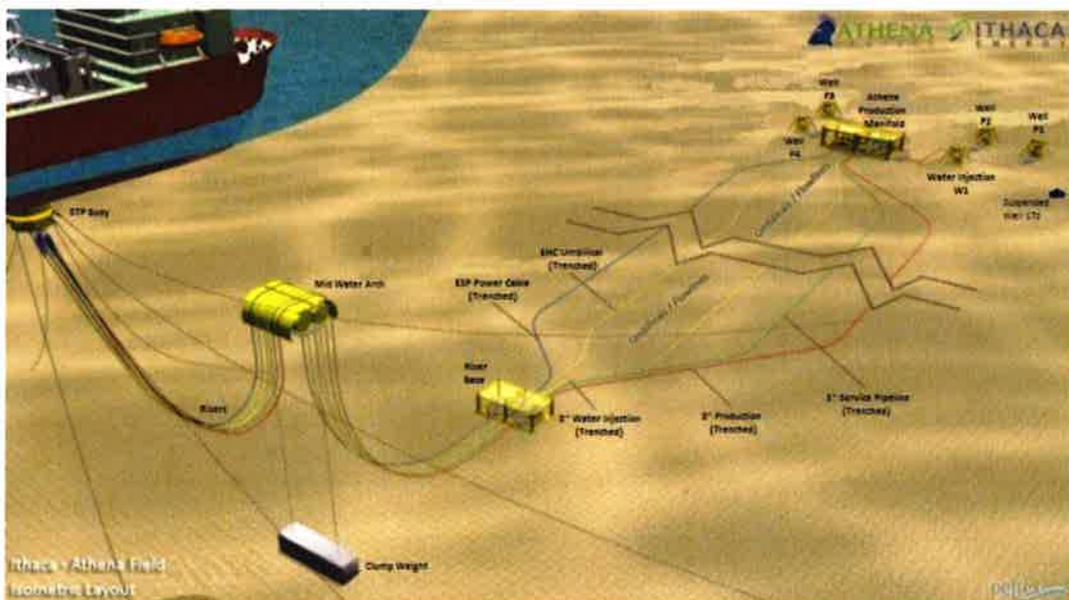


Decommissioning Programmes

Final Version 8th September 2016



Athena Field

Floating Production Storage and Offloading Vessel, Subsea Installations and Associated Pipelines

Document Control

Approvals

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Prepared by	S Scott		22/08/2016
Reviewed by	S Finch		30/08/2016
Approved by	J Airnes		08/09/2016

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1. Terms and Abbreviations

Abbreviation	Explanation
BEIS	Department for Business, Energy and Industrial Strategy
BWO	Bergesen Worldwide Offshore
CA	Comparative Assessment
CoP	Cessation of Production
CSV	Construction Support Vessel
DCR	Design and Construction Regulations 1996
DSV	Diving Support Vessel
EHC	Electro/Hydraulic/Control Umbilical
EIA (ES)	Environmental Impact Assessment (Environmental Statement)
ESP	Electrical Submersible Pump
FPSO	Floating Production Storage & Offloading
GMS	Global Marine Systems Limited
GOR	Gas Oil Ratio
HSE	Health and Safety Executive
IPR	Interim Pipeline Regime
LIS	Left in Situ
LSA	Low Specific Activity
MEG	Monoethylene Glycol
MODU	Mobile Offshore Drilling Unit
MWA	Mid-Water Arch
NFFO	National Federation of Fishermen's Organisations
NIFPO	Northern Ireland Fish Producer's Organisation
NORM	Naturally Occurring Radioactive Material
OGUK	Oil & Gas United Kingdom
OSPAR	Oslo and Paris Commissions
OIW	Oil in Water
P and A	Plug and Abandon
PETS	Portal Environmental Tracking System
PON	Petroleum Operations Notice

Abbreviation	Explanation
PWA	Pipeline Works Authorisation
SFF	Scottish Fishermen's Federation
STP	Submerged Turret Production
te	Tonne
UKCS	United Kingdom Continental Shelf
WI	Water Injection

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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:

- 8 Athena Field Installations
- 32 Athena 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 BEIS guidelines. The schedule outlined in this document is for a 4 year decommissioning project plan due to begin in 2016. The BWO Athena FPSO was removed from the field in February 2016. The buoy and mid water arch will be removed in 2016 to reduce the risk to shipping from submerged objects and to permit deployment of the vessel elsewhere.

Installations:

In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Athena 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 Athena 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

Athena is a low GOR Oil prospect lying in block 14/18b of the UK sector of the Central North Sea, and was proven by the drilling and testing of the 14/18b-15A well in September 2006 and well 14/18b-16 in October 2007. Athena lies approximately 18.6km west of the Talisman operated Claymore facility and 116km from Fraserburgh. It received approval in 2010 for a Floating Production Storage & Offtake vessel. The FPSO was installed and production started in 2012. Production ceased on the 4th January 2016 due to declining production rates and equipment failures (ESP's). Cessation of Production notification was submitted in 2015 and approved on the 18th December 2015 by the Oil & Gas Authority.

The facilities in the Athena Field comprise the BWO Athena FPSO and associated subsea equipment to tie-in 4 production wells and 1 water injection well approximately 2km from the vessel in 132m water depth. It was designed and operated to produce and treat fluids from the reservoir with oil offloaded to a shuttle tanker and transported to the Nigg oil terminal for storage. Gas was compressed and used for fuel to provide electrical power for the facilities.

Following public, stakeholder and regulatory consultation the decommissioning programmes will be submitted without derogation and in full compliance with BEIS 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 umbilicals 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:	Athena	Production Type (Oil/Gas)	Oil & Gas
Water Depth (m)	132m	UKCS block	14/18b
Surface Installations			
Number	Type	Topsides Weight (Te)	Jacket Weight (Te)
1	FPSO	14,000	N/A
Subsea Installations		Number of Wells	
Number	Type	Platform	Subsea
5	Wellheads including protection frames	0	5
1	Suspended well*	0	1
1	Manifold Structure including protection frame, piles, piping & control modules		
1	Riser base including roof panels and piles		
1*	Mid water arch including 2 x clump weights, MWA base, piles and tethers		
Drill Cuttings piles		Distance to median	Distance from nearest UK coastline
Number of Piles	Total Estimated volume (m ³)	km	km
9**	1548	119	116

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

**Including 3 cuttings piles from appraisal wells previously abandoned.

Table 1.2 Installations Section 29 Notice Holders Details		
Section 29 Notice Holders	Registration Number	Equity Interest (%)
DYAS EXPLORATION UK LIMITED	06850220	17.5%
ITHACA ENERGY (UK) LIMITED	SC272009	22.5%
PARKMEAD (E&P) LIMITED	SC397002	30.0%
SPIKE EXPLORATION UK LIMITED	08266502	15.0%
TRAP OIL LTD	06490608	15.0%
BWO CARMEN LIMITED	40291	0% (Included on Section 29 notice as FPSO Owner)
DYAS UK LIMITED	04024945	0% (Transferred to DYAS EXPLORATION UK LIMITED)
EWE VERTRIEB GMBH	FC029837 UK BR014820 O'SEAS HRB204481	0% (Transferred to PARKMEAD (E&P) LIMITED)
ZEUS PETROLEUM LIMITED	03005575	0% (Transferred to PARKMEAD (E&P) LIMITED)

1.4.2 Pipelines

Table 1.3: Pipelines Being Decommissioned		
Number of Pipelines	32	(See Table 2.3)

Table 1.4: Pipelines Section 29 Notice Holders Details		
Section 29 Notice Holders	Registration Number	Equity Interest (%)
DYAS EXPLORATION UK LIMITED	06850220	17.5%
ITHACA ENERGY (UK) LIMITED	SC272009	22.5%
PARKMEAD (E&P) LIMITED	SC397002	30.0%
SPIKE EXPLORATION UK LIMITED	08266502	15.0%
TRAP OIL LTD	06490608	15.0%
DYAS UK LIMITED	04024945	0% (Transferred to DYAS EXPLORATION UK LIMITED)
EWE VERTRIEB GMBH	FC029837 UK BR014820 O'SEAS HRB204481	0% (Transferred to PARKMEAD (E&P) LIMITED)

Table 1.4: Pipelines Section 29 Notice Holders Details		
Section 29 Notice Holders	Registration Number	Equity Interest (%)
ZEUS PETROLEUM LIMITED	03005575	0% (Transferred to PARKMEAD (E&P) LIMITED)

1.5 Summary of Proposed Decommissioning Programmes

Table 1.5: Summary of Decommissioning Programmes		
Selected Option	Reason for Selection	Proposed Decommissioning Solution
1. Topsides/FPSO		
BWO Athena FPSO removed from station for re-use.	Vessel suitable for re-use	BWO Athena FPSO was taken off station on February 14 th 2016 and transferred to the Nigg Oil Terminal for cleaning. It will be redeployed by BWO.
2. Jackets		
N/A	N/A	N/A
3. Subsea Installations		
Complete removal for re-use or recycling.	To remove all seabed structures and leave a clean seabed. Complies with OSPAR requirements	Wellheads, Manifold structure including protection frame, piping and control modules. Riser base including piping to be disconnected and completely removed. Manifold and riser base is flushed <10mg/l. OIW. MWA and MWA base including clump weights & all associated piles. All to be disconnected and completely removed. Either by DSV or crane vessel with barge. Piles for manifold, riser base & MWA base structures will be removed to 2.0 – 3.0m below seabed.
4. Pipelines, Flowlines & Umbilicals		
Complete removal for re-use or recycling.	To remove all seabed structures and leave a clean seabed	Pipelines will be disconnected, capped and removed by reverse reeling. It is intended that the mattresses, sand and grout bags be recovered to shore, however in the event of practical difficulties BEIS will be consulted and a comparative assessment submitted.
5. Wells		
Abandon Wells in accordance with HSE DCR 1996 and OGUK Guidelines for the Suspension and Abandonment of Wells Issue 5, July 2015.	Meets BEIS and HSE regulatory requirements	Athena wells including previously suspended well will be plugged and abandoned using a drill rig. A PONS, Marine Licence and PETS will also be submitted to BEIS for approval to abandon the wells.
6. Drill Cuttings		
Leave in place to degrade naturally	Cuttings piles are small and located around each wellhead and fall below both of OSPAR 2006/5 thresholds	Left undisturbed on seabed.

Table 1.5: Summary of Decommissioning Programmes		
Selected Option	Reason for Selection	Proposed Decommissioning Solution
7. Interdependencies		
Wellheads can only be removed after disconnection and well P&A.		
Manifold, Riser base MWA, MWA Clump weight base can only be removed after line flushing, tie-in spools, ESP jumpers, EHC bundles and pipelines are disconnected.		
FPSO came off station after wells were isolated and pipeline flushing completed.		
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.		

1.6 Field Location Including Field Layout and Adjacent Facilities

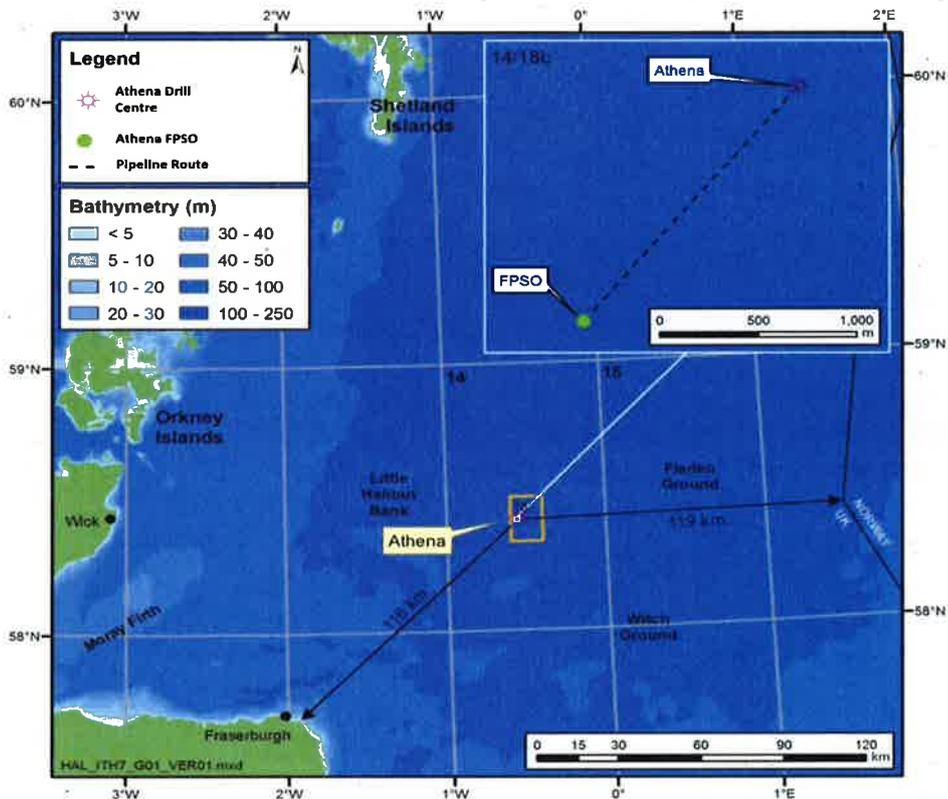


Figure 1.1: Field Location in UKCS

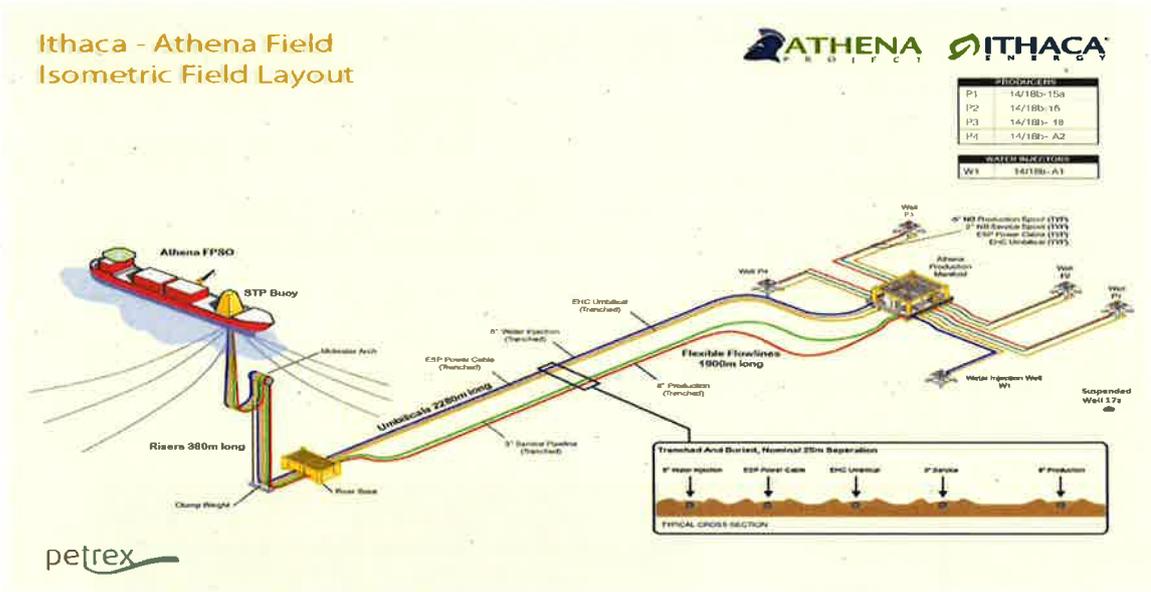


Figure 1.2: Field Layout

Table 1.6 Adjacent Facilities					
Owner	Name	Type	Distance/Direction	Information	Status
Repsol Sinopec	Claymore	Platform	18.6km East	Gas/liquids processing	Operational
Impacts of Decommissioning Proposals					
No expected impact on adjacent Claymore facility.					



Figure 1.3: Adjacent Facilities

1.7 Industrial Implications

The work to decommission the Athena Field installations and pipelines will be largely completed from a Diving Support Vessel (DSV)/ Construction Support Vessel (CSV) or a crane barge. Well plug and abandonment operations will be completed using a 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 Athena 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 – FPSO

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)
BWO Athena	FPSO	WGS84 Decimal	58.406° 0.574°	14,000	1	N/A	N/A	N/A	N/A
		WGS84 Decimal Minute	58°24.374'N 0° 34.432'W						

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
Wellheads (including protection structure, ESPs, ESP Cables, Tubing and Casing)	5	P1 5.72m x 5.72m Total = 170.22te	WGS84 Decimal	58.420° 0.550°	Wellhead structures consist of flow base, tree and debris cap which will be recovered individually during well P and A programme.
			WGS84Decimal Minute	58° 25.205'N 0° 33.017'W	

Table 2.2: Subsea Installations and Stabilisation Features

Subsea installations including Stabilisation Features	Number	Size/Weight (te)	Location	Comments/Status	Subsea installations including Stabilisation Features
Suspended well	P2	5.72m x 5.72m	WGS84 Decimal	58.420° 0.550°	<p>Completions including tubing, ESP pumps and motors and cables will also be recovered. All above materials will be returned onshore for re- use or recycling. Casing will be cut >2.0 -3.0m below seabed, recovered and returned onshore for recycling</p> <p>All tree valves are closed and production spools are flushed to < 10mg/l OIW.</p> <p>Lines are filled with inhibited seawater. Wells Shut in.</p>
			WGS84 Decimal minute	58° 25.205'N 0° 33.017'W	
	Total = 192.84te	5.72m x 5.72m	WGS84 Decimal	58.421° 0.551°	
			WGS84 Decimal minute	58°25.232'N 0° 33.064'W	
	P3	5.72m x 5.72m	WGS84 Decimal	58.420° 0.551°	
			WGS84 Decimal minute	58°25.224'N 0°33.078'W	
	Total = 205.88te	5.72m x 5.72m	WGS84 Decimal	58.420° 0.551°	
			WGS84 Decimal minute	58°25.204'N 0° 33.044'W	
	P4	5.72m x 5.72m	WGS84 Decimal	58.420° 0.550°	
			WGS84 Decimal minute	58°25.197'N 0°33.033'W	
Total = 244.4te	5.72m x 5.72m	WGS84 Decimal	58.420° 0.550°		
		WGS84 Decimal minute	58°25.197'N 0°33.033'W		
WI	5.72m x 5.72m	WGS84 Decimal	58.420° 0.551°		
		WGS84 Decimal minute	58°25.204'N 0° 33.044'W		
Total = 131.05te	5.72m x 5.72m	WGS84 Decimal	58.420° 0.550°		
		WGS84 Decimal minute	58°25.197'N 0°33.033'W		
14/18b-17z Casing top section 2.54te	5.72m x 5.72m	WGS84 Decimal	58.420° 0.550°		
		WGS84 Decimal minute	58°25.197'N 0°33.033'W		
<p>Appraisal well previously drilled. Well currently suspended.</p> <p>Well will be P and A during the well programme.</p> <p>Casing will be cut >2.0 -3.0m below seabed, recovered and returned onshore for recycling</p>					

Table 2.2: Subsea Installations and Stabilisation Features

Subsea installations including Stabilisation Features	Number	Size/Weight (te)	Location	Comments/S tatus	Subsea installations including Stabilisation Features
Manifold including protection frame, control & Piping modules and piles	1	20m x 9m x 6m including piping module 79te, Controls module 59te, protection frame 56te and roof panels 25te 4 x 36m x 0660m piles 115,78te Total weight 328.78te	WGS84 Decimal	58.420° 0.551°	The Manifold will be disconnected and recovered in four separate sections, roof panels, manifold module, controls module and protection frame. These will be removed and returned onshore for re-use. 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	58°25.210'N 0°33.065'W	
Riser Base Structure including piles	1	20m x 4.75m x 4m 45 tonnes 4 x 28m x 0.66m piles Total = 135 te	WGS84 Decimal	58.408° 0.571°	Riser base will be disconnected recovered and returned onshore for re-use or recycling. Piles will be cut 2-3m below the seabed recovered and returned onshore for recycling.
			WGS84 Decimal Minute	58°24.472'N 0° 34.271'W	
Midwater Arch including MWA base with clump weights, piles and tether	1	MWA 14m x 4.3m Total = 552te	WGS84 Decimal	58.407° 0.572°	Mid water arch, clump weight base, clump weights and tethers will be removed recovered and returned onshore for re-use or recycling.
			WGS84 Decimal Minute	58°24.426'N 0°34.345'W	
Concrete mattresses	N/A				
Grout/Sand bags	N/A				
Formwork	N/A				
Frond Mats	N/A				
Rock Dump	N/A				

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	PL2818	8"	2.280	8" Static Flexible Duplex carcass Pipeline and 8" Flexible Duplex carcass Riser	Oil; Gas	Subsea Manifold To STP Buoy	Trenched & Buried with 0.38km of flexible riser exposed	IPR	Flushed <10mg/l OIW Treated sea water

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
P1 tie-in spool	PL2818JP1	6"	0.060	Rigid Spool Super duplex	Oil; Gas	P1 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Flushed <10mg/l OIW Treated sea water
P2 tie-in spool	PL2818JP2	6"	0.044	Rigid Spool Super duplex	Oil; Gas	P2 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Flushed <10mg/l OIW Treated sea water
P3 tie-in spool	PL2818JP3	6"	0.053	Rigid Spool Super duplex	Oil; Gas	P3 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Flushed <10mg/l OIW Treated sea water
P4 tie-in spool	PL2818JP4	6"	0.042	Rigid Spool Super duplex	Oil; Gas	P4 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Flushed <10mg/l OIW Treated sea water

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
Water injection line	PL2819	8"	2.280	8" Static Flexible Duplex carcass Pipeline and 8" Flexible Duplex carcass Riser.	Treated sea water/produced water re-injection	Subsea Manifold To STP Buoy	Trenched & Buried with 0.38km of flexible riser exposed	IPR	Flushed Treated sea water
WI tie-in spool	PL2819JW1	6"	0.026	Super Duplex	Treated sea water/produced water re-injection	WI well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Flushed Treated sea water

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
Service line	PL2820	3"	2.280	3" Static Flexible Duplex carcass Pipeline and 3" Flexible Duplex carcass Riser	Treated Seawater	Subsea Manifold To STP Buoy	Trenched & Buried with 0.38km of flexible riser exposed	IPR	Flushed Treated sea water
P1 service tie-in spool	PL2820JP1	2"	0.060	Rigid Spool Duplex	Treated Seawater	P1 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Flushed Treated sea water
P2 service tie-in spool	PL2820JP2	2"	0.044	Rigid Spool Duplex	Treated Seawater	P2 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Flushed Treated sea water
P3 service tie-in spool	PL2820JP3	2"	0.053	Rigid Spool Duplex	Treated Seawater	P3 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Flushed Treated sea water

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
P4 service tie-in spool	PL2820JP4	2"	0.042	Rigid Spool Duplex	Treated Seawater	P4 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Flushed Treated sea water
ESP Power Cable	PLU2821	8"	2.280	Combined static to dynamic umbilical (via transition bulkhead)	Electric Power	Subsea Manifold To STP Buoy	Trenched & Buried with 0.38km of flexible riser exposed	IPR	Isolated & positively disconnected at FPSO
P1 tie in Jumper	PLU2821JP1	2"	0.100	Flexible Jumper	Electric power	P1 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Isolated & positively disconnected at FPSO

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
P2 tie in Jumper	PLU2821JP2	2"	0.085	Flexible Jumper	Electric power	P2 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Isolated & positively disconnected at FPSO
P3 tie in Jumper	PLU2821JP3	2"	0.085	Flexible Jumper	Electric power	P3 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Isolated & positively disconnected at FPSO
P4 tie in Jumper	PLU2821JP4	2"	0.070	Flexible Jumper	Electric power	P4 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Isolated & positively disconnected at FPSO
EHC Umbilical	PLU2822	8"	2.280	Combined static to dynamic umbilical (via transition bulkhead)	Electrical Power/ Hydraulic Fluid/ Chemicals	Subsea Manifold To STP Buoy	Trenched & Buried with 0.38km of flexible riser exposed	IPR	Hydraulic hoses retain HW540E Water based Hydraulic Oil. Chemical Flushed 50/50 MEG/Potable water

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
Electric cable bundle	PLU2823	3"	0.095	Jumper bundle containing 4 x electric cables	Electric power	P1 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Isolated & positively disconnected at FPSO
Hydraulic hose bundle	PLU2824	6"	0.100	Jumper bundle containing 13 x hydraulic hoses	Hydraulic fluid	P1 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Retain HW540E Water based Hydraulic, Oil
Chemical hose bundle	PLU2825	2"	0.095	Jumper bundle containing 2 x chemical hoses	Chemicals	P1 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Flushed 50/50 MEG/Potable water
Electric cable bundle	PLU2826	3"	0.070	Jumper bundle containing 4 x electric cables	Electric power	P2 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Isolated & positively disconnected at FPSO
Hydraulic hose bundle	PLU2827	6"	0.070	Jumper bundle containing 13 x hydraulic hoses	Hydraulic fluid	P2 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Retain HW540E Water based Hydraulic, Oil

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
Chemical hose bundle	PLU2828	2"	0.085	Jumper bundle containing 2 x chemical hoses	Chemicals	P2 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Flushed 50/50 MEG/Potable water
Electric cable bundle	PLU2829	3"	0.085	Jumper bundle containing 4 x electric cables	Electric power	P3 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Isolated & positively disconnected at FPSO
Hydraulic hose bundle	PLU2830	6"	0.085	Jumper bundle containing 13 x hydraulic hoses	Hydraulic fluid	P3 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Retain HW540E Water based Hydraulic, Oil
Chemical hose bundle	PLU2831	2"	0.085	Jumper bundle containing 2 x chemical hoses	Chemicals	P3 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Flushed 50/50 MEG/Potable water
Electric cable bundle	PLU2832	3"	0.070	Jumper bundle containing 4 x electric cables	Electric power	P4 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Isolated & positively disconnected at FPSO

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
Hydraulic hose bundle	PLU2833	6"	0.070	Jumper bundle containing 13 x hydraulic hoses	Hydraulic fluid	P4 well To Subsea Manifold	Hydraulic hose bundle	IPR	Retain HW540E Water based Hydraulic, Oil
Chemical hose bundle	PLU2834	2"	0.070	Jumper bundle containing 2 x chemical hoses	Chemicals	P4 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Flushed 50/50 MEG/Potable water
Electric cable bundle	PLU2835	3"	0.070	Jumper bundle containing 3 x electric cables	Electric power	W1 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Isolated & positively disconnected at FPSO
Hydraulic hose bundle	PLU2836	4"	0.070	Jumper bundle containing 8 x hydraulic hoses	Hydraulic fluid	W1 well To Subsea Manifold	Mattresses. Connections supported by grout bags	IPR	Retain HW540E Water based Hydraulic, Oil

Table 2.4: Subsea Pipeline Stabilisation Features

Stabilisation Feature	Total Number	Weight (Te)	Locations	Exposed/Buried/Condition
Concrete mattresses	172	6 te each 1032te	At riser base and manifold end of pipelines and between manifold and wells	Exposed
Grout bags	1440	25kg each 36te	At riser base, manifold and well tie-in spools	Exposed
Sand bags	400	25kg each 10te	At manifold for flushing spool support	Exposed
Formwork	n/a	n/a	n/a	n/a
Fronnd Mats	n/a	n/a	n/a	n/a
Rock Dump	n/a	n/a	n/a	n/a

2.4 Wells

Table 2.5 Well Information			
Subsea Wells	Designation	Status	Category of Well
14/18b-15A (A5) / (P1)	Oil/Gas Production	Shut in	SS 3-3-3
14/18b-16 (A3) / (P2)	Oil/Gas Production	Shut in	SS 3-3-3
14/18b-18 (A4) / (P3)	Oil/Gas Production	Shut in	SS 3-4-3
14/18b-PH (A2) / (P4)	Oil/Gas Production	Shut in	SS 3-3-3
14/18b-A1 (W1)	Water Injection	Shut in	SS 3-3-3
14/18b-17Z	Appraisal	Suspended	SS 0-0-1
14/18b-7	Appraisal	Abandoned	Abandoned
14/18b-11	Appraisal	Abandoned	Abandoned
14/18b-12	Appraisal	Abandoned	Abandoned

For details of well categorisation see OGUK Guidelines for the Suspension or Abandonment of Wells, Issue 5, July 2015

2.5 Drill Cuttings

(See Section 3.7 for further information)

Table 2.6: Drill Cuttings Piles Information				
Well	Location of Pile Centre (Latitude/Longitude)		Seabed Area (m ²)	Estimated volume of cuttings (m ³)
	WGS84 Decimal	WGS84 Decimal Minute		
P1	58.420° 0.550°	58° 25.205'N 0° 33.017'W	135	232
P2	58.420° 0.550°	58° 25.211'N 0° 32.029'W	109	187
P3	58.420° 0.551°	58°25.232'N 0° 33.064'W	110	190
P4	58.420° 0.551°	58°25.224'N 0°33.078'W	80	137
WI	58.420° 0.551°	58°25.204'N 0° 33.044'W	109	188

Table 2.6: Drill Cuttings Piles Information

Location of Pile Centre (Latitude/Longitude)			Seabed Area (m ²)	Estimated volume of cuttings (m ³)
Well	WGS84 Decimal	WGS84 Decimal Minute		
17z	58.420° 0.550°	58°25.197'N 0°33.033'W	116	200
14/18b-7	58.418° 0.545°	58°25.086'N 0°32.722'W	100	172
14/18b-11	58.414° 0.505°	58°24.837'N 0°30.278'W	100	172
14/18b-12	58.428° 0.540°	58°25.703'N 0°32.383'W	100	172

Note:

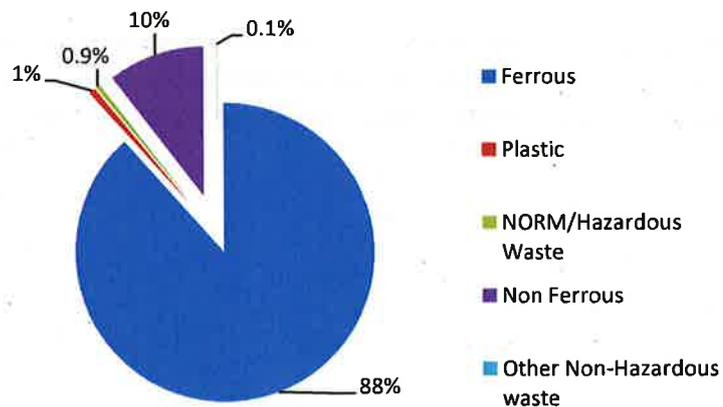
Drill cuttings from water based mud for each well top hole sections, cuttings from lower sections were drilled using oil based mud and were disposed of onshore therefore no oil release anticipated. Three of the cuttings piles are associated with appraisal wells previously abandoned.

2.6 Inventory Estimates

Table 2.7 Installations Inventory Estimates							
Area	Concrete	Ferrous Metal	Non Ferrous Metal	NORM/Hazardous waste	Plastic	Other Non-Hazardous waste te	Total te
FPSO	0.00	12000.00	1800.00	90.00	100.00	10.00	14000
Wellheads	0.00	832.82	89.83	0.00	24.28	0.00	946.93
Manifold	0.00	328.78	0.00	0.00	0.00	0.00	328.78
Riser base	0.00	135.00	0.00	0.00	0.00	0.00	135.00
MWA	0.00	549.00	0.00	0.00	3.00	0.00	552.00
STP Buoy	0.00	211.10	0.00	0.00	0.00	0.00	211.10
Anchors	0.00	1917.00	0.00	0.00	0.00	0.00	1917.00
Total	0.00	15973.7	1889.83	90.00	127.28	10.00	18090.80

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

Installations Inventory Estimates

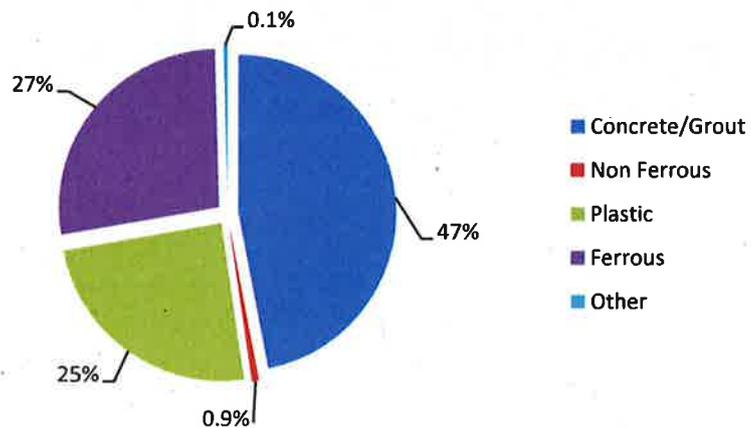


Total Tonnage 18090.80te

Figure 2.6.1 Pie Chart of Installations Inventory Estimates

Table 2.8 Pipelines Inventory Estimates							
Area	Concrete/ Grout	Ferrous Metal	Non Ferrous Metal	NORM/Hazardous waste	Plastic	Other Non-Hazardous waste te	Total te
Tie-in Spools	234.75	13.19	0	0	0	0	247.94
ESP/EHC Jumpers	0	15.11	0.41	0	4.09	0	19.61
Manifold Approaches	524.75	0	0	0	0	10	534.75
Flowlines	0	330.46	0	0	288.42	0	618.88
ESP/EHC Umbilical	0	185.93	15.4	0	205.03	0	406.36
Riser Base Approaches	302.5	0	0	0	0	0	302.5
Risers	0	73.9	0	0	57.68	0	131.58
Total	1062	618.59	15.81	0	555.22	10	2261.62

Pipelines Inventory Estimates



Total Tonnage 2261.62te

Figure 2.6.2 Pie Chart of Pipelines Inventory Estimates

3.0 Removal and Disposal Methods

Potential for re-use of the BWO Athena FPSO is being actively pursued.

Redeployment of the mooring anchor system including suction cans, chain and wire, mid water arch and MWA clump base assembly is also being actively pursued with BWO.

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

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.

The subsea production equipment is relatively modern and it may be possible to sell for re-use elsewhere.

3.1 Topsides/FPSO

Post subsea flushing and cleaning the BWO Athena FPSO was taken to Nigg Oil Terminal which has a licence to accept and treat 3rd party waste. The FPSO storage tanks were cleaned and the residue transferred to Nigg for treatment.

The BWO Athena FPSO will be redeployed elsewhere by BWO, this includes the STP buoy.

Table 3.1 Cleaning of FPSO for Removal		
Waste Type	Composition of Waste	Disposal Route
Onboard Hydrocarbons	Process fluids, fuels and lubricants	Hydrocarbons transported via FPSO to Nigg Oil Terminal for disposal and treatment
Other Hazardous Materials	Pipeline clean up fluids and chemicals (MEG)	Hydrocarbons transported via FPSO to Nigg Oil Terminal for disposal and treatment

3.2 Jacket

N/A

3.3 Subsea Installations and Stabilisation Features

See Appendix C.1 for photographs

Table 3.2: Subsea Installations and Stabilisation Features			
Subsea installations and stabilisation features	Number	Option	Disposal Route (if applicable)
Wellheads, completions including protection structures, ESPs, Cables, Tubing and top 4.5m section of casing.	5	Full recovery as part of MODU campaign to P&A wells	Return to shore for re-use or recycling
Manifold; Piping module & Control module	1	Full recovery	Return to shore for re-use or recycling
Template	0	N/A	N/A
Riser base including piles	1	Full recovery of riser base. Piles cut 2.0 – 3.0m below seabed	Return to shore for re-use or recycling
Mid water arch including clump weight base and base piles	1	Full recovery, Piles cut 2.0 – 3.0m below seabed	Return to shore for re-use or recycling
Formwork	0	N/A	N/A
Fronnd Mats	0	N/A	N/A
Rock Dump	0	N/A	N/A
Other	0	N/A	N/A

3.4 Pipelines

Decommissioning Options:

*Key to Options:

- | | | |
|-----------------------------|---------------------------|-----------------------|
| 1) Remove - reverse reeling | 2) Remove - Reverse S lay | 3) Trench and bury |
| 4) Remedial removal | 5) Remedial trenching | 6) Partial Removal |
| 7) Leave in place | 8) Other | 9) Remedial rock-dump |

Table 3.3: 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
PL2818	Part Trenched, buried. Part Exposed	Whole	1, 3, 4, 5, 6, 7, 9
PL2818JP1 to PL2818JP4 PLU2821JP1 to PLU2821JP4 PL2820JP1 to PL2820JP4 PLU2822 to PLU2836	Surface laid with Concrete mattresses for protection	Whole	4
PL2819 to PLU2821	Trenched, buried	Whole	1, 3, 4, 5, 6, 7, 9
PL2819JW1	Surface laid connections supported by sand bags	Whole	4

Comparative Assessment Method:

A two phased process was used comprising of a multidiscipline screening team followed by the assessment workshop for compilation and option selection. The purpose of the comparative assessment being to identify the best overall option for decommissioning each of the production, water injection, service pipelines, ESP cable and the EHC umbilical.

Initially all decommissioning options were considered at a screening meeting to establish potential options to consider for risk assessment: Options 2 and 8 were discounted during screening as unsuitable.

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 below contains the options considered during the multidiscipline assessment workshop consisting of experienced in house and external participants.

Option 1) Remove - reverse reeling. 3) Trench and Bury. 4) Remedial Removal. 6) Partial Removal.

7) Leave in Place

Outcome of Comparative Assessment:

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

Table 3.4: Outcomes of Comparative Assessment		
Pipeline or Group	Recommended Option*	Justification
PL2818 PL2819 PL2820 PLU2821 PLU2822	1	<p>Static section is trenched and buried to >0.6m below seabed. Ends will be disconnected and capped at both the riser base and manifold and removed by reverse reeling to a recovery vessel.</p> <p>Dynamic section (riser) will be disconnected and capped at the riser base and STP buoy, removed from the MWA and completely removed by reverse reeling to a recovery vessel.</p> <p>This will cause some minor disturbance to the seabed local to the removal site, however the environmental effect is judged to be minimal.</p> <p>The pipeline and riser will be transported onshore for re-use or recycling.</p>
PL2818JP1 - 4	4	Tie in spools will be disconnected and removed by crane to DSV or support barge and returned onshore for recycling.
PL2819JW1	4	Tie in spool will be disconnected and removed by crane to DSV or support barge and returned onshore for recycling.
PL2820JP1 - 4	4	Tie in spools will be disconnected and removed by crane to DSV or support barge and returned onshore for recycling.
PLU2821JP1 to PLU2821JP4	4	ESP cable Jumper sections from manifold to wellheads will be disconnected and removed and recovered to support barge for recycling onshore.
PLU2823, PLU2824, PLU2825	4	Electric, Hydraulic and Chemical control jumper sections from manifold to P1 wellhead will be disconnected removed and recovered to support barge for recycling onshore.
PLU2826, PLU2827, PLU2828	4	Electric, Hydraulic and Chemical control jumper sections from manifold to P2 wellhead will be disconnected removed and recovered to support barge for recycling onshore.

Pipeline or Group	Recommended Option*	Justification
PLU2829, PLU2830, PLU2831	4	Electric, Hydraulic and Chemical control jumper sections from manifold to P3 wellhead will be disconnected removed and recovered to support barge for recycling onshore.
PLU2832, PLU2833, PLU2834	4	Electric, Hydraulic and Chemical control jumper sections from manifold to P4 wellhead will be disconnected removed and recovered to support barge for recycling onshore.
PLU2835 and PLU2836	4	Electric and Hydraulic control jumper sections from manifold to WI wellhead will be disconnected removed and recovered to support barge for recycling onshore.

3.5 Pipelines Stabilisation Features

Stabilisation features	Number	Option	Disposal Route
Concrete mattresses	172	Full recovery It is intended that the mattresses be recovered to shore, however in the event of practical difficulties BEIS will be consulted and a comparative assessment submitted.	Recover onshore for re-use or recycling.
Grout bags	1440	Full recovery. It is intended that the grout bags be recovered to shore, however in the event of practical difficulties BEIS will be consulted and a comparative assessment submitted.	Recover onshore for re-use or recycling.
Sand bags	400	Full recovery. It is intended that the sand bags be recovered to shore, however in the event of practical difficulties BEIS will be consulted and a comparative assessment submitted.	Recover onshore for re-use or recycling.
Formwork	N/A	N/A	N/A
Froned Mats	N/A	N/A	N/A
Rock Dump	N/A	N/A	N/A

3.6 Wells

Table 3.6: Well Plug and Abandonment
<p>The Athena Field consists of four production wells, one water injection well, one previously drilled well that is currently suspended 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 and Gas UK Guidelines for Abandonment of Wells Issue 5, July 2015.</p> <p>A PONS/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 3.7 Drill Cuttings Decommissioning Options									
How many drill cuttings piles are present?	9								
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 <input checked="" type="checkbox"/> Remove and treat onshore <input type="checkbox"/> Remove and treat offshore <input type="checkbox"/> Other									
Review of Pile characteristics	Pile 1	Pile 2	Pile 3	Pile 4	Pile 5	Pile 6	Pile 7	Pile 8	Pile 9
How has the cuttings pile been screened? Desktop exercise	Y	Y	Y	Y	Y	Y	Y	Y	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	Y	Y	Y	Y	Y	Y	Y	Y
Will the drill cuttings pile have to be displaced in order to remove the jacket?	N/A								
What quantity (m ³) would have to be displaced/removed?	N/A								
Will the drill cuttings pile have to be displaced in order to remove any pipelines?	N/A								
What quantity (m ³) would have to be displaced/removed?	N/A								
Have you carried out a Comparative Assessment of options for the Cuttings Pile?	N	N	N	N	N	N	N	N	N

Comparative Assessment Method:

The well programme for the Athena field was developed to allow discharge of drill cuttings for the top hole sections only which were completed using an environmentally friendly water based mud. Lower hole sections that required oil based mud systems utilised a skip and ship regime. All lower hole sections completed had the drill cuttings removed to onshore for treatment and disposal

The discharged drill cuttings at each of the wellheads were from the top hole sections of the wells and were completed using a water based mud. These piles do not contain any oil based mud cuttings.

It was therefore accepted to consider the options to either to leave in place or remove and treat onshore.

Outcome of Comparative Assessment:

Given the evidence that localised repopulation by incumbent flora and fauna had effectively reclaimed the area. The decommissioning team chose the option to leave in place as this was considered the most environmentally friendly option.

3.8 Waste Streams

Waste Stream	Removal and Disposal Method
Bulk liquids	Subsea system including wellheads, pipelines, manifold, riser base and risers are flushed with treated sea water <10mg/l OIW returned to FPSO cargo tanks post final cargo discharge. Line cleaning and tank washings will be offloaded at a licenced onshore facility for treatment prior to disposal. Pipeline ends will be capped and any residual fluids from within the subsea facilities will be released to the marine environment under permit prior to removal to shore. Further cleaning and decontamination will take place onshore prior to re-use/recycling.
Marine growth	Removed offshore and disposed of according to guidelines. Residual marine fouling will be removed onshore at a recognised and certified disposal contractor's base. Disposed of waste according to guidelines.
NORM/LSA Scale	NORM is not expected, however NORM/Benzene checks will continue as part of the clean-up/disposal process. Any NORM encountered will be dealt with and disposed of in accordance with guidelines.
Asbestos	N/A
Other hazardous wastes	Will be recovered to shore and disposed of according to guidelines, company policies and under the appropriate permit.
Onshore Dismantling sites	Appropriate licenced sites will be selected. Facility chosen by removal contractor must demonstrate proven disposal track record and waste stream management throughout the deconstruction process and demonstrate their ability to deliver innovative recycling options.

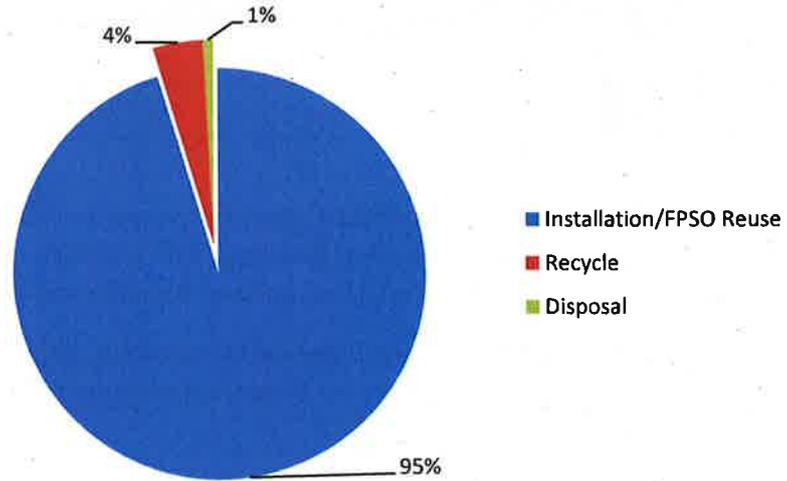
Table 3.9 Inventory Disposition			
Inventory	Total Inventory Tonnage	Planned Tonnage to shore	Planned Left in Situ
Installations	18090.80	18090.80	0
Pipelines	2261.62	2261.62	0

All materials will be removed and returned onshore for re-use or recycling. Ithaca has identified a possible re-use opportunity for some items such as the flexible flowlines and risers and the wellheads manifold and riser base. The STP buoy will be recovered and presented to BWO for re-use with the FPSO.

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 3.10 are best case.

Table 3.10 Re-use, Recycle & Disposal Aspirations for Material Recovered Onshore			
Inventory	Re-use	Recycle	Disposal
Installations 18090.80	Approx. 97%	Approx. 2%	1%
Pipelines 2261.62te	Approx. 51%	Approx. 47%	2%

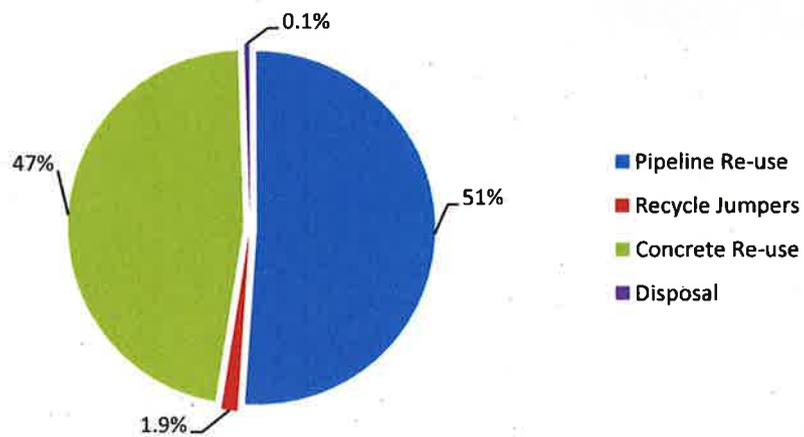
Installations Inventory Disposition



Total Tonnage 18090.80te

Fig 3.9.1 Installations Inventory Disposition

Pipelines Inventory Disposition



Total Tonnage 2261.62te

Fig 3.9.2 Pipelines Inventory Disposition

4.0 Environmental Impact Assessment (Environmental Statement)

4.1 Environmental Sensitivities (Summary)

Table 4.1: Environmental Sensitivities	
Environmental Receptor	Main Features
Conservation interests	<p>The coasts of north east Scotland, Orkney and Shetland have a variety of important habitats and species protected under international, national and local designations; however, these are all at least 116km from the Athena area. These sites have year round importance. A candidate Special Area of Conservation for pockmark habitat features lies 89km to the east (Scanner pockmark). It is possible that this site could be impacted should a large hydrocarbon release occur. However the likelihood of such an event is very low and the control and mitigation measures in place will minimise the impact therefore the residual risk to the area is low. No additional conservation management is required.</p>
Seabed	<p>Gard line (2007a) sampled the infauna at sites within and around several pockmark features in the Athena area. Around the drilling location, grab samples revealed that the faunal community was fairly uniform across the area, with no evidence that species composition was influenced by variation in sediment chemistry (Gard line 2007a). Similarly, seabed photographs taken within and outside of pockmark features across the same area (Gard line 2007a & b) and interpreted in this ES did not identify any evidence of cemented sediments, chemosynthetic communities or variation in epifauna between pockmark and non-pockmark areas.</p> <p>Information provided by the seabed surveys indicated that pockmark features in the Athena area do not qualify as Annex I habitat (Gardline 2007a & b).</p> <p>The pipelines and connections have been flushed with treated sea water, therefore only relatively small volumes of chemicals/hydrocarbons will be released and the quantities covered by permit. The potential impact on the marine environment will be small and changes to the chemical composition of the sediment are low. The removal of the pipelines will create a localized disturbance to the seabed in the immediate vicinity of the pipelines.</p> <p>Impact on the seabed and its associated ecosystem will be short term with rapid recovery. An assessment of the potential impact on the seabed concluded that the significance of the impact is low.</p>
Fisheries	<p>Impacts on fishing industry have been assessed as low significance as the decommissioning activities will be relatively short term. The area will be over trawled to ensure there are no snag hazards post decommissioning. The safety exclusion zones at the riser base and the manifolds seas will be removed on completion of the project, thereby increasing the area available for fishing.</p>

Table 4.1: Environmental Sensitivities

Environmental Receptor	Main Features																								
Fish	<p>The area overlaps with known spawning grounds of <i>Nephrops</i>, Whiting, Norway Pout and Sprat (see below for timing). The area also supports known nursery grounds of <i>Nephrops</i>, Blue Whiting, Norway Pout and Sprat. These fish populations could be affected by chemical/hydrocarbon releases to the marine environment and of the increased noise. The pipelines and connections have been flushed with treated sea water, therefore only relatively small volumes of chemicals/hydrocarbons will be released and the quantities covered by permit. The potential impact on the fish population has been assessed as of low significance.</p> <p>Given the existing background noise levels and the relatively short duration of the decommissioning activities, the underwater noise levels generated by vessels are unlikely to lead to physiological damage to fish. While the fish may be disturbed by the noise generated in the immediate vicinity of the decommissioning area the noise will be short term and has been assessed as low significance.</p> <table border="1" data-bbox="480 819 1374 887"> <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> </tr> </thead> <tbody> <tr> <td></td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Key: 1 = 1 species spawning, 2 = 2 species spawning, 3= 3 species spawning</p>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		3	3	3	3	3						
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec														
	3	3	3	3	3																				
Marine Mammals	<p>The most frequently occurring cetaceans in the general Athena area are Harbour Porpoise, White-Beaked Dolphin and Minke Whale. Atlantic White-Sided Dolphin may also occur in the area, particularly in summer. Limited sightings of Killer Whale and Bottlenose Dolphin have also been recorded in the general area. The Moray Firth and the coast of eastern Scotland is home to the only resident population of Bottlenose Dolphins in the North Sea; however, these are a primarily coastal species and are unlikely to be frequently present in the Athena area. Harbour and Grey Seals may occur in the proposed Athena area, but in very limited numbers and for fairly short periods of time as this area is beyond their typical foraging habitat. Given the existing background noise levels and the relatively short duration of the decommissioning activities, the underwater noise levels generated by vessels are unlikely to lead to physiological damage to marine mammals. While the cetaceans & pinnipeds sighted in the area may be disturbed by the noise generated in the immediate vicinity of the decommissioning area the noise will be short term and has been assessed as low significance.</p> <table border="1" data-bbox="480 1391 1374 1458"> <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> </tr> </thead> <tbody> <tr> <td></td> </tr> </tbody> </table> <p>Key: Darker colour reflects months when marine mammals most frequently observed</p>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec												
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec														
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 disposal sites already exist and the volume of waste is relatively small.</p>																								

Table 4.1: Environmental Sensitivities

Environmental Receptor	Main Features																																							
Birds	<p>At an annual scale, the area may be considered to be of moderate importance for seabirds in the context of the North Sea as a whole. Seabird vulnerability to surface pollution in Block 14/18 varies between moderate-low from Dec-Jun and high-very high from Jul-Nov (JNCC 1999). The region is a considerable distance from important coastal water bird sites and seabird breeding colonies. Post breeding dispersal from the colonies sees rafts of adult and juvenile birds, primarily Auks congregate on the sea surface. This, along with birds migrating through the area, accounts for the high vulnerability. The main prey of many bird species is sandeels which are not present in the fine sediments of the Fladen Ground</p> <p>Seabird vulnerability to surface pollution for block 14/18. The greatest risk to birds would be an accidental large release of hydrocarbons. Oil spill modelling has shown that should a worst case diesel release occur, only small volumes can be expected to remain on the sea surface after 10 days. Although birds could be affected, mitigation measures to restrict activities out with the high risk months identified below and the relatively short duration that diesel would be expected to remain on the sea surface the potential impact is of low significance</p> <table border="1" data-bbox="453 891 1347 994"> <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>4</td> <td>2</td> <td>3</td> <td>4</td> <td>3</td> <td>4</td> <td>1</td> <td>1</td> <td>2</td> <td>2</td> <td>2</td> <td>3</td> <td>14/18</td> </tr> <tr> <td>4</td> <td>3</td> <td>4</td> <td>4</td> <td>3</td> <td>4</td> <td>2</td> <td>2</td> <td>3</td> <td>2</td> <td>2</td> <td>3</td> <td>14/19</td> </tr> </tbody> </table> <p>Key 1=Very High. 2=High. 3=Moderate. 4=Low</p>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		4	2	3	4	3	4	1	1	2	2	2	3	14/18	4	3	4	4	3	4	2	2	3	2	2	3	14/19
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Other Users of the Sea	<p>The Athena area lies within ICES rectangle 45E9 this area receives considerable fishing effort, primarily from demersal trawlers targeting Nephrops and demersal fish. In 2015, UK landings into Scotland from rectangle 45E9 were worth approximately £2.3m. Fishing effort fluctuates considerably between months and years, although effort appears to be greatest from Oct-Jan and Jun-Aug. Twenty-five shipping routes pass within 10nm of the Athena location. There are no Ministry of Defence exercise areas, dredging areas or marine disposal sites in the Athena area. There are 17 wells and two gas pipelines within block 14/18. There are no designated protected wrecks in the area, but several wrecks are known.</p> <p>There will be a relatively short period when decommissioning vessels will be operating around the Athena area and there will be a higher than normal level of shipping activity. However the associated effects will be short term. All material will be removed from the seabed therefore the long term impact on other users of the sea has been assessed as low.</p> <table border="1" data-bbox="453 1473 1347 1547"> <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 style="background-color: #000080;"></td> <td></td> </tr> </tbody> </table> <p>Key: Darker colour reflects months when fishing effort is typically greater</p>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec																											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec																													
Atmosphere	<p>Generally conditions offshore provide an environment which leads to the rapid dispersion and dilution of any emissions to atmosphere. The majority of decommissioning activities will be conducted at the field location and emissions can mainly be attributed diesel fuel from the various vessels required. These are likely to be short term durations, highly localised and assessed as low significance. The emission of combustion gases will contribute to global effects (e.g. global warming and acid rain). However given the relatively small volume of gases to be emitted and the control and mitigation measures that will be implemented the impact is low.</p>																																							

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 Athena 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 BEIS should this plan change.

Table 4.2: Environmental Impact Management		
Activity	Main Impacts	Management
FPSO	Disconnection and submersion of the STP buoy to -24m may cause some environmental impact due to potential risk to shipping from a submerged obstruction.	An SFF guard vessel will remain on station to ensure any approaching shipping is made aware of the obstruction and advised to change course if necessary. In addition the buoy location has been advised to the Hydrographers Office and Fishsafe.
Topsides Removal	N/A	N/A
BWO FPSO Anchor system	Removal of the anchor suction cans will cause some localised environmental impact at the individual anchor sites.	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 suction cans by reverse installation alternative methods of removal will be discussed and agreed with the regulator.
Subsea Installations Removal	Removal of Wellheads, Manifold, Riser Base and MWA Clump Weight Base 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	Removal of the pipelines, ESP bundle and umbilical will have a localised impact on the seabed. Removal of the risers 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.	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.
Decommissioning Stabilisation Features	There will be some localised disturbance of the seabed by relocating mattresses, grout and sand bags prior to recovery. 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.	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.
Decommissioning Drill Cuttings	None – drill cuttings will remain in place to degrade naturally.	Drill cuttings do not contain any oil and fall below the OSPAR limits.

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

Meetings and telephone calls have been held with SFF 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 Aberdeen Evening Express 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
Informal Consultations		
Scottish Fishermen's Federation	Informal telephone discussions and a meeting at Ithaca office to present the outline decommissioning programmes	Positive feedback and pleased to see that the area will be accessible for fishing on completion of the decommissioning programmes
Partners	Hi level presentation to partners on the decommissioning programmes	Minor comments on content and decommissioning programmes updated.
Statutory Consultations		
Scottish Fishermen's Federation	One point we would appreciate clarification on at this stage is with regard to drill cuttings. We note that that the proposed decommissioning solution is for the drill cuttings piles (described as small and located around each wellhead and falling below both of OSPAR 2006/5 thresholds) to be left undisturbed on seabed to degrade naturally. As, in due course, the 500 metre Safety Zones will be removed and therefore the	With regards to the cuttings piles, it is difficult to determine the thickness of the cuttings and pile is misleading. From our video footage the cuttings appear to be spread fairly evenly around the wellheads and show reasonable signs of re-colonisation. Estimated

	<p>areas will be opened up to fishing operations, we would be obliged if Ithaca could provide details on the estimated height and footprint of each individual drill cutting pile.</p>	<p>footprints are as detailed in the decommissioning programmes. Further clarification will be provided prior to completing the well plug and abandonment scope.</p>
<p>National Federation of Fishermen's Organisations</p>	<p>No comments</p>	
<p>Northern Irish Fish Producers Organisation</p>	<p>No comments</p>	
<p>Global Marine Systems Limited</p>	<p>I have reviewed the document you provided and note in Table 4.1 – Environmental Sensitivities, under 'Other Users of the Sea', there is no mention of fibre optic telecommunications cables. Have cables and other subsea linear structures been considered in the proposal? There are trans-Atlantic fibre optic cables in the vicinity of the Athena area, and other systems nearby.</p> <p>I assume there are no crossings or direct interactions that you are aware of, but the works will need to be publicised and notice to mariners arranged to ensure that other sea users are fully informed of works in case of any inadvertent interactions whilst marine works take place.</p>	<p>Review of cables and other subsea linear structures have been considered and will not be affected by the decommissioning programmes work scopes.</p> <p>No crossings or direct interactions have been identified and notices to mariners and others will be provided prior to commencement of work.</p>

Table 5.1 Summary of Stakeholder Comments		
Who	Comment	Response
Statutory Consultations		
Public	Consideration should be given to the possibility that the suction anchors may not be easily removed as stated in the programme – Please insert a comment into the document (Page 44 - Table 4.2) to advise that in the event of practical difficulties in removing the suction cans by reverse installation, alternative methods of removal will be discussed and agreed with the regulator.	Table 4.2 updated.
	Update the ICES statistics data to include 2015 data.	ICES updated to include 2015 data.

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 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 BEIS.

6.2 Post-Decommissioning Debris Clearance and Verification

A post decommissioning site survey will be carried out around 500m radius of installation sites and 200m corridor along each existing pipeline route. Any seabed debris related to offshore oil and gas activities 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 installation sites and pipeline corridors. This will be followed by a statement of clearance to all relevant governmental departments and non- governmental organisations.

6.5 Close Out

In accordance with the BEIS Guidelines, a close out report will be submitted to BEIS explaining any variations from the Decommissioning Programmes (normally within 4 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 sites of the wellheads and installations, will be conducted. The survey will focus on chemical and physical disturbances of the decommissioning 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 BEIS. All pipeline routes and installation sites will be the subject of surveys when decommissioning activity has concluded. After the surveys have been sent to BEIS and reviewed, a post monitoring survey regime will be agreed by both parties. Typically a minimum of 2 post decommissioning environmental surveys and structural pipeline surveys are expected.

7.0 Supporting Documents

Document Number	Title
ITH-ATH-DCOM-ENS-001	Environmental Statement
ITH-ATH-DCOM-COA-001	Comparative Assessment

8.0 Partner Letters of Support

- BWO CARMEN
- DYAS EXPLORATION UK LIMITED
- PARKMEAD (E&P) LIMITED
- SPIKE EXPLORATION UK LIMITED
- TRAP OIL LTD

Appendix A.1 Public Notice

PUBLIC NOTICE

The Petroleum Act 1998

Athena Field Decommissioning Programmes

Ithaca Energy (UK) Limited has submitted, for the consideration of the Secretary of State for Energy and Climate Change, draft Decommissioning Programmes for the Athena Field facilities: FPSO BWO Athena

Associated pipelines Manifolds and wellheads, in accordance with the provisions of the Petroleum Act 1998.

It is a requirement of the Act that interested parties be consulted on such decommissioning proposals.

The items/facilities covered by the Decommissioning Programmes are:

Subsea Installations;

1. Wellheads
2. Manifold piping and control module
3. Riser base module
4. Mid Water Arch and Clump weight base
5. Anchor suction cans and chains

Pipelines;

1. Well tie in spools
2. Electric Hydraulic & Chemical control lines
3. Electric Submersible Pump cables
4. Electric Hydraulic Chemical umbilical
5. Electric Submersible Pump supply cable
6. 8" Flexible Production flowline & Dynamic Riser
7. 8" Flexible Water Injection flowline & Dynamic Riser
8. 3" Flexible Service flowline & Dynamic Riser

Hard copies of the Decommissioning Programmes can be inspected at the:- BEIS Website <https://www.gov.uk/guidance/oil-and-gas-decommissioning-of-offshore-installations-and-pipelines> and at the following location during office hours.

7-8 Rubislaw Terrace, Aberdeen, AB10 1XE Contact Jamie Airnes 01224 652186 for appointments

Representations regarding the Athena Decommissioning Programmes should be submitted in writing to applicant's nominated contact at the above address, where they should be received by closing date 15th July 2016 and should state the grounds upon which any representations are being made.

Date: 16th June 2016

J. Airnes, Delivery Manager

Thursday, June 16, 2010
www.eveningexpress.co.uk

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Noticeboard

6 Recruitment

14 Public Notices

PUBLIC NOTICE
The Aberdeen and District Council

Aberdeen Flood Conservation Programme

It has been agreed to fund the Aberdeen Flood Conservation Programme to the value of £100,000. The programme will be used to fund the following projects:

1. Aberdeen Flood Conservation Programme
2. Aberdeen Flood Conservation Programme
3. Aberdeen Flood Conservation Programme
4. Aberdeen Flood Conservation Programme
5. Aberdeen Flood Conservation Programme
6. Aberdeen Flood Conservation Programme
7. Aberdeen Flood Conservation Programme
8. Aberdeen Flood Conservation Programme
9. Aberdeen Flood Conservation Programme
10. Aberdeen Flood Conservation Programme

For further information, please contact the Aberdeen Flood Conservation Programme at 01224 661212.

Legal Notices

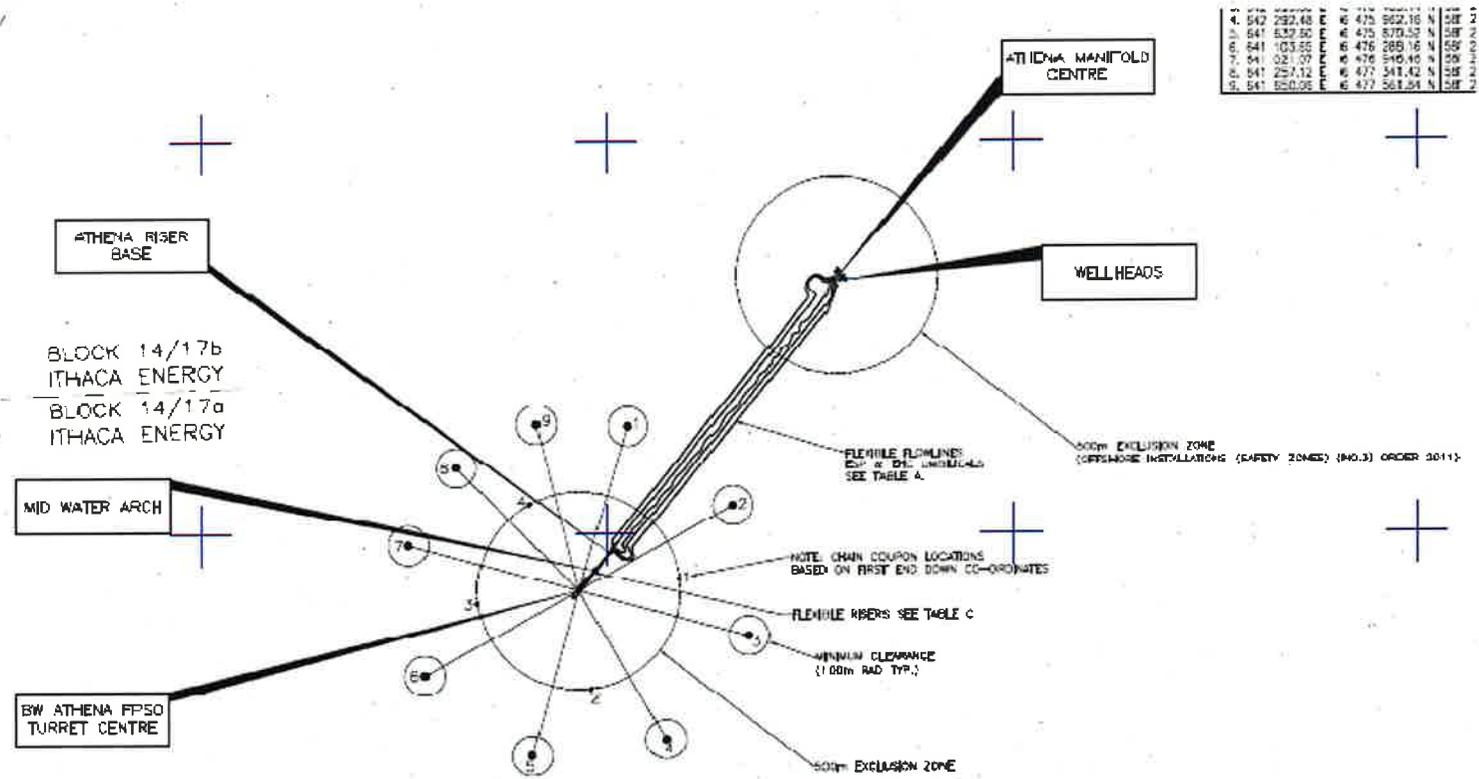
PUBLIC NOTICE
The Petroleum Act 1998
Athens Field

The Decommissioning Programme for the Athens Field (the "Programme") has been approved by the Secretary of State for Energy and Climate Change. The Programme is set out in the Athens Field Decommissioning Programme (the "Programme") and is subject to the terms and conditions set out in the Programme. The Programme is subject to the terms and conditions set out in the Programme. The Programme is subject to the terms and conditions set out in the Programme. The Programme is subject to the terms and conditions set out in the Programme.

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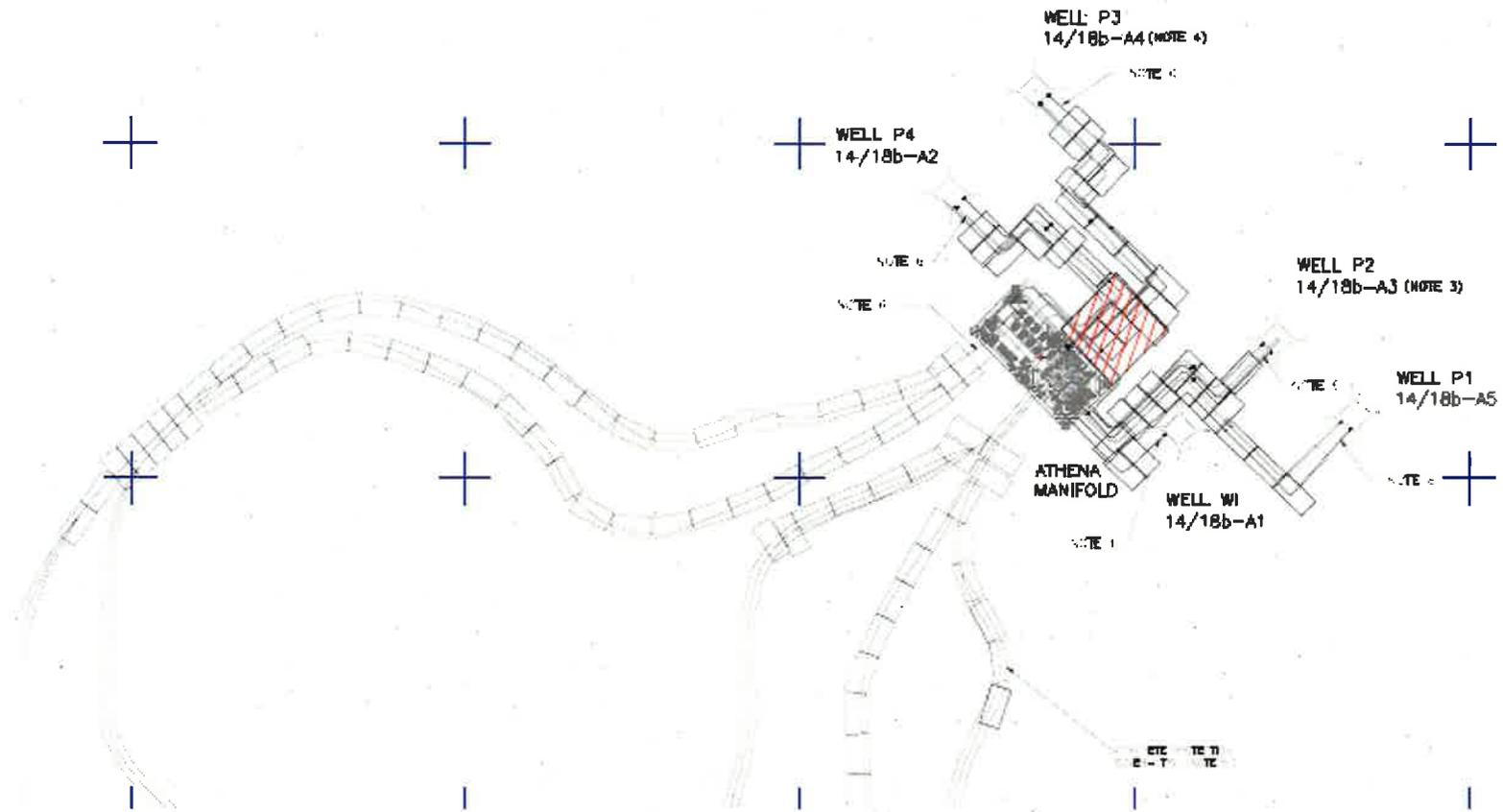
7-8 Ruskildan Terrace
Aberdeen AB10 1XZ
Tel: 01224 652286
Fax: 01224 652287
Email: decommission@athensfield.co.uk
Web: www.athensfield.co.uk
The Decommissioning Programme for the Athens Field (the "Programme") has been approved by the Secretary of State for Energy and Climate Change. The Programme is set out in the Athens Field Decommissioning Programme (the "Programme") and is subject to the terms and conditions set out in the Programme. The Programme is subject to the terms and conditions set out in the Programme. The Programme is subject to the terms and conditions set out in the Programme.

Appendix B.1 Athena Overall Subsea Layout

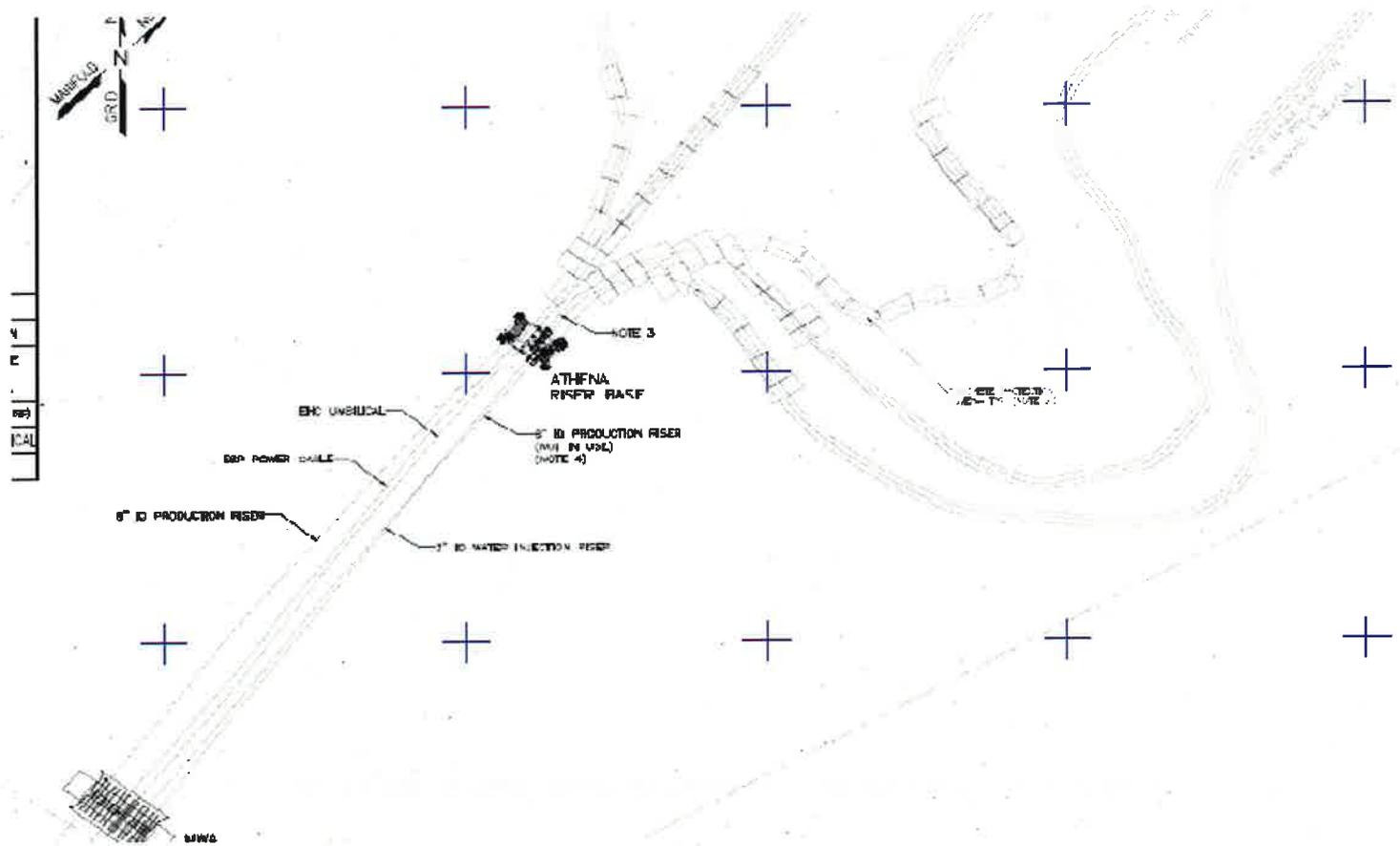


CHAIN COUPON NUMBER	Easting	Northing	DEPTH (m)
1	472 292.48	6 425 802.16	500
2	471 537.50	6 425 870.55	500
3	471 103.55	6 426 268.16	500
4	471 02.37	6 426 540.46	500
5	471 254.12	6 427 541.42	500
6	471 020.05	6 427 561.94	500

Appendix B.2 Subsea Wells, Manifold, Pipeline Approaches and Stabilisation Features



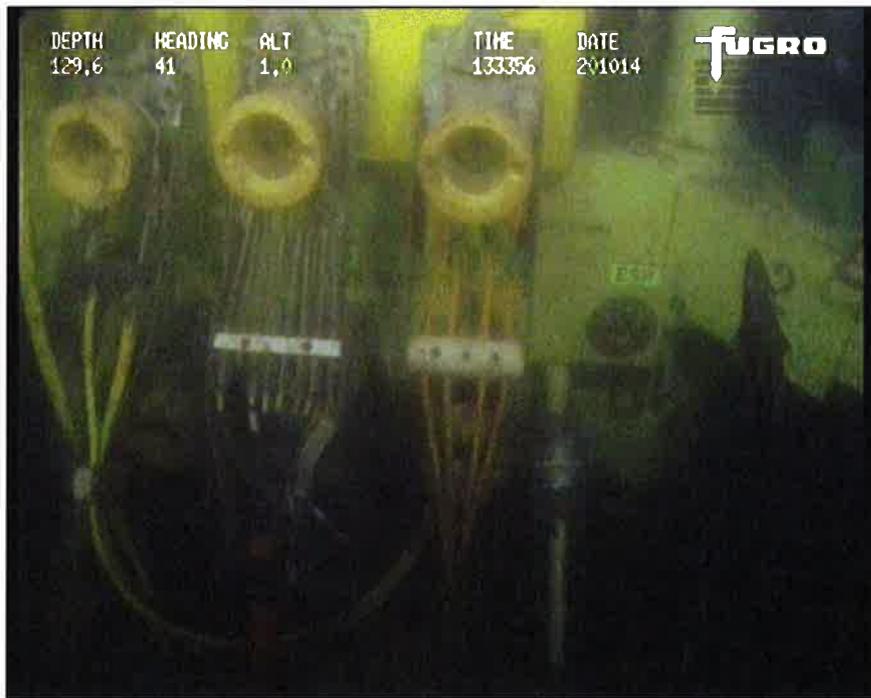
Appendix B.3 Riser Base Pipeline Approaches and Stabilisation Features



Appendix C.1 Photographs of Subsea Equipment



Photograph of Xmas Tree



Photograph of installed Xmas Tree P1 (Oct 2014)



Photograph of Manifold piping module



Photograph of Manifold control module



Photograph of Manifold protection frame



Photograph of Riser base



Photograph of Mid Water Arch

Trapoil

Department for Business Energy
& Industrial Strategy
3rd Floor, Wing C
AB1 Building
Crimon Place
Aberdeen
AB10 1BJ

28th September 2016

Registered Office
10 The Triangle
NG2 Business Park
Nottingham
NG2 1AE
United Kingdom

w/trapoil.com

Dear Sir or Madam

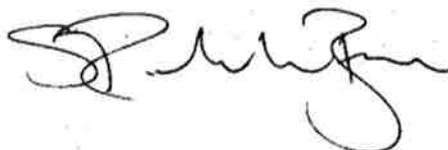
**ATHENA DECOMMISSIONING PROGRAMMES
PETROLEUM ACT 1998**

We acknowledge receipt of your letter dated 8th September 2016.

We, Jersey Oil and Gas PLC on behalf of Trap Oil Limited confirm that we authorise Ithaca Energy (UK) Limited to submit on our behalf abandonment programmes relating to the Athena Field facilities as directed by the Secretary of State on 20th December 2011.

We confirm that we support the proposals detailed in the Athena Decommissioning Programmes dated 8th September 2016, which is to be submitted by Ithaca Energy (UK) Limited in so far as they relate to those facilities in respect of which we are required to submit abandonment programmes under section 29 of the Petroleum Act 1998.

Yours faithfully



Scott Richardson Brown

Chief Financial Officer

For and on behalf of Trap Oil Limited

**Unlocking
potential**

Trap Oil Group plc
Registered office: 10 The Triangle, NG2 Business Park, Nottingham NG2 1AE
Registered no. 7503957



Department for Business Energy
& Industrial Strategy
3rd Floor, Wing C
AB1 Building
Crimon Place
Aberdeen
AB10 1BJ

Date: 16th September 2016

Dear Sir or Madam,

**ATHENA DECOMMISSIONING PROGRAMMES
PETROLEUM ACT 1998**

We acknowledge receipt of your letter dated 08th September 2016.

We, BW Offshore (UK) Limited confirm that we authorise Ithaca Energy (UK) Limited to submit the abandonment programmes relating to the Athena Field facilities as directed by the Secretary of State on 20th December 2011.

We confirm that we have no objection to the proposals detailed in the Athena Decommissioning Programmes dated 08th September 2016, which is to be submitted by Ithaca Energy (UK) Limited in so far as they relate to those facilities in respect of which we are required to submit abandonment programmes under section 29 of the Petroleum Act 1998.

Yours Faithfully,

A handwritten signature in blue ink, appearing to read 'Rod MacLeod'.

Rod MacLeod
Asset Manager, UK

For and on behalf of BW Offshore (UK) Limited

BW Offshore (UK) Ltd Voyager House, 75 Waterloo Quay, Aberdeen AB11 5DE, United Kingdom
Tel: +44 (0)1224900260 Fax: +44 (0)1224 900261 www.bwoffshore.com

Registered Office – BW Offshore (UK) Ltd - Voyager House - 75 Waterloo Quay - Aberdeen – Scotland – AB11 5DE – Registered in Scotland No. SC382123



Dyas Exploration UK Limited
Rijnkade 1
3511 LC Utrecht
P.O. Box 2065
3500 GB Utrecht
The Netherlands
T +31 30 2338434
F +31 30 2338418
www.dyas.nl

Department for Business Energy
& Industrial Strategy
3rd Floor, Wing C
AB Building
Crimon Place
Aberdeen
AB10 1BJ
United Kingdom

Registered Office
Athena House
Athena Drive
Tachbrook Park
Warwick
Warwickshire CV34 6RL
United Kingdom

Subject
ATHENA DECOMMISSIONING PROGRAMME
PETROLEUM ACT 1998

Reference
1609009/JH/RB/KO

Date
September 12, 2016

Dear Sirs,

We acknowledge receipt of your letter dated 8th September 2016.

We, Dyas Exploration UK Limited confirm that we authorise Ithaca Energy (UK) Limited to submit on our behalf abandonment programmes relating to the Athena Field facilities as directed by the Secretary of State on 20th December 2011.

We confirm that we support the proposals detailed in the Athena Decommissioning Programmes dated 8th September 2016, which is to be submitted by Ithaca Energy (UK) Limited in so far as they relate to those facilities in respect of which we are required to submit abandonment programmes under section 29 of the Petroleum Act 1998.

Yours faithfully,

R.J. Baurdoux
Director
For and on behalf of Dyas Exploration UK Ltd

Companies House No
06850220

Group Headquarters:

Parkmead (E&P) Limited
4 Queen's Terrace
Aberdeen AB10 1XL
Tel: +44 1224 622200
Fax: +44 1224 623530
www.parkmeadgroup.com

19 September, 2016

Department for Business Energy & Industrial Strategy,
3rd Floor, Wing C,
ABI Building,
Crimon Place,
ABERDEEN.
AB10 1BJ

Dear Sir or Madam,

**ATHENA DECOMMISSIONING PROGRAMMES
PETROLEUM ACT 1998**

We acknowledge receipt of your letter dated 8 September, 2016.

We, Parkmead (E&P) Limited, confirm that we authorise Ithaca Energy (UK) Limited to submit on our behalf abandonment programmes relating to the Athena Field facilities as directed by the Secretary of State on 20 December, 2011.

We confirm that we support the proposals detailed in the Athena Decommissioning Programmes dated 8 September, 2016, which are to be submitted by Ithaca Energy (UK) Limited in so far as they relate to those facilities in respect of which we are required to submit abandonment programmes under section 29 of the Petroleum Act 1998.

Yours faithfully,
for and on behalf of Parkmead (E&P) Limited



Colin J. Percival
Technical Director

26 September 2016

Department for Business Energy
& Industrial Strategy
3rd Floor, Wing C
AB1 Building
Crimon Place
Aberdeen
AB10 1BJ

Reference: **AT-01-02-OE-L-0001**

Dear Sir or Madam

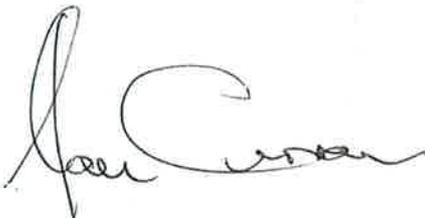
**ATHENA DECOMMISSIONING PROGRAMMES
PETROLEUM ACT 1998**

We acknowledge receipt of your letter dated 8th September 2016.

We, Verus Petroleum on behalf of Spike Exploration UK Limited confirm that we authorise Ithaca Energy (UK) Limited to submit on our behalf abandonment programmes relating to the Athena Field facilities as directed by the Secretary of State on 20th December 2011.

We confirm that we support the proposals detailed in the Athena Decommissioning Programmes dated 8th September 2016 which is to be submitted by Ithaca Energy (UK) Limited in so far as they relate to those facilities in respect of which we are required to submit abandonment programmes under section 29 of the Petroleum Act 1998.

Yours faithfully



Alan Curran
CEO

For and on behalf of Spike Exploration UK Limited

