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INEOS UK SNS Limited

INEOS UK SNS Limited



Windermere Decommissioning Programmes

CONTROLLED DOCUMENT

Title:

Windermere

Decommissioning Programmes

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Terms and Abbreviations

Abbreviation	Explanation		
BEIS	Department for Business, Energy & Industrial Strategy		
cSAC	Candidate Special Area of Conservation		
CEFAS	Centre for Environment, Fisheries and Aquaculture Science		
CO ₂	Carbon Dioxide		
COP	Cessation of Production		
EIA	Environmental Impact Assessment		
FPAL	First Point Assessment (a supply chain database tool)		
HLV	Heavy Lift Vessel		
HSE	Health and Safety Executive		
JNCC	Joint Nature Conservation Committee		
Km	kilometres		
LAT	Lowest Astronomical Tide		
LSA	Low Specific Activity		
m	Metres		
MAT	Master Application Template		
MCV	Monohull Crane Vessel		
MCZ	Marine Conservation Zone		
MoD	Ministry of Defence		
NORM	Naturally Occurring Radioactive Material		
NUI	Normally Unmanned Installation		
OGA	Oil and Gas Authority		
OGUK	Oil and Gas UK		
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning		
OSPAR	Oslo/Paris Convention (for the Protection of the Marine Environment in the North-East Atlantic)		
P&A	Plug and Abandonment		
PON	Petroleum Operations Notice		
SAT	Subsidiary Application Template		
SCI	Site of Community Importance		
SLV	Shear Leg Vessel		
SNS	Southern North Sea		
te	tonnes		
UKCS	United Kingdom Continental Shelf		



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1 Executive Summary

1.1 Combined Decommissioning Programmes

This document contains two decommissioning programmes for one installation and two pipelines. There is a separate decommissioning programme for each set of associated notices served under Section 29 of the Petroleum Act 1998. The Decommissioning Programmes are for:

- The Windermere Installation (Windermere platform); and
- The Windermere Pipelines (PL1273 and PL1273.1 to PL1273.3).

1.2 Requirement for Decommissioning Programmes

Installation

In accordance with the Petroleum Act 1998, and on behalf of the Section 29 notice holders of the Windermere installation (see Table 1-2), INEOS UK SNS Limited is applying to the Department for Business, Energy & Industrial Strategy (BEIS) to obtain approval for decommissioning the installation detailed in Section 2 of this document. (See also Section 8 – Partner Letters of Support).

Pipelines

In accordance with the Petroleum Act 1998, and on behalf of the Section 29 notice holders of the Windermere Pipelines (see Table 1-4), INEOS UK SNS Limited is applying to BEIS to obtain approval for decommissioning the pipelines detailed in Section 2 of this document. (See also Section 8 – Partner Letters of Support).

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 (including planning phase) commencing in 2021.

1.3 Introduction

The Windermere Field, located in the Southern Basin of the UKCS (see Figure 1-1) in license block 49/9b, was discovered in 1989 and is located in 35m water depth. The operator of the Windermere field is INEOS UK SNS Limited, hereafter referred to as 'INEOS'.

The Windermere facilities comprise the platform, export pipeline (6.8km long) and umbilical (7.0km long) between Windermere and the ST-1 platform.

The Windermere platform is a Normally Unattended Installation (NUI). The Windermere Platform was installed in November 1996 and is a small topside minimum facilities structure, fixed on a three-legged tripod jacket. Production commenced in April 1997.

Field layout of the Windermere facilities (to ST-1) is shown in Figure 1-2 (page 12).

Production ceased from Windermere in April 2016. In 2017, the pipeline and umbilical between Windermere and ST-1 were cleaned and flushed and left in a flooded condition. The helideck, crane and lifeboat on Windermere were taken out of service and walk-to-work docking stations installed in order to allow a once-per-year interventions to be undertaken on Windermere. Due to power previously being received from ST-1 no longer being available, solar powered NAVAIDS and new platform signs were installed on the platform whilst it remains in this 'hydrocarbon safe mode' prior to decommissioning. The two wells on Windermere were plugged and abandoned in 2019.

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Windermere Decommissioning Programmes

Following public, stakeholder and regulatory consultation, the decommissioning programmes are 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 programme for the pipelines is supported by a comparative assessment.

The proposed activities are summarised as follows.

- Topsides and jacket will be removed and recycled or disposed onshore;
- The gas export pipeline will be partially removed. The tie-in spools will be removed and recycled or disposed onshore. The exposed sections at both ends will be removed or lowered to achieve adequate depth of coverage. The existing buried sections of pipeline will be left *in situ*;
- The umbilical will be partially removed. The exposed sections adjacent to the platforms will be removed and recycled or disposed onshore. The exposed ends will be lowered to achieve adequate depth of coverage. The existing buried sections of umbilical will be left *in situ*; and
- On completion of the decommissioning programmes a seabed survey will be undertaken to identify and recover debris within the platform 500m zone and a 100m wide corridor along each pipeline route.



1.4 Overview of Installation & Pipelines Being Decommissioned

Table 1-1 Installation Being Decommissioned

Installation Being Decommissioned						
Field(s):	Windermere	Production Type (Oil/Gas/Condensate)	Gas/Condensate			
Water Depth (m)	35 m	UKCS block	49/9b			
	Surface I	nstallation(s)				
Number	Туре	Topsides Weight (Te)	Jacket Weight (Te)			
One	Small/Tripod Fixed Steel Jacket/NUI	452	382			
Subsea I	nstallation(s)	Number of Wells				
Number	Туре	Platform	Subsea			
None	-	Two (plugged and abandoned)	None			
Drill Cut	tings pile(s)	Distance to median	Distance from nearest UK coastline			
Number of Piles	Total Estimated volume (m ³)	km	km			
None	None	9	140km NE of Great Yarmouth			

Table 1-2 Installation Section 29 Notice Holders Details

Installation Section 29 Notice Holders Details				
Section 29 Notice Holder(s)	Registration Number	Equity Interest (%)		
INEOS UK SNS Limited	01021338	60		
Noble Energy (Oilex) Limited	00797339	20		
Spirit Energy North Sea Limited	04594558	20		
Spirit North Sea Gas Limited	SC182822	0		

Table 1-3 Pipelines Being Decommissioned

Pipelines Being Decommissioned				
Number of Pipelines	2	(See Table 2.3)		

Table 1-4 Pipelines Section 29 Notice Holders Details

Pipeline Section 29 Notice Holders Details					
Section 29 Notice Holder(s)	Registration Number	Equity Interest (%)			
INEOS UK SNS Limited	01021338	60			
Noble Energy (Oilex) Limited	00797339	20			
Spirit Energy North Sea Limited	04594558	20			
Spirit North Sea Gas Limited	SC182822	0			



1.5 Summary of Proposed Decommissioning Programmes

Table 1-5 Summary of Decommissioning Programmes

Summary of Decommissioning Programmes						
Selected Option	Reason for Selection	Proposed Decommissioning Solution				
1. Topsides						
Complete removal for re-use and recycling.	To remove all structures and leave a clean seabed. To comply with OSPAR requirements.	Cleaned equipment refurbished for re-use where possible. Equipment which cannot be re- used will be recycled or go to other disposal routes as appropriate.				
	2. Jacket					
Complete removal for re- use and recycling.	To remove all structures and leave a clean seabed. To comply with OSPAR requirements.	Recovered materials will be recycled or go to other disposal routes as appropriate.				
	3. Subsea Installa	tion(s)				
n/a	n/a	n/a				
	4. Pipelines, Flowlines	& Umbilicals				
The pipeline will be partially removed. The pipeline has been flushed and cleaned. Buried sections of pipeline will be left buried <i>in situ</i> .	The pipeline was subject to a qualitative and quantitative comparative assessment from which remedial pipeline end burial was selected on the basis of minimal seabed disturbance, lower energy use and reduced risk to personnel. The pipeline is sufficiently buried and stable, posing no hazard to marine users.	The pipeline has been cleaned. The buried section will be left <i>in situ</i> . The exposed sections at both platform ends will be removed or lowered to at least 0.6m. The tie-in spools will be removed and returned to shore for recycling or disposal. Surveys indicate the pipeline will remain buried. Degradation will occur over a long time period within seabed sediment, and this is not expected to represent a hazard to other users of the sea.				
The umbilical will be partially removed. The umbilical has been flushed and cleaned. Buried sections of the umbilical with be left buried <i>in-situ</i> .	The umbilical was subject to a qualitative and quantitative comparative assessment from which remedial umbilical end burial was selected on the basis of minimal seabed disturbance, lower energy use and reduced risk to personnel. The umbilical is sufficiently buried and stable, posing no hazard to marine users.	The umbilical has been cleaned. The buried section will be left <i>in</i> -situ. The exposed sections at platform both ends will be removed or lowered to at least 0.6m. Surveys indicate the umbilical will remain buried. This is not expected to represent a hazard to other users of the sea.				
5. Wells						
Plugged and abandoned in accordance with HSE "Offshore Installations and Wells DCR 1996" and Oil & Gas UK Guidelines for the Suspension and	Meets HSE regulatory requirements.	The wells have been plugged and abandoned to comply with HSE "Offshore Installations and Wells DCR 1996" and in accordance with OGUK Guidelines for the "Suspension and Abandonment of Wells" (Issue 6, June 2018) as it meets BEIS and HSE requirements.				



Summary of Decommissioning Programmes					
Selected Option Reason for Selection Proposed Decommissioning Solut					
Abandonment of wells (Issue 6, June 2018).					
	6. Drill Cutting	gs			
n/a	No cuttings piles exist at the Windermere platform location, as confirmed in environmental surveys undertaken around the platform and pipelines in July 2014.	n/a			
7. Interdependencies					
The casing of well W1 has been installed prior to the installation of the platform jacket. The diameter of this casing being greater than the diameter of the jacket's guide rings above, it is planned to remove this casing after the jacket.					

Mattresses and grout bags will be removed as part of the partial pipeline and partial umbilical removal activities.



1.6 Field Location Including Field Layout and Adjacent Facilities

Figure 1-1 Field Location



INEOS UK SNS Limited



Windermere Decommissioning Programmes

Figure 1-2 Field Layout





Table 1-6 Adjacent Facilities

Adjacent Facilities (See Figure 1.3 overleaf)							
Owner	Name	Туре	Distance / Direction	Information	Status		
Spirit Energy North Sea Limited	Markham J6A	Platform	Approx. 11.4km East	Process facilities separated the Windermere fluids in to gas condensate and water before export of the gas and condensate to the Wintershall operated K-13A platform, which in turn exported Windermere production to Den Helder in the Netherlands.	Operational		
Wintershall Nordzee BV	No ID	24" gas export line	Approx. 11.4 km East	Emanating from J6A, this is the main export line from the Markham complex to shore. It is routed wholly within the Dutch sector.	Operational		
Spirit Energy North Sea Limited	Chiswick	Platform	Approx. 12 km North	Also includes 12" gas pipeline and 2" methanol line (PL2353 and PL2354) from Chiswick to J6A.	Operational		
Spirit Energy North Sea Limited	Kew	Subsea Well	Approx. 13.8 km North	Subsea well tied back to the Chiswick platform.	Operational		
Spirit Energy Resources Limited	Grove	Platform	Approx. 14 km South- southeast	Platform and associated pipelines (PL2639 and PLU2540), which are 13.4km long, and run to the J6A platform.	Operational		
TotalFinaElf	K4aD	Subsea Well	Approx. 18 km East- southeast	Subsea wellhead and associated 4.5" pipeline and umbilical (no ID) to J6A (wholly routed in the Dutch Sector). Approx. 7.3km long.	Operational		
TotalFinaElf	TotalFinaElfK1APlatformApprox. 20.2 km EastPlatform, plus 14" pipeline and 2" methanol line between the platform and J6A, routed within the Dutch sector.Operational						
	Impacts of Decommissioning Proposals						
Works will be re	equired at the sub decom	osea location of missioning. Th	the former Mark ere is currently a	sham ST-1 platform as part of the pipeline a marker buoy at this location.	and umbilical		
No impacts at any of the other adjacent facilities.							



Figure 1-3 Adjacent Facilities



(Courtesy of Spirit Energy)

1.7 Industrial Implications

In planning and preparing for executing the Windermere decommissioning strategy, INEOS as operator of the Windermere field, on behalf of the Section 29 Notice Holders, shall undertake to develop a contract strategy that will result in an efficient and cost effective execution of the decommissioning works.



2 Description of Facilities to be Decommissioned

2.1 Installation: Surface Facilities (Topsides/Jacket)

Table 2-1 Surface Facilities Information

Surface Facilities Information									
		Location		Topsides	s/Facilities		Ja	cket	
Name	Facility Type			Weight (Te)	No of modules	Weight (Te)	No. of legs	No. of piles	Weight of piles (Te)
	Fixed	WGS84 Decimal	N 53.8322819 E 02.7727297						285 (total of
Windermere	Platform (NUI)	WGS84 Decimal Minute	N 53°49.937' E 02°46.364'	452	1	382	3	3	the three piles)

2.2 Installation: Subsea including Stablisation Features

Table 2-2 Subsea including Stabilisation Features

Subsea Installation and Stabilisation Features						
Subsea Installations including Stabilisation Features	Number	Size/Weight (Te)	Location	Comments/Status		
Wellhead(s)	n/a	n/a	n/a	n/a		
Manifold(s)	n/a	n/a	n/a	n/a		
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		
Frond Mats	n/a	n/a	n/a	n/a		
Rock Dump	n/a	n/a	n/a	n/a		
Other	n/a	n/a	n/a	n/a		



2.3 Pipelines Including Stabilisation Features

Table 2-3 Pipeline / Flowline / Umbilical Information

Pipeline / Flowline / Umbilical Information									
Description	Pipeline No. (as per PWA)	Diameter (inches)	Length (km)	Description of Component Parts	Product Conveyed	From – To End Points	Burial Status	Pipeline Status	Contents
Export line (Windermere to ST-1)	PL1273	8"	6.8	Steel	Gas	Windermere – ST-1	Trenched and Buried	Out-of-use	Line has been cleaned/flushed and is now water filled.
Umbilical (Methanol and Corrosion Inhibitor line)	PL1273.1 to PL1273.3	3.7"	7.0	Umbilical	Chemicals	ST-1 - Windermere	Trenched and Buried	Out-of-use	Line has been cleaned/flushed and is now water filled.

Table 2-4 Subsea Pipeline Stabilisation Features

Subsea Pipeline Stabilisation Features					
Stabilisation Feature	Total Number	Weight (te)	Location(s)	Exposed/Buried/Condition	
Concrete mattresses	40	5.75 tonnes each	PL1273	Exposed	
Concrete mattresses	8	6 tonnes each	PL1273.1 to PL1273.3	Exposed	
Rock Dump	42 meters length	78.5 tonnes (estimate)	PL1273 (KP2.121 to KP 2.163)	Exposed	
Grout Bags	150	4.5	PL1273 (protection over flange connection, gooseneck, pipeline and spool at ST-1 end)	Exposed	
Grout Bags	105	3.15	Umbilical (Windermere end)	Exposed	

Subsea Pipeline Stabilisation Features						
Stabilisation Feature	Total Number	Weight (te)	Location(s)	Exposed/Buried/Condition		
Grout Bags	45	1.95	PL1273 (Spool support and protection at the Windermere end)	Exposed		
Formwork	n/a	n/a	n/a	n/a		
Frond Mats	n/a	n/a	n/a	n/a		
Other	n/a	n/a	n/a	n/a		

An illustration of the pipeline route taken from the 2014 Pre-Decommissioning Environmental Survey is provided in Appendix A.



2.4 Wells

Table 2-5 Well Information

Well Information						
Platform Wells	Designation	Status	Category of Well (O&GUK guidelines)			
49/9b-W1	Gas Production	Plugged and Abandoned	PL 2.1.1			
49/9b-W2z	Gas Production	Plugged and Abandoned	PL 2.1.1			

For details of well categorisations see OGUK Guidelines for the Suspension or Abandonment of Wells. Issue 6, June 2018.

2.5 Drill Cuttings

Drill Cuttings piles are not present at the Windermere platform location.

2.6 Inventory Estimates





Total Mass = 1119 Te

(Refer to Section 3.6 of the Environmental Statement for detailed data on inventory of materials and the handling /management of NORM and hazardous waste)



Figure 2-2 Estimated Inventory (Total Pipelines, Umbilical & Associated Stabilisation Materials)



Includes pipelines and associated stabilisation materials

<u> Total Mass = 1289.5 Te</u>

(Refer to Section 3.6 of the Environmental Statement for detailed inventory data and the handling/management of NORM/hazardous waste)

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 waste management 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 metals are estimated to account for the greatest proportion of the materials inventory.

Alternative uses for the Windermere facilities for renewable power generation and CO₂ sequestration were considered but were not found to be viable.

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



3.1 Topsides

Topsides Description: The Windermere topside structure comprises three levels and weighs approximately 452 te. It consists of: the cellar deck (+18.0m above LAT); the mezzanine deck (+ 21.5m above LAT); the weather deck (+26.0m above LAT); a helideck located at the upper level (+27.5m LAT). The platform is 30m x 30m, with the wellheads set above the cellar deck and the Xmas trees above the mezzanine deck.

Methodology: the topsides will be completely removed and returned to shore. Possible methods are described in Table 3-2 (on page 21). A final decision on decommissioning methods will be made following a commercial tendering process.

Figure 3-1 Diagram of Topsides





Preparation / Cleaning: below describes the methods that will be used to flush, purge or clean the topsides offshore, prior to removal to shore.

Table 3-1 Cleaning of Topsides for Removal

Cleaning of Topsides for Removal						
Waste Type	Composition of Waste	Disposal Route				
On-board hydrocarbons	Process fluids, fuels and lubricants.	Flushing of bulk hydrocarbons will be conducted offshore. Fuels and lubricants will be drained onshore for re-use/disposal.				
Other hazardous materials	Any evidence of NORM will be identified.	NORM, if present, will be disposed of under an appropriate permit.				
Original paint coating	Zinc Silicate primer, Tie-Coat, Aluminium epoxy resin, High Build Epoxy, polyurethane topcoat.	Painted items will be disposed of onshore with consideration given to any toxic components.				
Asbestos and ceramic fibre	Asbestos is not present.					

Removal Methods: topsides will be completely removed and returned to shore. Possible methods are outlined in Table 3-2 below.

Table 3-2 Topsides Removal Methods

Topsides Removal Methods					
1) Heavy Lift Vessel (HLV) ☑ 2) Monohull Crane Vessel (MCV) ☑ 3) Shear Leg Vessel (SLV) ☑ 4) Piece small □ 5) Other (Complete with Jacket, Jack-Up) ☑					
Method	Description				
Single lift removal by HLV / MCV / SLV	Removal of topsides as complete unit and transportation to shore for re-use of selected equipment, recycling, break up, and / or disposal				
Single lift removal with Jacket by HLV / MCV / SLV	Removal of topsides and jacket as a single unit and transportation to shore on the HLV/MCV/SLV slings for re-use of selected equipment, recycling, break up, and / or disposal				
Single lift removal by Jack-up	Removal of topsides as complete unit by jack-up used for well P&A and transportation to shore for re-use of selected equipment, recycling, break up, and / or disposal				
Proposed removal method and disposal route	Removal of topsides as complete unit by small HLV and transportation to shore for re-use of selected equipment, recycling, break up, and / or disposal. Should the topsides be taken to the Netherlands, an application under the Transfrontier Shipment of Waste Regulations shall be made to the Environment Agency. A final decision on the decommissioning method will be made following a commercial tendering process				



3.2 Jacket

3.2.1 Jacket Decommissioning Overview

The jacket legs will be cut at an appropriate elevation and new aids created¹ for the complete removal of the jacket in a single lift, see Figure 3-2 below. The piles will be cut 3m below the sea bed before the jacket is returned to shore for recycling.

Figure 3-2 Jacket Elevation



¹ Subject to detailed engineering. However, the current expectation is that new lift points will be drilled into the jacket legs to enable lifting bars to be installed.



3.2.2 Jacket Removal Methods

Table 3-3 Jacket Decommissioning Methods

Jacket Decommissioning Methods					
1) HLV (semi-submersib3) SLV ☑4)	le crane vessel) ☑2) Monohull crane vessel ☑Piece small □5) Other (Complete with Jacket, Jack-Up) ☑				
Method	Description				
Single lift removal by HLV / MCV / SLV	Removal of jacket as complete unit and transportation to shore for recycling				
Single lift removal with Jacket by SLV	Removal of topsides and jacket as a single unit and transportation to shore on the SLV slings for recycling				
Single lift removal by Jack-up	Removal of jacket as complete unit by jack-up used for well P&A and transportation to shore recycling				
Proposed removal method and disposal route	Removal of jacket as complete unit by small HLV and transportation to shore for recycling. Should the topsides be taken to the Netherlands, an application under the Transfrontier Shipment of Waste Regulations shall be made to the Environment Agency. A final decision on the decommissioning method will be made following a commercial tendering process.				

Note: If there is a delay between jacket and the topsides removal activities, appropriate navigational aids shall be in place, as per Consent to Locate requirements.

3.3 Subsea Installations and Stabilisation Features

Table 3-4 Subsea Installations and Stabilisation Features

Subsea Installation and Stabilisation Features					
Subsea installation and stabilisation features	Number	Option	Disposal Route		
Wellhead(s)	n/a	n/a	n/a		
Manifold(s)	n/a	n/a	n/a		
Protection Frame(s)	n/a	n/a	n/a		
Concrete Mattresses	n/a	n/a	n/a		
Grout Bags	n/a	n/a	n/a		
Formwork	n/a	n/a	n/a		
Frond Mats	n/a	n/a	n/a		
Rock Dump	n/a	n/a	n/a		
Other	n/a	n/a	n/a		



3.4 Pipelines

Decommissioning Options:

*Key to Options:

7) Leave in place

- Remove reverse reeling
 Remedial removal
- 2) Remove Reverse S lay5) Remedial trenching

8) Other (Cut and lift)

- 3) Trench and bury
- 6) Partial Removal
 - 9) Remedial rock-dump

Table 3-5 Pipeline or Pipeline Groups/Decommissioning Options

Pipeline or Pipeline Groups/Decommissioning Options					
Pipeline or Group (as per PWA)	Condition of line/group	Whole or part of pipeline/group	Decommissioning Options* considered		
PL1273	Buried	Whole	1, 6, 7, 8		
PL1273.1 to PL1273.3	Buried	Whole	1, 6, 7, 8		

Comparative Assessment [Ref 2]:

The purpose of the Comparative Assessment was to provide an assessment of the decommissioning options available for the Windermere 8" pipeline (PL1273) and 3.7" umbilical (PL1273.1 to PL1273.3) against a set of assessment criteria. These criteria were defined in line with BEIS guidance and previous similar studies, identifying the different risks to be considered during and after the decommissioning of the asset. Each option was marked, based on the likelihood and impact of each risk/criteria considered. This process has generated an overall semiquantitative assessment of each option allowing comparison of the options against each other. Burial profiles for the pipeline and umbilical are provided in Appendix B.

The comparative assessment is summarised as follows:

- The pipeline:
 - Is stable and buried throughout (apart from at each platform end); the most recent pipeline survey shows an average of depth of 1.06m.
 - Does not have a viable re-use potential.
 - Has been cleaned and flushed.
 - Will be partially removed (the two tie-in spools). Exposed sections of the remaining pipeline will be removed or lowered and left with the pipe ends open.
 - The two pipeline ends will be trenched and buried.
 - The majority of the pipeline will be left *in situ* as this has the least impact on the sea bed environment.
- The umbilical:
 - Is stable and buried; the most recent pipeline survey shows an average of depth of 0.71m, although there are a number of sections of the umbilical that are buried less than 0.6m deep.
 - Does not have a viable re-use potential.
 - Has been cleaned and flushed.
 - Left in situ has the least impact on the sea bed environment.
 - No spans or exposures have been detected during previous subsea surveys.



• Will be removed at the two platform ends (where unburied) and returned to shore for recycling/disposal. The remaining, buried, sections of umbilical will be left *insitu* as this has the least impact on the sea bed environment.

Table 3-6 Outcome of Comparative Assessment

Outcomes of Comparative Assessment										
Pipeline or Group	Recommended Option*	Justification								
PL1273	Remove mattresses and grout bags and tie-in spools. Trench and bury pipeline ends and leave <i>in situ</i>	The pipeline is stable and buried and leaving <i>in situ</i> represents the least impact to the sea bed.								
PL1273.1 to PL1273.3	Remove mattresses and grout bags at the two platform ends. Trench and bury umbilical ends and leave <i>in-situ</i> .	The umbilical is stable and buried and leaving <i>in situ</i> represents the least impact to the sea bed.								

3.5 Pipeline Stabilisation Features

Table 3-7 Pipeline Stabilisation Features

Pipeline Stabilisation Feature(s)									
Stabilisation feature(s)	Number	Option	Disposal Route (if applicable)						
Concrete mattresses over pipeline and umbilical	48	Remove to shore.	Recover to shore for re-use, recycling or disposal.						
Grout Bags	300	Remove to shore.	Recover to shore for re-use, recycling or disposal						
Rock Dump	42m (estimated to be 78.5 te)	Planned to leave in-situ	n/a						
Formwork	n/a	n/a	n/a						
Frond Mats	n/a	n/a	n/a						



3.6 Wells

Table 3-8 Well Plug and Abandonment

Well Plug and Abandonment

The wells, as listed in Section 2.4 (Table 2.5), have been plugged and abandoned in accordance with Oil and Gas UK Guidelines for the Suspension and Abandonment of Wells, Version 6, June 2018.

3.7 Drill Cuttings

It is believed that any cuttings discharged during the drilling of wells at the Windermere platform location are likely to have dispersed as there were no drill cuttings piles observed around the Windermere platform during the pre-decommissioning environmental surveys undertaken around the platform and pipelines in July 2014. The wells were drilled using pseudo oil based muds.

3.8 Waste Streams

Table 3-9 Waste Stream Management Methods

Waste Stream Management Methods							
Waste Stream	Removal and Disposal method						
Bulk liquids	Platform pipework and sumps will be drained prior to removal to shore and shipped in accordance with maritime transportation guidelines. Further cleaning and decontamination will take place onshore prior to recycling/re-use.						
	Liquids in the umbilical have already been flushed and cleaned. The umbilical is water filled. All wastes from this activity were injected downhole into the wells at Windermere. Liquids from the pipeline have also been flushed and pumped downhole at Windermere. The pipeline has been flushed and cleaned and is water filled.						
Marine growth	Some limited quantities of marine growth may be removed offshore to facilitate access to key parts of the structure, although the majority will be removed at the onshore disposal site. Disposal options will be managed through a Decommissioning Environmental Management Plan.						
NORM/LSA Scale	NORM is not expected. However, tests for NORM will be completed offshore and any NORM encountered will be dealt with and disposed of in accordance with guidelines and company policies. A permit shall be in place prior to commencement of works.						
Asbestos	Asbestos is not present						
Other hazardous wastes	Will be recovered to shore and disposed of according to guidelines and company policies.						
Onshore Dismantling sites	Appropriate licensed sites will be nominated by the platform removal contractor. The nominated facility will demonstrate a proven disposal track record and waste stream management throughout the deconstruction process and demonstrate their ability to deliver innovative recycling options.						



Table 3-10 Inventory Disposition

Inventory Disposition									
	Total Inventory Tonnage	Planned tonnage to shore	Planned left in situ						
Installations	1119 Te (incl. piles)	909 Te (incl. piles cut-offs)	210 Te (piles left 3m below seabed)						
Pipelines	818.4 Te	9 to 29 Te*	790-810 Te*						
Umbilical	105 Te	10 Te	95 Te						
Concrete Mattresses	278 Te	278 Te	0 Te						
Grout Bags	9.6 Te	9.6 Te	0 Te						
Rock Dump	78.5 Te	0 Te	78.5 Te						

* Depending on how much of the unburied pipeline is removed.

Selected equipment present on the platform may be considered for re-use.

As much as possible of the installation, umbilical, spools and concrete mattresses weight will be recycled, depending on the capacities of the selected disposal contractor. The remaining of the weight of the materials recovered to shore will be disposed of to landfill.

INEOS has set a project target for recycling as much as possible of the material recovered to shore. It is planned to recycle 100% of recovered concrete, greater than 95% non-ferrous metals, greater than 90% steel and greater than 85% of plastics/rubber recovered to shore during the dismantling works.

Additional details on percentages of materials recovered to shore that will be reused, recycled or disposed of to landfill are presented in Sections 3.6, 3.8 and Section 12 of the Environmental Impact Assessment [Ref 3].



4 Environmental Impact Assessment

4.1 Environmental Sensitivities (Summary)

Table 4-1 Environmental Sensitivities

Environmental Sensitivities							
Environmental Receptor	Main Features						
Conservation interests	 The Windermere Development is not situated in a protected area. The nearest marine protected areas are: the Klaverbank SAC located 2.5 km to the east; the Markham's Triangle MCZ located 3 km to the north east; and the North Norfolk Sandbanks and Saturn Reef SAC located 25.5 km to the south west. 						
Seabed	Seabed sediments are predominantly sand. An investigation into the presence of herring spawning grounds found that the seabed in the vicinity of the Windermere Development has no to low potential.						
Fish	The Windermere development is within a spawning area for cod, herring, lemon sole, mackerel, <i>Nephrops</i> , plaice, sandeels, sole, sprat and whiting; The area is also a fish nursery area for anglerfish, cod, herring, horse mackerel, lemon sole, mackerel, <i>Nephrops</i> , sandeels, sprat, spurdog, tope shark and whiting.						
Fisheries	Fishing effort is regarded as low and with relatively consistent effort throughout the year. Gear type is dominated by trawls.						
Marine Mammals	Cetacean numbers overall are generally low, with the harbour porpoise, minke whale and white-beaked dolphin having been recorded in the vicinity of the Windermere Development.						
Birds	Seabird sensitivity in the area is considered to be 'very high' in July and 'high' during November to January. The remainder of the year has as 'medium' or 'low' sensitivity.						
Onshore Communities	The Windermere Development is 140 km north east of the nearest UK landfall and therefore onshore communities should not be significantly impacted.						
Other Users of the Sea	Oil and gas activity within this area of the southern North Sea has been classed as moderate; The Windermere Development lies within a Royal Air Force practice and exercise area; Shipping movements in UKCS Block 49/4 and 49/5 are regarded as 'high' and in UKCS Block 49/9 regarded as 'low'.						
Atmosphere	Offshore operations and onshore waste processing will be the main source of atmospheric emissions, which will be a very small contributor of greenhouse gases.						

4.2 Potential Environmental Impacts and their Management

Although there is expected to be some environmental impact during the decommissioning of the Windermere development, long term impacts from the decommissioning operations are expected to be negligible. In addition, incremental cumulative impacts and transboundary effects associated with the planned decommissioning operations are expected to be negligible.

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Windermere Decommissioning Programmes

The main environmental impacts associated with decommissioning each of the facilities and management of each aspect are summarised in Table 4-2 (page 30-32).



Table 4-2 Environmental Impact Management

	Environmenta	I Impact Management
Activity	Main Impacts	Management
Topsides Removal	 Energy use and atmospheric emissions Underwater noise (marine mammals) Dropped object Accidental hydrocarbon release (marine spread) Seabed disturbance Water quality Benthic flora and fauna Land use 	Vessels will be audited as part of selection and pre-mobilisation. Work programmes will be planned to optimise vessel time in the field. Offshore vessels will avoid concentrations of marine mammals. A post decommissioning debris survey will be conducted and any debris recovered. Specialist oil spill response services will be provided. Removal methods will be assessed, with a view to implement the removal method, with the least impact to the seabed, water quality and benthos. INEOS will actively seek to minimise the amount of material required for stabilisation, if required. An effective waste management plan will be put in place prior to decommissioning activities commencing. INEOS will actively seek to minimise the amount of recovered materials that are sent to landfill.
Removal of Subsea Infrastructure (including jacket and platform wells)	 Energy use and atmospheric emissions Underwater noise (marine mammals) Dropped object Accidental hydrocarbon release (marine spread) Seabed disturbance Water quality Benthic flora and fauna Land use 	 Vessels will be audited as part of selection and pre-mobilisation. Work programmes will be planned to optimise vessel time in the field. Offshore vessels will avoid concentrations of marine mammals. A post decommissioning debris survey will be conducted and any debris recovered. Specialist oil spill response services will be provided. Removal methods will be assessed, with a view to implement the removal method, with the least impact to the seabed, water quality and benthos. INEOS will actively seek to minimise the amount of material required for stabilisation, if required.



	Environmental	Impact Management
Activity	Main Impacts	Management
		An effective waste management plan will be put in place prior to decommissioning activities commencing.
		INEOS will actively seek to minimise the amount of recovered materials that are sent to landfill.
		Underwater cutting is expected to be the highest source of sound, the operation of well-maintained equipment during decommissioning will ensure noise of operating machinery is kept as low as possible.
		INEOS will seek to conform to the JNCC protocol for minimising the risk of disturbance and injury to marine mammals from underwater noise throughout operations.
Decommissioning	Energy use and atmospheric emissions	Pipeline remedial work will ensure the site is over-trawlable for fishing activities.
Pipelines	 Underwater noise (marine mammals) Dropped object Accidental hydrocarbon release Seabed disturbance 	UK Hydrographical Office and Kingfisher will be informed of all activities and any structures left in place. INEOS will establish lines of communication to inform other sea users, including fishermen, of vessel operations during decommissioning.
	Water quality	Vessels will be audited as part of selection and pre-mobilisation.
	Benthic flora and fauna	Work programmes will be planned to optimise vessel time in the field.
	Damage or loss of fishing gear	Offshore vessels will avoid concentrations of marine mammals.
		A post decommissioning debris survey will be conducted and any debris recovered.
		Specialist oil spill response services will be provided.
		Removal methods will be assessed, with a view to implement the removal method, with the least impact to the seabed, water quality and benthos.
		INEOS will actively seek to minimise the amount of material required for stabilisation, if required.
		An effective waste management plan will be put in place prior to decommissioning activities commencing.

Environmental Impact Management									
Activity	Main Impacts	Management							
		INEOS will actively seek to minimise the amount of recovered materials that are sent to landfill.							
Decommissioning Stabilisation Features	 Energy use and atmospheric emissions Underwater noise (marine mammals) Dropped object Accidental hydrocarbon release Seabed disturbance Water quality Benthic flora and fauna Damage or loss of fishing gear 	Vessels will be audited as part of selection and pre-mobilisation. Work programmes will be planned to optimise vessel time in the field. Offshore vessels will avoid concentrations of marine mammals. A post decommissioning debris survey will be conducted and any debris recovered. Specialist oil spill response services will be provided. Removal methods will be assessed, with a view to implement the removal method, with the least impact to the seabed, water quality and benthos. INEOS will actively seek to minimise the amount of material required for stabilisation, if required. An effective waste management plan will be put in place prior to decommissioning activities commencing. INEOS will actively seek to minimise the amount of recovered materials that are sont to landfill							
Decommissioning Drill Cuttings	n/a	n/a							



5 Interested Party Consultations

Table 5-1 Summary of Stakeholder Comments

Summary of Stakeholder Comments										
Stakeholder	Comment	Response								
Informal Consultations										
Global Marine Systems	 No cables in immediate vicinity of platform/pipelines. Closest cable is "<i>NSC-1</i>", located 26km west of Windermere. Not aware of any planned cables to be installed in the area. 	Noted and relevant information presented in the EIA.								
CEFAS	No response	-								
Crown Estate	No response	-								
MoD	No response	-								
JNCC	 JNCC confirmed that operations will not take place in a designated/proposed conservation site. Ensure the environmental surveys are clearly reported in the EIA. Ensure seabird vulnerability is addressed. 	Noted and relevant information presented in the EIA.								
	Statutory Consultations									
National Federation of Fishermen's Organisations	-	-								
Scottish Fishermen's Federation	-	-								
Northern Irish Fish Producer's Organisation	-	-								
Global Marine Systems	-	-								
Public	-	-								

6 **Programme Management**

6.1 **Project Management and Verification**

The project management team resource will be provided from INEOS internal resource and by using external resources such as consultants, engineers and contractors.

A small, focused team of key personnel will be maintained within INEOS that will be responsible for leading a number of specialist contracting groups for the engineering, procurement, decommissioning and for interfacing with the regulatory bodies.



An Independent Verification Body will be appointed for the duration of the execute phase of the project.

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 survey will be conducted covering a 500m radius of the Windermere platform location and a 50m corridor along both gas export pipeline and umbilical route. Any seabed debris related to offshore oil and gas activities will be recovered and transported to shore to be disposed or recycled in line with existing disposal methods. Independent verification of seabed state will be obtained by trawling the platform area and pipelines. A clear seabed certificate will be submitted to BEIS.

6.3 Schedule

Figure 6-1 Gantt Chart of Project Plan – Main Offshore Activities

Activity Windows	20)18		20)19		20	020		20)21		20)22		20	23		20)24	
Engineering/Cost Review																					
Well P&A																					
Platform & Topsides Removal																					
Subsea Scope (Pipelines & Umbilical)																					
Over Trawl Surveys																					
Env. Survey Window																					
Env. Survey Window																					



6.4 Costs

The assumptions made to conduct the cost estimate presented below are:

Table 6-1 Provisional Decommissioning Programme Costs

Provisional Decommissioning Programme(s) costs							
Item	Estimated Cost (£'000)						
Project Management (inc. studies, surveys, etc.)	*						
Platform /Jacket - Preparation / Removal and Disposal	*						
Pipeline and Umbilical Infrastructure Decommissioning	*						
Continuing Liability – Future Pipeline and Environmental Survey Requirements	*						
TOTAL	*						

*Programme costs have been provided to BEIS separately.

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 12 months of completion of the offshore decommissioning scope. The report will include 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 around sites of the wellheads and installation, will be carried out. The survey will focus on chemical and physical disturbances of the decommissioning and shall be compared with the findings of 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 structure sites, including cut piles, 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 discussed and agreed by both parties, which is likely to consist of a minimum of two post decommissioning environmental surveys and structural pipeline surveys.



7 Supporting Documents

Table 7-1 Supporting Documents

	Supporting Documents							
Ref	Document Number	Title						
[1]	RD-WIN-ZPL002	Comparative Assessment Report						
[2]	RD-WIN-ZPL003	Environmental Impact Assessment						

8 Partner Letters of Support



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Noble Energy (Oilex) Limited c/o Spaces 1 Marischal Square Broad Street Aberdeen. AB10 1BL

Offshore Petroleum Regulator for Environment and Decommissioning Department for Business Energy & Industrial Strategy 3rd Floor, Wing C AB1 Building Crimon Place Aberdeen AB10 1BJ

Attn. Ms Debbie Taylor

Date: 25 March 2021

Dear Ms Taylor,

WINDERMERE DECOMMISSIONING PROGRAMMES - PETROLEUM ACT 1998

We, Noble Energy (Oilex) Limited (company number 00797339) confirm that we authorise INEOS SNS UK Limited (company number 01021338) to submit on our behalf the abandonment programmes relating to the Windermere Installation and the Windermere Pipelines, together the 'Decommissioning Programmes'.

We confirm that we have no objections to the proposals detailed in the Windermere Decommissioning Programmes, dated 18 March 2021, which were submitted by INEOS SNS 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 sincerely

MAD 22E744E1C43C

Michael J J Williams Director Noble Energy (Oilex) Limited

Noble Energy (Oilex) Limited Registered in England and Wales Registration No 00797339 Registered Address: Oceana House, 39-49 Commercial Road, Southampton, Hampshire, SO15 1GA

INEOS UK SNS Limited



Windermere Decommissioning Programmes

Offshore Petroleum Regulator for Environment and Decommissioning Department for Business Energy & Industrial Strategy 3rd Floor, Wing C AB1 Building Crimon Place Aberdeen AB10 1BJ



Spirit Energy North Sea Limited 5th Floor IQ Building 15 Justice Mill Lane Aberdeen AB11 6EQ

Telephone: 01224 415000 www.spirit-energy.com

Attn. Ms Debbie Taylor

26 March 2021

Dear Ms Taylor,

WINDERMERE DECOMMISSIONING PROGRAMMES - PETROLEUM ACT 1998

We, Spirit Energy North Sea Limited (company number 04594558), confirm that we authorise INEOS SNS UK Limited (company number 01021338) to submit on our behalf the abandonment programmes relating to the Windermere Installation and the Windermere Pipelines, together the 'Decommissioning Programmes'.

We confirm that we have no objections to the proposals detailed in the Windermere Decommissioning Programmes, dated 18 March 2021, which were submitted by INEOS SNS 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 sincerely

Muld

Nicola MacLeod General Counsel and Company Secretary

For and on behalf of Spirit Energy North Sea Limited

Spirit Energy North Sea Limited Registered in England and Wales No. 04594558 Trading Address: 5th Floor, IQ Building, 15 Justice MIII Lane, Aberdeen AB11 6EQ Registered Office: 1st Floor, 20 Kingston Road, Staines-upon-Thames, TW18 4LG

INEOS UK SNS Limited



Windermere Decommissioning Programmes

Offshore Petroleum Regulator for Environment and Decommissioning Department for Business Energy & Industrial Strategy 3rd Floor, Wing C AB1 Building Crimon Place Aberdeen AB10 1BJ

Attn. Ms Debbie Taylor

29 March 2021

Dear Ms Taylor,

WINDERMERE DECOMMISSIONING PROGRAMMES - PETROLEUM ACT 1998

We, Spirit North Sea Gas Limited (company number SC182822), confirm that we authorise INEOS SNS UK Limited (company number 01021338) to submit on our behalf the abandonment programmes relating to the Windermere Installation and the Windermere Pipelines, together the 'Decommissioning Programmes'.

We confirm that we have no objections to the proposals detailed in the Windermere Decommissioning Programmes, dated 18 March 2021, which were submitted by INEOS SNS 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 sincerely

Ad

Nicola MacLeod General Counsel and Company Secretary

For and on behalf of Spirit North Sea Gas Limited



Spirit North Sea Gas Limited 5th Floor IQ Building 15 Justice Mill Lane Aberdeen AB11 6EQ

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Appendix A - Seabed Features Along Pipeline Route (2014 Environmental Survey)



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Appendix B - Burial Profiles of Pipeline and Umbilical

