SCHOONER DECOMMISSIONING PROGRAMMES
FINAL
JULY 2019

09	18.07.19	Updated following company name change and BEIS HRA	Amy MacDonald	Mark Lauder	Paul Barron
08	7.11.18	For Consultation	Mark Lauder	Paul Barron	John Wood
07	7.11.18	For Consultation	Mark Lauder	Paul Barron	John Wood
06	16.11.18	For Review	Mark Lauder	Claire Orr Paul Barron	John Wood
05	5.11.18	For Review	Mark Lauder	Claire Orr Paul Barron	John Wood
04	23.09.18	For Review	Mark Lauder	Claire Orr Paul Barron	John Wood
03	11.07.18	For Review	Mark Lauder	Claire Orr Paul Barron	John Wood
02	12.06.18	For Review	Mark Lauder	Claire Orr	Paul Barron
01	27.04.2018	For Review	Mark Lauder	Claire Orr	Paul Barron
Revision:	**Date:**	**Reason for issue:**	**Prepared by:**	**Verified by:**	**Approved by:**

Title:

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Document number:

Project code	Originator code	Discipline code	Document code	Sequence no.
SCKE	FPROGB	O	TA	0001

A TABLE OF TERMS AND ABBREVIATIONS

Abbreviation	Explanation
API	American Petroleum Institute
BEIS	Department for Business, Energy and Industrial Strategy
CA	Comparative Assessment
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
COP	Cessation of Production
CtL	Consent to Locate
cSAC	Candidate Special Area of Conservation
DECC	Department of Energy and Climate Change (now BEIS)
DNO	DNO North Sea (ROGB) Limited
DP	Decommissioning Programme
DSV	Diving Support Vessel
E	Easting (coordinate)
EA	Environmental Assessment
ES	Environmental Statement
EU	European Union
ESDV	Emergency Shut Down Valve
FLO	Fishing Liaison Officer
HLV	Heavy Lift Vessel
ICC	Installation Control Centre
ICES	International Council for the Exploration of the Sea
HRA	Habitat Regulations Assessment
HSE	Health and Safety Executive
JNCC	Joint Nature Conservation Committee
km	Kilometre
KP	Kilometre Point
LAT	Lowest Astronomical Tide
LSA	Low Specific Activity
m	Metres
MAT	Master Application Template
MBES	Multi-Beam Echo Sounder
MCZ	Marine Conservation Zone
MeOH	Methanol
MMO	Marine Mammal Observer
MPA	Marine Protected Areas

MODU	Mobile Offshore Drilling Unit
N	Northing (coordinate)
NE	North East
NFFO	National Federation of Fishermen's Organisations
NIFPO	Northern Ireland Fish Producers Organisation Ltd
NNE	North North East
NNR	National Nature Reserves
NORM	Naturally Occurring Radioactive Material
N/A	Not Applicable
NUI	Normally Unattended Installation
NW	North West
OESEA2	UK Offshore Strategic Environmental Assessment 2
OGA	Oil & Gas Authority
OIW	Oil in Water
O & G UK	Oil & Gas UK
OPEP	Oil Pollution Emergency Plans
OPRED	Offshore Regulator for Environment and Decommissioning
OSRL	Oil Spill Response Limited
OSPAR	Oslo and Paris Convention
PAM	Passive Acoustic Monitoring
P & A	Plug and Abandonment
PL	Pipe Line
POB	Personnel on Board
PON	Petroleum Operations Notice
QRA	Quantitative Risk Assessment
SAC	Special Area of Conservation
SAT	Subsidiary Application Template
SCAP	Supply Chain Action Plan
SCI	Site of Community Importance
SE	South East
SLV	Sheer Leg Vessels
SNS	Southern North Sea
SFF	Scottish Fishermen's Federation
SSS	Side Scan Sonar
SSSI	Site of Special Scientific Interest
TBC	To Be Confirmed
Te	Tonnes
UK	United Kingdom
UKCS	United Kingdom Continental Shelf
UKDMAP	United Kingdom Digital Marine Atlas
WHPS	Wellhead Protection Structure

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1. EXECUTIVE SUMMARY

1.1 Combined Decommissioning Programmes

This document contains two Decommissioning Programmes (DPs) for two installations (one platform and one subsea well head) and two pipelines served under Section 29 of the Petroleum Act 1998, for the Schooner field in the Southern North Sea (SNS).

1.2 Requirement for Decommissioning Programmes

Installations: In accordance with the Petroleum Act 1998, the section 29 notice holders of the Schooner Installations (see Table 1.2) are applying to the Department for Business, Energy and Industrial Strategy (BEIS) to obtain approval for decommissioning the installations detailed in Section 2.1 and 2.2 of this programme. (See also Section 8 – Partner's Letter of Support).

Pipelines: In accordance with the Petroleum Act 1998 the section 29 notice holders of the Schooner field export pipeline PL1222 and piggyback pipeline PL1223 (see Table 1.4) are applying to BEIS to obtain approval for decommissioning the pipeline detailed in Section 2.3 of this programme. (See also Section 8 – Partner's Letter 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 six year decommissioning project due to begin in 2018.

1.3 Introduction

The Schooner field is located in the Southern Basin of the UKCS, in license block 44/26a, 26.9km from the Murdoch installation, which acts as the Installation Control Centre (ICC) for Schooner, off the Lincolnshire coast. The Schooner platform was installed in 1996 and exports gas through a 16" line to the Murdoch Platform. From Murdoch, the gas flows to shore at the Theddlethorpe Gas Terminal via a trunk line.

The co-ordinates of the Schooner platform are: 54° 03' 35.30" N, 02° 04' 40.10" E. (See Table 2.1).

The Schooner installation is a Normally Unattended Installation (NUI) with maximum personnel on board (POB) of 12 plus 2 flight crew with a temporary overnight shelter.

The owners of the Schooner field have considered several technical and commercial solutions in order to prolong field life as described in the Cessation of Production (COP) document; either as a standalone field or in conjunction with other fields in the area; however, none of them have been economic. The Schooner field partnership is now seeking consent for the Cessation of Production in line with the Theddlethorpe Gas Terminal cessation of operations in 2018.

The Schooner installation estimated weights are; Topsides 2,375 tonnes (this includes the weight of the conductors and their tress 1,100 tonnes), Jacket 2,021 tonnes and Piles 694 tonnes.

The Schooner topside is a conventional carbon steel structure with a sub-cellar deck (+19.5m), cellar deck (+23.5m) mezzanine deck (+27.7m) and a top deck (+32.5m). A helideck is situated

above the top deck (+37.5m). Access between platform levels is provided by ladders and stairways. There are twelve well slots of which eleven have been drilled. The overall base dimensions of the jacket are 20m x 22m.

The Schooner jacket is a conventional 4-leg skirt piled steel structure with a single tubular pile installed through each leg's skirt structure. The jacket has a single vertical face to facilitate approach of a jack-up rig; the three other faces have a batter.

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 Assessment (EA) and in the case of the pipelines and their associated stabilisation features a Comparative Assessment (CA).

1.4 Overview of Installations/Pipelines Being Decommissioned

1.4.1 Installations

Table 1.1: Installations Being Decommissioned			
Field:	Schooner	**Production Type (Oil/Gas/Condensate)**	Gas
Water Depth (m)	71	**UKCS block**	44/26a
Surface Installation			
Number	**Type**	**Topsides Weight (Te)**	**Jacket Weight (Te)**
1	4-leg Skirt Piled Steel Jacket	2,375[2]	2,021[1]
Subsea Installation		**Number of Wells**	
Number	**Type**	**Platform**	**Subsea**
1	Two part WHPS & debris cap structure on subsea well	11 Platform Wells	1 Subsea Well
Drill Cuttings pile		**Distance to median**	**Distance from nearest UK coastline**
Number of Piles	**Total Estimated volume (m^3)**	**km**	**km**
None	0	50	135

[1] Jacket weight excludes weight of the top portion of the piles to be removed with the jacket and weight of marine growth.

[2] Topsides weight includes weight of conductors and trees estimated to be 1,100 tonnes total.

Table 1.2 Installations Section 29 Notice Holders Details		
Section 29 Notice Holder(s)	**Registration Number**	**Equity Interest (%)**
DNO NORTH SEA (ROGB) LIMITED	01852301	60%
TULLOW OIL SK LIMITED	05287330	40%
DNO NORTH SEA (U.K.) LIMITED	04848017	0%
DNO NORTH SEA PLC	04622251	0%
TULLOW OIL PLC	03919249	0%
NEPTUNE E&P UKCS LTD	03386464	0%

Premier Oil E & P UK EU Limited	02907493	0%

1.4.2 Pipelines

Table 1.3: Pipelines Being Decommissioned		
Number of Pipelines	2	(See Table 2.3)

Table 1.4: Pipeline PL1222 Section 29 Notice Holder Details		
Section 29 Notice Holders	**Registration Number**	**Equity Interest (%)**
DNO NORTH SEA (ROGB) LIMITED	01852301	60%
TULLOW OIL SK LIMITED	05287330	40%
DNO NORTH SEA (U.K.) LIMITED	04848017	0%
NEPTUNE E&P UK Ltd	03386464	0%
Premier Oil E&P UK EU Limited	02907493	0%

The above table shows current and exited parties for PL1222 from Schooner SA to and including the spool piece at MD.

Table 1.5: Murdoch Risers PL1222 & PL1223 Section 29 Notice Holder Details		
Section 29 Notice Holders	**Registration Number**	**Equity Interest (%)**
CONOCOPHILLIPS (U.K.) LIMITED	00524868	31.75%
CONOCOPHILLIPS (U.K.) BETA LIMITED	02316577	15%
PREMIER OIL E&P UK LIMITED	02761032	20%
TULLOW OIL SK LIMITED	05287330	17%
NEPTUNE E&P UK Ltd	03386464	16.25%

The above table shows current parties for:-

- PL1222 from but excluding the spool piece at MD to and including Murdoch MD.
- PL1223 from and including Murdoch platform to but excluding the spool piece at Murdoch

Table 1.6: Pipeline PL1223 Section 29 Notice Holder Details		
Section 29 Notice Holders	**Registration Number**	**Equity Interest (%)**
DNO NORTH SEA (ROGB) LIMITED	01852301	60%
TULLOW OIL SK LIMITED	05287330	40%
DNO NORTH SEA (U.K.) LIMITED	04848017	0%

The above table shows current and exited parties for PL1223 from and including the spool piece at Murdoch to and including the Schooner platform.

1.5 Summary of Proposed Decommissioning Programmes

There are currently two options under consideration for the decommissioning of the Schooner platform. The topsides and jacket will be rendered hydrocarbon free. They will then either be:-

- Completely removed and re-used or recycled. (default option) or;
- Remain in situ and be converted to an offshore windfarm support facility. Once this reuse option has come to an end, the first complete removal option will be followed.

Discussions between DNO, the Duty Holder for the platform and an offshore wind farm company, regarding the feasibility of the platform being converted to an offshore windfarm accommodation support facility, are currently at an early stage. A final decision regarding whether the platform is to be reused or removed and disposed of onshore will be made in 2020, when the reuse feasibility studies and any reuse commercial agreements have been completed. Following the feasibility / commercial evaluation process, DNO will inform OPRED of the result and vary the DP to show the final removal option.

Table 1.7: Summary of Decommissioning Programmes		
Selected Options	Reason for Selection	Proposed Decommissioning Solution
1. Topsides		
Topsides to remain in situ and be converted to an offshore windfarm accommodation support facility	Complies with OSPAR requirements. Reuse in situ is the most economic and environmentally friendly post decommissioning option	Remove all hydrocarbons and hydrocarbon related equipment. Convert and remodel topsides for use as an offshore wind farm support facility
Or complete removal and re-use or recycle	Complies with OSPAR requirements and maximizes recycling of materials.	Decontaminate the topside and remove the topside either by HLV or combination of crane vessel and piece small dismantling. Re-use followed by recycle and then landfill will be the prioritised disposal options for the topside.
2. Jacket		
Jacket to remain in situ to support topsides converted to an offshore windfarm accommodation support facility	Complies with OSPAR requirements. Reuse in situ is the most economic and environmentally friendly post decommissioning option	Jacket to remain in situ

Or complete removal and recycling	Leaves clean seabed, removes a potential obstruction to fishing operations and maximizes recycling of materials, to comply with OSPAR requirements.	Jacket legs will be removed and dismantled at an onshore location. Recycle and then landfill will be the prioritised disposal options. Piles will be severed at least -3.0m below the seabed. If any practical difficulties are encountered DNO will consult BEIS.
3. Subsea Installation		
Complete removal and recycling of the two piece wellhead protection structure	Leaves clean seabed, removes a potential obstruction to fishing operations and maximizes recycling of materials, to comply with OSPAR requirements.	The well head and integrated two piece wellhead protection structure will be removed and dismantled at an onshore location. Recycle and then landfill will be the prioritised disposal options.
4. Pipelines, Flowlines & Umbilical		
The 16" export line (PL1222) will be pigged, flushed and left buried in situ. The 3" MeOH line (PL1223) will be flushed and left buried in situ.	Minimal seabed disturbance, lower energy usage, reduced risk to personnel engaged in the activity, pipelines are sufficiently buried and are stable.	The 16" export line along with the 3" MeOH line will be left in situ, with the cut ends re-buried at such a depth to ensure that any remains are unlikely to become uncovered. Surveys indicate the pipelines will remain buried Degradation will occur over a long period within seabed sediment and is not expected to represent a hazard to other users of the sea. Pipeline burial profiles are included in the appendices
5. Wells		
Plug and abandoned to comply with the HSE's "Offshore Installations and Wells (Design and Construction, etc.) Regulations 1996" and in accordance with O & G UK guidance for the Suspension and Abandonment of Wells.	Meets HSE regulatory requirements in accordance with O & G UK and OGA.	A Master Application Template (MAT) and the supporting Subsidiary Application Template (SAT) will be submitted in support of works carried out. A PON 5 will also be submitted to the OGA in support of works carried out.
6. Drill Cuttings		
Drill cuttings were removed to shore when wells were drilled	N/A	N/A
7. Interdependencies		
Whole of jacket can be removed. Small amounts of sediment may have to be displaced to allow cutting of jacket's piles.		

1.6 Field Location Including Field Layout and Adjacent Facilities

Figure 1.1: Schooner location within Southern North Sea

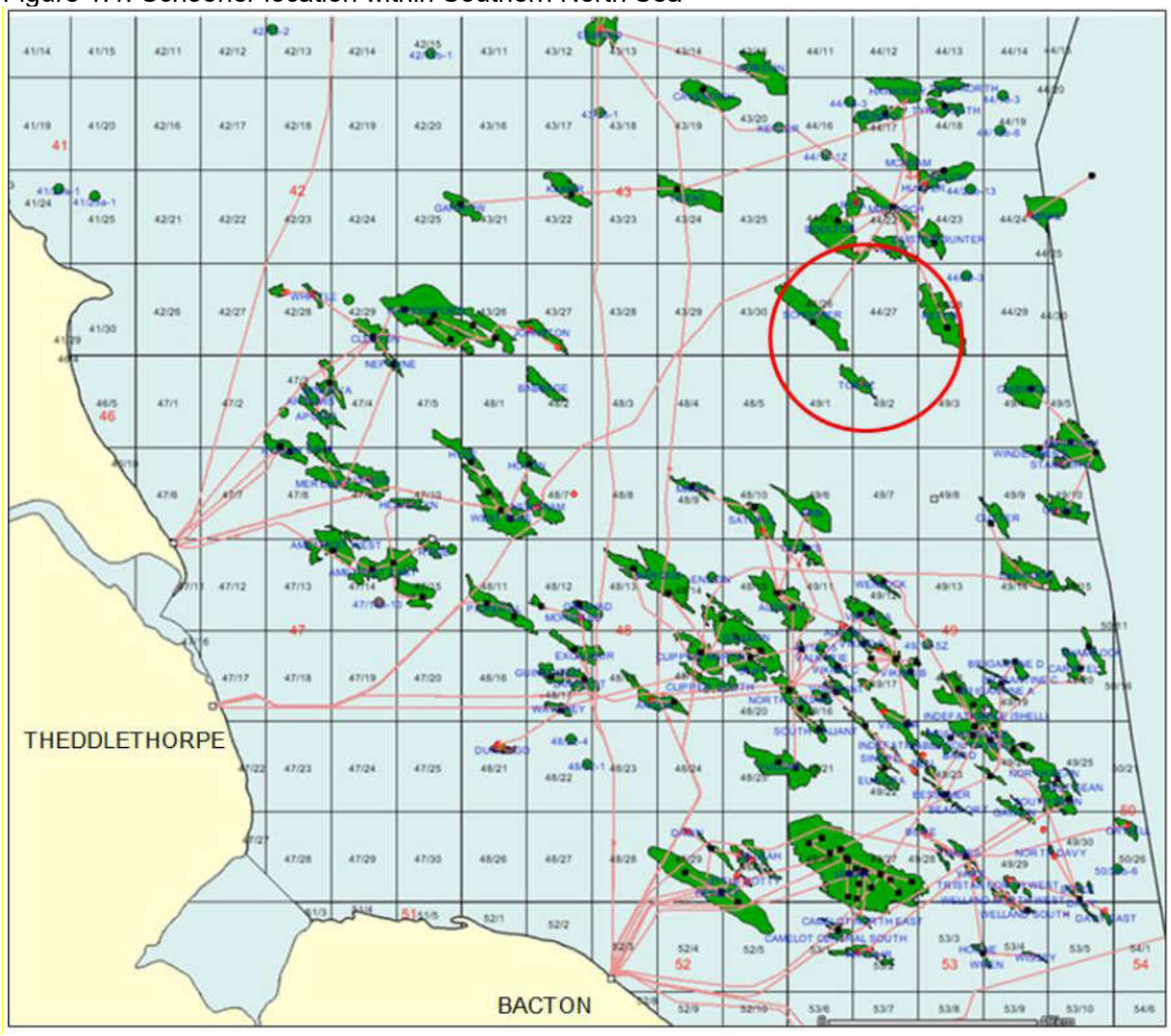


Figure 1.2: Field Layout

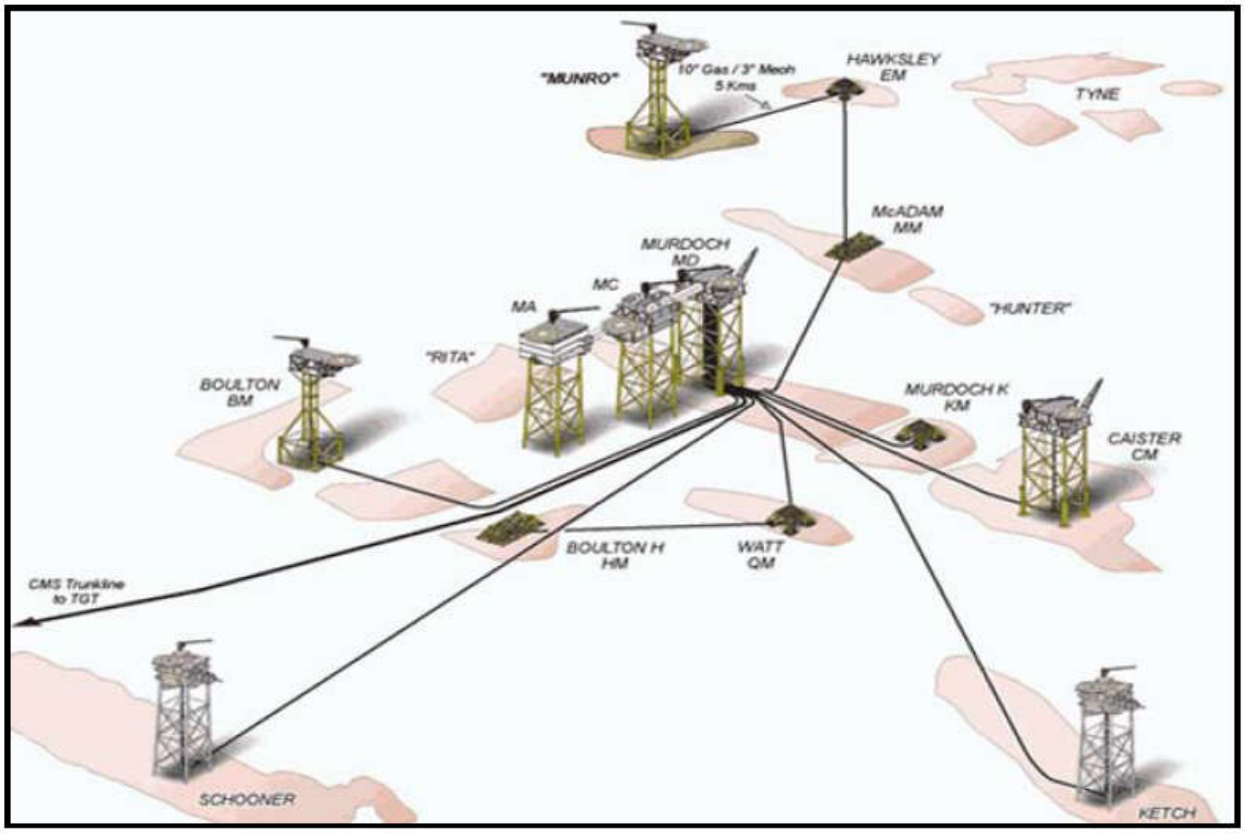


Table 1.8 List of Adjacent Facilities					
Owner	**Name**	**Type**	**Distance/Direction**	**Information**	**Status**
DNO North Sea (ROGB) Limited	Ketch	Platform	Located 26.9 km East of Schooner.	Platform tied back to the Murdoch installation.	Operational
DNO North Sea (ROGB) Limited	Ketch Pipelines	Pipelines	From Ketch platform to Murdoch platform	Gas export and MeOH pipelines, in close proximity to Schooner pipelines at Murdoch	Operational
ConocoPhillips (U.K.) Limited	Murdoch MA	Platform	Located 28.5 km NNE of Schooner.	Installation control centre for Ketch and Schooner. Bridge linked to MC and MD platforms	Operational

ConocoPhillips (U.K.) Limited	Murdoch MC	Platform	Located 28.5 km NNE of Schooner.	Installation control centre for Ketch and Schooner. Bridge linked to MC and	Operational
ConocoPhillips (U.K.) Limited	Murdoch MD	Platform	Located 28.5 km NNE of Schooner.	Installation control centre for Ketch and Schooner. Bridge linked to MC and MD platforms Link for onward	Operational
ConocoPhillips (U.K.) Limited	Murdoch K	Well	Located 22.3 km NNE of Schooner.	Satellite subsea well tied back to the Murdoch installation.	Operational
Ineos UK SNS Limited	Topaz	Well	Located 15.6 km SE of Schooner	Subsea well tied back to Schooner	Operational
Ineos UK SNS Limited	Topaz to Schooner Pipeline	Pipeline	Export pipeline from Topaz to Schooner	Gas export pipeline from Topaz to Schooner	Operational
ConocoPhillips (U.K.) Limited	Boulton	Platform	Located 21.1 km NNE of Schooner.	Platform tied back to the Murdoch	Operational
ConocoPhillips (U.K.) Limited	Caister	Platform	Located 28.6 km NE of Schooner.	Platform tied back to the Murdoch installation.	Non-Operational
ConocoPhillips (U.K.) Limited	McAdam	Well	Located 38.8 km NNE of Schooner.	Satellite subsea well tied back to the Murdoch installation.	Operational
ConocoPhillips (U.K.) Limited	Boulton H	Well	Located 16.8 km NNE of Schooner.	Satellite subsea well tied back to the Murdoch installation	Operational
ConocoPhillips (U.K.) Limited	Watt	Well	Located 22.8 km NE of Schooner.	Satellite subsea well tied back to the Murdoch installation.	Operational
ConocoPhillips (U.K.) Limited	Munro	Platform	Located 44.1 km NNE of Schooner.	Platform tied back to the Murdoch installation via Hawksley	Operational

ConocoPhillips (U.K.) Limited	Hawksley EM	Well	Located 48.2 km NNE of Schooner.	Satellite subsea well tied back to the Murdoch installation	Operational
ConocoPhillips (U.K.) Limited	CMS Trunk line	Pipeline	From Murdoch platform to Theddlethorpe onshore gas terminal	Gas export pipeline in close proximity to Schooner at Murdoch	Operational
ConocoPhillips (U.K.) Limited	Watt to Boulton H Pipeline	Pipeline	From Watt subsea well to Murdoch platform	Gas export pipeline crosses the Schooner pipelines	Operational
ConocoPhillips (U.K.) Limited	Caister to Murdoch Pipeline	Pipeline	From Caister platform to Murdoch	Gas export pipeline crosses under Schooner pipelines adjacent to the Murdoch platform	Operational

Impacts of Decommissioning Proposals
Decommissioning of the Schooner installations and pipelines will have no impact on adjacent facilities. The decommissioning of the Topaz subsea well and pipelines connecting it to the Schooner platform will be coordinated with the decommissioning of the Schooner field.

Figure 1.3: Adjacent Facilities

1.7 Industrial Implications

The project includes the following key activities:

- Well plugging & abandonment
- Pipeline severance
- Removal of topsides and jacket
- Removal of subsea well and integral wellhead protection structure (cap)

The above activities will be planned carefully to recognise synergies and efficiencies, the engineering and planning will be completed to understand the possibilities of potential integration of various activities.

A Supply Chain Action Plan (SCAP) has been produced for these decommissioning programmes in accordance with OGA guidance. The SCAP has been submitted to the OGA for approval. DNO have some pre-existing Master Service agreements with specialist contractors, which were the result of previous tender exercises. These contractors will be asked to quote for services to support the decommissioning activity in the first instance. Other specialist services will be competitively tendered or novated. Suppliers' offers will be assessed along many criterions, among which are: capacity to execute the work safely; the commercial offer and experience of carrying out this type of operation on the UKCS.

Current operational contracts for items such as environmental permitting, potential vessel sharing and logistic support will be implemented to support decommissioning activities.

Decommissioning will be undertaken in four main operational stages as described below:-

- Plugging and abandonment – A MODU / jack-up barge will attend the platform and subsea well to carry out well plugging and abandonment and removal of the NW Schooner subsea well and protection structures.
- Hydrocarbon Free Phase – Pipeline severance, removing all hydrocarbons from topside pipework / vessels and preparing the platform for heavy lift. Pipelines will be flushed before severance. Best endeavours will be undertaken to achieve 30ppm OIW (oil in water). The platform will then be left in coldstack / lighthouse mode for a period of up to 4 years. During lighthouse mode the markings of the platform will be maintained in accordance with the requirements of the regulator / Trinity House using a solar powered navaid with a back-up battery. If the platform is converted to the windfarm support facility the current navigation aids will be maintained. No visits to the platform will be made until the dismantlement contractor arrives.
- Dismantling Phase - The successful tenderer will remove the topsides and jacket.
- Seabed clearance and verification – Overtrawl surveys and a post decommissioning environmental survey will be undertaken following platform removal.

2. DESCRIPTION OF ITEMS TO BE DECOMMISSIONED

2.1 Installation: Surface Facilities

Table 2.1: Surface Facilities Information									
Name	Facility Type	Location		Topsides/Facilities		Jacket (if applicable)			
				Weight (Te)	No of modules	Weight (Te)	Number of Legs	Number of piles	Weight of piles (Te)
Schooner	Fixed steel jacket	WGS84 Decimal Degrees	59.059806° N 2.077806° E	2,375	1	2021	4	4	694
		WGS84 Degrees Minutes Seconds	54° 03’ 35.30” N 02° 04’ 40.10” E						

Note weight of marine growth on the jacket, which is estimated to be 141Te, is not included in the above weights. Topsides weight includes the weight of the conductors and their trees which is estimated to be 1,100 tonnes.

2.2 Installation: Subsea including Stabilisation Features

Table 2.2: Subsea Installations and Stabilisation Features				
Subsea installations and Stabilisation Features	Number	Size/Weight (Te)	Location(s)	Comments/ Status
Wellhead(s)	1	40	54.085111° N 2.02635° E 54° 05’ 06.40” N 02° 01’ 34.86” E	Shut in exploratory well
Protection Frame	1	30	See Coordinates for wellhead	2 part WHPS & debris cap structure on subsea well
Concrete mattresses	0	N/A	N/A	
Grout bags	0	N/A	N/A	
Frond Mats	0	N/A	N/A	
Rock Dump	0	N/A	N/A	
Formwork	0	N/A	N/A	

Note weight of marine growth on the protection frame, which is estimated to be <1%, is not included in the above weights.

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[1]	Product Conveyed[2]	From – To End Points	Burial Status[3]	Pipeline Status[4]	Current Content[5]
Export line	PL1222	16	28.500	Coated Steel	Gas	Schooner to Murdoch	Trenched and buried	Operational	Hydrocarbons
Piggyback line	PL1223	3	28.500	Coated Steel	MeOH	Schooner to Murdoch	Trenched and buried	Operational	MeOH in line

[1]e.g. Concrete; Steel; umbilical; Flexible; Bundle
[2]e.g. Oil; Gas; Water; Chemicals
[3]e.g. Laid on seabed; Trenched; Trenched and Buried; Spanning
[4]e.g. Operational; Out-of-use; Interim pipeline Regime
[5]e.g. Cleaned; Flushed; Hydrocarbons and/or Chemicals in line

Table 2.4: Subsea Pipeline Stabilisation Features				
Stabilisation Feature	Total Number	Weight (Te)	Location(s)	Exposed/Buried/Condition
Mattresses on Caister / Schooner pipelines crossing	8	22	Under PL1222 / 1223 supports pipelines where they cross PL935, in Murdoch platform 500m zone	Exposed / partially buried
Schooner platform mattresses	14	171	On PL1222 / 1223 in Schooner platform 500m zone adjacent to platform	Buried / partially buried
Murdoch Platform mattresses	13	188.5	On PL1222 / 1223 in Murdoch platform 500m zone, adjacent to platform	Buried / partially buried
Grout bags	Approx. 400	Approx. 26	Under PL1222 / 1223 supports pipelines either side of where they cross PL935, in Murdoch platform 500m zone	Exposed / partially buried / buried
Frond Mats	0	N/A	N/A	N/A
Rock Dump	0	N/A	N/A	N/A

2.4 Wells

Table 2.5 Well Information			
Platform Wells	Designation	Status	Category of Well
SA01 - 44/26a-A1	Gas Production	Suspended	PL4-4-3
SA02 - 44/26a-A2	Gas Production	Completed Operating	PL4-4-3
SA03 - 44/26a-A3	Gas Production	Completed Operating	PL4-4-3
SA04 - 44/26a-A4	Gas Production	Completed Operating	PL4-4-3
SA05 - 44/26a-A5	Gas Production	Completed Operating	PL4-4-3
SA06 - 44/26a-A6Y	Gas Production	Completed Operating	PL4-4-3
SA07 - 44/26a-A7	Gas Production	Completed Operating	PL0-4-3
SA08 - 44/26a-A8Z	Gas Production	Completed Operating	PL4-4-3
SA09 - 44/26a-A9Z	Gas Production	Completed Operating	PL4-4-3
SA10 - 44/26a-A10Z	Gas Production	Completed Operating	PL4-4-3
SA11 - 44/26a-A11	Gas Production	Completed Operating	PL4-4-3
Subsea Wells			
NW Schooner - 44/26a-7	Gas Production	Suspended	SS4-4-3

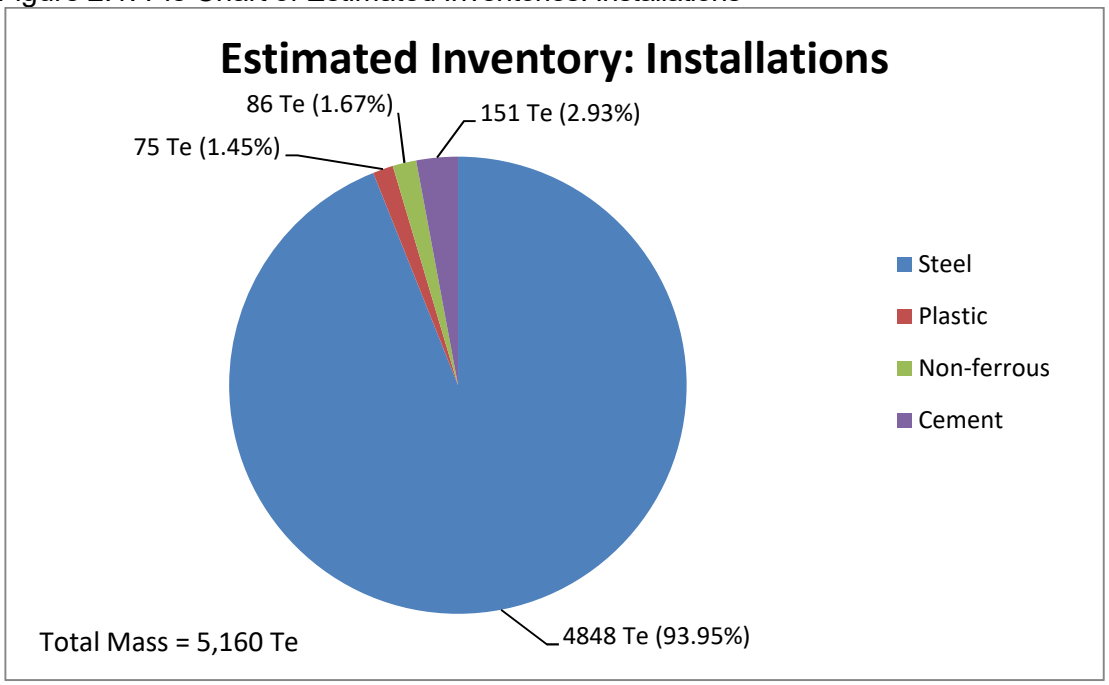
Category of well as per O & G UK Guidelines for the suspension and abandonment of wells, Issue 5, July 2015.

2.5 Drill Cuttings

There is no evidence of drill cuttings associated with the Schooner installation in the area. Drill cuttings that were generated were skipped and shipped to shore when the wells were installed.

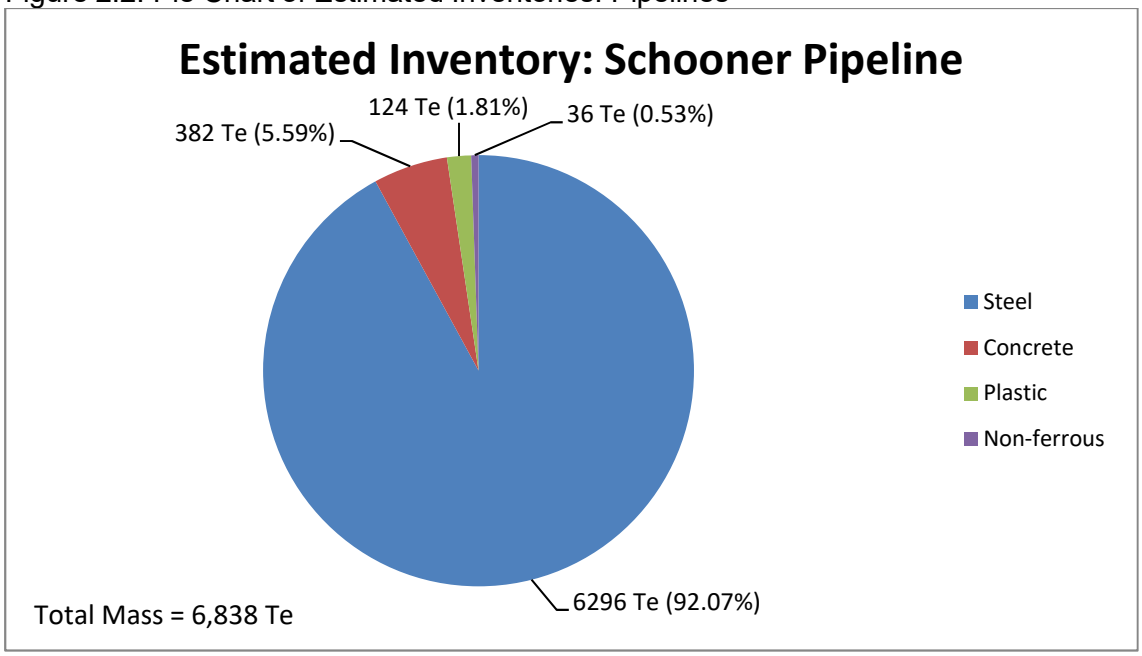
2.6 Inventory Estimates

Figure 2.1: Pie Chart of Estimated Inventories: Installations



Reference the Environmental Assessment for detailed data. NORM / Hazardous Waste - reference the supporting evidence in EA.
Note: The above figures exclude the weight of marine growth on the jacket and subsea wellhead two part protection structure. Marine growth is estimated to be 141Te which is 2.7% of the Total mass presented in the above figure.

Figure 2.2: Pie Chart of Estimated Inventories: Pipelines



Reference the Environmental Assessment for detailed data. NORM / Hazardous Waste - reference the supporting evidence in EA.
Note: The above figures exclude the weight of marine growth on those end sections of pipelines/stabilisation materials that are to be recovered. Marine growth is estimated to be <1% of the total mass presented in the above figure.

3. REMOVAL AND DISPOSAL METHODS

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

DNO assessed options for extending the producing life of the platform, utilising it as an infrastructure hub for third party tie backs and enhanced recovery programmes, but none proved commercially viable.

DNO then went on to assess options for the relocation of the platform as a producing asset, but concluded that due to its ageing process technology and the high cost of maintaining the fabric and structural integrity of the platform, no technically viable re-use option was available.

Liaison between DNO and an offshore wind farm company regarding the feasibility of the platform being converted to an offshore windfarm support facility are currently ongoing. This option and the default option of removing the platform to shore for dismantlement and recycling will continue to be developed. A final decision regarding whether the platform is to be re-used or removed and disposed of onshore will be made when the re-use feasibility studies and any reuse commercial agreements have been completed. It should be noted that the pipelines require flushing and disconnecting before any re-use option is to be commenced. Best endeavours will be taken to achieve 30ppm OIW (oil in water).

If the reuse option is selected, the well P & A (including the removal of the platform conductors) and rendering of the topsides hydrocarbon free will still be undertaken. When, at some point in the future, the reuse facility is no longer required, it will be decommissioned under the appropriate regime.

DNO have reviewed, and will continue to review, the platform's equipment inventories to assess the potential for adding to their existing asset portfolio spares inventory or for resale to the open market.

In the event that the platform removal option is selected, recovered material will be landed ashore for disposal by a contractor. It is not possible to forecast the wider reuse market with any accuracy or confidence this far forward. DNO will continue to track reuse market trends in order to seize reuse opportunities at the appropriate time.

The location where removed materials will be disposed of is not known at this early stage. They are generally expected to be recycled / disposed of in the UK. A final decision on the location of onshore dismantlement, disposal and recycling will be made following a commercial tendering process. If the location selected is abroad, a transfrontier shipment of waste permit will be applied for and put in place with the EA and the relevant foreign environmental / waste authority.

3.1 Topsides

3.1.1 Topsides Decommissioning Overview

Topsides Description: The Schooner installation is a Normally Unattended Installation (NUI) in block 44/26a in the Southern North Sea.

The Schooner topside is a conventional carbon steel structure with a sub-cellar deck (+19.5m), a cellar deck (+23.5m), a mezzanine deck (+27.7m) and top deck (+32.5m). A helideck is situated

above the top deck (+37.5m). Access between platform levels is provided by ladders and stairways. There are twelve well slots, eleven of which are drilled.

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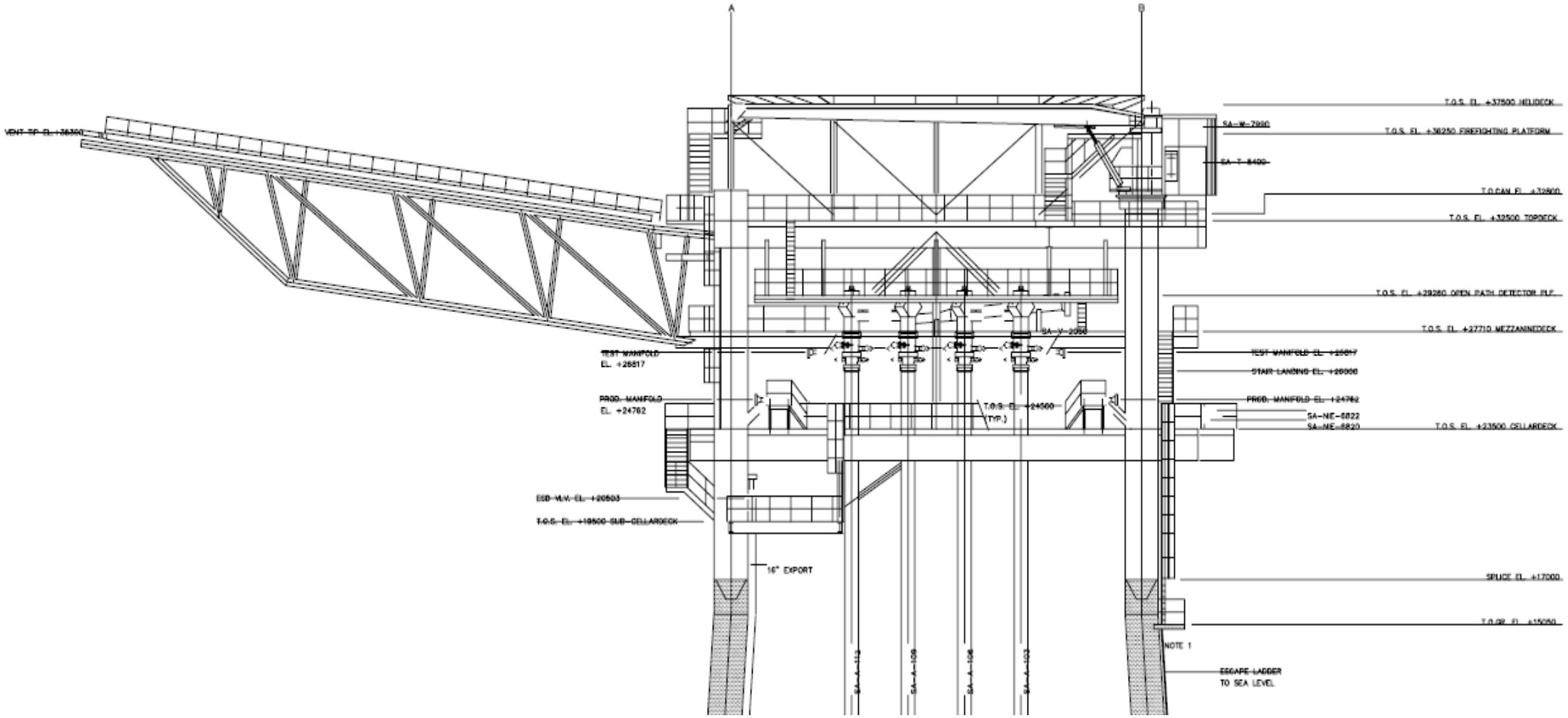
Figure 3.1: Diagram of Schooner topside



Preparation/Cleaning:

Table 3.1: Cleaning of Topsides for Removal		
Waste Type	**Composition of Waste**	**Disposal Route**
On-board hydrocarbons	Process fluids, fuels and lubricants	Flushed and drained to tote tanks for transport and appropriate disposal onshore
Other hazardous materials	NORM, and radioactive material, instruments containing heavy metals, batteries	Transported ashore for re-use/disposal by appropriate methods
Original paint coating	Lead-based paints	May give off toxic fumes/dust if flame-cutting or grinding/blasting is used so appropriate safety measures will be taken
Asbestos and ceramic fibre	Not expected	Appropriate control and management will be enforced. Transported ashore for disposal by appropriate methods

Removal Methods:

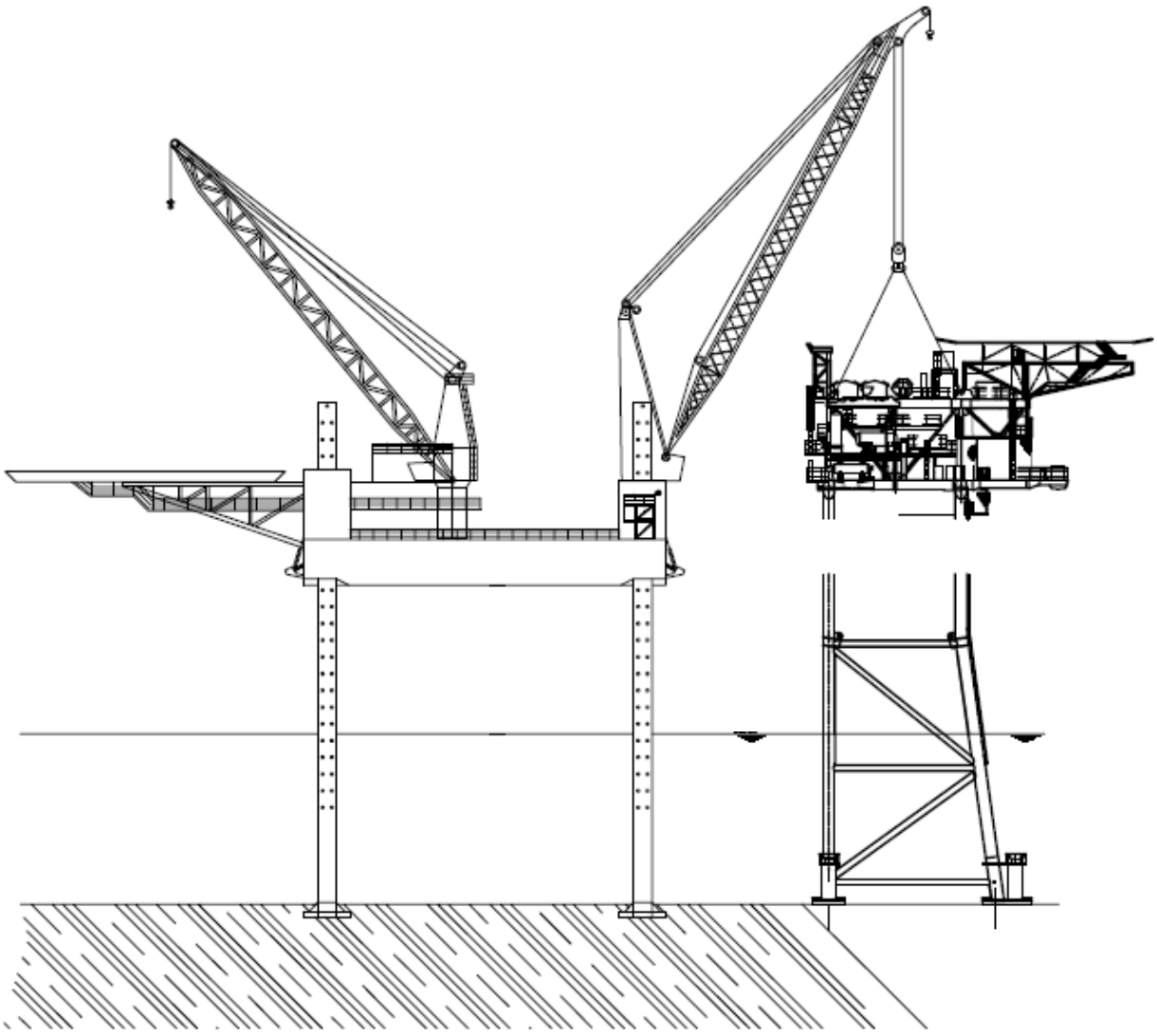
Table 3.2: Topsides Removal Methods	
1) HLV (semi-submersible crane vessel) ☑ 2) Mono-hull crane vessel ☑ 3) SLV ☑ 4) Piece small ☑ 5) Other ☐	
Method	Description
Single lift removal by SLV/HLV	Removal of topsides as complete unit and transportation to shore for re-use of selected equipment, recycling, break up and/or disposal. Single lift dependant on vessel availability.
Modular removal and re-use/recycle by HLV	Removal of parts/modules of topsides for transportation and reuse in alternate location(s) and/or recycling/disposal
Offshore removal 'piece small' for onshore reuse/disposal	Removal of topsides by breaking up offshore and transporting to shore using work barge. Items will then be sorted for re-use, recycling or disposal.
Proposed removal method and disposal route	**Topsides will be removed to shore and disposed of at a selected disposal yard to comply with relevant legislation and company policy. A final decision on the decommissioning method will be made following a commercial tendering process. It is likely that optimum safety/cost topsides removal solution will be single lift removal by SLV/HLV. The removal method illustrated below is based on this option – the final removal solution and methodologies will follow a detailed engineering study.**

Note: Preliminary studies have indicated that the following methods are likely to be used.

Schooner Topsides Removal

It is anticipated that the Schooner platform removal method will be a reverse of the installation method. A single lift reusing the padeyes. See Figure 3.2.

Figure 3.2: Anticipated Topsides Removal



3.2 Jacket

3.2.1 Jacket Decommissioning Overview

The jacket will be removed to shore for cleaning and disposal. The pile cuts will be made below the seabed level at such a depth to ensure that any remains are unlikely to become uncovered. Best endeavours will be made to achieve a minimum of 3m of burial of the remaining piles, measured from mean seabed level The means of cutting could be diamond wire, oxyacetylene, high pressure abrasive water jet cutting or laser cutting. Figure 3.3 illustrates one of the preferred removal options although the exact cutting points and removal method are subject to detailed engineering and commercial tendering. 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.

The approximate lift weight of the jacket is 2194 Te (jacket weight 2021 Te plus approx. 173 Te of piles) plus approximately 141Te of marine growth.

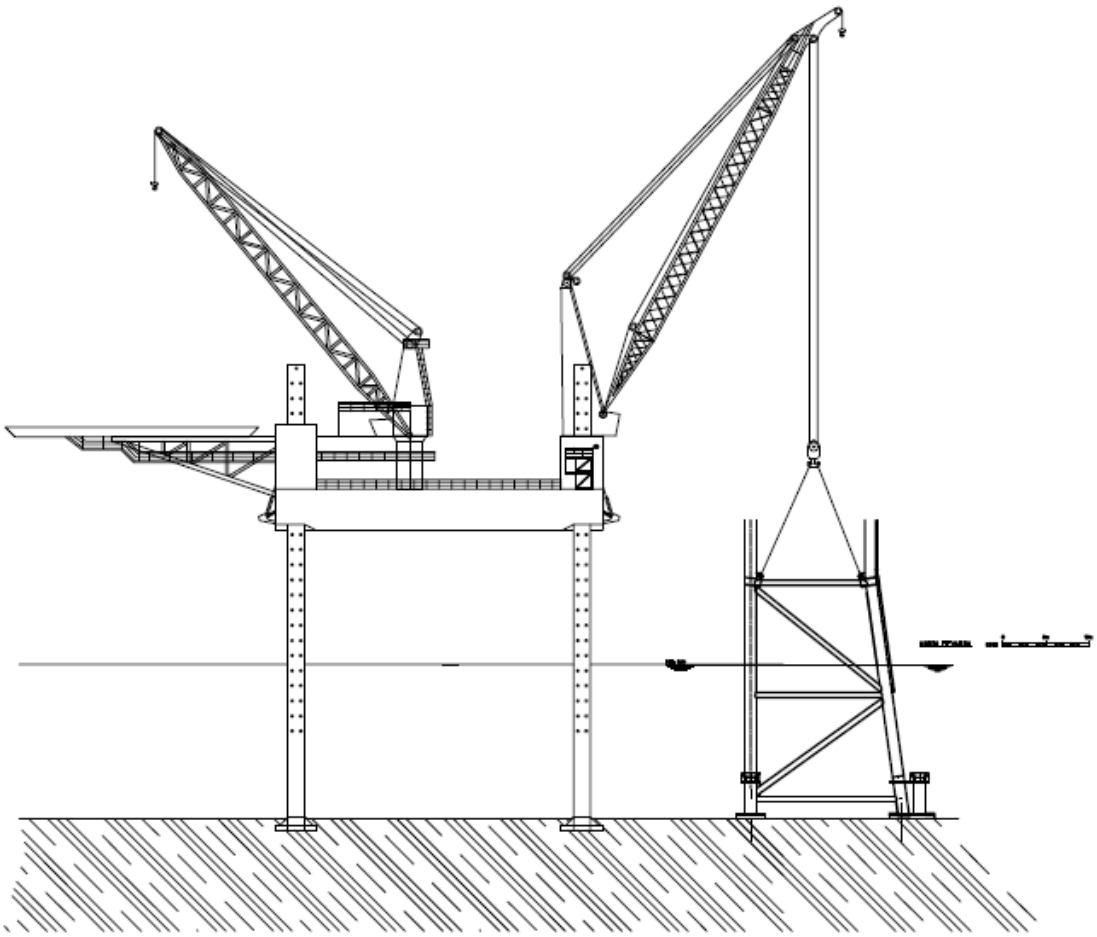
3.2.2 Jacket Removal Methods

Table 3.3: Jacket Decommissioning Methods	
1) HLV (semi-submersible crane vessel) ☑ 2) Monohull crane vessel ☑ 3) SLV ☑ 4) Piece small ☐ 5) Other – (describe briefly) ☑	
Method	**Description**
Onshore disposal using HLV, Monohull crane vessel or SLV	Removal of the jacket in a single (or two pieces) lift and transport ashore for break up and recycling of steel.
Onshore disposal using 'piece small'	Remove jacket in several pieces using attendant work barge and transport to shore yard.
Other	A pull on barge removal method based on a submersible barge which is submerged on one end to the seabed. The jacket will then be pulled on to the barge/vessel by winch.
Proposed removal method and disposal route	**The jacket will be removed to shore and disposed of at a selected disposal yard to comply with relevant legislation, company policy and a commercial tendering process. The removal method illustrated in the following figure is one of the preferred options. The exact cutting points and removal methodology will follow a detailed engineering study.**

Schooner Jacket Removal

It is anticipated that the Schooner jacket removal method will be a reverse of the installation method. A single lift reusing the padeyes see Figure 3.3.

Figure 3.3: Anticipated Jacket Removal Method



3.3 Subsea Installations and Stabilisation Features

There is one subsea installation. NW Schooner is an exploratory well and integral protection structure that never produced and was shut in shortly after being drilled.

Table 3.4: Subsea Installation and Stabilisation Feature Decommissioning

Subsea installations and stabilisation features	Number	Option	Disposal Route (if applicable)
Wellhead	1	Full recovery as part of MODU campaign to P & A well	Transported ashore for re-use/disposal by appropriate methods
2 part WHPS	1	Full recovery as part of MODU campaign to P & A well	Transported ashore for re-use/disposal by appropriate methods
Concrete mattresses		N/A	N/A
Grout bags		N/A	N/A
Formwork		N/A	N/A
Frond Mats		N/A	N/A
Rock Dump		N/A	N/A
Other		N/A	N/A

The WHPS, debris cap and Xmas tree are shown in figure 3.4, below. The WHPS sits on the tree and the debris cap sits on top of the WHPS.

Figure 3.4: Two part WHPS and debris cap structure on subsea well - debris cap (left) and WHPS on wellhead Xmas tree (right)

3.4 Pipelines

Decommissioning Options:

Table 3.5: Pipeline or Pipeline Groups Decommissioning Options			
Pipeline or Group (as per PWA)	**Condition of the line / group (Surface laid /Trenched / Buried / Spanning)**	**Whole or part of pipeline / group**	**Decommissioning Options* considered**
PL1222	Trenched, buried	Whole pipeline	1,2,3,4,5,6,7,8
PL1223	Trenched, buried	Whole pipeline	1,2,3,4,5,6,7,8

*Key to Options

1. Completely remove the lines by reverse installation (S or J lay);
2. Completely remove the lines cut and lift;
3. Partially remove the lines by reverse installation (S or J lay);
4. Partially remove by cut and lift;
5. Bury by trenching and backfilling with natural deposits;
6. Bury by rock dump; in situ – cover cut ends with gravel / grout bags;
7. Leave in situ – cover cut ends with gravel / grout bags;
8. Leave in situ – cover cut ends with existing mattresses.

Comparative Assessment Method:

The Comparative Assessment process involved a multi-disciplinary team participating in a Comparative Assessment workshop and a preliminary Quantitative Risk Assessment (QRA) of the available decommissioning options. At the Comparative Assessment workshop, each decommissioning option has been scored against a set of assessment criteria using categories derived from BEIS guidance: 1. Safety; 2. Environmental; 3. Technical; 4. Societal; 5. Economic. The Comparative Assessment is referenced in Section 7.

The pipelines are trenched and buried. The mattresses are partially buried to varying degrees.

The Comparative Assessment concluded that only the section of pipelines and mattresses that form the crossing over the Caister pipeline adjacent to the Murdoch platform (the final 80m of the pipelines before the platform) and the section of pipelines and mattresses adjacent to the Schooner platform (the final 90m before the platform) will be removed. The pipelines will be left in situ due to the disturbance to the sea-bed, the risks to the personnel carrying out the work and the difficulty and cost to remove the pipelines. The pipelines will be monitored as agreed with BEIS. It should be noted that 2.287km of the pipelines at the Murdoch end are in the Dogger Bank SAC and 217m of the pipelines are in the cSAC. The Murdoch pipeline disconnects and crossing of the Caister pipeline are in the protected sites.

Outcomes of Comparative Assessment:

Table 3.6: Outcomes of Comparative Assessment

Pipeline or Group	Recommended Option*	Justification
PL1222	Option 7	Line is significantly buried and will be safe to leave in situ (7). End sections (including the Caister pipeline crossing and associated mattresses) will be removed and covered as required. Monitoring will be performed to confirm pipeline remains stable and buried at a frequency to be agreed with BEIS.
PL1223	Option 7	Line is significantly buried and will be safe to leave in situ (7). End sections (including the Caister pipeline crossing and associated mattresses) will be removed and covered as required. Monitoring will be performed to confirm pipeline remains stable and buried at a frequency to be agreed with BEIS.

3.5 Pipeline Stabilisation Features

Table 3.7: Pipeline Stabilisation Features

Stabilisation feature(s)	Number	Option	Disposal Route (if applicable)
Concrete Mattresses (Murdoch approach and Caister Crossing)	21	1	Transported ashore for reuse/disposal by appropriate methods

Concrete Mattresses (Schooner approach)	14	1	Transported ashore for reuse/disposal by appropriate methods
Grout bags	Approx. 400 (Caister pipeline crossing)	1	Transported ashore for re-use/disposal by appropriate methods
Formwork	0	N/A	N/A.
Frond Mats	0	N/A	N/A
Rock Dump	0	N/A	N/A

*Key to Options

1) Completely remove the mattresses;
2) Partially remove the mattresses;
3) Bury by trenching and backfilling with natural deposits;
4) Bury by rock / gravel dump;
5) Leave in situ. (subject to a survey to determine over trawlability).

If problems are encountered when mattresses are being removed (for example mattress ropes failing during lifting), BEIS will be consulted and an alternative approach agreed before any other options are executed.

3.6 Wells

Table 3.8: Well Plug and Abandonment
The wells listed in Section 2.4 (Table 2.5) will be plugged and abandoned in line with considerations raised in OGUK Well Abandonment guidelines and relevant DNO BMS Standards. A PON 5 will be submitted. A Master Application Template (MAT) and the supporting Subsidiary Application Template (SAT) will be submitted in support of any work to be carried out.

3.7 Drill Cuttings

Table 3.9: Drill Cuttings Decommissioning Options			
How many drill cutting piles are present?	None, removed to shore when wells were drilled		
Tick Options examined			
Remove and re-inject	Leave in place	Cover	
Relocate on seabed	Remove and treated onshore √	Remove and treat offshore	
Other			
Review of Pile Characteristics		Pile 1	Pile 2
How has the cutting piles been screened (desktop exercise)		N/A	N/A
Dates of Sampling		N/A	N/A
Sampling to be included in pre-decommissioning survey		N/A	N/A
Does it fall below both OSPAR thresholds?		Y	Y
Will the drill cuttings pile have to be displaced in order to remove the jacket		N	N
What quantity (m^3) will have to be displaced/removed		$0m^3$	$0m^3$

Will the drill cuttings pile have to be removed in order to remove any pipelines	N	N
What quantity (m^3) will have to be displaced/removed	$0m^3$	$0m^3$
Have you carried out a Comparative Assessment of options for the Cuttings Pile?	N	N

Comparative Assessment Method
A comparative assessment was not carried out because drill cuttings were removed to shore when the wells were drilled and no drill cuttings piles were identified during the pre-decommissioning environmental survey.

3.8 Waste Streams

Table 3.10: Waste Stream Management Methods	
Waste Stream	**Removal and Disposal method**
Bulk liquids	Removed from vessels and discharged to tote tanks for transport and appropriate disposal onshore. Vessels, pipework and sumps will be drained prior to removal to shore and shipped in accordance with maritime transportation guidelines. Package filtration equipment for disposal of liquids to sea may be utilised and relevant permits will be sought for such operations.
Marine growth	Removed offshore /onshore. Disposed of according to guidelines.
NORM/LSA Scale	Tests for NORM/LSA will occur offshore and onshore. NORM will be dealt / disposed with according to guidelines and company policies under the appropriate permit.
Asbestos	Tests for asbestos will occur offshore and will be dealt/disposed with according to guidelines and company policies. Schooner topside is not expected to have any asbestos.
Other hazardous wastes	The inventory of hazardous materials will show how DNO will manage risks and prevent spills offshore. Detailed survey for other hazardous wastes will be undertaken offshore and will be dealt / disposed with according to guidelines and company policies.
Onshore Dismantling sites	Appropriate licensed sites will be selected. The chosen facility must demonstrate proven disposal track record and waste stream management throughout the deconstruction process and demonstrate their ability to deliver innovative recycling options.

Table 3.11 Inventory Disposition			
	Total Inventory Tonnage	**Planned tonnage to shore**	**Planned tonnage left in situ**
Installations	5,160	4,639	521 (piles)
Pipelines	6,838	66	6,772

Note weights exclude weight of marine growth. Installations total tonnage and planned tonnage to shore includes the weights of the conductors and trees.

Table 3.12 Proposed Fate of Schooner Infrastructure Materials		
Infrastructure	**Recommended decommissioning options**	**Destination**
Jacket	Complete removal (one or two lifts dependant on the vessel selected by a commercial tendering process) piles under 3.0m below seabed level to remain	100% Recycling
Topside	Full removal * (single lift)	>98% Reuse or Recycle <2%Landfill / Incineration
Export Pipeline and MeOH Pipeline	Decommission in situ and remove pipeline ends by cut and lift	>99% Decommission in situ <1% Recycling
Pipelines' Stabilisation Material	Stabilisation materials decommissioned in situ or removed	95% Reuse or Recycle 5% Decommission in situ

*Dependent on contract awarded

4 ENVIRONMENTAL APPRAISAL

4.1 Environmental Sensitivities (Summary)

Table 4.1: Environmental Sensitivities	
Environmental Receptor	**Main Features**
Conservation Interests	The northernmost part of the project area, where the export pipelines join the Murdoch Platform, enters the Dogger Bank SAC and MPA which is located approximately 24.3 kilometres northwest of the Ketch NUI. The Dogger Bank SAC/SCI and MPA is designated due to the vast expanse of Annex I shallow sandbank habitat in less than 20 metres water depth (JNCC, 2015a). All of the 90m of both pipelines that are scheduled for removal (with mattresses) at the Murdoch end are within the Dogger Bank SAC and the SNS cSAC. The Southern North Sea cSAC and MPA, located approximately 12 kilometres north of the Schooner NUI, falls within the decommissioning project area due to the presence of the export pipelines at the Murdoch platform end which just encroach on the site. The Southern North Sea cSAC and MPA has been identified as an area of importance for the Annex II species, harbour porpoise and has been put forward to the EU for formal designation. Furthermore, the recommended conservation zone Markham's Triangle is located 24 kilometres southwest of the Ketch NUI and the North Norfolk Sandbanks and Saturn Reef SAC/SCI are located approximately 42 kilometres south-west of the Ketch NUI. The North Norfolk Sandbanks and Saturn Reef SAC/SCI and MPA is designated dues to the presence of Annex I shallow sandbank habitat, typical marine fauna which inhabit sandbanks are; polychaete worms, amphipods and small clams which burrow within the sediment and hermit crabs, seastar, brittlestars and flatfish (plaice and sole) on the seabed (JNCC, 2015a) and also due to the presence of the Saturn Reef (also an Annex I habitat). A large number of nationally designated sites are also present along this section of the coast and include SSSIs selected for geological interest or presence of special plants, terrestrial invertebrates, breeding seabirds or breeding waterfowl and National Nature Reserves (NNRs) which contain examples of some of the most important ecosystems in Britain, including sand dune, shingle, saltmarsh, mudflat and wet grassland.

Table 4.1: Environmental Sensitivities – cont'd	
Environmental Receptor	**Main Features**
Benthic Communities	Colonial epifauna are inclusive of encrusting epifauna which are generally recorded in high counts or as presence/absence. For the Schooner survey they were only represented by the cnidaria species, *Clytia hemisphaerica* and *Anthoathecata*, and the bryozoan *Triticella flava*. For the Ketch EBS they include three anemones, Actiniaria, *Cerianthus lloydii* and Edwardsiidae. Colonial epifauna were only represented by the cnidarian species, *Clytia hemisphaerica*, Anthoathecata, Astrohiza, and *Lovenella clausa*. Annelids, crustaceans and molluscs were found to dominate the infauna at almost all of the Ketch and Schooner survey stations. Three main habitats were identified during the Ketch and Schooner surveys: Fine-medium sand, muddy sand, and rippled sand with sporadic shell and pebble fragments, Observed fauna within the Ketch and Schooner muddy sand habitats included: Annelida (*Ophiodromus flexuosus* and *Aphrodita acueleata*), Chordata (*Callionymus lyra and* Gadiformes sp.), and Arthropoda (Paguridae sp.). Associated fauna within the areas of mixed sediment included: Sand eels (Ammodytidae sp.), Echinodermata (*Astropecten irregularis*), Arthropoda (*Liocarcinus depurator*), Annelida (Serpulidae sp.) and Cnidaria (*Alcyonium digitatum*) (Only present in the Schooner survey area).
Fish and Fisheries	Fish species known to use the project area for spawning are: mackerel, plaice, herring, sole, sprat, *Nephrops*, whiting, cod and sandeel, in addition the following species use the site as a nursery: mackerel, herring, sprat, *Nephrops*, Whiting, Spurdog, Tope, Cod, Blue Whiting, Ling, european hake, anglerfish and sandeel. In a survey conducted by CEFAS, twenty-six species of Elasmobranch were identified and recorded throughout the North Sea and surrounding waters. Of these, only the spurdog (*Squalus acanthias*), tope shark (*Galeorhinus galeus*), starry smooth hound (*Mustelus asterias*), and starry ray (*Amblyraja radiata*) may be present within the general vicinity of the Schooner and Ketch NUIs (*Ellis et al., 2004*). Commercial fishing activity within the vicinity of the project area is generally low with peak moderate activity in August and September; however, data was undisclosed from December to April (*Scottish Government, 2016*). The project area lies with ICES rectangle 37F2. Landings are predominantly demersal species making up 77.17 per cent of catches, followed by shellfish (22.79 per cent) and pelagic making up approximately 0.05 per cent of catches (*Scottish Government,* 2016). The most common gear types observed in the region were trawls.

Table 4.1: Environmental Sensitivities – cont'd	
Environmental Receptor	**Main Features**
Marine Mammals	Cetaceans previously sighted within the project area which include which include Atlantic white-sided dolphin (*Lagenorhynchus acutus*) (ICUN conservation status: Least Concern), harbour porpoise (*Phocoena phocoena*) (ICUN conservation status: Least Concern) and minke whale (*Balaenoptera acutorostrata*) (ICUN conservation status: Least Concern).. Pinnipeds such as Grey seal (*Halichoerus grypus*) and harbour seals (*Phoca vitulina*) are both resident in UK waters and are listed under Annex II of the EU Habitats Directive. Harbour seals are not normally found foraging more than 60 kilometres from shore (*DECC OESEA2, 2011*). Grey seal pupping generally occurs in October, with moulting occurring between February and March (*DECC OESEA2, 2011*). During this period, grey seals will be found either onshore or on foraging trips in the vicinity of their haul-out site. The project area is located 130 kilometres from the coast so it is highly unlikely that these species may be encountered in the vicinity of the decommissioning operations.
Seabirds	Seabird distribution and abundance in the SNS varies throughout the year, with offshore areas in general, containing peak numbers of birds following the breeding season and through winter (DECC, 2016). Only a small number of the seabird species breeding in the UK are not listed in Mitchell *et al*. (2004) as breeding within Regional Sea 2 where the project is located (for example Manx Shearwater, Storm Petrel, Leach's Storm Petrel, Arctic Skua, Great Skua and Black Guillemot). The North Norfolk Coast SPA site, located approximately 160 km south west from the project area qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive during the breeding season: for the presence of Common Tern (*Sterna hirundo*), Little Tern (*Sterna albifrons*), Mediterranean Gull (*Larus melanocephalus*), Roseate Tern (*Sterna dougallii*) and Sandwich Tern (*Sterna sandvicensis*) (JNCC, 2001). The most common species of seabird found in the area include: Herring gull (*Larus argentatus*), Great black-backed gull (*Larus marinus*), Sabine's gull (*Xema sabini*), Kittiwake (*Rissa tridactyla*), Guillemot (*Uria aalge*), Fulmar (*Fulmarus glacialis*) and Gannet (*Morus bassanus*) (UKDMAP, 1998). Seabird vulnerability to oil is considered extremely high during July for all Blocks and during December for Block 44/21 and Block 44/26 within the project area (Certain *et al.,* 2015).

Table 4.1: Environmental Sensitivities – cont'd	
Environmental Receptor	**Main Features**
Onshore industries	Major communities within this include Hull (a commercial and passenger port, with ro-ro ferry services to Belgium and the Netherlands) and Grimsby (the main port of the Humber, particularly important for commercial fishing landings). Data shows that shipping densities in this area are moderate, with highest activity in the summer months (DECC 2009 and Oil and Gas Authority 2016). Popular seaside resorts along this stretch of the coast include Whitby, Filey and Scarborough which are all popular for their bathing beaches (DECC 2009). The tourism industry is not likely to be impacted by normal offshore oil and gas operations but leisure activities could be threatened in the event of a major accidental spill approaching the coast, however this is unlikely given the coast is approximately 130 kilometers from the project area.
Other Users of the Sea	Oil and gas activity within the project area is moderate compared to other blocks to the north east. The project area contains the Ketch gas fields, and the pipeline from Topaz to Schooner, Blocks 44/26, 44/27 and 44/28 all overlap with a military exercise area (*Oil & Gas Authority, 2017*). As a result, these blocks are considered to be an area of concern to the Ministry of Defence (*Oil & Gas Authority, 2017*). There are currently no operational wind farm sites located in the vicinity of the project area. However, seven Round 3 wind farms were proposed, two are currently at the pre-planning application stage (Hornsea Project three and Hornsea Project four) and five (Hornsea Project Two, Creyke Beck A and B (Dogger Bank), Teeside A and B (Dogger Bank)) are now consented. The Hornsea Project Two and the wind farms located on the Dogger Bank are located less than 10 kilometers south and 25 kilometers north of the project area respectively (*The Crown Estate, 2017*). There are three charted wrecks in the project area, the closest lying approximately 1 kilometre to the northwest of the Schooner NUI (Hydrographer of the Navy, 2008).
Atmosphere	The local atmosphere will be influenced by atmospheric emissions from combustion activities associated with vessel movements and deconstruct activities during decommissioning operations. It is expected that these emissions will be localised to the project area, will rapidly disperse to non-detectable levels and have negligible on the health of personnel aboard vessels.

4.2 Potential Environmental Impacts and their Management

The Environmental Appraisal provides a review of the key features of the environment in the proposed Schooner Decommissioning Programmes Area in block 44/26a in the southern North Sea (SNS).

A key consideration when planning and finalising the decommissioning of the Schooner installation and pipelines is a clear understanding of the surrounding sensitive environmental receptors. In order to understand the potential for the project activities to interact with these environmental receptors, so that appropriate controls can be adopted to mitigate negative impacts, an environmental appraisal has been undertaken which involved the risk assessment of interactions between the project and the environment.

We have noted the recent BEIS letter regarding the Habitats Regulations Assessment (HRA) for decommissioning in and immediately around the Dogger Bank SAC. This will be addressed in the final EA.

Environmental Impact Appraisal Summary:

Table 4.2 Environmental Impact Appraisal Summary		
Activity	**Main Impacts**	**Management**
Topside Removal	Atmospheric emissions	• All engines, generators on the vessels will be well maintained and correctly operated to ensure that they are working efficiently to minimise energy use and gaseous emissions. • Vessels will be audited as part of selection and pre-mobilisation. • Vessel operations will be minimised where practical, with work programmes planned to optimise vessel time in the field.
	Underwater noise	• Management measures will be put in place to reduce the impact on sensitive receptors including Annex II and Annex IV marine mammals, fish and impacts on harbour porpoise. This includes use of marine mammal observers for example (see JNCC guidance).
	Liquid waste / discharge	• Decommissioning of topsides planned to avoid / minimise liquid waste discharges. • Subsea pipelines flushed and cleaned to 30ppm (OIW) prior to them being cut subsea. • The WIA application in PETS to document the previous annuli contents which may be discharged during abandonment. • Liquid waste discharges subject to Chemical Permit approval process. • Liquid waste / marine discharges involving reservoir hydrocarbons will be subject to the requirements of the OPPC.
	Solid waste	• Materials are reused and recycled where possible. • Compliance with UK waste legislation and duty of care. • Use designated licensed sites only. • Permits and traceable chain of custody for waste management, shipment, treatment and onshore disposal. • Waste Management Plan will be implemented. • Overview to be provided in accordance with section 5.4.1.1 of the EA. There will be no stabilisation deposits.
	Other users of the sea	• Cutting and lifting operations will occur within the Schooner platform 500 m exclusion zone. • The Ketch pipelines including their cut ends will be naturally buried, if the ends do not remain buried grout bags will be used as a contingency. • A vessel corridor approach will be used. UK Hydrographical Office and Kingfisher will be informed of all activities. • A post decommissioning debris survey will be conducted.

Table 4.2 Environmental Impact Appraisal Summary – cont'd		
Activity	**Main Impacts**	**Management**
		• DNO have UKCS membership with Oil Spill Response (OSRL) for Tier 2/3 incidents.
	Dropped object(s)	• A post decommissioning debris survey will be conducted and debris recovered in line with BEIS regulations. • Adhere to lifting and handling procedures and use of certified equipment for lifting. • Retrieve items of debris from the seabed after operations, in compliance with relevant legislation.
Jacket & Subsea Installations Removal	Atmospheric emissions	• All engines, generators on the vessels will be well maintained and correctly operated to ensure that they are working efficiently to minimise energy use and gaseous emissions. • Vessels will be audited as part of selection and pre-mobilisation. • Vessel operations will be minimised where practical, with work programmes planned to optimise vessel time in the field.
	Underwater noise	• The use of explosives is a contingency option if both internal and external cutting of the piles fails. The measures presented in the JNCC guidelines for minimising the risk of injury to marine mammals from using explosives including MMOs, a PAM system, pre-detonation search and the inclusion of a ten minute 'soft start' procedure will be adhered to. • A noise assessment will be completed to determine the likely impact of noise generated by the proposed operations on marine mammals in the surrounding area. The results of the assessment will be used during the planning of vessel operations. • Management measures will be put in place to reduce the impact on sensitive receptors including Annex II and Annex IV marine mammals, fish and impacts on harbour porpoise. This includes use of marine mammal observers for example (see JNCC guidance). • Underwater cutting could be a potential source of sound, the operation of well-maintained equipment during decommissioning will ensure noise of operating machinery is kept as low as possible. • An MMO/ PAM operator will be on-board the vessel during cutting operations, should the need be required
	Liquid waste / discharge	• Decommissioning of pipelines planned to avoid / minimise liquid waste discharges. • Subsea pipelines flushed and cleaned to 30ppm (OIW) prior to them being cut subsea. • The WIA application in PETS to document the previous annuli contents which may be discharged during abandonment. • Liquid waste discharges subject to Chemical Permit approval process.
	Seabed impacts	• The decommissioning operations will be carefully designed and executed so as to minimise the area of seabed that will be disturbed. • The introduction of new material to the marine environment is to be avoided or minimised throughout the proposed operations.

Table 4.2 Environmental Impact Appraisal Summary – cont'd		
Activity	**Main Impacts**	**Management**
		• If anchored vessels are required to be used an anchor management plan will be implemented. • The vessels involved will position themselves directly over each item before lifting so that the item can be lifted vertically as far as possible, to avoid dragging on the seabed and therefore minimise the area of seabed disturbed. • The entire jacket and jacket piles, to -3.0m below seabed, will be removed utilising a method of internal cutting that minimises seabed impacts. • Rock / gravel stabilisation deposits are not envisaged to be required if a jack-up vessel is selected to remove the platform. This also applies to the drilling rig that carries out P & A of the platform wells and removal of the conductors (refer to WIA application). • Rock / gravel stabilisation deposits are not envisaged to be required for the drilling rig that carries out the P & A / removal of the NW Schooner subsea well (refer to WIA application) and two part protection structure. • Refer to section 5 of the EA for details of the estimated impacts that various methods of removing the jacket and subsea installations will have on the seabed.
	Other users of the sea	• Cutting and lifting operations will occur within the Schooner platform 500 m exclusion zone. • The markings of the platforms will be maintained in accordance with the CtL and the requirements of the regulators until the platforms removal. • A vessel corridor approach will be used. UK Hydrographical Office and Kingfisher will be informed of all activities. • A post decommissioning debris survey will be conducted.
	Damage or loss of fishing gear	• A post decommissioning debris survey will be conducted. • Over trawl survey performed to confirm over trawlability. (This only applies to areas outside the Dogger Bank SAC and cSAC). • Locations of any remaining footprint of the structure will be accurately mapped and information disseminated via the Hydrographic Office and Kingfisher notification system.
	Solid waste	• Materials are reused and recycled where possible. • Compliance with UK waste legislation and duty of care. • Use of designated licensed sites only. • Permits and traceable chain of custody for waste management, shipment, treatment and onshore disposal. • Waste Management Plan will be implemented

Table 4.2 Environmental Impact Appraisal Summary – cont'd		
Activity	**Main Impacts**	**Management**
	Accidental hydrocarbon release	• Schooner Decommissioning Oil Pollution Emergency Plan (OPEP) and Communications and Interface Plan will be in place. • DNO have UKCS membership with Oil Spill Response (OSRL) for Tier 2/3 incidents. • Material changes to the safety case will be made to cover the decommissioning and dismantlement of the platform. • Liquid waste / marine discharges involving reservoir hydrocarbons will be subject to the requirements of the OPPC.
	Dropped object(s)	• Adhere to lifting and handling procedures and use of certified equipment for lifting. • Retrieve items of debris from the seabed after operations, in compliance with relevant legislation. • A post decommissioning debris survey will be conducted.
Decommissioning Pipelines (left in situ, ends removed)	Atmospheric emissions	• All engines, generators on the vessels will be well maintained and correctly operated to ensure that they are working efficiently to minimise energy use and gaseous emissions. • Vessels will be audited as part of selection and pre-mobilisation. • Vessel operations will be minimised where practical, with work programmes planned to optimise vessel time in the field.
	Underwater noise	• Management measures will be put in place to reduce the impact on sensitive receptors including Annex II and Annex IV marine mammals, fish and impacts on harbour porpoise. This includes use of marine mammal observers for example (see JNCC guidance).
	Seabed impacts	• Operations to remove the pipeline ends will be carefully designed and executed so as to minimise disturbance to the seabed within the SAC / cSAC. • Any new material introduced will be minimised and will be carefully placed using a suitable vessel. The resulting berm profile will be over-trawlable. • Pipeline disconnects to be carried out in advance of platform removal whilst 500m safety zone is in place. • Pipeline ends to be recovered with mattresses. • Cut pipeline ends will be covered with biodegradable grout bags to give a smooth snag free profile and ensure the ends will remain buried. • DNO will apply for a Marine Licence to cover the potential disturbance of the seabed. DNO will ensure that disturbance is kept to a minimum during the operations. • Pipeline cutting and lifting activities to be undertaken in the Murdoch platform 500m exclusion zone, will be carried out by ConocoPhillips on behalf of DNO and be covered by ConocoPhillips risk assessments.
	Marine discharges	• The pipelines will be flushed prior to cutting of the pipeline ends. • Pipeline ends will be buried preventing snagging by fishing nets and the direct release of pipeline contents into the marine environment.

Table 4.2 Environmental Impact Appraisal Summary – cont'd		
Activity	**Main Impacts**	**Management**
		• A chemical risk assessment will be undertaken and operations permitted under the Offshore Chemicals Regulations 2002 (as amended). • Liquid waste / marine discharges involving reservoir hydrocarbons will be subject to the requirements of the OPPC
	Other users of the sea	• A vessel corridor approach will be used. UK Hydrographical Office and Kingfisher will be informed of all activities. • A post decommissioning debris survey will be conducted. • Pipeline cutting and lifting activities to be undertaken in the Murdoch platform 500m exclusion zone, will be carried out by ConocoPhillips on behalf of DNO and be covered by ConocoPhillips risk assessments. • A cumulative assessment has been undertaken of other oil and gas / windfarm activities in the immediate vicinity at the time of decommissioning. Schooner decommissioning will have negligible impact on these activities (i.e. Hornsea 1 & 2 & potentially Hornsea 3) and vice versa. • The pipelines including their cut ends are to be naturally buried. Biodegradable grout bags will be used as a contingency to bury pipeline ends in the event that they do not remain buried.
	Damage or loss of fishing gear	• A post decommissioning debris survey will be conducted. • Locations of any remaining footprint of the pipelines will be accurately mapped and information disseminated via the Hydrographic Office and Kingfisher notification system.
	Accidental hydrocarbon release	• Schooner Decommissioning Oil Pollution Emergency Plan (OPEP) and Communications and Interface Plan will be in place. • DNO have UKCS membership with Oil Spill Response (OSRL) for Tier 2/3 incidents. • Liquid waste / marine discharges involving reservoir hydrocarbons will be subject to the requirements of the OPPC.
	Dropped object(s)	• A post decommissioning debris survey will be conducted. • Adhere to lifting and handling procedures and use of certified equipment for lifting. • Retrieve items of debris from the seabed after operations, in compliance with relevant legislation.
Decommissioning Pipelines' Stabilisation Features	• Potential snagging hazards to other users of the sea. • Long term degradation of pipeline and release of degraded material to the environment	• Pipelines decommissioned in situ will continue to be shown on Navigational charts. • Stabilisation features associated with pipelines are removed. • Side scan sonar (SSS) and multi-beam echo sounder (MBES) will be used to determine overtrawlability within the Dogger Bank SAC and SNS cSaC as opposed to carrying out an overtrawl, to avoid any further physical disturbance in these protected marine sites. • Pipelines will be flushed to remove mobile hydrocarbons prior to commencement of decommissioning activities. • Locations of any remaining infrastructure will be accurately mapped and information disseminated via the UK Hydrographic Office and Kingfisher notification system.

Table 4.2 Environmental Impact Appraisal Summary – cont'd		
Activity	**Main Impacts**	**Management**
		• An agreed monitoring programme and remediation will be proposed which will support the leave in situ assessment and highlight any potential snagging risk post decommissioning. • Grout bags may be re-used as a contingency to stabilise the pipeline ends if they do not remain buried.
	Solid waste	• Solid waste will be produced from the full removal of the pipeline stabilisation features. • Materials are reused and recycled where possible. • Compliance with UK waste legislation and duty of care. • Use of designated licensed sites only. • Permits and traceable chain of custody for waste management, shipment, treatment and onshore disposal. • Waste Management Plan will be implemented

5 INTERESTED PARTY CONSULTATIONS

Consultations Summary:
(This section will be updated when the consultation phase is completed).

Table 5.1 Summary of Consultee Comments		
Who	**Comment**	**Response**
INFORMAL CONSULTATIONS		
BEIS	Meetings with OPRED on 13th November 2017, 26th February 2018, 24th May 2018 and 10th July 2018.	Guidance provided regarding the scope and content of the DP.
JNCC	The Preliminary Environmental Scoping report was sent to the EA on 16th April 2018.	JNCC letter reference OIA 5264 dated 14th May 2018.
NFFO	DNO's Fishing Liaison Officer (FLO) liaised with the NFFO on 27th April 2018.	FLO's summary note of meeting with NFFO dated 10th May 2018.
EA	The EA are likely to be the waste authority, they were consulted on 26th February 2018.	Guidance provided with regard to disposal in the UK and transfrontier shipment of waste.
OGA	The OGA were consulted at the SCAPs workshops at the OGA's London office on 7th March 2018 and at meetings in Aberdeen on 30th May and 21st June 2018.	Guidance received regarding SCAPs and ongoing liaison with the OGA.
STATUTORY CONSULTATIONS		
NFFO	None	N/A
SFF	None	N/A
NIFPO	None	N/A
Global Marine Systems	None	N/A
Public	None	N/A

6 PROGRAMME MANAGEMENT

6.1 Project Management and Verification

A DNO Project Management team has been appointed to manage suitable sub-contractors for the removal of the Schooner installation. DNO standard procedures for operational control and hazard identification and management will be used. Where possible the work will be coordinated with other decommissioning operations in the SNS. DNO and their duty holder will monitor and track the progress 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. Petrofac are the designated duty holder and they will be involved in all offshore work conducted.

6.2 Post-Decommissioning Debris Clearance and Verification

A post decommissioning site survey will be carried out in 500m radius of the Schooner installation site. Oil and gas seabed debris will be recovered for onshore disposal or recycling in line with existing disposal methods. Independent verification of seabed state will be obtained. Whilst the worst-case seabed disturbance from overtrawl has been assessed, it is recognised that some of the decommissioning activities are occurring in the Dogger Bank SAC/SCI and MPA protected site, therefore different methods of determining debris clearance and snag risk may be required. The methods used will therefore be discussed and finalised with the regulator. This will be followed by a statement of clearance to all relevant governmental departments and non-governmental organisations.

6.3 Schedule

Project Plan:

DNO intends to progress the decommissioning of Schooner in stages. The intent is to perform activities on Schooner platform so that a Hydrocarbon free status can first be achieved. DNO would then look to complete the removal of the topside and jacket within the project timeframe as declared in Section 1.2, but at such time that would be most efficient and cost effective to the project. The schedule indicates the earliest and latest dates activities are due to take place.

Figure 6.1: Gantt chart of Project Plan

The availability of the MODU / jack-up barge for the well P&A; a heavy lift vessel for the lift; and favourable weather windows drive the completion dates of the overall project.
The coloured bars in the Gantt chart indicate the earliest start and duration of an activity. The black lines indicate the maximum window that activity can be undertaken in.
Wells will be monitored as if they were producing until they have been independently verified as being plugged and abandoned.

6.4 Costs

Costs will be submitted separately to OPRED.

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 the completion of the offshore decommissioning scope, including debris removal and independent verification of seabed clearance and the post-decommissioning environmental survey. In the close out report, the company responsible for the subsequent management of on-going residual liabilities for any infrastructure left in-situ will be detailed. That company will also be the contact point for any third party claims arising from damage caused by any remains from the Schooner decommissioning programme. The pipelines and pipeline stabilisation features, which are proposed to be left in place, remain the property and responsibility of the licensees.

6.6 Post-Decommissioning Monitoring and Evaluation

A post decommissioning environmental seabed survey will be carried out in the 500m zone of the Schooner installation. The survey will focus on chemical and physical disturbances of the decommissioning area and be compared with the pre-decommissioning survey, which was carried out before decommissioning commenced. Results of this survey will be forwarded to BEIS. The pipeline routes will be the subject of surveys when decommissioning activity has concluded. The survey includes the 100m corridor along the pipeline routes. Side scan sonar (SSS) and multi-beam echo sounder (MBES) will be used to determine overtrawlability within the Dogger Bank SAC and SNS cSaC as opposed to carrying out an overtrawl, to avoid any further physical disturbance.This will then be added to the pipeline profile graphs..After the surveys have been sent to BEIS and reviewed, the post-decommissioning monitoring regime will be discussed and agreed with BEIS. Typically a minimum of one post decommissioning environmental survey and two pipeline surveys are expected.

6.7 Residual Liability

DNO recognises that they will continue to retain ownership of, and residual liability for all decommissioned items allowed to remain in place through acceptance of the results of the comparative assessment process in Section 3. DNO undertakes;

- to contact OPRED in advance, in the event that any parties to the programmes will no longer have a presence in the UK, to provide the details of the organisation or individual who will act in their place;
- to notify OPRED of any organisation/individual that will engage with OPRED on future legacy and liability matters;
- to notify OPRED of any organisation/individual that will be the contact point for any future third party claims for damage caused by pipelines left in place;
- to ensure that any alternative organisation/individual will have appropriate authority for and knowledge of the DPs, to engage with OPRED;
- to ensure that any alternative organisation/individual will have access to appropriate funding to carry out any actions relating to the residual legacy and liability as outlined in the approved DPs.

7 SUPPORTING DOCUMENTS

Table 7.1: Supporting Documents	
Document Number	**Title**
1	Schooner Environmental Appraisal
2	Schooner Pipelines Comparative Assessment Report
3	Geoxyz. 2018. Pre-decommissioning Environmental Baseline and Debris Survey Campaign.

8. PARTNER LETTER OF SUPPORT

Tullow Oil SK Limited
9, Chiswick Park, 566 Chiswick High Road, London, W4 5XT
Tel: +44 (0)203 249 9000 Fax: +44 (0)203 249 8801

Ref: TO/R/S&K-10

29 July 2019

Offshore Petroleum Regulator for Environment & Decommissioning (OPRED)
Department of Business Energy & Industrial Strategy (BEIS)
AB1 Building
Crimon Place
Aberdeen
AB10 1BJ

F.A.O Decommissioning Manager

Dear Sir / Madam,

Schooner Decommissioning Programme

We, Tullow Oil SK Limited, confirm that we authorise DNO North Sea (ROGB) Limited (formerly known as Faroe Petroleum (ROGB) Limited) ("**DNO**") to submit on our behalf the final Decommissioning Programme for the Schooner facilities.

We support the proposals detailed in the Decommissioning Programme (Doc No. SCKE-FPROGB-O-TA-0001 Rev: 09) submitted by **DNO** as required by section 29 of the Petroleum Act 1998.

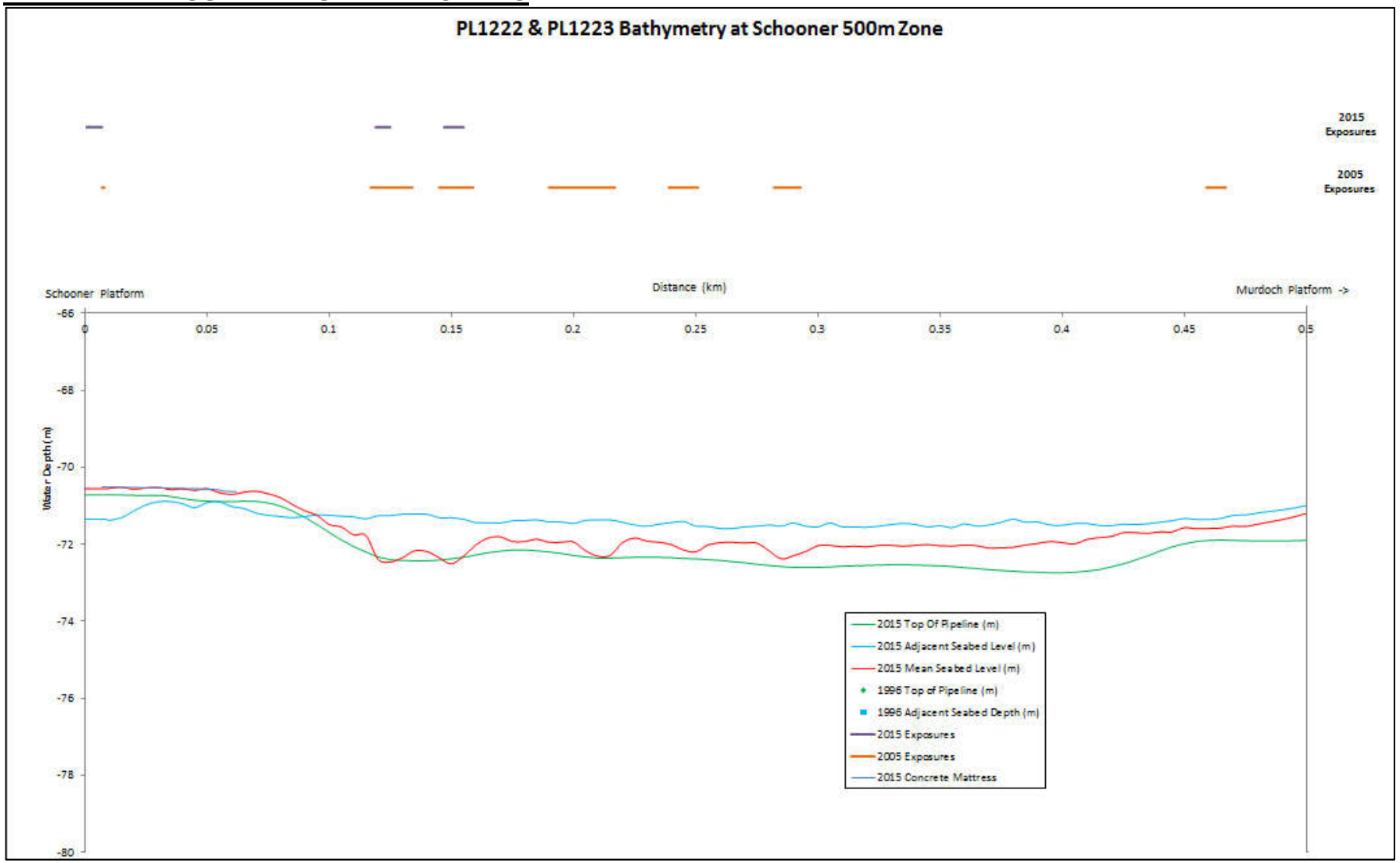
Your faithfully

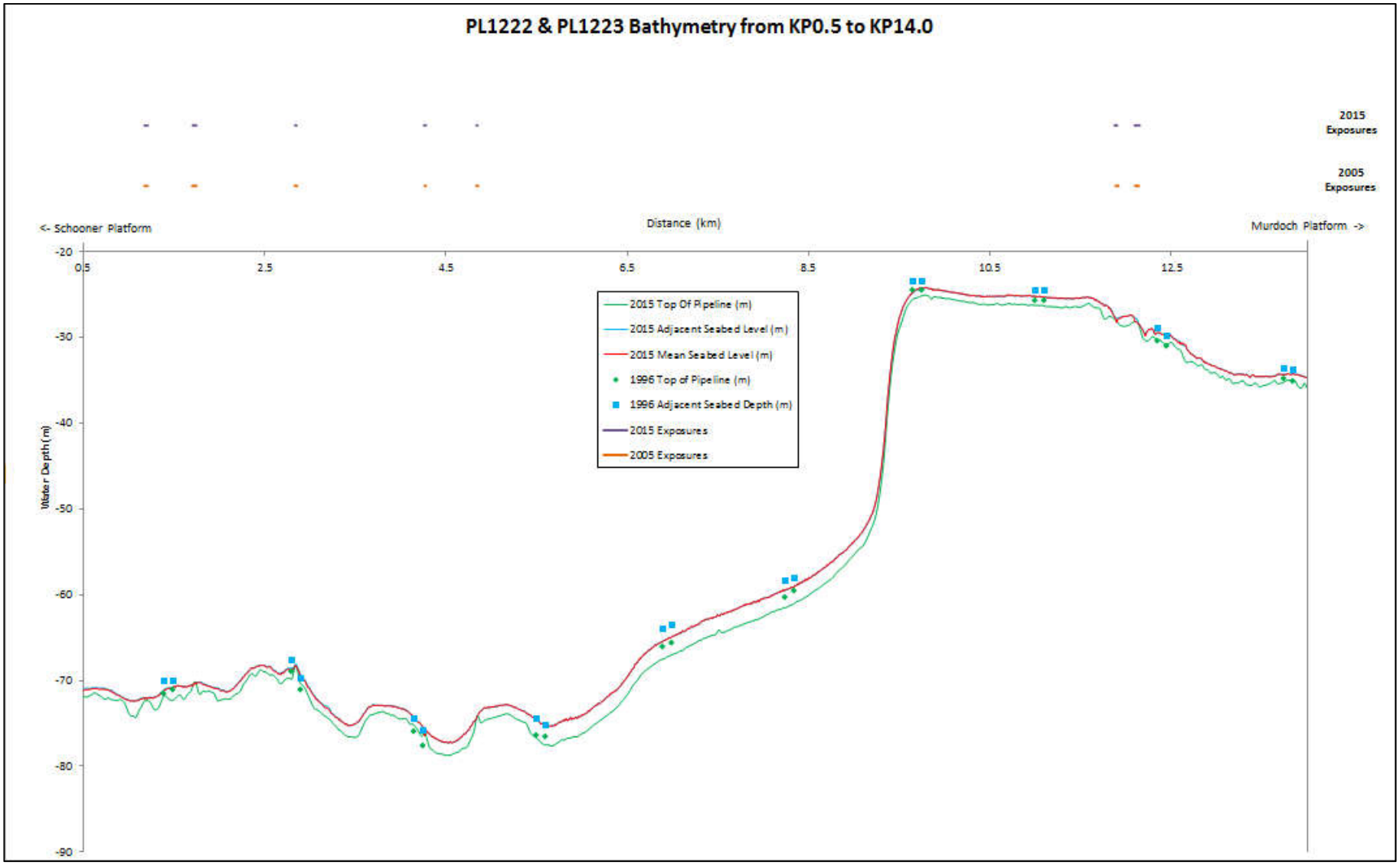
For and on behalf of **Tullow Oil SK Limited**

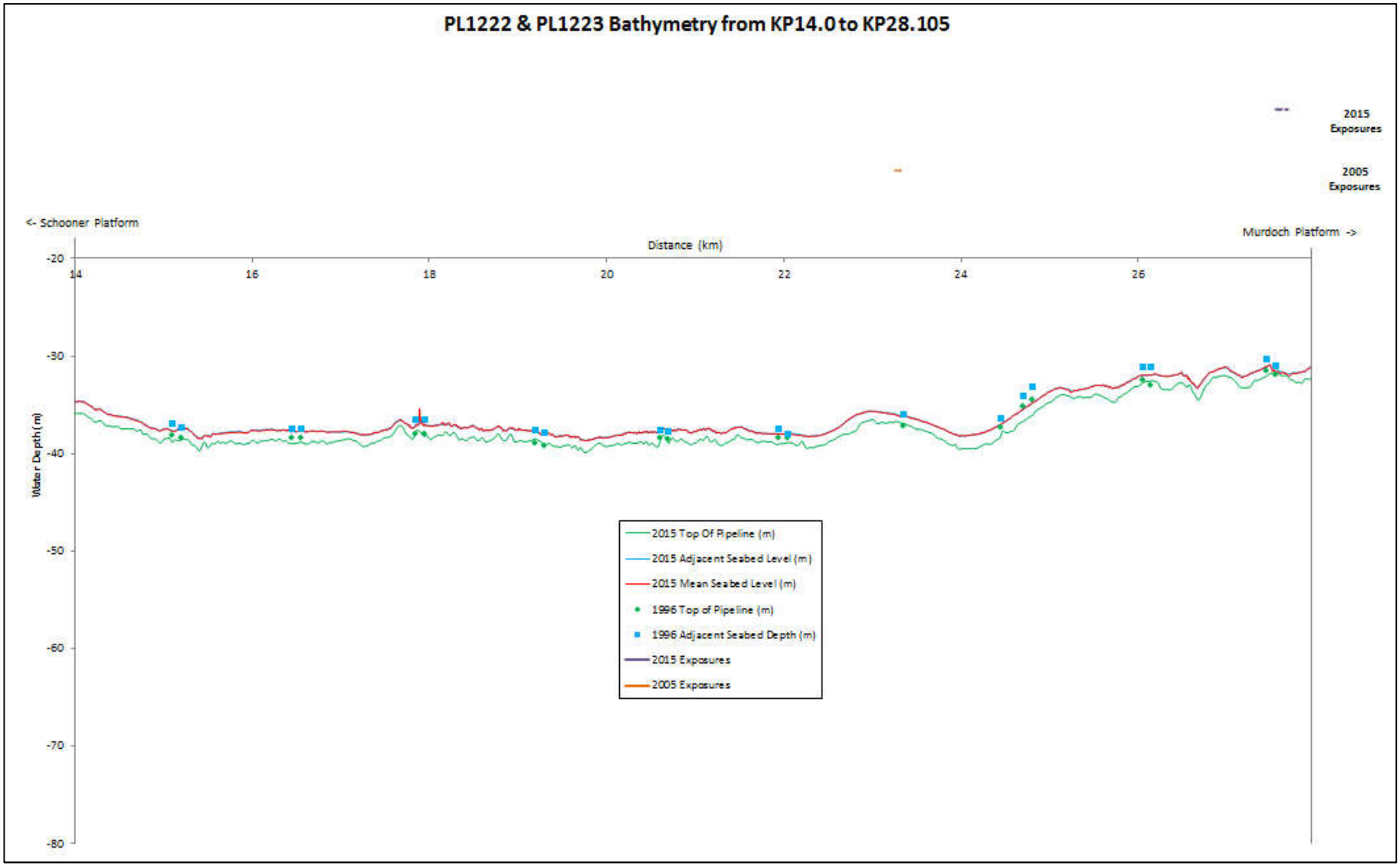
Signed:.....
Name: KEVIN MASSIE
Title: DIRECTOR

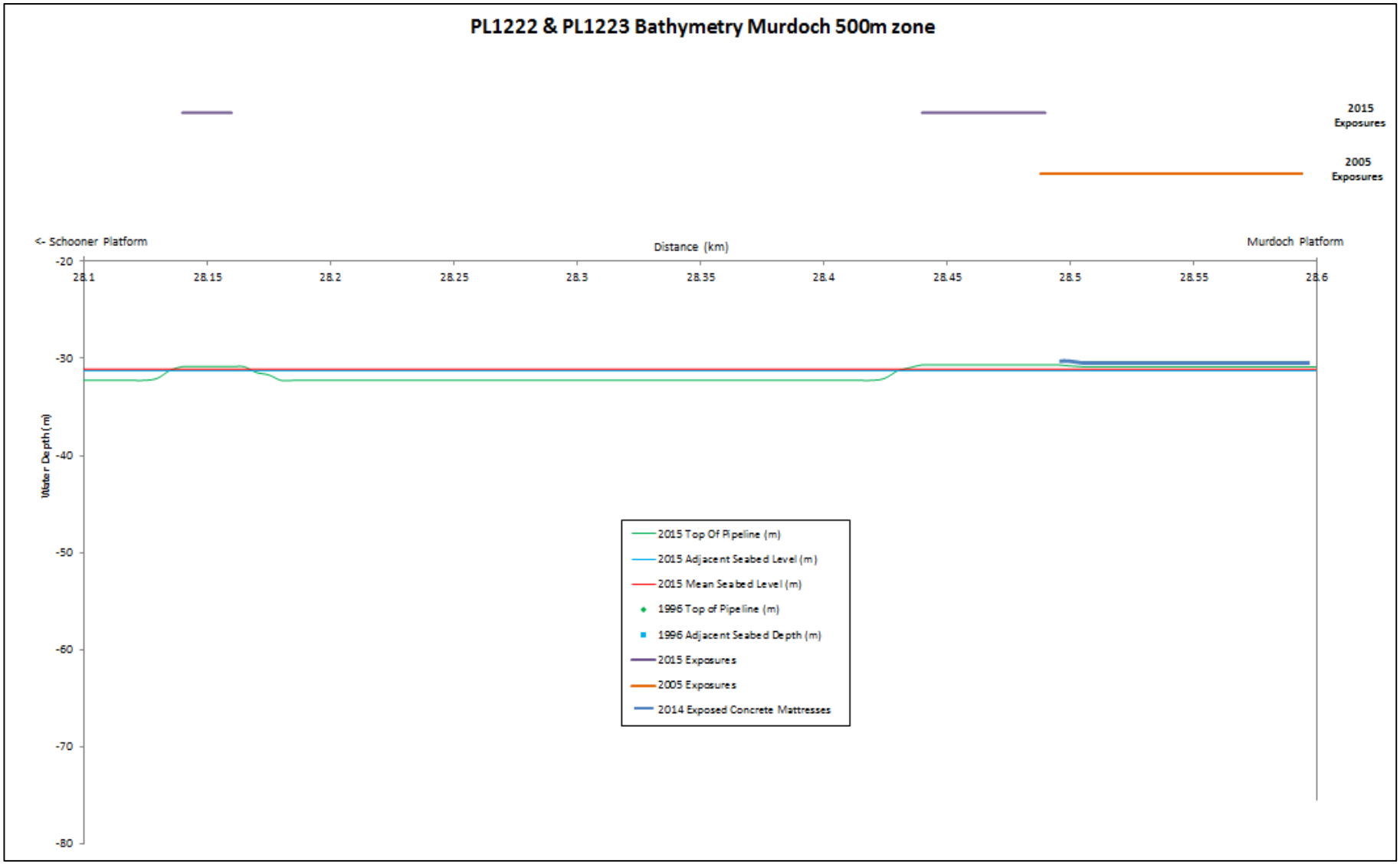
Registered in England: Number 5287330
Registered Office as above

APPENDIX 1 – SURVEY BURIAL PROFILES

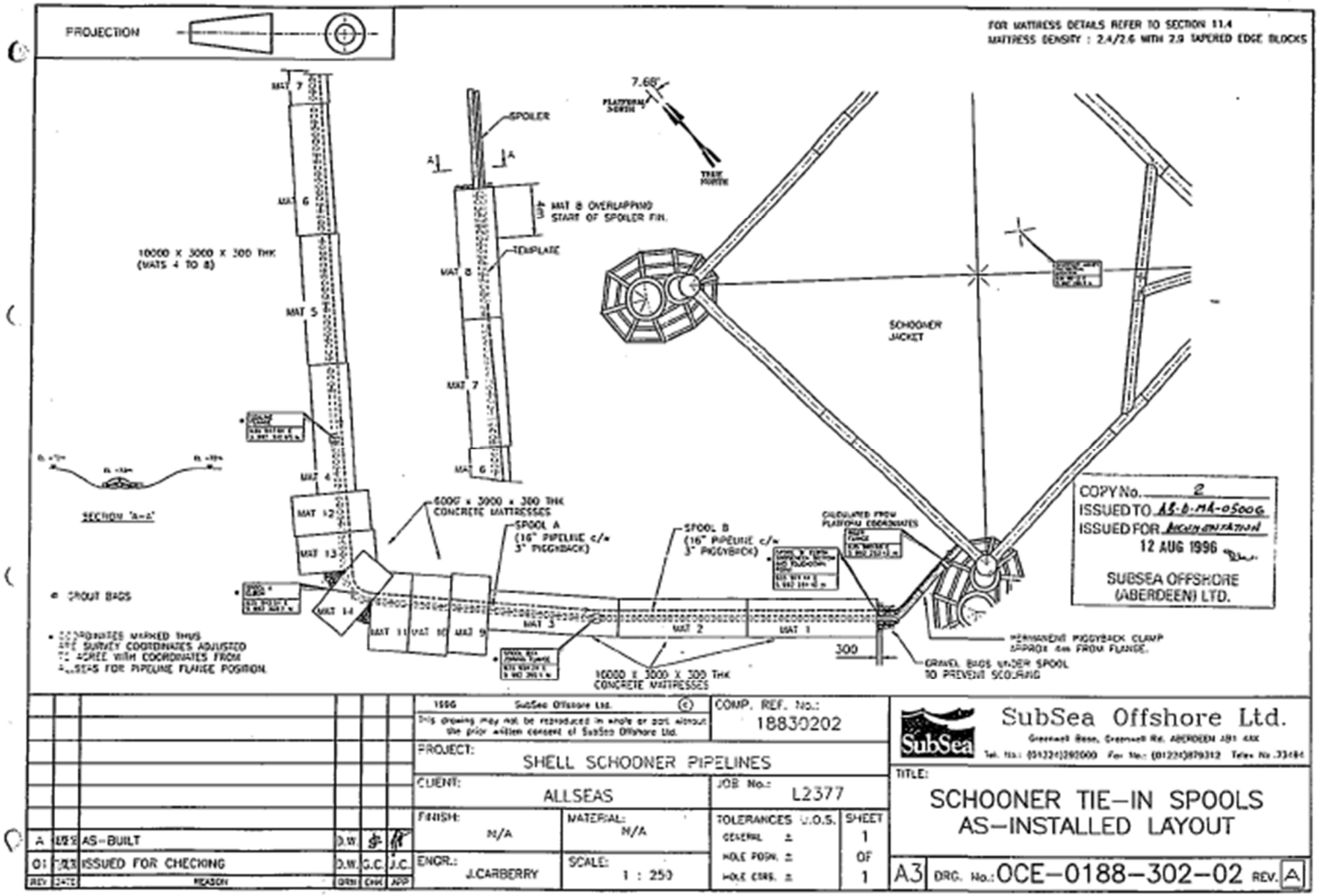


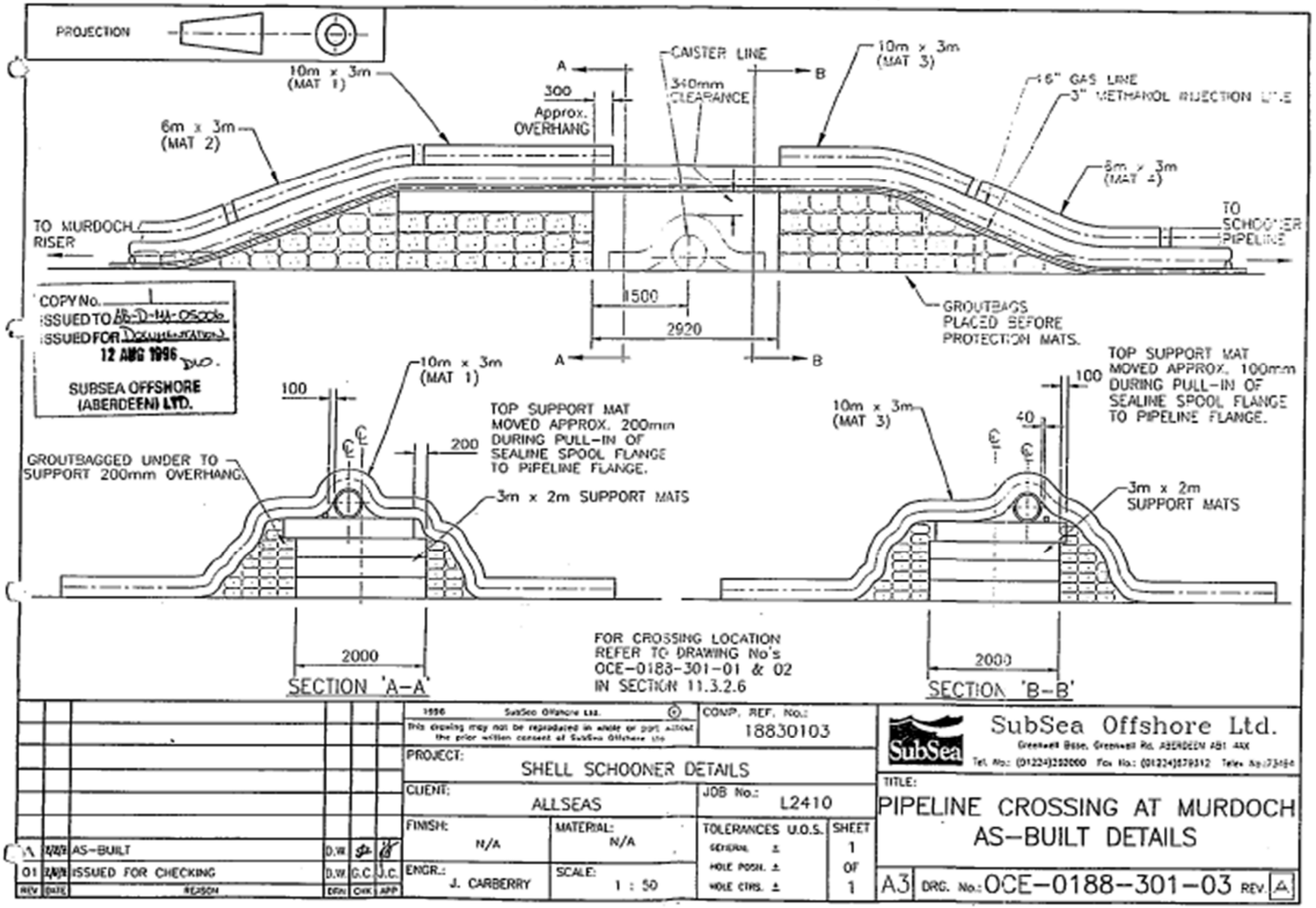

PL1222 & PL1223 Bathymetry from KP0.5 to KP14.0
2015 Exposures
2005 Exposures
<- Schooner Platform
Distance (km)
Murdoch Platform ->
0.5
2.5
4.5
6.5
8.5
10.5
12.5
-20
-30
-40
-50
-60
-70
-80
-90
Water Depth (m)
2015 Top Of Pipeline (m)
2015 Adjacent Seabed Level (m)
2015 Mean Seabed Level (m)
1996 Top of Pipeline (m)
1996 Adjacent Seabed Depth (m)
2015 Exposures
2005 Exposures


PL1222 & PL1223 Bathymetry from KP14.0 to KP28.105
2015 Exposures
2005 Exposures
<- Schooner Platform
Murdoch Platform ->
Distance (km)
14
16
18
20
22
24
26
-20
-30
-40
-50
-60
-70
-80
Water Depth (m)
2015 Top Of Pipeline (m)
2015 Adjacent Seabed Level (m)
2015 Mean Seabed Level (m)
1996 Top of Pipeline (m)
1996 Adjacent Seabed Depth (m)
2015 Exposures
2005 Exposures


PL1222 & PL1223 Bathymetry Murdoch 500m zone
2015 Exposures
2005 Exposures
<- Schooner Platform
Distance (km)
Murdoch Platform
-20
-30
-40
-50
-60
-70
-80
28.1
28.15
28.2
28.25
28.3
28.35
28.4
28.45
28.5
28.55
28.6
Water Depth (m)
2015 Top Of Pipeline (m)
2015 Adjacent Seabed Level (m)
2015 Mean Seabed Level (m)
1996 Top of Pipeline (m)
1996 Adjacent Seabed Depth (m)
2015 Exposures
2005 Exposures
2014 Exposed Concrete Mattresses

APPENDIX 2 – PLANS OF PIPELINE ENDS




PROJECTION
10m x 3m (MAT 1)
6m x 3m (MAT 2)
A
300
Approx. OVERHANG
CAISTER LINE
340mm CLEARANCE
B
10m x 3m (MAT 3)
16" GAS LINE
3" METHANOL INJECTION LINE
6m x 3m (MAT 4)
TO MURDOCH RISER
TO SCHOONER PIPELINE
1500
2920
GROUTBAGS PLACED BEFORE PROTECTION MATS.
COPY No. 1
ISSUED TO AB-D-MA-05006
ISSUED FOR Documentation
12 AUG 1996
SUBSEA OFFSHORE (ABERDEEN) LTD.
100
200
GROUTBAGGED UNDER TO SUPPORT 200mm OVERHANG
TOP SUPPORT MAT MOVED APPROX. 200mm DURING PULL-IN OF SEALINE SPOOL FLANGE TO PIPELINE FLANGE.
3m x 2m SUPPORT MATS
2000
SECTION 'A-A'
FOR CROSSING LOCATION REFER TO DRAWING No's OCE-0188-301-01 & 02 IN SECTION 11.3.2.6
40
TOP SUPPORT MAT MOVED APPROX. 100mm DURING PULL-IN OF SEALINE SPOOL FLANGE TO PIPELINE FLANGE.
SECTION 'B-B'
1996 SubSea Offshore Ltd.
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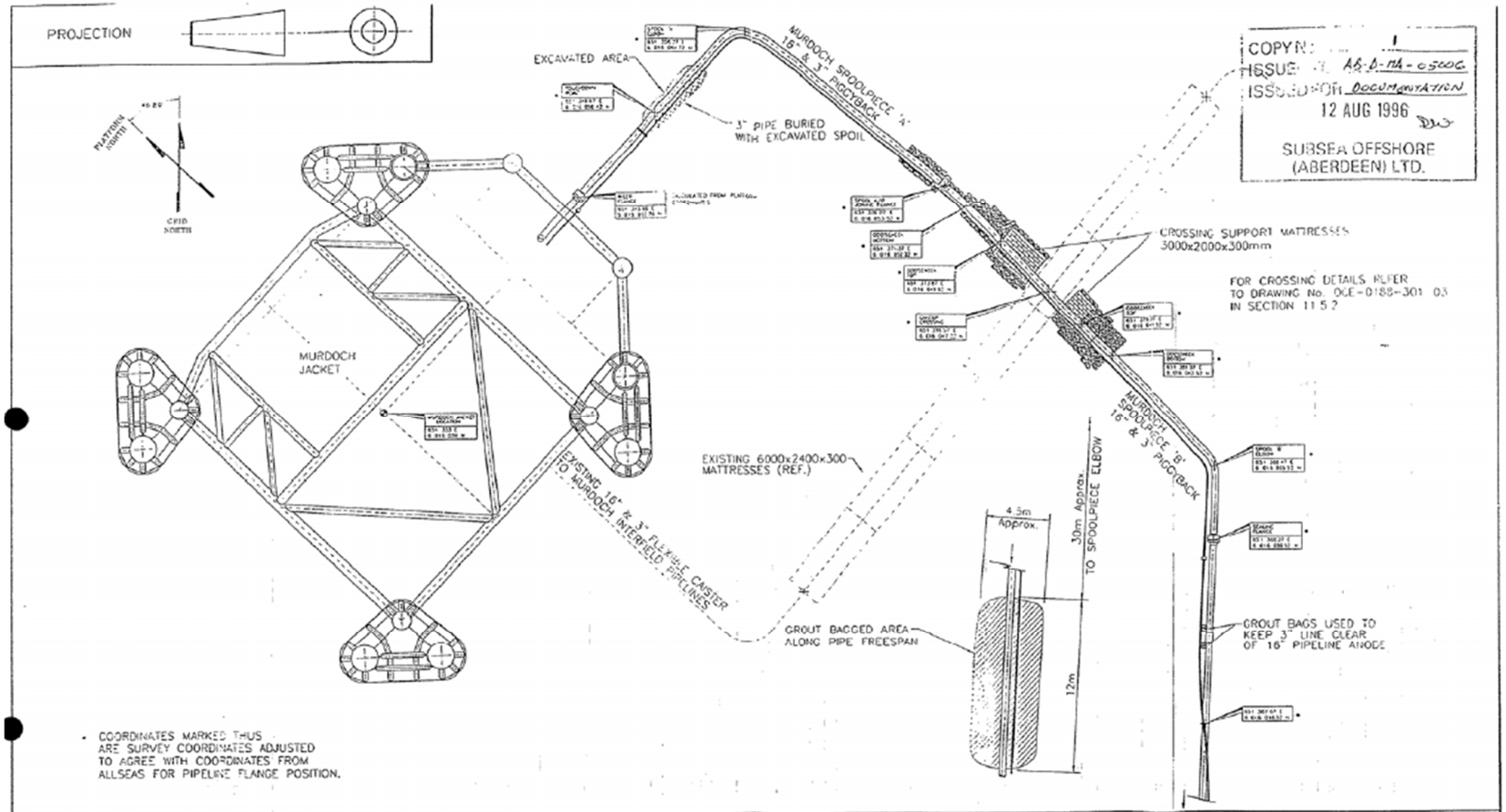
CONTR. REF. No.: 18830103
PROJECT: SHELL SCHOONER DETAILS
CLIENT: ALLSEAS
JOB No.: L2410
FINISH: N/A
MATERIAL: N/A
TOLERANCES U.O.S.
SHEET 1 OF 1
ENGR.: J. CARBERRY
SCALE: 1 : 50
A 12/8/96 AS-BUILT D.W
01 8/8/96 ISSUED FOR CHECKING D.W G.C J.C
REV DATE REASON DRN CHK APP
SubSea Offshore Ltd.
Greenwell Base, Greenwell Rd, ABERDEEN AB1 4AX
TITLE: PIPELINE CROSSING AT MURDOCH AS-BUILT DETAILS
A3 DRG. No.: OCE-0188-301-03 REV. A


PROJECTION
EXCAVATED AREA
3" PIPE BURIED WITH EXCAVATED SPOIL
MURDOCH SPOOLPIECE 16" & 3" PIGGYBACK
COPYN:
ISSUE:
ISSUED FOR DOCUMENTATION
12 AUG 1996
SUBSEA OFFSHORE (ABERDEEN) LTD.
CROSSING SUPPORT MATTRESSES 3000x2000x300mm
FOR CROSSING DETAILS REFER TO DRAWING No. CCE-0188-301 03 IN SECTION 11 5.2
MURDOCH JACKET
EXISTING 6000x2400x300 MATTRESSES (REF.)
EXISTING 16" & 3" FLEXIBLE CASTER TO MURDOCH INTERFIELD PIPELINES
GROUT BAGGED AREA ALONG PIPE FREESPAN
4.5m Approx.
30m Approx. TO SPOOLPIECE ELBOW
12m
GROUT BAGS USED TO KEEP 3" LINE CLEAR OF 16" PIPELINE ANODE
COORDINATES MARKED THUS * ARE SURVEY COORDINATES ADJUSTED TO AGREE WITH COORDINATES FROM ALLSEAS FOR PIPELINE FLANGE POSITION.
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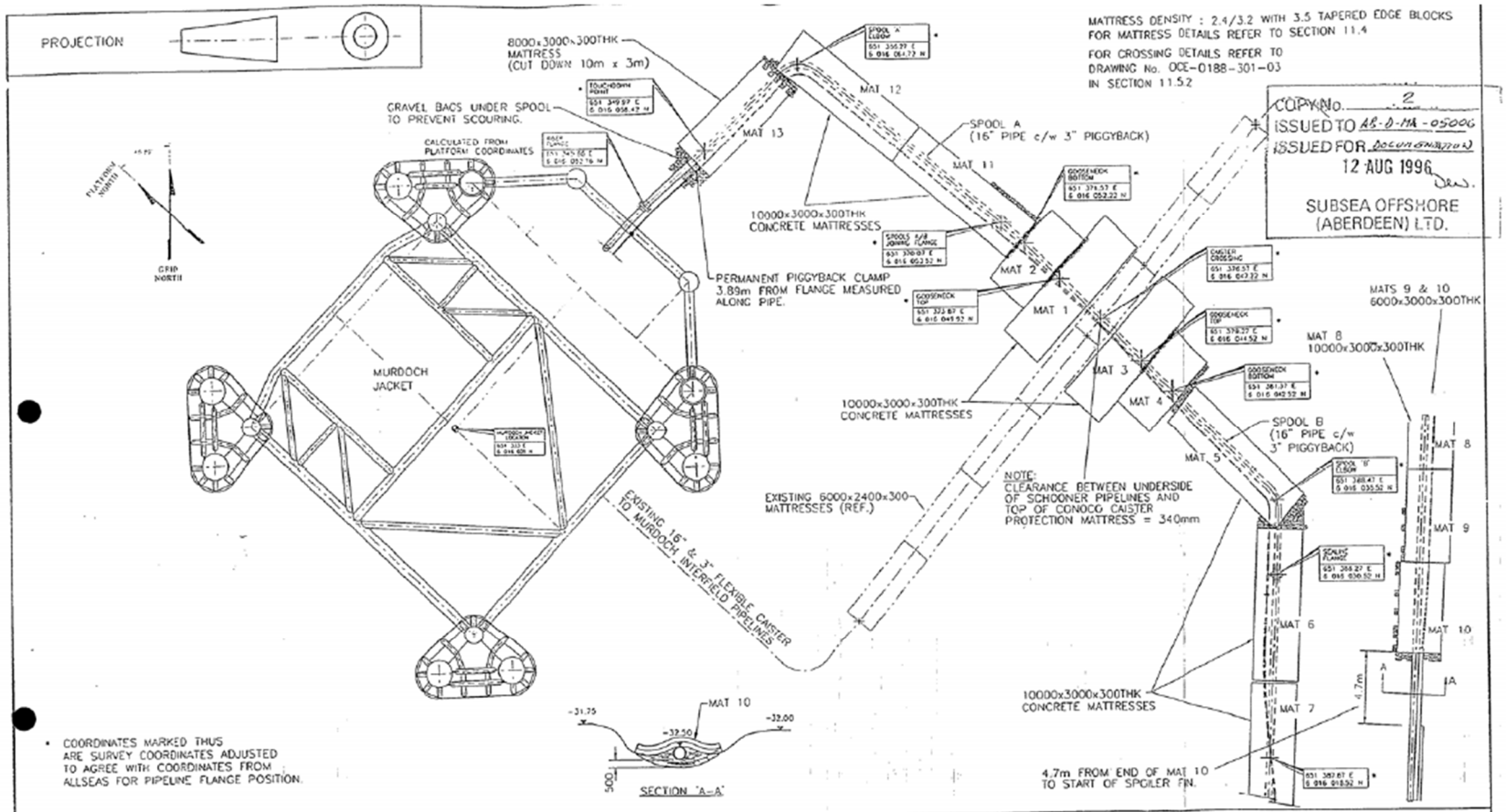
COMP. REF. No.: 18830101
PROJECT: SHELL SCHOONER PIPELINES
CLIENT: ALLSEAS
JOB No.: L2410
FINISH: N/A
MATERIAL: N/A
TOLERANCES U.O.S. GENERAL ± HOLE POSN. ± HOLE CTRS. ±
SHEET 1 OF 1
ENGR.: J.CARBERRY
SCALE: 1 : 250
A 2/12/96 AS-BUILT D.W.
01 31/9/96 ISSUED FOR CHECKING D.W. G.C. J.C.
REV DATE REASON DRN CHK APP
SubSea Offshore Ltd.
Greenwell Base, Greenwell Rd. ABERDEEN AB1 4AX
Tel. No.: (01224)292000 Fax. No.: (01224)879312 Telex No.:73494
TITLE: MURDOCH TIE-IN SPOOLS AS-BUILT LAYOUT
A3 DRG. No.: CCE-0188-301-01 REV. A


PROJECTION
8000x3000x300THK MATTRESS (CUT DOWN 10m x 3m)
GRAVEL BAGS UNDER SPOOL TO PREVENT SCOURING.
CALCULATED FROM PLATFORM COORDINATES
MAT 12
MAT 13
SPOOL A (16" PIPE c/w 3" PIGGYBACK)
MAT 11
10000x3000x300THK CONCRETE MATTRESSES
PERMANENT PIGGYBACK CLAMP 3.89m FROM FLANGE MEASURED ALONG PIPE.
MAT 2
MAT 1
MURDOCH JACKET
MAT 3
MAT 4
10000x3000x300THK CONCRETE MATTRESSES
SPOOL B (16" PIPE c/w 3" PIGGYBACK)
MAT 5
EXISTING 16" & 3" FLEXIBLE CAISSON TO MURDOCH INTERFIELD PIPELINES
EXISTING 6000x2400x300 MATTRESSES (REF.)
NOTE: CLEARANCE BETWEEN UNDERSIDE OF SCHOONER PIPELINES AND TOP OF CONOCO CAISSON PROTECTION MATTRESS = 340mm
MATS 9 & 10 6000x3000x300THK
MAT 8 10000x3000x300THK
MAT 8
MAT 9
MAT 10
MAT 6
MAT 7
10000x3000x300THK CONCRETE MATTRESSES
4.7m
4.7m FROM END OF MAT 10 TO START OF SPOILER FIN.
GRID NORTH
COORDINATES MARKED THUS * ARE SURVEY COORDINATES ADJUSTED TO AGREE WITH COORDINATES FROM ALLSEAS FOR PIPELINE FLANGE POSITION.
SECTION 'A-A'
MATTRESS DENSITY : 2.4/3.2 WITH 3.5 TAPERED EDGE BLOCKS
FOR MATTRESS DETAILS REFER TO SECTION 11.4
FOR CROSSING DETAILS REFER TO DRAWING No. OCE-0188-301-03 IN SECTION 11.5.2
COPY No. 2
ISSUED TO AS-D-MA-05006
ISSUED FOR DOCUMENTATION
12 AUG 1996
SUBSEA OFFSHORE (ABERDEEN) LTD.
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COMP. REF. No.: 18830102
SubSea Offshore Ltd.
Greenwell Base, Greenwell Rd. ABERDEEN AB1 4AX
Tel. No.: (01224)292000 Fax No.: (01224)879312 Telex No.:73494
PROJECT: SHELL SCHOONER PIPELINES
CLIENT: ALLSEAS
JOB No.: L2410
TITLE: MURDOCH TIE-IN SPOOLS AS-INSTALLED LAYOUT
FINISH: N/A
MATERIAL: N/A
TOLERANCES U.O.S. GENERAL ± HOLE POSN ± HOLE CTRS. ±
SHEET 1 OF 1
ENGR.: J.CAREERRY
SCALE: 1 : 250
A3 DRG. No.: OCE-0188-301-02 REV. A
A AS-BUILT D.W.
01 ISSUED FOR CHECKING D.W. G.C. J.C.
REV DATE REASON DRN CHK APP