 & PL1968) at KP5.06	Operational
	PL1968 Carrack MEG	Pipeline			Operational
ConocoPhillips	PL2107 Saturn gas export	Pipeline	Approx. 25km from Saturn ND to LOGGS	PL948 crosses <b>under</b> the Saturn pipelines (PL2107 & PL2108) at KP7.96	Operational
	PL2108 Saturn methanol	Pipeline			Operational
BT	Weybourne to ACMI MASTER	Telecoms Cable	from Weybourne to ACMI Master.	PL948 crosses <b>over</b> BT Cable at KP9.87. Crossing overlain with rock	Unknown
Centrica	PL2165 Ann A4 umbilical jumper	Umbilical	Approx. 124m from Ann manifold to Ann A4	PL948 crosses <b>under</b> Ann A4 umbilical jumper (PL2165) at KP13. Crossing covered with concrete mattresses	Out of use

<sup>5</sup> For pipeline PL948, the Audrey B (XW) platform end represents KP0

Table 1.10: Adjacent Facilities<sup>3</sup>

Owner	Name	Type	Distance/ Direction	Information	Status
<b>PL1099 Subsea Pipelines Crossings<sup>6</sup></b>					
ConocoPhillips	PL2107 Saturn gas export	Pipeline	Approx. 35.7km from Saturn ND to LOGGS	PL1099 crosses <b>under</b> the Saturn pipelines (PL2107 & PL2108) at KP8.38	Operational
	PL2108 Saturn methanol	Pipeline			Operational
Unknown	Weybourne to Fano	Cable	Weybourne to Fano	PL1099 trenched and buried at KP10.05	Out of use
Centrica	PL947 Ann gas export	Pipeline	Approx. 41.8km from Ann to LOGGS	PL1099 crosses <b>over</b> Ann pipeline (PL947) at KP14.93. Crossing covered with concrete mattresses	Out of use
<b>Impacts of Decommissioning Proposals</b>					
<p>There are no direct impacts on adjacent facilities from the associated decommissioning works outside the LOGGS complex. Timing of works within the LOGGS 500m zone will be agreed with the LOGGS owner.</p> <p>Where crossings are overlain with rock, it is proposed to decommission the rock and the infrastructure beneath by leaving <i>in situ</i>.</p> <p>As part of the environmental assessment we have considered potential in combination or cumulative effect of activities in the area, including decommissioning and aggregate extraction. This was completed using data that are publicly available. However, operational windows tend to include a degree of flexibility so it is not possible to be precise. However, as part of the operational phase any potential impacts will be mitigated in two ways. The first is via direct communication with the parties involved, and the other is via submission of the MATs and SATs.</p>					

<sup>6</sup> For pipeline PL1099, the Audrey B (XW) platform end represents KP0

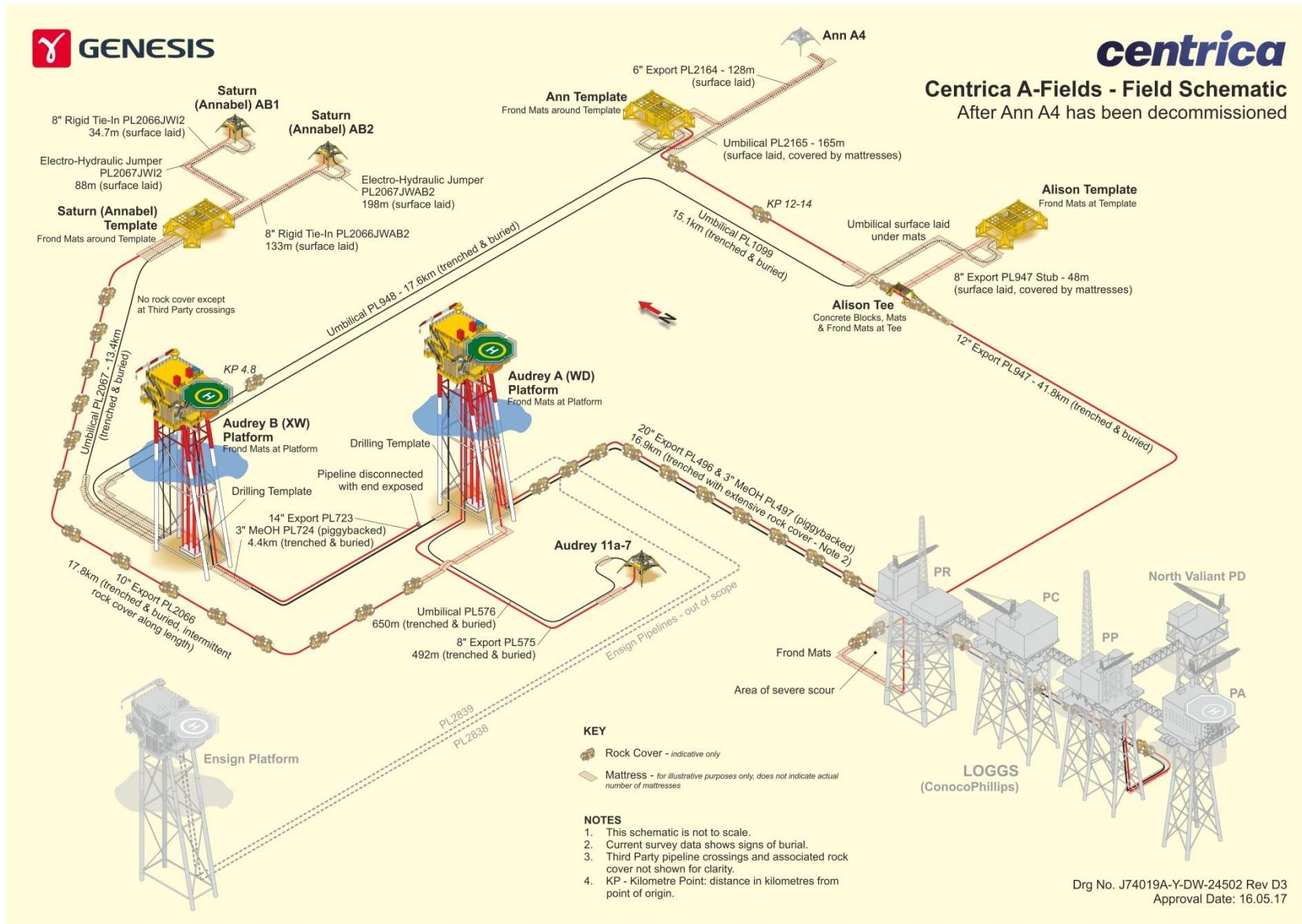


Figure 1.7: Adjacent Facilities

## 1.8 Industrial Implications

Well abandonment and removal will be completed using a drilling rig. Some preparatory work will be undertaken by a light well intervention vessel and/or a diving support vessel subject to commercial considerations.

It is Centrica's intention to use a combination of existing framework agreements and new contracts for the decommissioning of Ann and Alison installations. Subject to collaborative effort and commercial agreements, Centrica are also planning to combine Ann and Alison decommissioning activities with other development or decommissioning activities such as the abandonment of the ConocoPhillips' owned "KX" well at Alison. A drilling rig will be sourced in 2017 for a number of well abandonment activities in the Southern North Sea and as such it is possible that the sequence of work may change.

## 2 DESCRIPTION OF ITEMS TO BE DECOMMISSIONED

### 2.1 Ann Field

#### 2.1.1 Ann Field Installation: Surface Facilities

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)
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

#### 2.1.2 Ann Field Installation: Subsea including Stabilisation Features

Table 2.2: Subsea Installations and Stabilisation Features					
Subsea installations including Stabilisation Features	Number	Size/Weight (Te)	Location		Comments/Status
Wellheads	2	<b>A2</b> 2.9 x 2.9 x 2.3m 13.2Te	WGS84 Decimal	53.714781° N 02.054847° E	Enclosed within Ann template
			WGS84 Decimal Minute	53° 42.88684" N 02° 03.29081" E	
		<b>A3</b> 2.9 x 2.9 x 2.3m 13.2Te	WGS84 Decimal	53.714781° N 02.054847° E	
			WGS84 Decimal Minute	53° 42.88684" N 02° 03.29081" E	
Ann template	1	16 x 12 x 5m 101Te	WGS84 Decimal	53.714781° N 02.054847° E	Secured with four steel piles
			WGS84 Decimal Minute	53° 42.88684" N 02° 03.29081" E	
FronDED mats	10	5 x 5 x 2.5m 7.5Te	Located around the base of the Ann template		Surface laid
Protection frame(s)	1	1.4 x 6.7 x 2m 1.5Te	WGS84 Decimal	53.508621° N 02.167870° E	n/a
			WGS84 Decimal Minute	53° 30.51726" N 02° 10.07220" E	Protection for Alison tie in pipe spools
Concrete mattresses	n/a	n/a	n/a		n/a
Grout bags	n/a	n/a	n/a		n/a
Formwork	n/a	n/a	n/a		n/a
Deposited rock	n/a	n/a	n/a		n/a
Other	n/a	n/a	n/a		n/a

### 2.1.3 Ann Field Pipelines Including Stabilisation Features

Table 2.3: Pipeline/Flowline/Umbilical Information									
Description	Pipeline Number (as per PWA) <sup>7</sup>	Diameter (inches)	Length (km)	Description of Component Parts	Product Conveyed	From – To End Points	Burial Status	Pipeline Status	Current Content
Ann gas export tie-in pipe spool	PL947	12	0.048	Steel with concrete and fusion bonded epoxy coating	Hydrocarbon gas	Ann manifold to gas export pipeline	Surface laid	Out of use	Hydrocarbon
Gas export pipeline		12	41.8	Steel with fusion bonded epoxy coating		Ann GE tie-in spool to LOGGS GE tie-in spool	Trenched and buried	Out of use	Hydrocarbon
Alison tee		12	0.002			Ann export pipeline at KP24.2 to Alison tie-in spool	Surface laid	Out of use	Hydrocarbon
Alison gas export tie-in pipe spool (PL947 stub)		8	0.046			Alison tee piece to Alison manifold	Surface laid	Out of use	Hydrocarbon
LOGGS tie-in pipe spool		12	0.039	Steel with concrete and fusion bonded epoxy coating		Gas export pipeline to gas export riser	Surface laid	Out of use	Hydrocarbon
Chemical injection and control umbilical	PL948	4	17.6	Umbilical pipeline	Methanol & corrosion inhibitor	Audrey B (XW) platform to Ann manifold	Trenched and buried	Out of use	Treated seawater
Gas export pipe spool	PL2164	6	0.128	Steel with concrete and fusion bonded epoxy coating	Natural gas, condensate, water	Ann A4 well to Ann manifold	Surface laid	Out of use	Treated seawater

<sup>7</sup> At the time of writing the Ann and Alison wells are being abandoned. Pipelines containing treated seawater have already been flushed and cleaned. Other pipelines will be flushed and cleaned as per Gantt Chart (section 6.3, Figure 6.1).

**Table 2.3: Pipeline/Flowline/Umbilical Information**

Description	Pipeline Number (as per PWA) <sup>7</sup>	Diameter (inches)	Length (km)	Description of Component Parts	Product Conveyed	From – To End Points	Burial Status	Pipeline Status	Current Content
Power, control & chemical injection jumper	PL2165	4	0.165	Flexible jumper	Hydraulic oil, methanol and electrical	Ann manifold to Ann A4 well	Surface laid	Out of use	Treated seawater

**Table 2.4: Subsea Pipeline Stabilisation Features**

Stabilisation Feature	Total Number	Weight (Te)	Location(s)	Exposed/Buried/Condition
Concrete mattresses, (116 total)	4	9.2	PL947 BT cable crossing (KP6.1)	Laid under pipeline and 100% burial with rock
	1	2.3	PL947 Weybourne to Fano cable cut end (KP20.04)	Exposed (laid over cut cable end)
	6	56.7	PL947 stub at Alison	Exposed with partial rock cover
	1	15.3	Protection on top of Alison tee	Exposed on top of protection frame
	6	13.8	PL947 Viking crossing (PL27/PL161) at KP25.55	Laid under pipeline and 100% burial with rock
	8	18.4	PL947 Audrey crossing (PL496/PL497) at KP41.54	Laid under pipeline and 100% burial with rock
	4	9.2	PL947 LOGGS crossing (PL454/PL455) at KP41.72	Laid under pipeline and 100% burial with rock
	19	78.8	Protection for PL947 on approach to LOGGS	Indications are that these are buried
	4	18.4	Protection for PL948 approach from Audrey B (XW)	Exposed with partial sediment cover
	12	41.5	PL948 BT cable crossing (KP9.87)	Laid under pipeline and 100% burial with rock
19	210.3	Protection for PL948 approach to Ann template	Largely exposed, however some mattresses have a dusting of sediment cover	



**Table 2.4: Subsea Pipeline Stabilisation Features**

Stabilisation Feature	Total Number	Weight (Te)	Location(s)	Exposed/Buried/Condition
	23	190.9	Protection for PL2164 between Ann & Ann A4	Largely exposed, however some mattresses have a dusting of sediment cover
	9	74.7	Protection for PL2165 between Ann & Ann A4	Largely exposed, however some mattresses have a dusting of sediment cover
Froned mats, (14 total)	10	7.5	Around PL947 within LOGGS 500m zone	Indications are that these are buried
	4	3	Around Alison tee (i.e. PL947)	Exposed with partial rock cover
Grout bags, (117Te) <sup>8</sup>	1927	111.7	Over PL947	Exposed
	844	5.7	Over PL948	Exposed
Concrete blocks, (6 total)	6	70.8	Around Alison tee	Exposed
Deposited rock <sup>9</sup>	n/a	17,438	PL947 & PL948 pipeline crossings. Spot rock dumping on PL947. Majority of deposited rock at LOGGS	Exposed, partially covered in sediment
Formwork	n/a	n/a	n/a	n/a

<sup>8</sup> Although the number of grout bags appears precise, the number is based on engineering judgement and an interpretation of the data available; the exact number is used for traceability across the various documents

<sup>9</sup> Details of the distribution of the deposited rock may be found in the comparative assessment for the pipelines [2], Appendix A.1

## 2.1.4 Ann Wells

Table 2.5: Well Information			
Platform Wells	Designation	Status	Category of Well
n/a	n/a	n/a	n/a
Subsea Wells	Designation	Status	Category of Well
46/6a-A2	Gas production	Shut in	SS-1-3-3
49/6a-A3z	Gas production	Shut in	SS-1-3-3

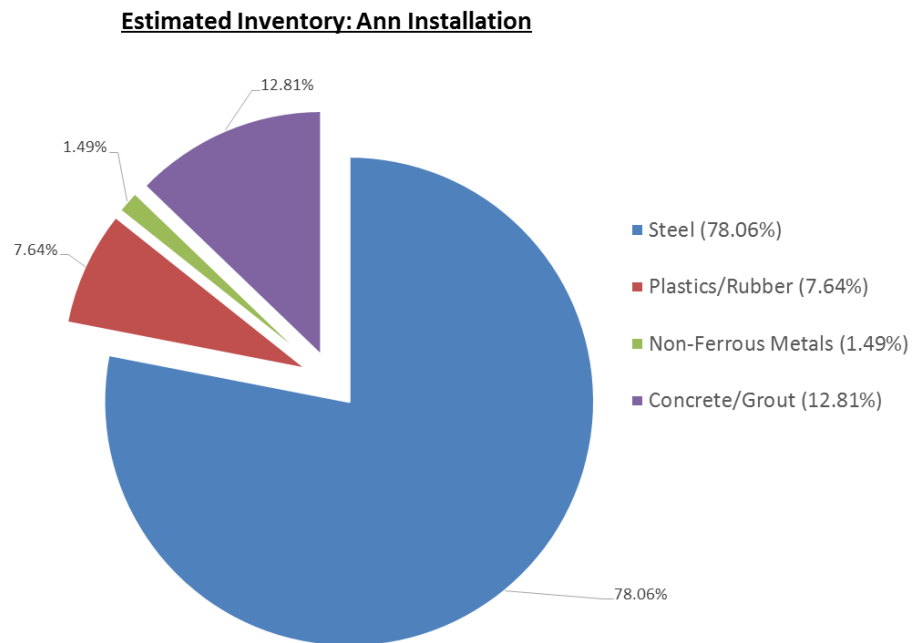
For details of well categorisation see Oil & Gas UK Guidelines for the Abandonment of Wells. Issue 5, July 2015.

**Note:** There are three subsea wells in the Ann field, however only two form part of this Decommissioning Programme. The third well (Ann A4) has been submitted as part of a separate Decommissioning Programme [1].

## 2.1.5 Ann Drill Cuttings

Table 2.6: Drill Cuttings Pile(s) Information		
Location of Pile Centre (Latitude/Longitude)	Seabed Area (m <sup>2</sup> )	Estimated volume of cuttings (m <sup>3</sup> )
No drill cuttings pile exists at Ann. Please refer Section 2 of the Ann Pre-decommissioning Environmental Survey [5].	n/a	n/a

## 2.1.6 Ann Inventory Estimates



**Figure 2.1: Pie-Chart of estimated inventories (Ann installation)**

Refer to section 6.6 of the Environmental Impact Assessment [3] for further details.

## Estimated Inventory: Ann Pipelines (excl. Rock)

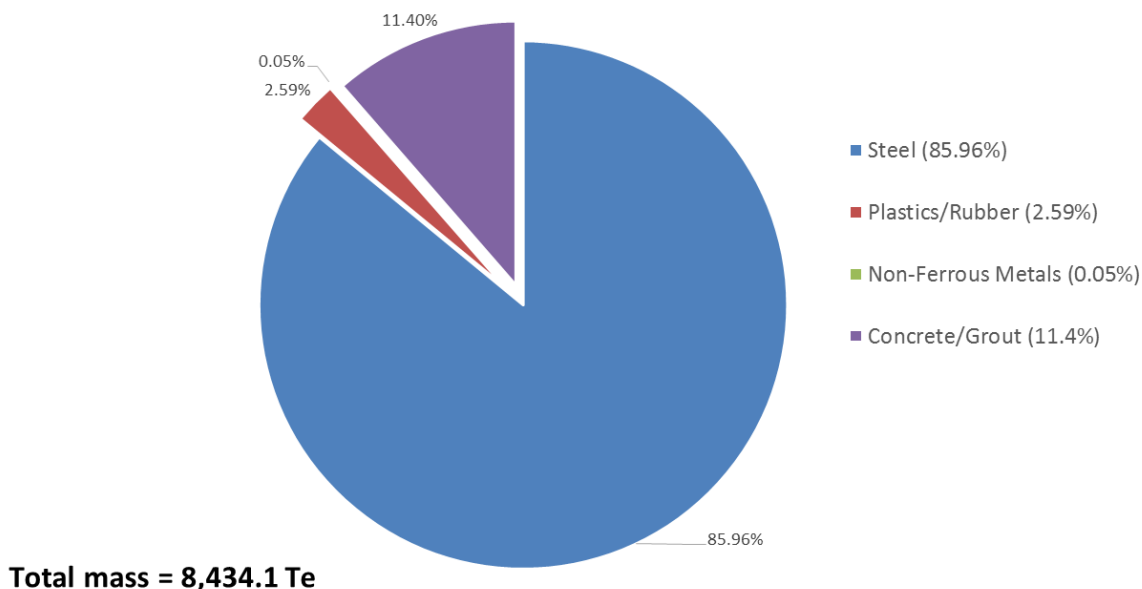


Figure 2.2: Pie-Chart of estimated inventories (Ann pipelines) excl. rock

Refer to section 6.6 of the Environmental Impact Assessment [3] for further details.

## Estimated Inventory: Ann Pipelines (incl. Rock)

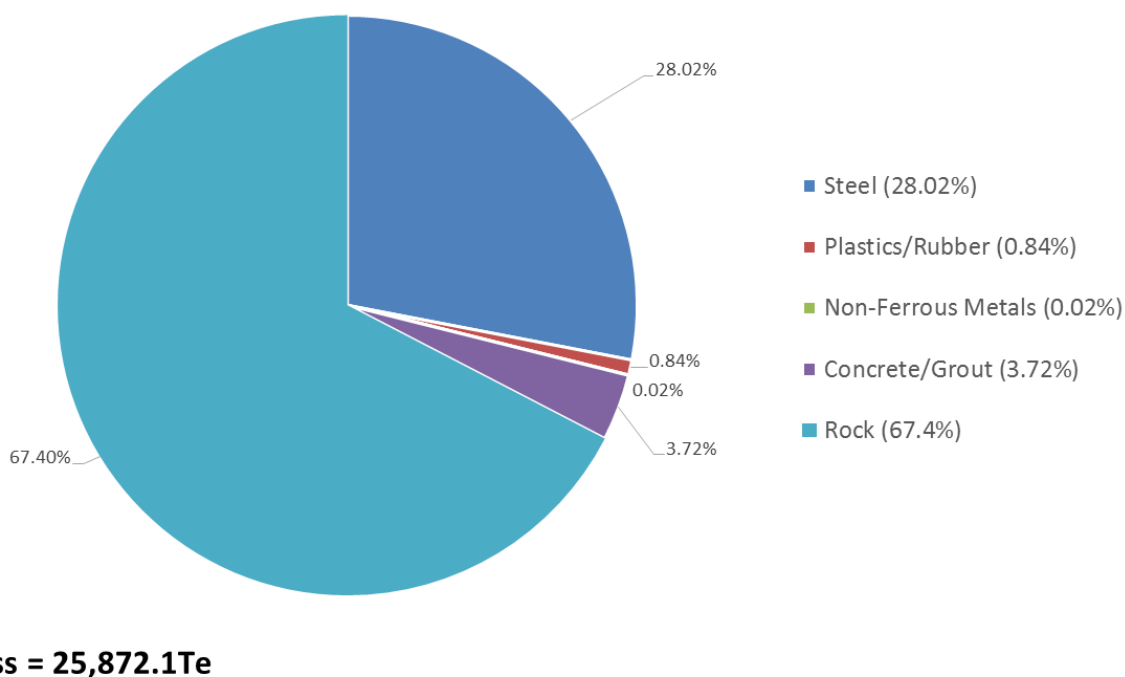


Figure 2.3: Pie-Chart of estimated inventories (Ann pipelines) incl. rock

Refer to section 6.6 of the Environmental Impact Assessment [3] for further details.

## 2.2 Alison Field

### 2.2.1 Alison Field Installation: Surface Facilities

Table 2.7: 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)	
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

### 2.2.2 Alison Field Installations: Subsea including Stabilisation Features

Table 2.8: Subsea Installations and Stabilisation Features					
Subsea installations including Stabilisation Features	Number	Size/Weight (Te)	Location		Comments/ Status
Wellheads/trees	1	49/11a-B3 2.9 x 2.9 x 2.3m 13.2Te	WGS84 Decimal	53.508470° N 02.168544° E	Enclosed within Alison template
			WGS84 Decimal Minute	53° 30.50818" N 02° 10.11265" E	
Alison template	1	16 x 12 x 5m 96.7Te	WGS84 Decimal	53.508470° N 02.168544° E	Secured with four steel piles
			WGS84 Decimal Minute	53° 30.50818" N 02° 10.11265" E	
Fronnd mats	2	5 x 5 x 1m 1.5Te	Located around the base of the Alison template		Surface laid
Protection frame(s)	n/a	n/a	n/a		n/a
Concrete mattresses	n/a	n/a	n/a		n/a
Grout bags	n/a	n/a	n/a		n/a
Formwork	n/a	n/a	n/a		n/a
Deposited rock	n/a	n/a	n/a		n/a
Other	n/a	n/a	n/a		n/a

### 2.2.3 Alison Field Pipeline Including Stabilisation Features

Table 2.9: 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
Power, control & chemical injection umbilical pipeline	PL1099	4"	15.1	Umbilical pipeline	Hydraulic oil, methanol, electrical	Audrey B (XW) platform to Alison template	Trenched and buried	Out of use	Treated seawater

Table 2.10: Subsea Pipeline Stabilisation Features				
Stabilisation Feature	Total Number	Weight (Te)	Location(s)	Exposed/Buried/Condition
Concrete mattresses (24 in total)	4	44.3	Protection for PL1099 on approach from Audrey B (XW)	Exposed
	20	190.6	Protection for PL1099 on approach to Alison template	Exposed
Bitumen mattresses (3 in total)	3	11.2	PL1099 Ann crossing (KP14.93)	Under PL1099 crossing, currently covered with rock
Grout bags (5.4Te) <sup>10</sup>	40	1	On PL1099 approach to Audrey B (XW)	Exposed
	170	4.4	On PL1099 approach to Alison template	Exposed
Rock	n/a	n/a	n/a	n/a
Formwork	n/a	n/a	n/a	n/a
Other	n/a	n/a	n/a	n/a

<sup>10</sup> Although the number of grout bags appears precise, the number is based on engineering judgement and an interpretation of the data available; the exact number is used for traceability across the various documents

## 2.2.4 Alison Wells

Table 2.11: Well Information			
Platform Wells	Designation	Status	Category of Well
n/a	n/a	n/a	n/a
Subsea Wells <sup>11</sup>	Designation	Status	Category of Well
49/11a-B3	Gas Production	Shut in	SS-3-3-3

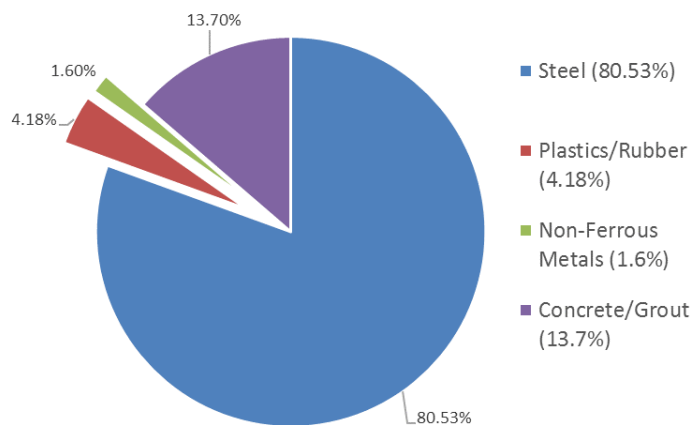
For details of well categorisation see the Oil and Gas UK, Guidelines for the Abandonment of Wells, Issue 5, July 2015.

## 2.2.5 Alison Drill Cuttings

Table 2.12: Drill Cuttings Pile(s) Information		
Location of Pile Centre (Latitude/Longitude)	Seabed Area (m <sup>2</sup> )	Estimated volume of cuttings (m <sup>3</sup> )
No drill cuttings pile exists at Alison. Please refer Section 2 of the Alison Pre-decommissioning Environmental Survey [4].	n/a	n/a

## 2.2.6 Alison Inventory Estimates

### Estimated Inventory: Alison Installation



**Total mass = 151.6 Te**

Figure 2.4: Pie-Chart of estimated inventories (Alison installation)

Refer to section 6.6 of the Environmental Impact Assessment [3] for further details.

<sup>11</sup> There is an Open Water Suspended Well (49/11a-4z, Category SS-3-3-3) located next to the Alison template. However, as it is not a production well it is not listed here. There is another well located inside the Alison template (Alison KX) that owned by CUK. Although Centrica and CUK are exploring potential synergies with the Alison well abandonment programme, the Alison KX well is outside the scope of this Decommissioning Programme

## Estimated Inventory: Alison Pipeline

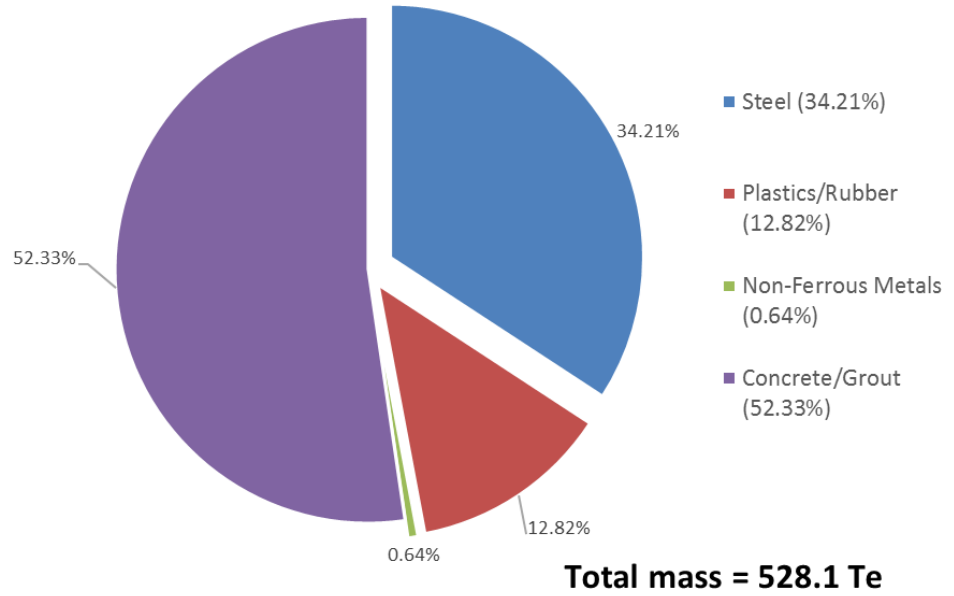


Figure 2.5: Pie-Chart of estimated inventories (Alison pipeline)

Refer to section 6.6 of the Environmental Impact Assessment [3] for further details.

### 3 REMOVAL AND DISPOSAL METHODS

Waste will be dealt with in accordance with the Waste Framework Directive. The reuse of an installation or pipelines (or parts thereof) is first in the order of preferred decommissioning options. Options for the reuse of installations or pipelines (or parts thereof) 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. Steel and other recyclable metal are estimated to account for the greatest proportion of the materials inventory. Refer to section 6.6 of the Environmental Impact Assessment [3] for further details concerning disposal of waste.

#### 3.1 Topsides

n/a

#### 3.2 Jacket(s)

n/a

#### 3.3 Subsea Installations and Stabilisation Features

Table 3.1: Subsea Installations and Stabilisation Features			
Subsea installations and stabilisation features	Number	Option	Disposal Route (if applicable)
Wellheads & trees	3	Complete removal following well abandonment	Return to shore for reuse or recycling
Manifolds	n/a	n/a	n/a
Froned mattresses	12	Leave <i>in situ</i>	n/a
Template(s)	2	Complete recovery	Return to shore for reuse or recycling
Protection frame(s)	n/a	n/a	n/a
Grout bags	n/a	n/a	n/a
Formwork	n/a	n/a	n/a
Deposited rock	n/a	n/a	n/a
Other	n/a	n/a	n/a

#### 3.4 Pipelines

All surface laid pipelines including tie-in spool pieces and jumpers which have not been trenched or buried will be completely recovered from the seabed and taken to shore for reuse or recycling or final disposal. The pipelines as detailed in Table 3.2 have been considered for *in situ* decommissioning and as such have been subjected to a comparative assessment.

All pipeline transitions at the ends (namely at the Ann manifold, Audrey B (XW) and LOGGS PR Riser Platform) will be completely removed, except where rock protection is currently in place (i.e. over the 12" gas export pipeline, PL947, at the Ann manifold and at LOGGS PR Riser Platform).



## Decommissioning Options

\*Key to Options:

- 1) Complete removal;
- 2) Partial removal or remediation of exposures;
- 3) Leave *in situ*, after making pipeline ends safe

Table 3.2: Pipeline 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
PL947 (Ann gas export pipeline)	Trenched and buried at installation. Pipeline is stable in trench	12" gas export pipeline	1, 2 & 3
PL947 stub	Surface laid pipespools, 48m long	8" gas export pipeline	1
PL948 (Ann umbilical)	Trenched and buried at installation. Umbilical is stable in trench	4" (approx.) chemical injection and control umbilical	1, 2 & 3
PL1099 (Alison umbilical)	Trenched and buried at installation. Unstable in trench with numerous exposures between KP0 and KP8.38. Umbilical is stable in trench between KP8.38 and KP15.1	4" (approx.) chemical injection and control umbilical	1, 2 & 3 (first half) 1, 3 (second half)
PL2164 (Ann A4 gas export pipeline)	Surface laid pipespools, 128m long	6" gas export pipeline	1
PL2165 (Ann A4 umbilical jumper)	Surface laid umbilical jumper, 165m long	4" (approx.) chemical injection and control umbilical jumper	1

## Comparative Assessment Method

A comparative assessment of the decommissioning options was performed in accordance with the Centrica Guidance for Comparative Assessments for Decommissioning. Each decommissioning option was qualitatively assessed against Safety, Environment, Technical and Societal and Cost. Refer [2] for details.

**Outcome of Comparative Assessment:**

Table 3.3: Outcomes of the Comparative Assessment		
Pipeline or Group	Recommended Option	Justification
PL947	<p>Leave <i>in situ</i>, leaving most of the pipeline <i>in situ</i> and making safe the ends.</p> <p>As PL947 exits Ann manifold it is buried in rock and apart from the exposed sections at the pipeline ends at Ann and LOGGS PR the pipeline will be decommissioned by leaving <i>in situ</i>. Short exposed lengths of the pipeline at KP3.4 and KP4.7 as well as a potentially exposed area near a sand bank between KP31.0 and KP33.5 will be left <i>in situ</i>. Sections of PL947 protected by deposited rock on the approach to LOGGS PR will be left <i>in situ</i> but short exposed sections in this area will be recovered.</p>	<p>The pipeline is buried and stable for most of its length. Therefore, we propose to leave most of the pipeline <i>in situ</i>. This will result in minimal seabed disturbance, lower energy usage, reduced risk to personnel and lower cost all contribute to the proposed recommendation.</p> <p>Please refer Appendix A.1 for pipeline burial profile.</p> <p>No pipeline crossings would be disturbed.</p> <p>Monitoring to confirm the pipeline remains buried will be completed to a schedule agreed with BEIS.</p>
PL948	<p>Leave pipeline <i>in situ</i>. On the Audrey B (XW) and Ann approaches the umbilical is surface laid and protected and stabilised using concrete mattresses; we would propose to fully remove these parts of the power, control and chemical umbilical pipeline.</p>	<p>For the most part PL948 is buried and stable.</p> <p>Therefore, we propose to leave most of the pipeline <i>in situ</i>. This will result in minimal seabed disturbance, lower energy usage, reduced risk to personnel and lower cost all contribute to the proposed recommendation.</p> <p>Please refer Appendix A.2 for pipeline burial profile.</p> <p>No pipeline crossings would be disturbed.</p> <p>Monitoring to confirm the umbilical pipeline remains buried will be completed to a schedule agreed with BEIS.</p>
PL1099	<p>Completely remove first half of the power, control and chemical pipeline from Audrey B (XW) and approx. KP8.0 and leave the remainder of the umbilical pipeline <i>in situ</i>.</p>	<p>The first half of the umbilical passes through an area of mega-ripples and sand waves up to 3.5m high. In this section the number and length of exposures has been increasing over time. The second half of the umbilical pipeline passes through a major depression before crossing a smooth area of seabed with occasional mega-ripples before crossing a lone sand wave and then crossing smooth gravelly sand that continues to the proximity of the Alison manifold. The second half appears buried and stable.</p> <p>We propose to completely remove the umbilical between Audrey B (XW) and approx. KP8.0 and leave the remainder (approx. 7.1km) <i>in situ</i>, except for the final surface laid length between the PL947 pipeline crossing and the Alison manifold. We propose to completely remove this</p>

**Table 3.3: Outcomes of the Comparative Assessment**

Pipeline or Group	Recommended Option	Justification
		<p>section.</p> <p>Please refer Appendix A.3 for pipeline burial profile.</p> <p>Monitoring to confirm the remaining umbilical pipeline remains buried will be completed to a schedule agreed with BEIS.</p>
PL947 stub	Completely remove all pipespools and pipeline stabilisation features.	This pipeline and associated stabilisation features are surface laid. We believe that to leave these elements <i>in situ</i> would render the pipeline and stabilisation features vulnerable to damage during fishing activities from beam trawls, requiring future remedial activities
PL2164	Completely remove all pipespools and pipeline stabilisation features	As per PL947 stub described above
PL2165	Completely remove the umbilical jumper and all associated pipeline stabilisation features, most of which are shared with PL2164	As per PL947 stub described above

### 3.5 Pipeline Stabilisation Features

Table 3.4: Pipeline Stabilisation Features			
Stabilisation Features	Number	Option	Disposal Route (if applicable)
Concrete mattresses	Approaches: 102	Complete recovery of those elements that are not buried	Recovered to shore for recycling or disposal to landfill
	Crossings: 38	Leave <i>in situ</i> as part of pipeline crossing as buried under existing rock	Leave <i>in situ</i>
Bitumen mattresses	Crossings: 3	Complete recovery	Recovered to shore for recycling or disposal to landfill.
Fronn mattresses	Installations: 14	Leave <i>in situ</i> (buried under sediment)	Leave <i>in situ</i>
Grout bags	Crossings: 162 x 25kg	Leave <i>in situ</i> as part of pipeline crossing as buried under existing rock	Leave <i>in situ</i>
	Approaches: 2576 x 25kg 53 x 1000kg	Complete recovery	Recovered to shore for recycling or disposal to landfill.
Concrete blocks	6	Complete recovery	Recovered to shore for recycling or disposal to landfill
Rock dump (existing)	17,438Te	Leave <i>in situ</i>	Leave <i>in situ</i>

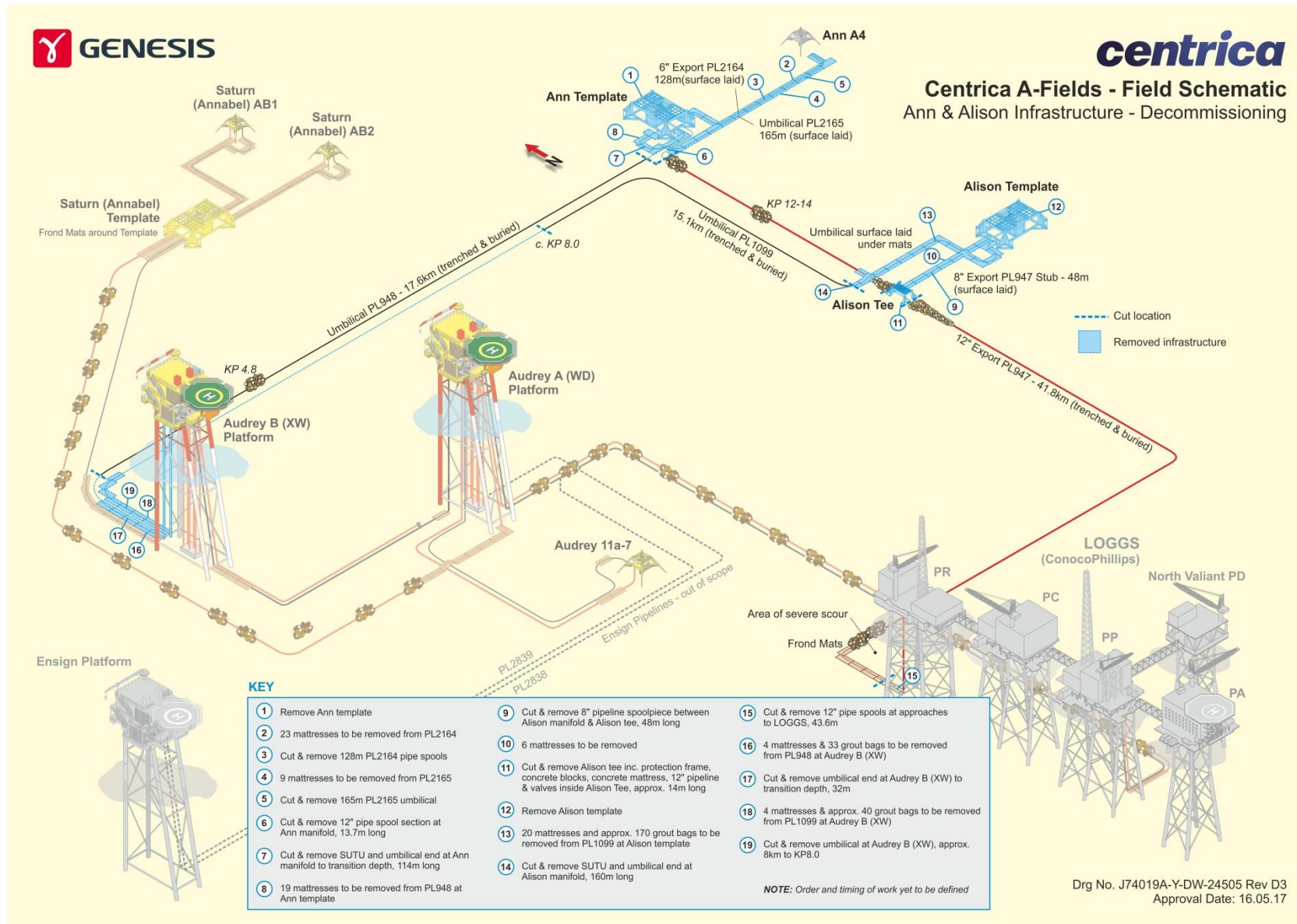


Figure 3.1: Overview of pipeline decommissioning proposals

### 3.6 Wells

Table 3.5: Well Plug and Abandonment

The Ann and Alison fields contain a total of four Centrica owned subsea production wells and one open water suspended well.

Within the Ann field, two production wells (Ann A2 and A3) are located within the Ann template as listed in Section 2.1.4 (Table 2.5), and a third well (Ann A4) has been described in a separate Decommissioning Programme [1].

Within the Alison field, there is one Centrica owned production well located within the Alison manifold (49/11a-B3) as listed in 2.2.4 (Table 2.11) and one open water suspended well located adjacent to the Alison manifold.

There is also a second well (KX) within the Alison manifold, which is owned by CUK and does not form part of this Decommissioning Programme.

The wells will be plugged and abandoned in accordance with Oil & Gas UK Guidelines for the Abandonment of Wells, Issue 5, July 2015. A Master Application Template (MAT) and the supporting Subsidiary Application Template(s) (SAT) will be submitted in support of works carried out. A PON5 and the appropriate marine licenses will also be submitted to BEIS for application to abandon the wells. Well abandonment activities are scheduled to occur in 2017.

### 3.7 Drill Cuttings

There is no existing drill cuttings pile associated with either the Ann or Alison installations. This conclusion is supported by the bathymetry from the 2016 surveys [4] and [5] which showed no evidence of an accumulation of cuttings at the locations. Recent survey data suggests that the level of barium (an indicator of the presence of contamination from drilling) is slightly elevated compared to reference levels at only one station. While this might indicate the presence of residual drilling discharges, it does not indicate the presence of drill cuttings.

### 3.8 Waste Streams

Waste Stream	Removal and Disposal method
<b>Bulk Liquids</b>	The pipeline will be pigged, flushed and left filled with seawater. The corrosion inhibitor and methanol will be removed from the umbilical pipeline prior to the start of the decommissioning activities. Bulk fluids will be disposed down a donor well on North Valiant platform that is located adjacent to the LOGGS complex. Any residual fluids from within the sections of pipeline and umbilical pipelines will be released to marine environment under permit prior to removal to shore. Further cleaning and decontamination will take place onshore prior to recycling or re-use.
<b>Marine Growth</b>	Where necessary and practicable to allow access, some marine growth will be removed offshore. The remainder will be brought to shore and disposed of in accordance with guidelines and company policies.
<b>NORM/LSA Scale</b>	Tests for NORM will be performed offshore and any NORM encountered will be dealt with and disposed of under the appropriate permit and managed in accordance with guidelines and company policies.
<b>Asbestos</b>	No asbestos is associated with the Ann and Alison installations or pipelines.
<b>Other hazardous wastes</b>	Other hazardous wastes will be recovered to shore and disposed of under the appropriate permit and managed in accordance with guidelines and company policies.
<b>Onshore Dismantling sites</b>	Appropriate licenced sites will be selected. Facility chosen must demonstrate proven disposal track record and waste stream management throughout the deconstruction process.

Inventory	Total inventory tonnage	Planned tonnage to shore	Planned left <i>in situ</i>
<b>Ann Installation</b>	162	136	26
<b>Ann Pipelines</b>	8,434	1,045	7,389
<b>Ann Pipelines (rock)</b>	17,438	0	17,438
<b>Alison Installation</b>	152	126	26
<b>Alison Pipeline</b>	528	403	125

In Table 3.7 a distinction is made between the planned quantity of material decommissioned *in situ* and materials that would be recovered to shore.

All recovered material will be transported onshore for reuse, recycling or disposal. It is not possible to predict the market for reusable materials with any confidence; the figures in Table 3.8 are aspirational percentages for disposal.

Table 3.8: Re-use, Recycle & Disposal Aspirations for Material Recovered to Shore			
Inventory	Re-use	Recycle	Disposal
Ann Installation (136Te)	<5%	>95%	<5%
Ann Pipelines (1,045Te)	<5%	>95%	<5%
Alison Installation (126Te)	<5%	>95%	<5%
Alison Pipeline (403Te)	<5%	>95%	<5%

Please refer to Section 6.6 of the Environmental Impact Assessment [1] in Section 7 for further details.



## 4 ENVIRONMENTAL IMPACT ASSESSMENT

### 4.1 Environmental Sensitivities

Table 4.1: Environmental Sensitivities	
Environmental Receptor	Main Features
Conservation interests	<p>No Annex I habitats have been identified in any surveys undertaken within or adjacent to the Ann and Alison wells. LOGGS is on one of the sandbanks for which the North Norfolk Sandbanks was designated. As the area is within a Harbour Porpoise Possible SAC, there is potential for a number of Annex II species to be present within the vicinity. However, the nature of the activities being undertaken is anticipated to have low impact significance upon these species. The majority of the infrastructure is within the North Norfolk Sandbank SCI, however the activities are not anticipated to have any impacts upon the site due to the small scale of the activities. In the event of a large hydrocarbon release, a proportion of the hydrocarbon could be captured within the seabed sediment. However, the possibility of such an event and the low concentrations that would be recorded within the sediment (comparable to background concentrations) mean the significance of the impact is considered low.</p>
Seabed	<p>The seabed in the Ann area comprises fine to medium sand developed into megaripples with scattered shell fragments and occasional gravel including pebbles and cobbles.</p> <p>The seabed in the Alison area comprises sand with varying amounts of shell fragments, gravel, (including pebbles) and cobbles.</p> <p>The seabed in the LOGGS area comprises sand with shells and shell fragments with sand waves and ripples indicating a mobile sandy seabed.</p> <p>In general, the marine habitats and their associated species depend on the available substrate and sediment composition. Multivariate comparison of the survey data concluded that the macrofaunal community in the Ann, Alison and LOGGS survey area were characterised mainly according to natural variation in sediment composition (rather than contaminants).</p> <p>The removal of installations, pipe spools, pipeline ends and protection features from the seabed will impact the seabed. Sensitive marine habitats are likely to be damaged as a result of seabed disturbance and the temporary placement of materials on the seabed. In addition, there is potential for re-suspended sediment to settle on sensitive habitat and species smothering them. However, the extent of the disturbance is likely to be minimal in comparison to the area of available habitat. The habitat observed is not unique to the area and represents a small proportion to that available within the wider Southern North Sea. In the event of a large hydrocarbon release, it was found that a proportion of the hydrocarbon could be captured within the sediment. However, given the likelihood of such an event and the low concentrations that would be recorded within the sediment (comparable to background concentrations) the significance of the impact is considered low.</p>
Atmosphere	<p>In general, offshore meteorological conditions will lead to rapid dispersion and dilution of atmospheric emissions. Impacts arising because of emissions (largely comprising combustion gases) are therefore likely to be short-term and highly localised and are assessed as of low significance.</p>

**Table 4.1: Environmental Sensitivities**

Environmental Receptor	Main Features
	<p>The emission of combustion gases will contribute to global effects (e.g. global warming). However, given the relatively small volume of gases to be emitted and the control and mitigation measures that will be implemented the significance of the impact is low.</p>
Birds	<p>The greatest risk to birds from the activities would be the accidental occurrence of a large hydrocarbon release. The Ann area has high or very high vulnerability of seabirds to surface pollution (only September is of moderate vulnerability). The Alison area has a moderate or high vulnerability of seabirds to surface pollution (only March is of very high vulnerability). The LOGGS area has a moderate or high vulnerability of seabirds to surface pollution (only March and November is of very high vulnerability). Although birds could be affected by the diesel release, given the relatively short duration of the activities, and the relatively short duration it would be expected to remain on the sea surface (and therefore being available to oil birds' feathers) the potential impact is assessed as of low significance.</p>
Fish	<p>Fish populations in the area could be affected by seabed disturbance, the generation of underwater noise and chemical / hydrocarbon releases associated with activities. It is not anticipated that large amounts of turbidity will be generated which could impact fish themselves, however even a small amount of turbidity or disturbance of the seabed itself could have impacts to spawning and nursery grounds. Several species are known to use the seabed in the area around Ann, Alison and LOGGS as spawning and nursery grounds. Different species spawn at different times; therefore, it is likely that whenever the activities are undertaken they could coincide with a spawning period. However, information regarding spawning grounds and nursery grounds covers large areas, the seabed is representative the wider area and therefore the significance of any impact has been assessed as low. The same is the case for nursery grounds.</p> <p>The levels of noise generated are not anticipated to have any physiological impact to fish. It is likely that the activities will result in a startled response, moving fish away from the area.</p>
Marine mammals	<p>Given the existing background noise levels and the relatively short duration of the activities, the underwater noise levels generated by vessels are unlikely to lead to physiological damage to marine mammals.</p> <p>White beaked dolphin and harbour porpoise (an Annex II (Habitats Directive) species) have been recorded in the area. The locally resident or transiting populations of marine mammals may be disturbed by noise in the immediate vicinity, but any such disturbance is expected to be short-term and the impact has been assessed as of low significance.</p>
Fishing industry	<p>Impacts on fishing industry have been assessed as of low significance as the decommissioning activities will be relatively short-term and within the 500m exclusion zones around the installations. The area is predominantly targeted for demersal species.</p>
Other Users of the Sea	<p>There will be a relatively short period when vessels will be operating around the installations and there will be a higher than normal level of shipping activity. The associated effects will be short-term. There are no planned wind farm developments or aggregate extraction licenses at the site, although there is an aggregate area to the north of the site. The activities are not anticipated to impact on the aggregate area.</p>

Table 4.1: Environmental Sensitivities	
Environmental Receptor	Main Features
Onshore Communities	The impact of the disposal of waste on onshore communities would be slightly beneficial as it will contribute to the continuation of jobs. However this is expected to be small as the disposal sites already exist and the volume of waste is relatively small.

## 4.2 Potential Environmental Impacts and their Management

### Environmental Impact Assessment Summary

There will be some planned and unplanned environmental impacts arising from decommissioning of the Ann and Alison infrastructure (49/6a, 48/10a & 49/11a). 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. There will be a requirement for a new environmental management protection plan to be produced and submitted to BEIS should the Decommissioning Programmes change.

Table 4.2: Environmental Impact Management		
Activity	Main Impacts	Management
Topsides Removal	n/a	n/a
Jacket/Floating Facility Removal	n/a	n/a
Subsea installations Removal	For decommissioning and removal of the installations the impacts are disturbance of the seabed by lifting, temporary placement on seabed if required, noise from vessels and cutting and operational discharges from vessels. Impacts are expected to be short-term and localised and of low significance.	Activities will be planned to be executed as efficiently as possible, minimising cutting and disturbance of the seabed in order to reduce the potential for impact on the area around the installations. Vessels will be managed to minimise the durations required and associated discharge. In addition, on board operational practices will address fuel efficiency, noise management and minimise waste.
Decommissioning Pipelines	For decommissioning and removal of the pipe spools, tee and pipeline ends the impacts are disturbance of the seabed by lifting, temporary placement on seabed if required, noise from vessels and cutting and operational discharges from vessels. Impacts are expected to be short-term and localised and of low significance.	Activities will be planned to be executed as efficiently as possible, minimising cutting and disturbance of the seabed in order to reduce the potential for impact on the area around the pipelines. Vessels will be managed to minimise the durations required and associated discharge. In addition, on board operational practices will address fuel efficiency, noise management and minimise waste.
Decommissioning Stabilisation Features	For decommissioning and removal of the mattresses and grout bags the impacts are disturbance of the seabed by lifting, temporary placement on seabed if required, noise from vessels and operational discharges from vessels. Impacts are expected to be short-term and localised and of low significance.	Activities will be planned to be executed as efficiently as possible, minimising disturbance of the seabed in order to reduce the potential for impact on the area around the mattresses and grout bags. Vessels will be managed to minimise the durations required and associated discharge. In addition, on board operational practices will address fuel efficiency, noise management and minimise waste.

Table 4.2: Environmental Impact Management		
Activity	Main Impacts	Management
Decommissioning Drill Cuttings	n/a	n/a

## 5 INTERESTED PARTY CONSULTATIONS

### 5.1 Consultations Summary

Table 5.1: Summary of Stakeholder Comments		
Who	Comment	Response
<b>INFORMAL CONSULTATIONS</b>		
<b>ConocoPhillips</b>	We are in constant dialogue with ConocoPhillips UK Ltd in terms of examining collaboration opportunities in the Alison well abandonments as well as decommissioning operations in the LOGGS complex area.	
<b>JNCC</b>	We presented the decommissioning proposals for Ann and Alison (as well as Annabel and Audrey), including our proposals for limiting overtrawl sweeps (to within 500m zones and the removed section of PL1099) in a meeting with two representatives from JNCC 02 May 2017.	<p>The decommissioning proposals were acceptable. In particular the following items were raised as the main discussion points.</p> <ul style="list-style-type: none"> <li>• Cumulative effects are of particular interest to JNCC and it was suggested that we take into account the marine aggregate industry within the EIA.</li> <li>• JNCC commented that rock dumping is a concern. However, none is planned for the Ann and Alison decommissioning.</li> <li>• JNCC welcomed the proposals to curtail the overtrawl activities to areas within the 500m zone and the removed section of PL1099.</li> </ul>
<b>NFFO</b>	<p>We discussed the decommissioning proposals with NFFO via teleconference 14 March 2017. We also discussed the type of fishing and were advised that the predominant type of fishing in the area is demersal fishing using rock hoppers and beam trawling.</p> <p>The NFFO have confirmed that to meet BEIS requirements they can only provide a Clear Seabed Certificate for areas that have been subject to over-trawl.</p>	The decommissioning proposals were acceptable. One of the more major concerns is that while 'rock hoppers' can quite easily overcome obstacles such as surface laid concrete mattresses, should these be left in place, these can quite easily be caught up in beam trawlers' and be dragged for several miles without being noticed, removing the protection from infrastructure decommissioned in situ and therefore increasing the risk of future snagging.
<b>STATUTORY CONSULTATIONS</b>		
<b>Scottish Fishermen's Federation (SFF)</b>		
<b>National Federation of Fishermen's Organisations</b>		

Table 5.1: Summary of Stakeholder Comments		
Who	Comment	Response
(NFFO)		
Northern Irish Fish Producers Organisation (NIFPO)		
Global Marine Systems Limited		
Public		

## 6 PROGRAMME MANAGEMENT

### 6.1 Project Management and Verification

A Centrica project management team will be appointed to 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 Centrica Health and Safety principles. Changes to the Decommissioning Programmes will be discussed with BEIS and any necessary approval sought.

### 6.2 Post-Decommissioning Debris Clearance and Verification

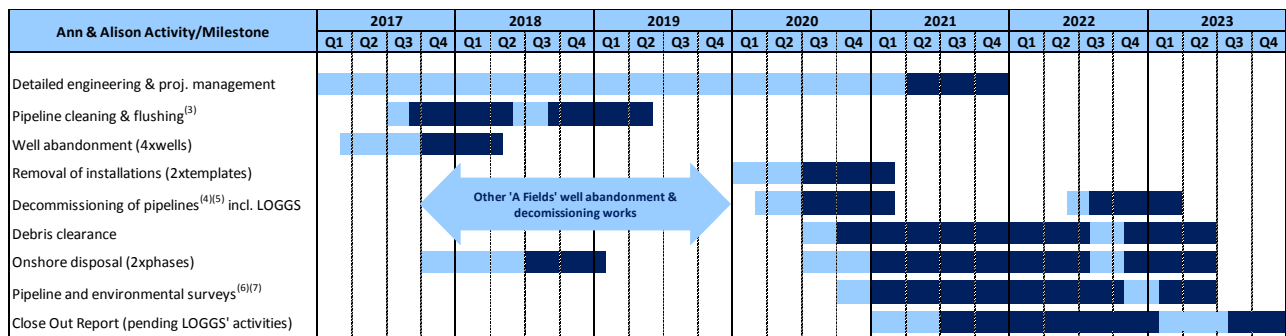
The Ann and Alison installation sites and the 500m safety zones will be subject to debris and trawlability surveys when decommissioning activities have concluded. Although obliged to carry out trawlability surveys along a 200m wide corridor along all decommissioned pipelines, due to the sensitive nature of the North Norfolk Sandbanks and surrounding area, we would prefer not to carry out trawlability surveys over pipeline areas that have not been subject to decommissioning activities. Given the burial status of the pipelines we would hope that we can agree a practical compromise that satisfies the requirements of the stakeholders concerned.

Any seabed oil and gas debris will be recovered for onshore disposal or recycling in line with existing disposal methods. Independent verification of seabed state will be obtained by trawling the well and pipeline areas and this will be supported by a Certificate of Clearance. This will be included in the Close Out Report and sent to the Seabed Data Centre (Offshore Installations) at the Hydrographic Office.

### 6.3 Schedule

A proposed schedule is provided in Figure 6.1. The activities are subject to the acceptance of the Decommissioning Programmes 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**

1. Earliest potential activity [Light Blue Box]
2. Activity window to allow commercial flexibility associated with well abandonment, installation and pipeline decommissioning activities [Dark Blue Box]
3. Pipeline PL947 flushing in 2017 campaign, pipeline PL948 and PL1099 flushing in 2018 campaign
4. Decommissioning of pipelines subject to Comparative Assessment
5. There may be an opportunity to decommission the pipeline ends at LOGGS concurrently with other decommissioning works, subject to agreement
6. Post decommissioning survey and environmental survey; timing of any future surveys to be agreed with BEIS
7. Timing and any synergistic opportunities to be explored for post-decommissioning survey at LOGGS

**Figure 6.1: Gantt Chart of Project Plan**



## 6.4 Costs

Table 6.1: Provisional Decommissioning Programme Costs	
Item	Estimated Cost (£mm)
Operator project management	tba
Facility running/owner costs	tba
Well plugging and abandonment	tba
Facilities/pipelines making safe	tba
Topsides preparation	tba
Substructure removal (incl. subsea installations)	tba
Topsides and substructure onshore recycling	tba
Subsea infrastructure (pipelines, umbilical lines)	tba
Site remediation	tba
Monitoring and residual liabilities	tba
<b>TOTAL</b>	<b>tba</b>

## 6.5 Close Out

A close out report will be submitted to BEIS within four months of the completion of the offshore works, including debris clearance and post-decommissioning surveys, as required in BEIS Guidance Notes. The report will explain any variance from the Decommissioning Programmes.

## 6.6 Post-Decommissioning Liability, Monitoring and Evaluation

After decommissioning has been completed, pipeline status surveys and environmental surveys will be completed with the findings being sent to BEIS in the Close Out report. The frequency of future surveys will be agreed with BEIS and supported with a risk assessment. Residual liability will remain with the Section 29 holders identified in Table 1.4 and Table 1.8. Unless agreed otherwise in advance with BEIS, Centrica North Sea Limited will remain the focal point for such matters, such as any change in ownership, for example.

The requirement for legacy and liability management will be described in more detail in the Close Out report.

## 7 SUPPORTING DOCUMENTS

Table 7.1: Supporting Documents		
Item	Document Number	Document Title
[1]	CEU-DCM-SNS0096-REP-0001	Ann A4 Decommissioning Programme, Jan 2017
[2]	CEU-DCM-SNS0096-REP-0007	Ann and Alison Decommissioning Comparative Assessment for Pipelines, April 2017
[3]	CEU-DCM-SNS0096-REP-0012	Ann and Alison Decommissioning Environmental Impact Assessment, April 2017
[4]	10786.1	Alison Pre-Decommissioning Survey, Gardline Geosurvey Limited, March 2017
[5]	10786.2	Ann Pre-Decommissioning Survey, Gardline Geosurvey Limited, March 2017
[6]	10786.4	Audrey Pre-Decommissioning Survey, Gardline, Geosurvey Limited, March 2017

## APPENDIX A: PIPELINE BURIAL PROFILES

### Appendix A.1 Burial Profile – Pipeline PL947

PL947 is the Ann gas export pipeline that is approximately 41.8km long and routed from the Ann Manifold inside the Ann template through to LOGGS PR Riser Platform. When installed in 1993 the pipeline was trenched. On the approach to the Ann manifold the pipeline was trenched and protected with rock. Approximately half-way along is the Alison tee which has 46m long spool pieces branching from PL947 and connecting the Alison manifold to the main Ann gas export pipeline. We refer to this as the PL947 stub. The Alison tee and enclosed pipeline arrangement is protected and stabilised by steelwork, several large concrete blocks, concrete mattresses, grout bags and deposited rock. As PL947 approaches and exits the Alison tee it is protected and stabilised using rock. The short pipeline stub is laid on the surface and protected by concrete mattresses.

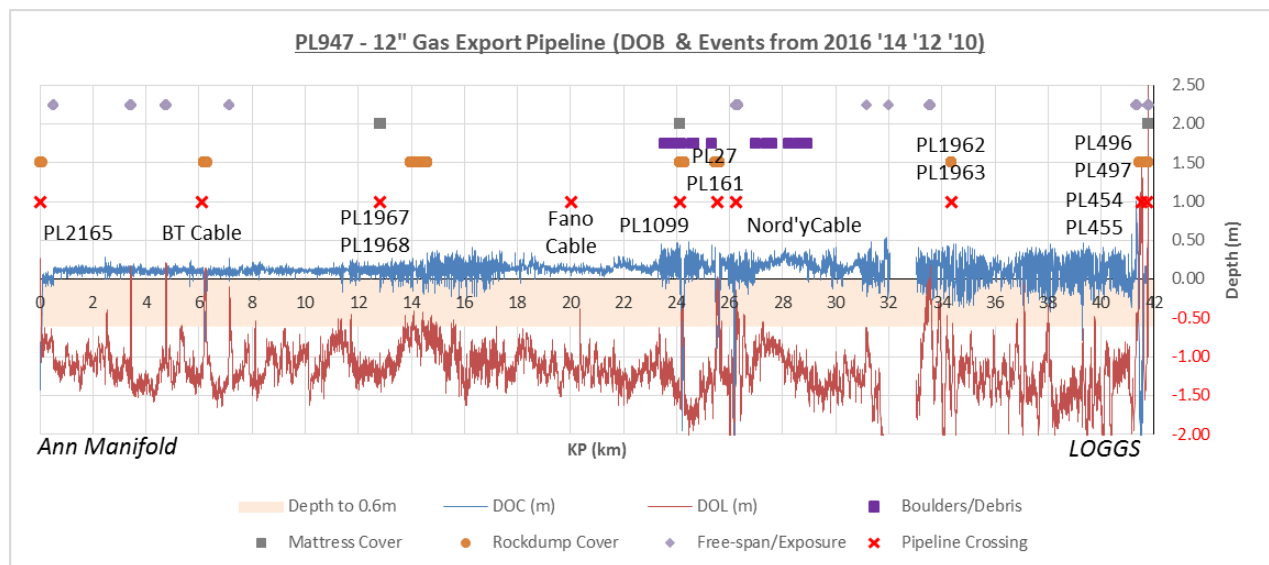
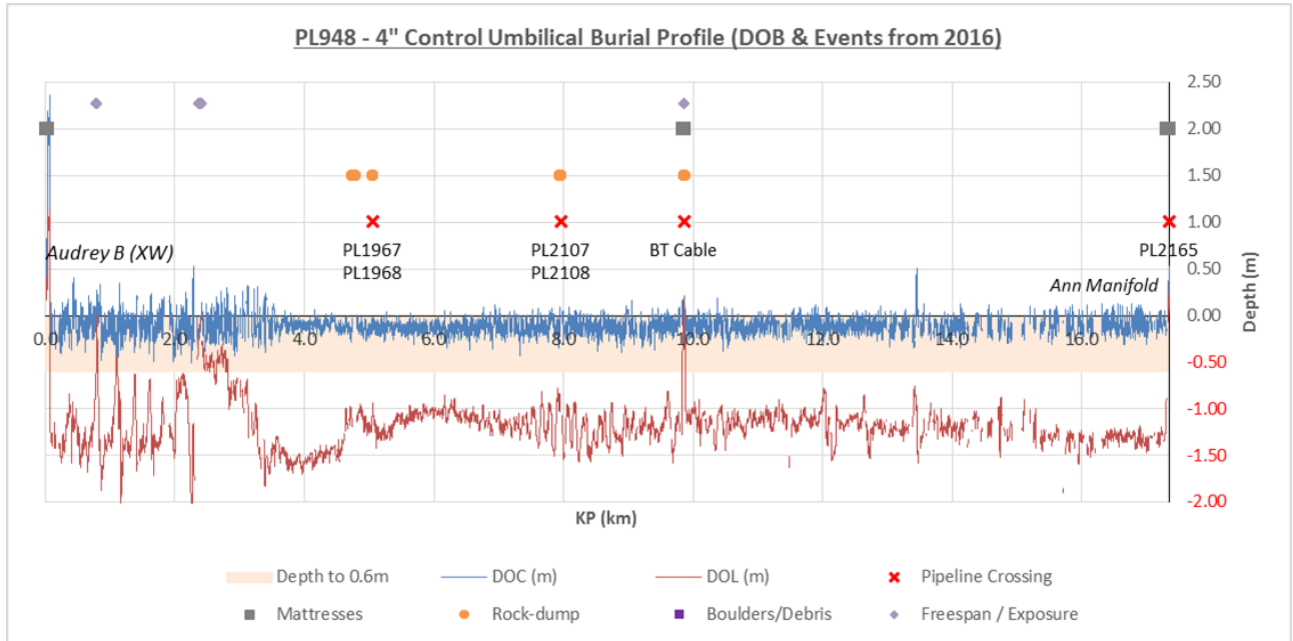


Figure A.1: PL947 burial profile (12" gas export line Ann to LOGGS)<sup>12</sup>

<sup>12</sup> Burial profile of "PL947 stub" which comprises 46m of surface laid pipe spools is not shown

## Appendix A.2 Burial Profile – Pipeline PL948

The Ann manifold valves and wellhead are supplied with chemicals and hydraulic controls from Audrey B (XW) via pipeline PL948. This is an umbilical. The umbilical is approximately 17.6km long and when installed it was trenched. In the transition and surface laid sections at both Audrey B (XW) and the Ann manifold the pipeline is protected and stabilised using concrete mattresses.

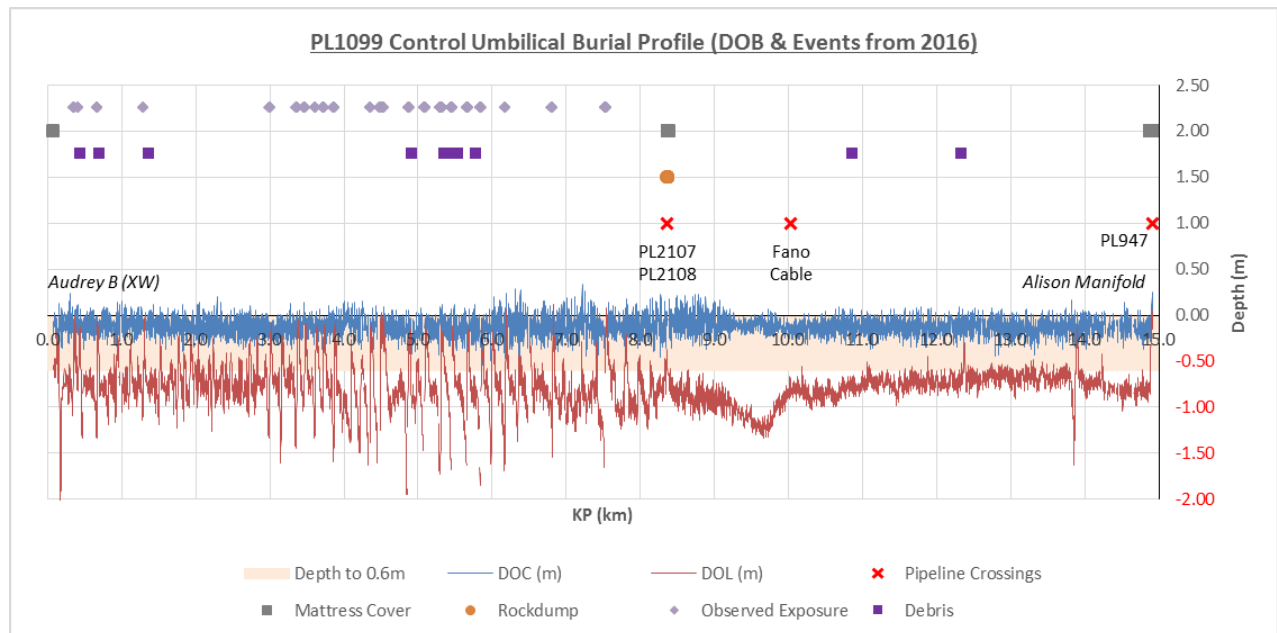


**Figure A.2: PL948 burial profile (umbilical pipeline Audrey B (XW) to Ann)**

### Appendix A.3 Burial Profile – Pipeline PL1099

The Alison manifold valves and wellhead derive chemicals and hydraulic controls from Audrey B (XW) via pipeline PL948. This is an umbilical. As can be seen in Figure A.3, PL1099 is a 15.1km long umbilical line of two halves, each having a distinct trench profile. Between KP0 (i.e. ‘Start’) and KP8.0 the depth of cover for the umbilical line fluctuates throughout. Historically, since the umbilical was originally installed, there has been an increase in the number and length of exposures over the first 8km. We believe that this is due to the presence of large mobile sand waves near the Audrey B (XW) platform.

From KP8.0 to KP15.1 (i.e. ‘End’) the burial and depth of cover has remained relatively stable since it was first installed, with no exposures occurring along the remainder of its length to the Alison manifold.



**Figure A.3: PL1099 burial profile (umbilical pipeline Audrey B (XW) to Alison)**

## **APPENDIX B: PUBLIC NOTICE & CONSULTEE CORRESPONDENCE**

### **Appendix B.1 Public Notices**

**HOLD**

### **Appendix B.2 Correspondence**

**HOLD**