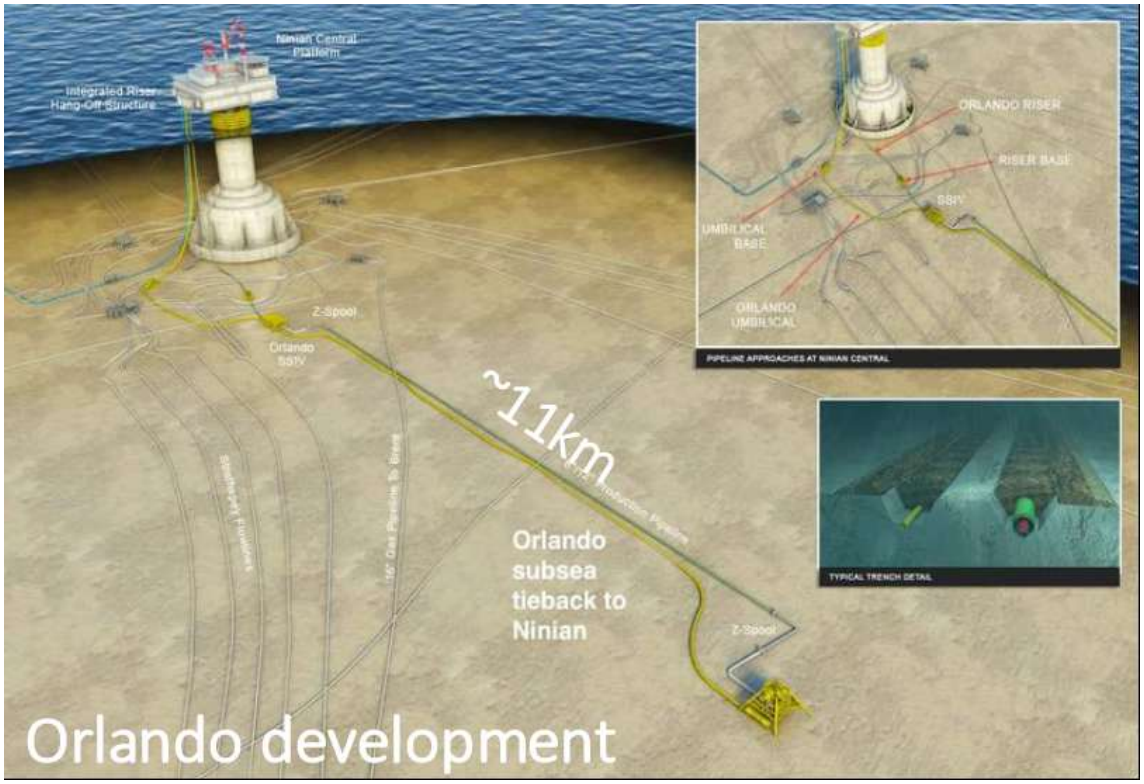

Document Title: **Orlando Field Decommissioning – Decommissioning Programmes Consultation Draft**

Document Number: **ORL-SECL-HSE-DOC-0008**

Date	Title	Rev.	By	Check	Approved
07/07/25	Issued for internal review	01	RT	RL	
04/08/25	Pre-consultation draft DP for OPRED review	02	RT	RL	TW
25/11/25	Updated pre-consultation draft DP in response to OPRED comments	03	RT	RL/EM	MS
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20/04/2026	Updated pre-consultation draft DP in response to OPRED comments	05	RT	RL/EM	MS
15/05/2026	Consultation Draft	06	RT	RL/EM	MS

Contents

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Tables

Abbreviations

BAT/BEP	Best Available Technique/Best Environmental Practice
BEIS	Department for Business, Energy and Industrial Strategy, now Department for Energy Security and Net Zero (DESNZ)
CA	Comparative Assessment
CCUS	Carbon Capture Usage and Storage
CGBS	Concrete Gravity Based Structure
CNRI	CNR International (UK) Limited
CoP	Cessation of Production
CSV	Construction Support Vessel
DESNZ	Department of Energy Security and Net Zero
DP	Decommissioning Programme
DSV	Diving Support Vessel
EA	Environmental Appraisal
GHGs	Greenhouse Gases
HSE	Health & Safety Executive
HIRA	Hazard Identification and Risk Assessment
ICES	International Council for the Exploration of the Sea
INTOG	Innovation and Targeted Oil and Gas
JNCC	Joint Nature Conservation Committee
LTOBM	Low Toxicity OBM
MNCR	Marine Nature Conservation Review
NCMPA	Nature Conservation Marine Protected Area
NCP	Ninian Central Platform
NPS	Ninian Pipeline System
NSTA	North Sea Transition Authority
OBM	Oil-based mud
ODU	Offshore Decommissioning Unit
OEUK	Offshore Energies UK
OGUK	Oil and Gas UK, now Offshore Energies UK (OEUK)
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning, Department for Energy Security and Net Zero
OSPAR	Oslo and Paris Convention for the Protection of the Marine Environment of the North-East Atlantic
PMF	Priority Marine Feature
POSA	Processing and Operating Services Agreement
PWA	Pipeline Works Authorisation
ROV	Remotely operated vehicle
SAC	Special Area of Conservation
SACFOR	Super-abundant, Abundant, Common, Frequent, Occasional, Rare
SCANS	Small Cetaceans in European Atlantic waters and the North Sea
SFF	Scottish Fishermen's Federation
SPA	Special Protection Area
SSIV	Subsea Isolation Valve

tCO_2eq	Tonnes carbon dioxide equivalent. Standard unit for measuring the impact of different greenhouse gases on climate change, expressed in terms of the amount of CO_2 that would produce the same warming effect.
Te	Tonnes
UKCS	United Kingdom Continental Shelf
WONS	Well Operations and Notification System
WHPS	Wellhead Protection Structure

1.0 Executive Summary

1.1 Decommissioning Programmes

This document contains two Decommissioning Programmes (DP) for the two associated notices served under Section 29 of the Petroleum Act 1998, covering offshore installations and submarine pipelines in the Orlando Field in Block 3/03b. The following is covered by each DP:

Offshore installations

- All subsea equipment associated with the Orlando Field, including:
  - Production Xmas Tree including Wellhead Protection Structure (WHPS)
  - Production riser base structure and associated clump weights
  - Umbilical riser base structure and associated clump weights

Submarine pipelines

- The following pipelines and associated apparatus (note the Pipeline Works Authorisation (PWA) Identification numbers (ID No.) are provided, see Table 2.2):

  - PL4383
    - ID No. 1 (wellhead valve spool, 9m long)
    - ID No. 2 (8" spools, 44m long)
    - ID No. 3 (8"/12" pipe-in-pipe production pipeline, 10,813m long)
    - ID No. 4 (8" spools, 58m long)
    - ID No. 5 (8" SSIV piping, 11m long)
    - ID No. 6 (7" dynamic riser, 341m long)
    - Associated apparatus
      - Wellhead Valve Spool Structure (contains PWA ID No. 1 above) attached to the Production Xmas Tree
      - SSIV structure (contains PWA ID No. 5 above)
  - PLU4384
    - ID No. 1 (dynamic riser umbilical, 450m long)
    - ID No. 2 (static umbilical, 11,000m long)

  - Surface laid / exposed pipeline/umbilical protective/stabilisation material (concrete mattresses and grout bags)

The 10.813m, 8”/12” pipe-in-pipe production pipeline (PL4383 ID No. 3), connects via 8” rigid spool pieces (44m length, PL4383 ID No. 2) to the Orlando wellhead valve spool (9m length, PL4383 ID No. 1) structure (6.4m x2.3m x1.7m, 8.4 tonnes) which is attached to the production Xmas Tree, and at the other end of the pipeline, via 8” rigid spool pieces (58m length, PL4383 ID No. 4) to the SSIV (11m length, PL4383 ID No. 5) structure, within the 500m safety zone of the NCP. The tie-in at NCP is via the SSIV structure (10.8m x 6.7m x 3.62m, 91.2 tonnes), a dynamic riser (341m length, PL4383 ID No. 6) and dynamic riser umbilical (450m length, PLU4384 Ident No. 1) which hang off the NCP topsides. The removal of both the dynamic riser and dynamic riser umbilical hang-off structures and associated equipment on the NCP topsides are covered by the CNR NCP topsides and associated riser sections DP and are therefore out with the scope of the Orlando DPs.

The Orlando field produces via the Ninian Central Platform (NCP) operated by CNR International (UK) Limited (CNRI). As part of a Processing and Operating Services Agreement (POSA), with CNRI, Serica

have an arrangement in place whereby CNRI will physically recover the Orlando SSIV structure, and the downstream facilities connected to the NCP (dynamic riser and riser base, dynamic riser umbilical and riser base) (collectively known and referenced in this DP as, Clause 16.2 facilities). As these facilities are included within the Section 29 notices indicated above (and detailed in Section 1.4 below), their recovery is covered by the Orlando DPs. It is noted that the NCP topsides DP includes reference to the disconnection and lay down of the dynamic riser and dynamic riser umbilical, as this will happen as part of topsides decommissioning but these elements are not covered by the NCP topsides DP. Similarly, the Ninian Hub Subsea DP will reference the recovery of the risers, riser base structures and SSIV structure but these elements are not covered by that DP.

1.2 Requirement for Decommissioning Programmes

Installations

In accordance with the Petroleum Act 1998, Serica Energy Chinook Limited (as operator of the Orlando Field), and the Section 29 notice holders of the Orlando Field installation (Table 1.2) are applying to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) to obtain approval for decommissioning the installations detailed in Sections 1.4 and 2.1 of this document (see also Section 8 - Section 29 Notice Holders Letter(s) of Support).

Pipelines

In accordance with the Petroleum Act 1998, Serica Energy Chinook Limited (as operator of the Orlando Field), and the Section 29 notice holders of the Orlando pipelines (Table 1.4) are applying to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) to obtain approval for decommissioning the pipelines detailed in Sections 1.4 and 2.2 of this document (see also Section 8 – Section 29 Notice Holders Letter(s) of Support).

In conjunction with public, stakeholder and regulatory consultation, the decommissioning programmes are submitted without derogation and in compliance with national and international regulations and OPRED guidelines.

The schedule outlined in this document is for a 5 year decommissioning project, due to start in 2026. The project includes flushing and cleaning (either from NCP downhole via the P1 well or from the P1 well back to NCP), the Orlando pipeline and umbilical (expected Q1 2027 – Q3 2027), prior to disconnection and removal of the spools, jumpers and protective materials from the seabed and remediation of the cut ends of the pipeline and umbilical (expected Q1 2027 – Q3 2028). The P1 well will then be plugged and abandoned (expected Q4 2027 – Q3 2029), with the production Xmas Tree including wellhead protection structure and attached wellhead valve spool structure recovered as part of these operations. With respect to the decommissioning of the Clause 16.2 facilities (outlined in Section 1.1 above), the disconnection and laydown of the Orlando production and umbilical risers, recovery of the risers, riser bases and SSIV structure will be undertaken by CNRI and is expected Q1 2029 – Q2 2030. An outline schedule is provided in Section 6.3.

1.3 Introduction

The Orlando Field is operated by Serica Energy Chinook Limited, a subsidiary of Serica Energy PLC (from now on referred to as Serica), and is located in the northern North Sea (Block 3/03b, Licence P.1606), approximately 127km east of Shetland, 17km from the UK/Norway Median Line and ~11km north east of the CNRI operated Ninian Central Platform (NCP). The Orlando Field is *ca*. 81km from

the closest conservation site, the Pobie Bank Reef Special Area of Conservation (SAC). Water depths at Orlando are *ca*. 141m.

The Orlando Field was discovered in 1988/89 (well 3/3-11) by Chevron. The licence covering the Field, and Block 3/3b, (P.1606) was acquired in 2009 in the 25th Seaward Licensing Round. MPX North Sea Limited carried out an Environmental Impact Assessment (EIA) of the proposed development and submitted an Environmental Statement (DECC Ref: D/4130/2011) to the then Department of Energy and Climate Change (DECC) (now the Department for Energy Security & Net Zero), in December 2011. The Orlando Field was subsequently acquired by Iona Energy in 2012, and Decipher Energy in 2017, with the drilling of a single production well taking place in Q2 2018 (via re-entry and side-tracking of an existing appraisal well (3/3b-13z)), with pipeline installation and tie-in to Ninian Central Platform (NCP) completed in Q4 2018 (Figures 1.2–1.4). The Orlando field was developed as a single well, subsea tieback, via a 11.276km production pipeline (length includes spools and dynamic riser) and a 11.45km umbilical (includes dynamic static umbilical), trenched and buried separately to the NCP. The tie-in at NCP is via a subsea isolation valve (SSIV) structure and flexible production and umbilical catenary risers which hang off the NCP topsides. Production commenced in Q1 2019, and the Field was subsequently acquired by Tailwind Energy in 2021, and ultimately Serica in 2023.

The Orlando field produces via the NCP process systems and is then exported with Ninian Field hydrocarbons to Sullom Voe oil terminal. Cessation of production (CoP) at NCP is expected in Q1-Q2 2027. Provision of services for Orlando will then become unjustifiable and uneconomic to continue production and hence Orlando CoP is envisaged to be concurrent with NCP CoP.

The decommissioning programmes explain the principles of the removal activities and are supported by an environmental appraisal (EA). The decommissioning programme for the pipeline and umbilical is supported by a comparative assessment (CA).

1.4 Overview of Installations/Pipelines Being Decommissioned

Installations

Table 1.1: Orlando Installations Being Decommissioned

Field(s)	Orlando	**Production Type**	Oil
Water Depth (m)	141m	**UKCS block**	3/03b
Distance to median (km)	17km (Norway)	**Distance from nearest UK coastline (km)**	127km E of Shetland
Subsea Installation(s)		**Number of Wells**	
Number	**Type**	**Platform**	**Subsea**
1	Production Xmas Tree including Wellhead Protection Structure (and attached Wellhead Valve Spool Structure) (see Table 2.1)	N/A	1 x Producer
1	Production riser base structure (see Table 2.1)		
1	Production riser base clump weight		

Table 1.1: Orlando Installations Being Decommissioned			
1	Umbilical riser base structure (see Table 2.1)		
1	Umbilical riser base clump weight		
Drill Cuttings pile(s)			
Number of Piles	0	**Total Estimated volume (m^3)**	N/A

Table 1.2: Orlando Installations Section 29 Notice Holders Details		
Section 29 Notice Holder(s)*	**Registration Number**	**Equity Interest (%)**
Atlantic Petroleum North Sea Limited	06459546	0%
Atlantic Petroleum UK Limited	04395761	0%
*Serica Energy Chinook Limited	SC335305	100%
*Serica Energy Meltemi Limited	07879002	0%
*Serica Energy PLC	05450950	0%
*Serica Energy Sirocco Limited	10394113	0%

*Note: *The Serica companies are wholly owned by Serica Energy PLC.*

Pipelines

Table 1.3: Orlando Pipelines Being Decommissioned	
Number and total length (km) of Pipeline/umbilical	1 (11.276km) / 1 (11.45km) (see Table 2.2)
Number of Pipeline Structures	2 (Wellhead Valve Spool Structure, SSIV Structure, see Table 2.3)

Table 1.4: Pipeline(s) Section 29 Notice Holders Details		
Section 29 Notice Holder(s)*	**Registration Number**	**Equity Interest (%)**
*Serica Energy Chinook Limited	SC335305	100%
*Serica Energy Meltemi Limited	07879002	0%
*Serica Energy PLC	05450950	0%
*Serica Energy Sirocco Limited	10394113	0%

*Note: * The Serica companies are wholly owned by Serica Energy PLC.*

1.5 Summary of Proposed Decommissioning Programmes

Table 1.5: Summary of Decommissioning Programmes	
Proposed Decommissioning Solution	**Reason for Selection**
1. Subsea Installations	
The Production Xmas Tree including Wellhead Protection Structure (WHPS) (and attached Wellhead Valve Spool Structure) will be recovered by a semi-submersible drill rig as part of well abandonment activities and returned to	To remove seabed structures and leave a clear seabed in line with OPRED decommissioning policy (BEIS 2018), and to comply with OSPAR Decision 98/3.

Table 1.5: Summary of Decommissioning Programmes	
Proposed Decommissioning Solution	**Reason for Selection**
shore for reuse, recycling, or disposal as appropriate. The WHPS is not piled. The riser base structures and associated clump weights will be recovered and returned to shore for reuse, recycling, or disposal as appropriate.	
2. Pipelines, Flowlines, Umbilicals & Riser Sections	
The pipeline and umbilical will be decommissioned *in situ* except surface laid sections outwith trenches, which will be recovered with remediation of cut ends. Cutting and removal of tie-in spools and jumpers at the well and SSIV, returned to shore for reuse, recycling, or disposal as appropriate. The dynamic riser and umbilical riser which are not physically connected to the NCP gravity base structure (GBS) but connected to hang-off modules on the NCP topsides and are free hanging in the water column (see Figure 1-4), will be disconnected and initially laid temporarily on seabed before recovery, after which these will be returned to shore for reuse, recycling or disposal as appropriate. As noted in Subsea installations above, the Wellhead Valve Spool structure is attached to the Xmas Tree and will be removed as part of well abandonment activities. The SSIV structure will be recovered and returned to shore for reuse, recycling, or disposal as appropriate.	The pipeline, spools, umbilical, dynamic riser and SSIV will be flushed to an agreed acceptable cleanliness level with fluid either down the well or back to NCP prior to decommissioning. In line with OPRED expectations (BEIS 2018) and to comply with OSPAR Decision 98/3, all spools, jumpers, risers and surface infrastructure will be removed and returned to shore for reuse, recycling, or disposal as appropriate.
3. Pipeline and related infrastructure stabilisation features	
Full recovery of exposed concrete mattresses and grout bags. Where mattresses used at trench transitions and partially buried, full recovery at end of field life. (If practical difficulties are encountered, Serica will consult with OPRED to agree an alternative approach).	In line with OPRED expectations (BEIS 2018), all exposed related stabilisation features such as mattresses and grout bags will be fully removed to leave a clear seabed.
4. Wells	
Well 3/3b-13Y will be plugged and abandoned using a semi-submersible drilling rig in accordance with the OEUK Well Decommissioning Guidelines Issue 7 (November 2022). As part of well abandonment activities, the Xmas Tree including WHPS (and attached Wellhead Valve Spool structure) will be recovered for appropriate reuse, recycling or disposal. The	Complies with HSE and NSTA regulations.

Table 1.5: Summary of Decommissioning Programmes	
Proposed Decommissioning Solution	**Reason for Selection**
well conductor will be cut to a minimum of -3m below seabed. Upon completion of well abandonment activities, a debris survey will be undertaken.	
5. Drill Cuttings	
No evidence of drill cuttings associated with the Orlando well.	N/A
6. Interdependencies	
The Orlando Field produces via the NCP process systems and is then exported with Ninian Field hydrocarbons. The export of oil from NCP uses Ninian Pipeline System (NPS) PL10 pipeline to Sullom Voe Terminal. Serica is in continuous close discussions with CNRI regarding scheduling of Orlando and NCP decommissioning to align respective work scopes (e.g. well abandonment, riser removal etc) where relevant with the aim of maximising efficiencies.	

1.6 Field Location Including Field Layout and Adjacent Facilities

Figure 1-1: Orlando Field Location in UKCS

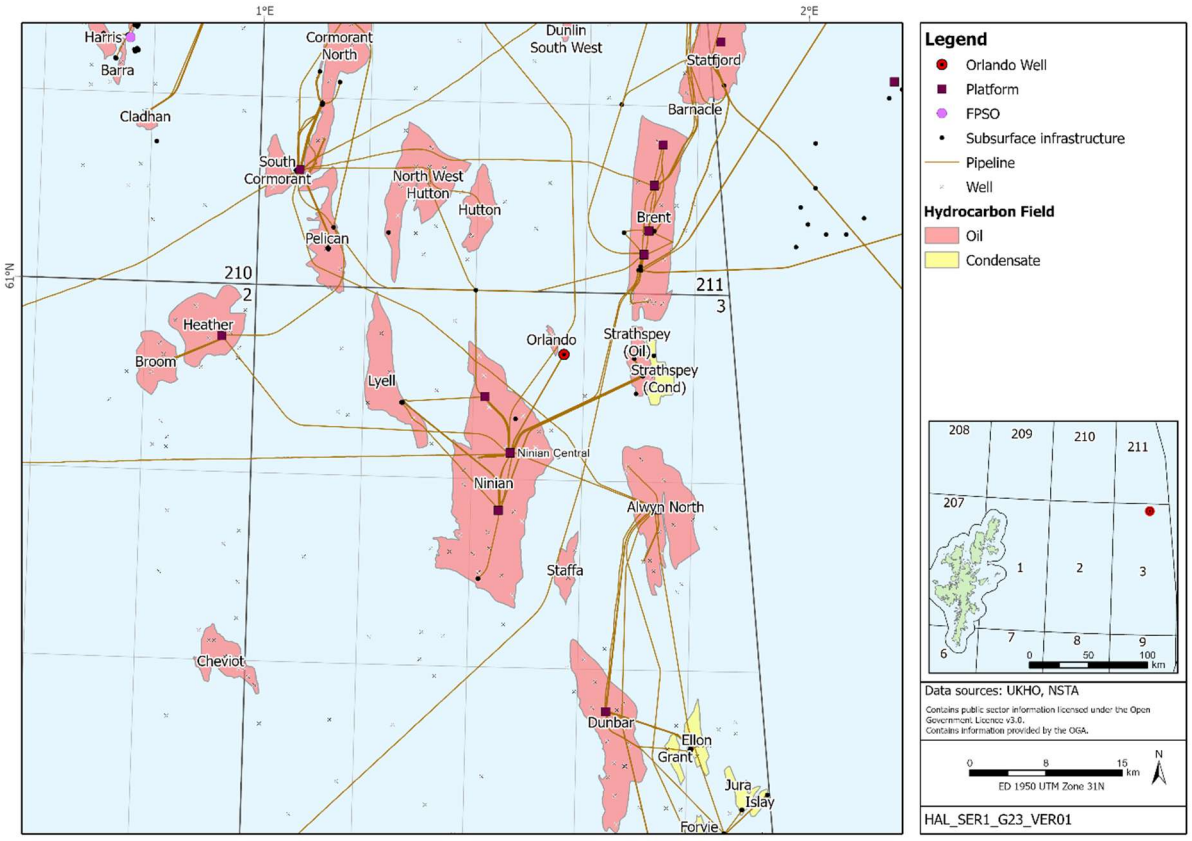


Figure 1-2: Orlando Field Layout

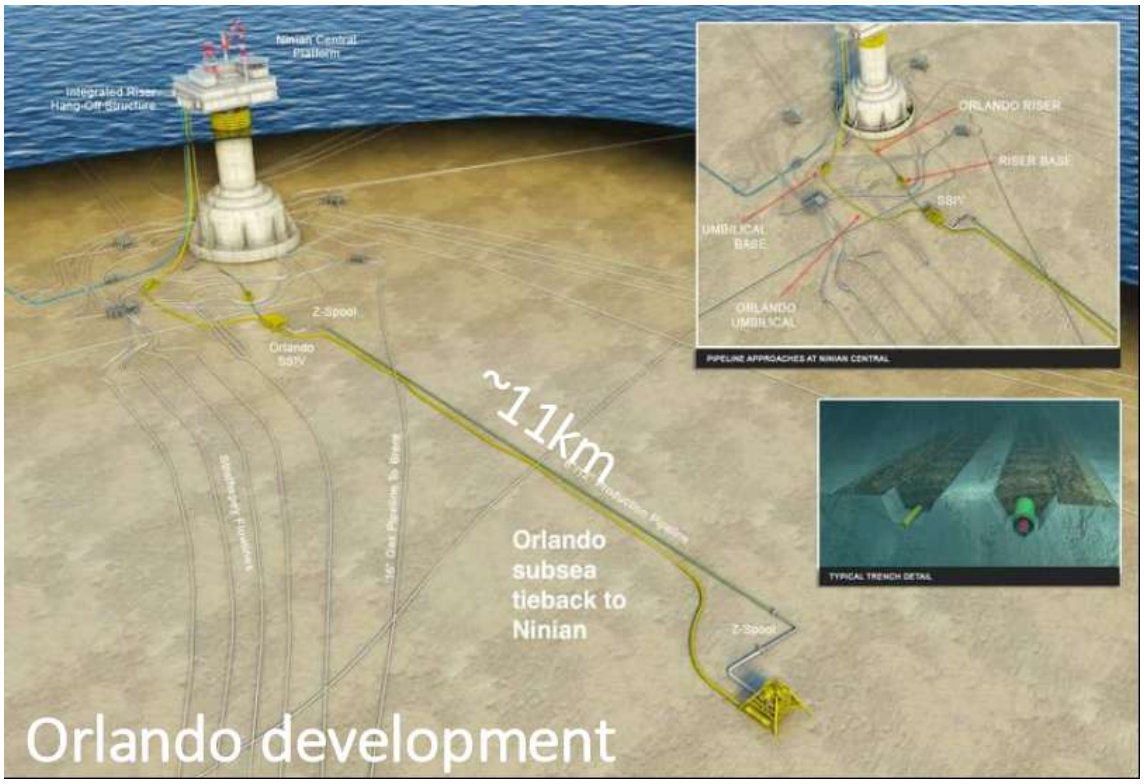


Figure 1-3: Orlando pipeline approaches at NCP

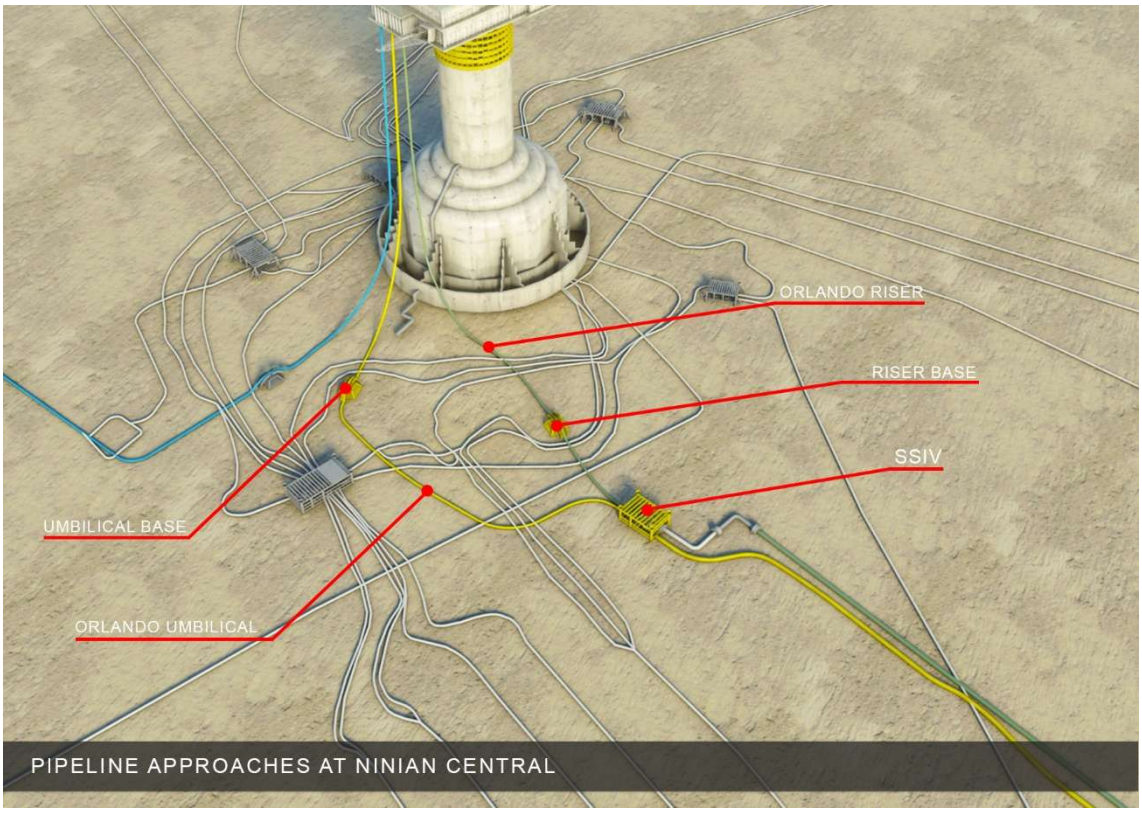


Figure 1-4: Orlando production riser catenary

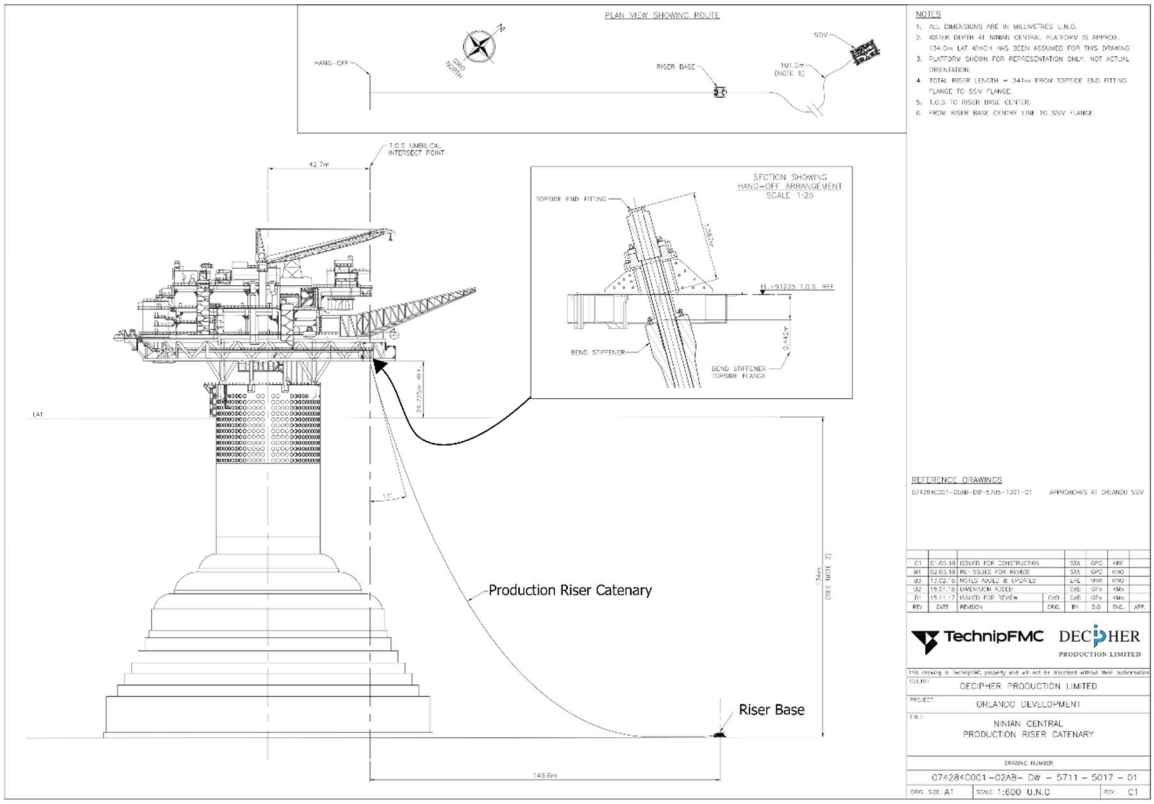


Table 1.6: Adjacent Facilities

Operator / Owner	Name	Type	Distance / Direction	Information	Status[1]
CNR International (U.K.) Limited	PL162 Ninian Central Water Injection Pipeline	Pipeline	0.37km west of Orlando pipeline / umbilical	12" water injection. Exposed. Untrenched.	Operational
CNR International (U.K.) Limited	PL116 Ninian Central Export Pipeline	Pipeline	0.29km west of Orlando pipeline / umbilical	Water. Ninian Central 10" Gas Export to Ninian Tee. Exposed. Trenched.	Not in use
CNR International (U.K.) Limited	PL71 Ninian Northern Export Pipeline	Pipeline	0.28km west of Orlando pipeline /umbilical	24" oil export. Exposed. Untrenched.	Not in use
EnQuest Heather Limited	PL139 Magnus to Ninian	Pipeline	0.23km west of Orlando pipeline /umbilical	Oil. Magnus to Ninian 24" MOL. Exposed. Untrenched.	Operational

Table 1.6: Adjacent Facilities

Operator / Owner	Name	Type	Distance / Direction	Information	Status[1]
TotalEnergies E&P UK Limited	PL1526 Alwyn NAB Export	Pipeline	Crossed by Orlando pipeline /umbilical	Alwyn NAB 12" oil export to Cormorant Alpha. Exposed. Untrenched.	Not in use
CNR International (U.K.) Limited	Ninian Central	Fixed Steel Platform	Dynamic riser and umbilical connect with NCP	Manned production/drilling facility	Operational.
CNR International (U.K.) Limited	PL917 Ninian Central Gas Export to Brent WLGP	Pipeline	Crossed by Orlando pipeline /umbilical within NCP 500m zone	Ninian Central to Brent 16" gas line. Exposed. Trenched.	Operational
CNR International (U.K.) Limited	PL917a Ninian Central gas importer riser	Riser	0.2km south east of Orlando production riser base	Gas	Operational
CNR International (U.K.) Developments Limited	PL918 Strathspey to Ninian Central	Pipeline	Crossed by dynamic riser and umbilical within NCP 500m zone	Mixed hydrocarbons. Strathspey to Ninian Central (Brent Production). Buried. Trenched.	Not in use
CNR International (U.K.) Limited	PL918a Strathspey riser at NCP	Riser	0.1km east of Orlando production riser base	Mixed hydrocarbons.	Not in use
CNR International (U.K.) Developments Limited	PL919 Strathspey to Ninian Central	Pipeline	0.14km east of Orlando pipeline /umbilical	Mixed hydrocarbons. Strathspey to Ninian Central (Brent Test). Buried. Trenched.	Not in use
CNR International (U.K.) Limited	PL919a Strathspey riser at NCP	Riser	0.2km south east of Orlando umbilical riser base	Mixed hydrocarbons.	Not in use
CNR International (U.K.) Developments Limited	PL920 Strathspey to Ninian Central	Pipeline	Crossed by dynamic riser and umbilical within NCP 500m zone	Mixed hydrocarbons. Buried. Trenched.	Not in use
CNR International (U.K.) Limited	PL920a Strathspey riser at NCP	Riser	0.1km east of Orlando production riser base	Mixed hydrocarbons.	Not in use
CNR International (U.K.) Developments Limited	PL921 Strathspey to Ninian Central	Pipeline	0.2km east of Orlando pipeline /umbilical	Mixed hydrocarbons. Buried. Trenched.	Not in use

Table 1.6: Adjacent Facilities

Operator / Owner	Name	Type	Distance / Direction	Information	Status[1]
CNR International (U.K.) Limited	PL921a Strathspey riser at NCP	Riser	0.2km south east of Orlando production riser base	Mixed hydrocarbons.	Not in use
CNR International (U.K.) Developments Limited	PL922 Ninian Central to Strathspey Utilities	Pipeline	0.17km east of Orlando pipeline /umbilical	Mixed hydrocarbons. Ninian Central to Strathspey Manifold Utilities 4". Piggybacked to PL918.	Not in use
CNR International (U.K.) Limited	PL922a Strathspey riser at NCP	Riser	0.2km south east of Orlando production riser base	Mixed hydrocarbons.	Not in use
CNR International (U.K.) Developments Limited	PL923 Ninian Central to Strathspey Methanol	Pipeline	0.2km east of Orlando pipeline /umbilical	Methanol. Ninian Central to Strathspey Manifold Methanol. Piggybacked to PL921.	Not in use
CNR International (U.K.) Limited	PL923a Strathspey riser at NCP	Riser	0.2km south east of Orlando production riser base	Methanol	Not in use
CNR International (U.K.) Developments Limited	PL924 Ninian Central to Strathspey Umbilical	Umbilical	Crossed by dynamic riser and umbilical within NCP 500m zone	Other fluid. Ninian Central to Strathspey Manifold chemical/hydraulic umbilical. Exposed. Trenched.	Not in use
CNR International (U.K.) Developments Limited	PL925 Ninian Central to Strathspey Umbilical	Umbilical	Crossed by dynamic riser and umbilical within NCP 500m zone	Other fluid. Ninian Central to Strathspey Manifold chemical/hydraulic umbilical. Exposed. Trenched.	Not in use
TotalEnergies E&P UK Limited	PL335 Alwyn NAB to Ninian	Pipeline	Crossed by dynamic riser and umbilical within NCP 500m zone	Alwyn NAB to Ninian 12" oil line	Operational
CNR International (U.K.) Limited	PL870A Ninian Southern to Strathspey	Pipeline	0.95km east of Orlando pipeline /umbilical	Ninian Southern to Strathspey 12" water line. Buried. Trenched.	Not in use
CNR International (U.K.) Developments Limited	PL870B Strathspey Water Injection Pipeline	Pipeline	1km east of Orlando pipeline /umbilical	Water. Exposed. Trenched.	Not in use

Table 1.6: Adjacent Facilities

Operator / Owner	Name	Type	Distance / Direction	Information	Status[1]
CNR International (U.K.) Limited	PL1999 NSP to NCP Oil Export	Pipeline	0.28km south of Orlando pipeline /umbilical	Mixed hydrocarbons. Buried. Trenched.	Not in use
CNR International (U.K.) Limited	PL70 Ninian Southern Oil Export Pipeline	Pipeline	0.34km south of Orlando pipeline /umbilical	Water. Ninian Southern to Ninian Central 24" oil export. Exposed. Untrenched.	Not in use
CNR International (U.K.) Limited	PL72 Ninian Southern Gas Export Pipeline	Pipeline	0.31km south of Orlando pipeline /umbilical	Ninian Southern to Ninian Central 8" gas import/export. Exposed. Trenched.	Operational
CNR International (U.K.) Limited	PL72A	Pipeline	0.16km south of Orlando pipeline /umbilical	8" gas flexible spool	Not in use
CNR International (U.K.) Limited	PL72B	Pipeline	5.9km south of Orlando pipeline /umbilical	8" gas flexible spool and riser	Not in use
CNR International (U.K.) Limited	PL73 Ninian NCP to Production Well 3/3-5	Umbilical	0.4km west of Orlando pipeline /umbilical	Water. Ninian NCP to early Production Well 3/3-5. Exposed. Untrenched.	Not in use
CNR International (U.K.) Limited	PL73.1	Umbilical	0.4km west of Orlando pipeline /umbilical	Water. Ninian NCP to early Production Well 3/3-5. Exposed. Untrenched.	Not in use
EnQuest Heather Limited	PL9 Heather to Ninian	Pipeline	0.3km west of Orlando pipeline /umbilical	Heather to Ninian 16" oil line	Not in use
EnQuest Heather Limited	PL10 Ninian to Grutwick MOL	Pipeline	0.35km west of Orlando pipeline /umbilical	Oil. Ninian to Grutwick 36" MOL. Exposed. Untrenched.	Operational
CNR International (UK) Limited	Ninian Southern	Fixed Steel Platform	6km South West of NCP	Manned production/drilling facility	Not in use

Impacts of Decommissioning Proposals on third party/adjacent facilities

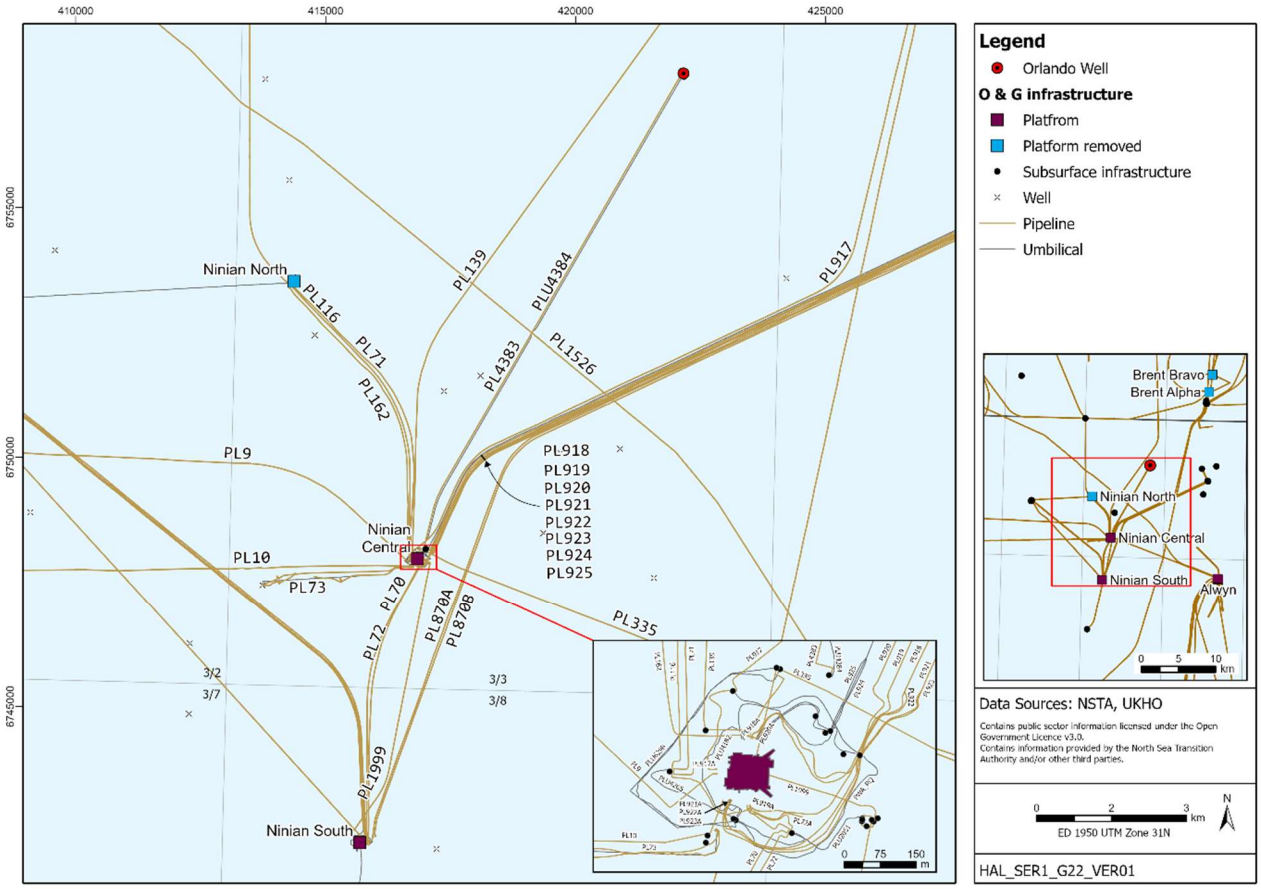
The decommissioning activities are being planned such that they will not affect adjacent facilities; the pipeline/umbilical will be decommissioned *in situ*, leaving the crossings over the active NCP to Brent 16" gas line and the inactive Alwyn NAB 12" oil export to Cormorant Alpha intact, and all works carried out within the NCP 500m zone will be in accordance with a permit to work. None of the Orlando decommissioning activities in the NCP 500m zone will prejudice the CNRI decommissioning of the NCP infrastructure.

The disconnection, laydown and recovery of the Orlando dynamic riser and dynamic riser umbilical (which will be undertaken by CNRI but is covered by the Orlando DP and the supporting Environmental Appraisal),

Table 1.6: Adjacent Facilities					
Operator / Owner	**Name**	**Type**	**Distance / Direction**	**Information**	**Status[1]**
could impact a number of adjacent pipelines and umbilicals (PL918, PL920, PL924, PL925, PL335). With the exception of PL335 (TotalEnergies), these pipelines and umbilicals are operated by CNRI which will ensure appropriate coordination of decommissioning activities. Serica will continue close discussions with CNRI and others regarding scheduling of Orlando and NCP decommissioning to ensure that all appropriate steps, e.g. Hazard Identification and Risk Assessments (HIRA) are taken to minimise potential impacts during subsequent decommissioning activiities. The supporting environmental appraisal considers potential significant impacts of decommissioning activities, including cumulative impacts in the context of other industry activites in the area.					

Note: Adjacent facilities that are crossed by the Orlando facilities are shaded grey. [1] It is noted that where the status of a number of the pipelines (e.g. PL162, PL1999) differs between the information provided by OPRED and CNRI (2025), the OPRED information has been used. Sources: NSTA website - https://www.nstauthority.co.uk/data-and-insights/data/, Ninian Central topsides and associated riser sections Decommissioning Programmes (CNRI 2025), OPRED comments on draft DP.

Figure 1-5: Adjacent Facilities



1.7 Industrial Implications

The decommissioning activities associated with the Orlando subsea installation and pipelines will be completed using the most effective combination of Diving Support Vessel (DSV) & Construction Support Vessel (CSV). Well abandonment operations will be completed using a semi-submersible drilling rig and Serica is exploring potential synergies with CNRI with respect to well abandonment work in the Ninian area. Flushing of the pipeline and umbilical will be undertaken in conjunction with CNRI.

Serica have an ongoing engagement with NSTA to ensure that Orlando decommissioning is cost effective, in accordance with regulatory requirements and consistent with their Decommissioning Strategy. It is Serica's intention to competitively tender the Orlando well abandonment activities and decommissioning of the subsea installation, pipelines and stabilisation features. Serica will also seek to combine Orlando decommissioning activities with other development or decommissioning works should the opportunity become available. Serica will keep dialogue with CNRI open with the aim of maximising any synergies in scope between the respective Decommissioning Programmes.

2.0 Description of Items to be Decommissioned

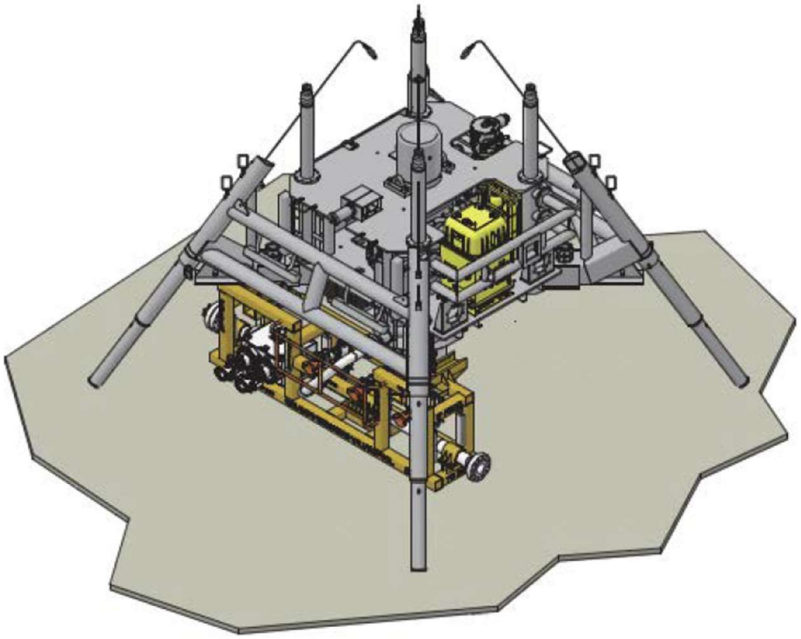
2.1 Installation(s): Subsea including Stabilisation Features

Table 2.1: Orlando Subsea Installations and Stabilisation Features

Subsea installations including Stabilisation Features*	Number	Size/Weight	Location	Comments/ Status
Production Xmas Tree including Wellhead Protection Structure (and attached Wellhead Valve Spool Structure, see Table 2.3 and Figure 2-1)	1	4.3m x 4.28m x 4.79m / 42.0 Tonnes (Te)	**WGS84 DD** 60.945, 1.561 **WGS84 DDM** 60° 56.672' N 01° 33.686' E	Well 3/3b-13Y (P1) is currently active. The WHPS is an integral part of the Xmas Tree overtrawlable structure. As such there are no piles.
Production Riser Base (Figure 2-2)	1	4.758m x 5.289m x 2.261m / 54.61 Te	**WGS84 DD** 60.858, 1.470 **WGS84 DDM** 60° 51.44' N 01° 28.193' E	Gravity-based structure.
Production Riser Base clump weight	1	2.360m x 3.922m x 0.625m / 29.22 Te		On production riser base
Umbilical Riser Base (Figure 2-3)	1	4.758m x 7.440m x 2.261m / 54.34 Te	**WGS84 DD** 60.857, 1.471 **WGS84 DDM** 60° 51.398' N 01° 28.259' E	Gravity-based structure.
Umbilical Riser Base clump weight	1	2.946m x 3.922m x 0.625m / 31.25 Te		On umbilical riser base

*Note: *There are no stabilisation features (e.g. grout bags, concrete mats) associated with the Orlando installations.*

Figure 2-1: Orlando Xmas Tree including WHPS and Wellhead Valve Spool Structure



Note: Wellhead Valve Spool Structure (PL4383 Ident. No. 1) shown in orange beneath the Xmas Tree.

Figure 2-2: Production Riser Base Structure and clump weight

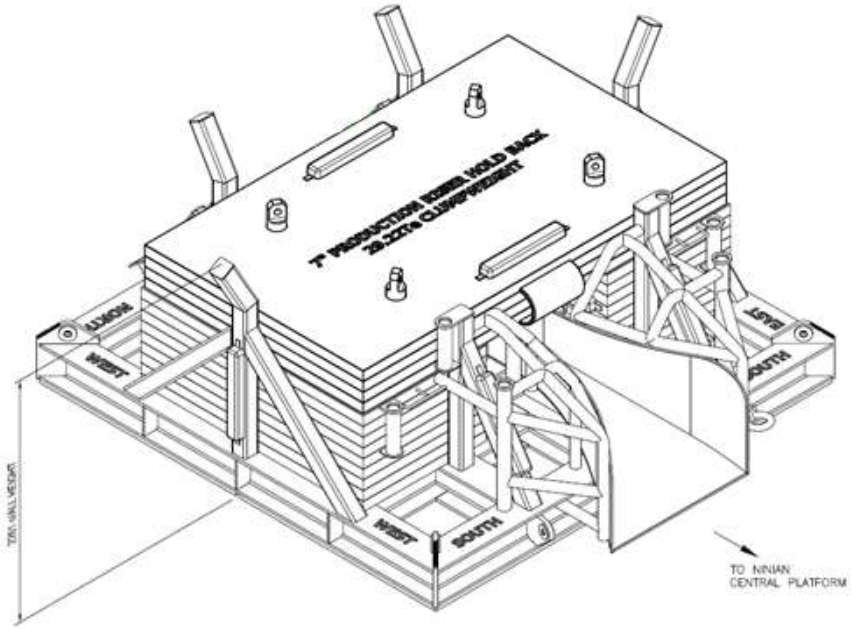
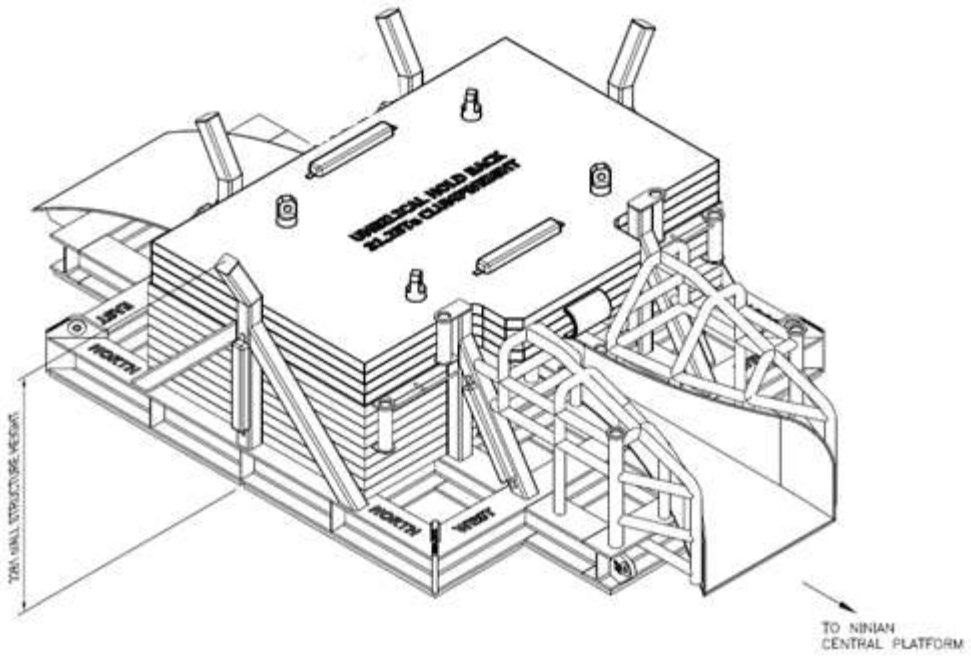


Figure 2-3: Umbilical Riser Base Structure and clump weight



2.2 Pipelines Including Stabilisation Features

Table 2.2: Orlando Pipeline/Flowline/Umbilical Information

Pipeline Number	Description (Include diameter)	Length (km)	Product Conveyed[2]	From – To Location Points	Burial Status	Pipeline Status	Current Content
PL4383 Ident. No. 1	Wellhead Valve Spool (rigid stainless steel spoolpieces housed in a valve structure attached to the Xmas Tree, 8" / 6") (see Table 2.3)	0.009 (9m)	Oil	Wellhead Valve Spool Flange to Wellhead Valve Spool	N/A as part of valve structure attached to tree	Operational	Hydrocarbons
PL4383 Ident. No. 2	8" Spools (rigid stainless steel spoolpieces)	0.044 (44m)	Oil	Wellhead Valve Spool Flange to Pipeline Spool Flange	Lowered below seabed and covered with log mattresses	Operational	Hydrocarbons
PL4383 Ident. No. 3	8"/12" Pipe-in-Pipe Production Pipeline (both carbon steel)	10.813 (10,813m)	Oil	Pipeline Spool Flange to SSIV Spool Flange	Trenched and Backfilled (except transitions / crossings where rock covered).	Operational	Hydrocarbons
PL4383 Ident. No. 4	8" Spools (rigid stainless steel spoolpieces)	0.058 (58m)	Oil	SSIV Spool Flange to SSIV	Laid on seabed and protected via concrete mattresses	Operational	Hydrocarbons
PL4383 Ident. No. 5	8" SSIV Piping (housed in a SSIV structure, see Table 2.3)	0.011 (11m)	Oil	SSIV to SSIV	N/A as part of SSIV structure	Operational	Hydrocarbons
PL4383 Ident. No. 6	7" Dynamic riser	0.341 (341m)	Oil	SSIV to NCP ESDV	N/A	Operational	Hydrocarbons
PL4383	**Total length**	**11.276 (11,276m)**					

Table 2.2: Orlando Pipeline/Flowline/Umbilical Information

Pipeline Number	Description (Include diameter)	Length (km)	Product Conveyed[2]	From – To Location Points	Burial Status	Pipeline Status	Current Content
PLU4384 Ident No. 1	Dynamic Riser Umbilical (232.8mm)	0.45 (450m)	Chemicals	NCP to SSIV	N/A	Operational	Chemicals
PLU4384 Ident No. 2	Static Umbilical (169mm)	11.0 (11,000m)	Chemicals	SSIV to P1 Well	Trenched and Backfilled (except transitions / crossings where rock covered).	Operational	Chemicals
PLU4384	**Total length**	**11.45 (11,450m)**					

Table 2.3: Orlando Structures associated with pipelines

Structures associated with Pipelines	Number	Size/Weight	Location	Comments/Status
Wellhead Valve Spool Structure (Figure 2-1 above)	1	6.4m x2.3m x1.7m / 8.4 Te	**WGS84 DD** 60.945, 1.561 **WGS84 DDM** 60° 56.672' N 01° 33.686' E	The Wellhead Valve Spool Structure is attached to the Xmas Production Tree
SSIV Structure (Figure 2-4 below)	1	10.8m x 6.7m x 3.62m / 91.2 Te	**WGS84 DD** 60.858, 1.470 **WGS84 DDM** 60° 51.487' N 01° 28.221' E	Gravity-based structure.

Table 2.4: Orlando Subsea Pipeline Stabilisation Features

Stabilisation Feature	Number	Size/Weight	Location		Exposed/Buried/Condition
			From	To	
Concrete mattresses	19	10m x 3.0 x 0.3m / 361 Te	**WGS84 DD** 60.945, 1.561 **WGS84 DDM** 60° 56.672' N 01° 33.686' E	**WGS84 DD** 60.944, 1.560 **WGS84 DDM** 60° 56.639' N 01° 33.614' E	Exposed.
			Note: 19 concrete log mattresses covering surface-laid spools on approach to P1 well. **PL4383 Ident. No. 1**: and **No.2**.		
	11	6m x 3.0 x 0.15m / 51.7 Te	**WGS84 DD** 60.945, 1.561 **WGS84 DDM** 60° 56.672' N 01° 33.686' E	**WGS84 DD** 60.944, 1.560 **WGS84 DDM** 60° 56.639' N 01° 33.614' E	1 fully buried, 1 partly buried, 9 exposed.
			Note: 11 mattresses covering surface-laid sections of the pipeline before ties into spools at P1 Well end. **PL4383 Ident. No. 3**.		
	8	6m x 3.0 x 0.15m / 37.6 Te	**WGS84 DD** 60.858, 1.470 **WGS84 DDM** 60° 51.487' N 01° 28.221' E	**WGS84 DD** 60.859, 1.470 **WGS84 DDM** 60° 51.513' N 01° 28.226' E	1 partly buried, 7 exposed.
			Note: 8 mattresses covering surface-laid sections of pipeline before ties into spools at SSIV end. **PL4383 Ident. No. 3**.		
	12	6m x 3.0 x 0.15m / 56.4 Te	**WGS84 DD** 60.858, 1.470 **WGS84 DDM** 60° 51.487' N 01° 28.221' E	**WGS84 DD** 60.859, 1.470 **WGS84 DDM** 60° 51.513' N 01° 28.226' E	Exposed.
			Note: 12 mattresses covering surface-laid spools on approach to SSIV. **PL4383 Ident. No. 4**.		
	7	3 off 6m x 3m x 0.15m / 14.1 Te 4 off 6m x 3m x 0.3m / 33.6 Te	**WGS84 DD** 60.858, 1.470 **WGS84 DDM** 60° 51.44' N 01° 28.193' E	**WGS84 DD** 60.858, 1.470 **WGS84 DDM** 60° 51.487' N 01° 28.221' E	Exposed.
			Note: Within NCP platform 500m zone, 3 mattresses (6m x 3.0 x 0.15m) used for stabilisation and 4 (6m x 3.0 x 0.3m) used at dynamic riser crossings of other pipelines. **PL4383 Ident. No. 6**.		
	11		**WGS84 DD** 60.857, 1.471	**WGS84 DD** 60.858, 1.470	Exposed.

Table 2.4: Orlando Subsea Pipeline Stabilisation Features

Stabilisation Feature	Number	Size/Weight	Location		Exposed/Buried/Condition
			From	To	
		4 off 6m x 3m x 0.15m / 18.8 Te 7 off 6m x 3m x 0.3m / 58.8 Te	**WGS84 DDM** 60° 51.398' N 01° 28.259' E	**WGS84 DDM** 60° 51.487' N 01° 28.221' E	
			Note: Within NCP platform 500m zone, 4 mattresses (6m x 3.0 x 0.15m) used for stabilisation and 7 (6m x 3.0 x 0.3m) used at dynamic umbilical crossings of other pipelines. **PLU4384 Ident No. 1**.		
	58	6m x 3.0 x 0.15m / 272.6 Te	**WGS84 DD** 60.945, 1.561 **WGS84 DDM** 60° 56.672' N 01° 33.686' E	**WGS84 DD** 60.943, 1.560 **WGS84 DDM** 60° 56.572' N 01° 33.587' E	Exposed.
			Note: 58 mattresses covering umbilical trench transition and umbilical on seabed surface on approach to P1 Well. **PLU4384 Ident No. 2**.		
	8	6m x 3.0 x 0.15m / 37.6 Te	**WGS84 DD** 60.858, 1.470 **WGS84 DDM** 60° 51.487' N 01° 28.221' E	**WGS84 DD** 60.859, 1.470 **WGS84 DDM** 60° 51.513' N 01° 28.226' E	1 fully buried, 1 partly buried, 6 exposed.
			Note: 8 mattresses covering umbilical on seabed on approach to SSIV. **PLU4384 Ident No. 2**.		
	2	6m x 3.0 x 0.3m / 16.8 Te	**WGS84 DD** 60.897, 1.508 **WGS84 DDM** 60° 53.841' N 01° 30.461' E	**WGS84 DD** 60.897, 1.508 **WGS84 DDM** 60° 53.841' N 01° 30.461' E	10 fully buried.
			Note: Mattresses part of pipeline crossing (KP 5.98) on **PL4383 Ident. No. 3**.		
	1	6m x 3.0 x 0.3m / 8.4 Te	**WGS84 DD** 60.897, 1.508 **WGS84 DDM** 60° 53.841' N 01° 30.462' E	**WGS84 DD** 60.897, 1.508 **WGS84 DDM** 60° 53.841' N 01° 30.462' E	
			Note: Mattress part of umbilical crossing (KP 5.98) on **PLU4384 Ident No. 2**.		
	2		**WGS84 DD** 60.898, 1.509	**WGS84 DD** 60.898, 1.509	

Table 2.4: Orlando Subsea Pipeline Stabilisation Features

Stabilisation Feature	Number	Size/Weight	Location		Exposed/Buried/Condition
			From	To	
		6m x 3.0 x 0.15m / 9.4 Te	**WGS84 DDM** 60° 53.892' N 01° 30.517' E	**WGS84 DDM** 60° 53.895' N 01° 30.52' E	
			Note: Mattresses part of pipeline crossing (KP 5.867) on **PL4383 Ident. No. 3**.		
	2	6m x 3.0 x 0.3m / 16.8 Te	**WGS84 DD** 60.859, 1.470 **WGS84 DDM** 60° 51.565' N 01° 28.214' E	**WGS84 DD** 60.859, 1.470 **WGS84 DDM** 60° 51.565' N 01° 28.214' E	
			Note: Mattresses part of pipeline crossing (KP 10.692) on **PL4383 Ident. No. 3**.		
	1	6m x 3.0 x 0.3m / 8.4 Te	**WGS84 DD** 60.859, 1.470 **WGS84 DDM** 60° 51.567' N 01° 28.218' E	**WGS84 DD** 60.859, 1.470 **WGS84 DDM** 60° 51.567' N 01° 28.218' E	
			Note: Mattress part of umbilical crossing (KP 10.692) **on PLU4384 Ident No. 2**.		
	2	6m x 3.0 x 0.3m / 16.8 Te	**WGS84 DD** 60.860, 1.470 **WGS84 DDM** 60° 51.58' N 01° 28.22' E	**WGS84 DD** 60.860, 1.470 **WGS84 DDM** 60° 51.58' N 01° 28.22' E	
			Note: Mattresses part of pipeline crossing (KP 10.663) on **PL4383 Ident. No.** 3.		
Total	19	10m x 3.0 x 0.3m / 361 Te	-	-	19 exposed
	106	6m x 3.0 x 0.15m / 498.2 Te			99 exposed, 3 partly, 4 fully buried
	19	6m x 3m x 0.3m / 159.6 Te			11 exposed, 8 fully buried
	144	**1,018.8 Te**			**129 exposed, 3 partly buried, 12 fully buried**

Table 2.4: Orlando Subsea Pipeline Stabilisation Features

Stabilisation Feature	Number	Size/Weight	Location		Exposed/Buried/Condition
			From	To	
Grout bags	160	25kg bags / 4 Te	**WGS84 DD** 60.945, 1.561 **WGS84 DDM** 60° 56.672' N 01° 33.686' E	**WGS84 DD** 60.944, 1.560 **WGS84 DDM** 60° 56.639' N 01° 33.614' E	Exposed.
			Note: Grout bags used along surface-laid spools on approach to P1 well Location. **PL4383 Ident. No. 1** and **No.2**.		
	80	25kg bags / 2 Te	**WGS84 DD** 60.945, 1.561 **WGS84 DDM** 60° 56.672' N 01° 33.686' E	**WGS84 DD** 60.945, 1.561 **WGS84 DDM** 60° 56.672' N 01° 33.686' E	Exposed
			Note: Grout bags laid close to both pipeline and umbilical in the area of the Orlando Well. **PL4383 Ident. No.1** and **PLU4384 Ident No. 2**.		
	80	25kg bags / 2 Te	**WGS84 DD** 60.858, 1.470 **WGS84 DDM** 60° 51.487' N 01° 28.221' E	**WGS84 DD** 60.859, 1.470 **WGS84 DDM** 60° 51.534' N 01° 28.199' E	Exposed.
			Note: Grout bags used at spool SSIV tie in location. **PL4383 Ident. No. 4**.		
	640	25kg bags / 16 Te	**WGS84 DD** 60.858, 1.470 **WGS84 DDM** 60° 51.44' N 01° 28.193' E	**WGS84 DD** 60.858, 1.470 **WGS84 DDM** 60° 51.487' N 01° 28.221' E	Exposed.
			Note: Within NCP platform 500m zone, grout bags used at dynamic riser crossings of other pipelines (North Alwyn – 11 tonnes, HE4 – 1 tonne) and at SSIV tie-in of dynamic riser (4 tonnes). **PL4383 Ident. No. 6**.		
	200	25kg bags / 5 Te	**WGS84 DD** 60.857, 1.471 **WGS84 DDM** 60° 51.398' N 01° 28.259' E	**WGS84 DD** 60.858, 1.470 **WGS84 DDM** 60° 51.487' N 01° 28.221' E	Exposed.

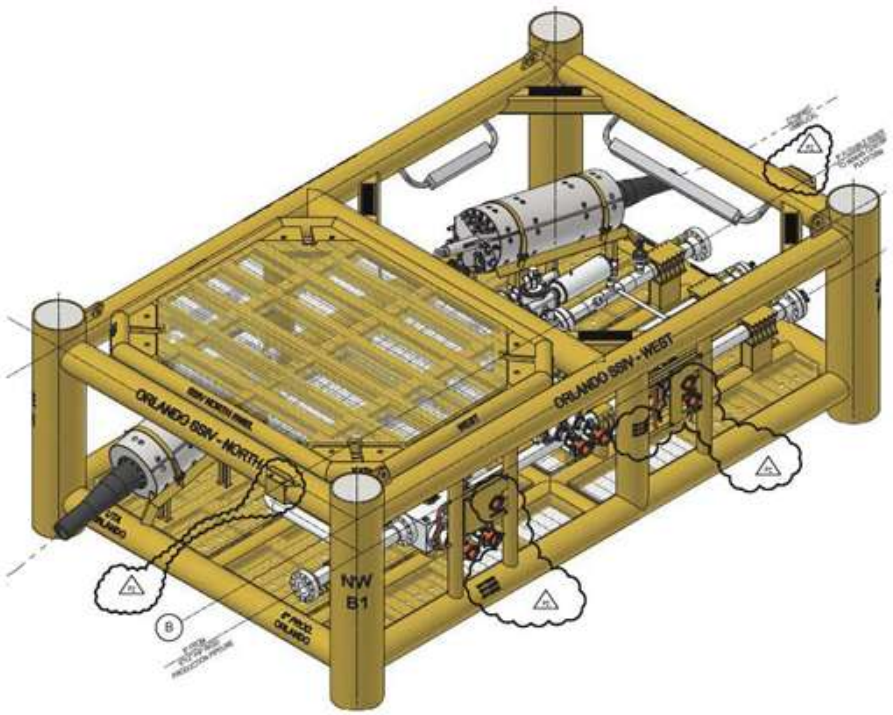
Table 2.4: Orlando Subsea Pipeline Stabilisation Features

Stabilisation Feature	Number	Size/Weight	Location		Exposed/Buried/Condition
			From	To	
			Note: Within NCP platform 500m zone, grout bags used at dynamic umbilical crossing of North Alwyn pipeline (4 tonnes) and at SSIV tie-in of dynamic umbilical (1 tonne). **PLU4384 Ident No. 1**.		
	80	25kg bags / 2 Te	**WGS84 DD** 60.858, 1.470 **WGS84 DDM** 60° 51.487' N 01° 28.221' E	**WGS84 DD** 60.859, 1.470 **WGS84 DDM** 60° 51.513' N 01° 28.226' E	Exposed.
			Note: Grout bags used at static umbilical tie-in to SSIV. **PLU4384 Ident No. 2**.		
	120	25kg bags / 3 Te	**WGS84 DD** 60.945, 1.561 **WGS84 DDM** 60° 56.672' N 01° 33.686' E	**WGS84 DD** 60.943, 1.560 **WGS84 DDM** 60° 51.513' N 01° 28.226' E	Exposed
			Note: Grout bags used for Well P1 to static umbilical mattress support. **PLU4384 Ident No. 2**.		
Total	**1,360**	**34 Te**	**-**	**-**	**Exposed**
Rock deposits	-	23,497 Te	**WGS84 DD** 60.859, 1.470 **WGS84 DDM** 60° 51.534' N 01° 28.199' E	**WGS84 DD** 60.944, 1.560 **WGS84 DDM** 60° 56.639' N 01° 33.614' E	
			Note: UHB Rock cover (blanket and spot combined) 1-5” Grade on pipeline **PL4383 Ident. No. 3**.		
	-	162 Te	**WGS84 DD** 60.859, 1.470 **WGS84 DDM** 60° 51.513' N 01° 28.226' E	**WGS84 DD** 60.859, 1.470 **WGS84 DDM** 60° 51.543' N 01° 28.209' E	
			Note: Spot Rock cover 1-5” Grade on static umbilical **PLU4384 Ident No. 2**.		
	-	2,770 Te	**WGS84 DD** 60.859, 1.470 **WGS84 DDM** 60° 51.534' N 01° 28.199' E	**WGS84 DD** 60.861, 1.471 **WGS84 DDM** 60° 51.685' N 01° 28.268' E	

Table 2.4: Orlando Subsea Pipeline Stabilisation Features

Stabilisation Feature	Number	Size/Weight	Location		Exposed/Buried/Condition
			From	To	
			Note: Rock 1-5" Grade at Brent crossing on pipeline **PL4383 Ident. No. 3**.		
	-	1,066 Te	**WGS84 DD** 60.859, 1.470 **WGS84 DDM** 60° 51.513' N 01° 28.226' E	**WGS84 DD** 60.861, 1.472 **WGS84 DDM** 60° 51.666' N 01° 28.292' E	
			Note: Rock 1-5" Grade at Brent crossing on static umbilical **PLU4384 Ident No. 2**.		
	-	7,984 Te	**WGS84 DD** 60.896, 1.506 **WGS84 DDM** 60° 53.737' N 01° 30.343' E	**WGS84 DD** 60.899, 1.51 **WGS84 DDM** 60° 53.939' N 01° 30.57' E	
			Note: Rock 1-5" Grade at South Cormorant crossing on pipeline **PL4383 Ident. No. 3**.		
	-	1,492 Te	**WGS84 DD** 60.896, 1.51 **WGS84 DDM** 60° 53.747' N 01° 30.394' E	**WGS84 DD** 60.899, 1.51 **WGS84 DDM** 60° 53.92' N 01° 30.589' E	
			Note: Rock 1-5" Grade at South Cormorant crossing on static umbilical **PLU4384 Ident No. 2**.		
Total	**-**	**36,971 Te**	**-**		**-**

Figure 2-4: SSIV Structure



2.3 Wells

Table 2.5: Orlando Well Information

Subsea Wells	Designation	Status	Category of Well
3/3b-13Y	Production	Operating	SS P-S-H

2.4 Drill Cuttings

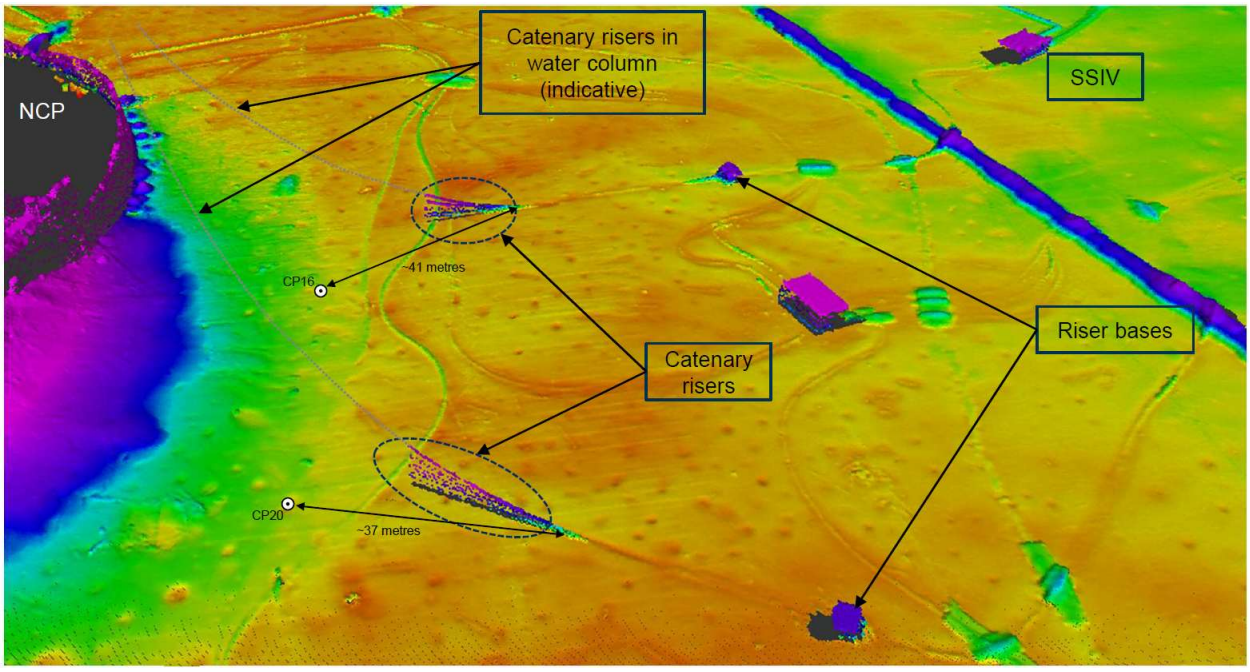
The single production well at Orlando was a re-entry and sidetrack of the previously suspended appraisal well (3/3b-13z), which was drilled in 2012 and did not involve the discharge of oil based mud cuttings (the discharge of which was banned after January 2001 under OSPAR Decision 2000/03). The sidetrack (3/3b-13y), was drilled in 2018 with low toxicity oil based mud (LTOBM). These muds and cuttings were either retained on the rig or backloaded to shore, with a minor component discharged with the cuttings following thermal treatment. The total mass of treated cuttings discharged was 897.4t.

There was no visual evidence of drill cuttings on the seabed around the well location during the 2024 ROV inspection survey. The 2021 seabed survey around the Orlando well concluded that the majority of stations were typical of background sediment in the northern North Sea with the exception of stations closest to the well, which showed some evidence of drilling fluids from drilling activities at the Orlando 3/3b-13Y well, but no negative effects on the macrofauna (Fugro 2025, see also Section 3 of the supporting EA document). No cuttings pile at the well location was reported by the 2021 survey.

There is a drill cuttings pile located on the east side of the NCP that rises to approximately 12m above the natural seabed, the details of which and management of, will be addressed

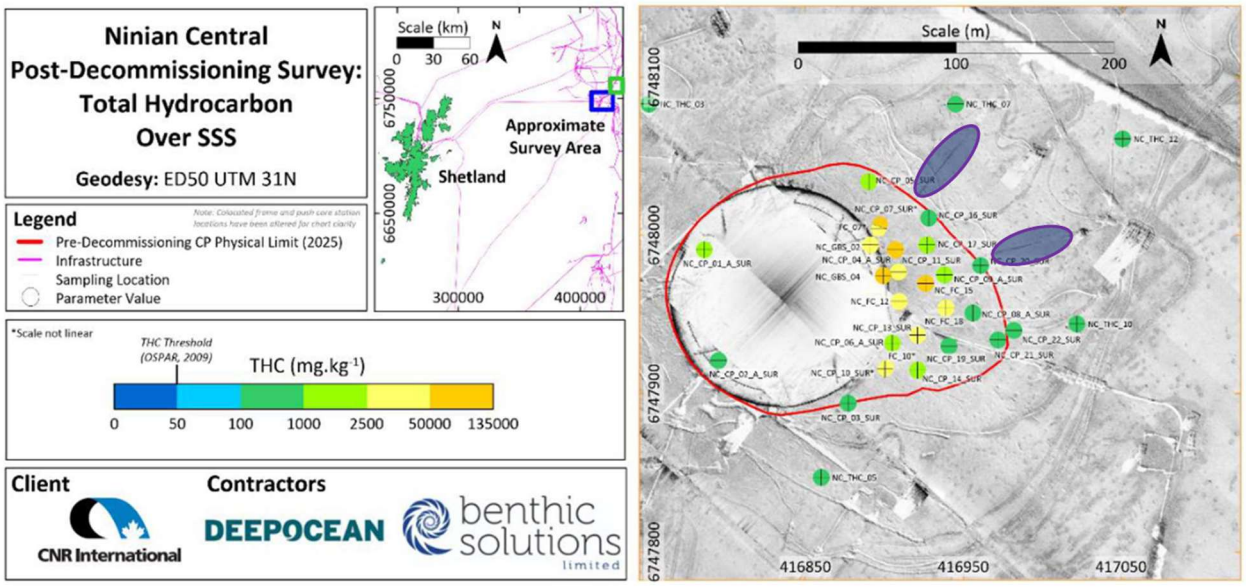
by the CNRI NCP substructure (CGBS) Decommissioning Programme. The NCP topsides DP indicates that the catenary risers on the east side of NCP (which includes the Orlando dynamic riser and dynamic riser umbilical) will be disconnected and temporarily laid down on the adjacent seabed. As part of this, the presence of the drill cuttings pile will be taken into consideration and measures employed to avoid disturbance of the cuttings pile. A multibeam echosounder (MBES) and push core sampling survey conducted in summer 2025 characterised the extent and characteristics of the NCP cuttings pile. The closest sample points used to characterise the physical extent of the NCP cuttings pile are approximately 37m from the touchdown point of the Orlando umbilical riser and approximately 41m from the touchdown point of the production riser catenary (Figure 2-5). Both risers hang in the water column well clear of the cuttings pile as they approach NCP. The highest total hydrocarbon concentrations (THC) were found in those parts of the cuttings pile closest to the NCP structure (noting that THC concentrations from sample points in the vicinity of the riser bases were above the OSPAR (2009)[1] threshold of 50 mg/kg (Figure 2-6). Disconnection, laydown and recovery timelines and laydown location(s) for the catenary risers will be discussed between CNRI and OPRED during work preparation phase utilising BAT/BEP studies and awareness of the proximity of the drill cuttings to the risers to inform the discussions, laydown and removal methodology, and applications for the necessary permitting.

Figure 2-5: MBES data of Orlando infrastructure with the nearest push core sampling locations marked (CP16 and CP20)



[1] OSPAR (2009). Implementation report on Recommendation 2006/5 on a management regime for offshore cutting piles.

Figure 2-6: Total hydrocarbon concentrations from push core samples in the vicinity of NCP



Note: Side scan sonar (SSS). Purple lozenges represent the Orlando catenary risers in Figure 2.5.

2.5 Inventory Estimates

The inventory related to subsea installations, submarine pipelines and stabilisation/protection features are shown in Figures 2.7, 2.8 and 2.9 respectively. The inventory is also listed in Table 2.6 and the atmospheric emissions associated with material recycling are detailed in Section 6.2 of the EA report.

Table 2.6: Inventory breakdown

	Percentage	Tonnes
Subsea installations (P1 wellhead tree including WHPS, 2 riser bases and 2 clump weights)		
Steel[1]	99.6	210.58
Plastics	0.4	0.84
Total	**100**	**211.42**
Submarine pipelines (pipeline and umbilical, related spools and wellhead valve spool structure, risers, SSIV and controls equipment)		
Steel	94	2,816.3
Non-ferrous	2.5	74.52
Plastics	2	60.86
"Other" materials[2]	1.5	44.07
Total	**100**	**2,995.75**
Stabilisation/protection features (concrete mattresses, grout bags and rock)		
Concrete	2.7	1,018.8
Grout	0.1	34
Rock	97.2	36,971
Total	**100**	**38,023.8**

Note: [1]The Xmas tree has a small non-ferrous component (e.g. Inconel, a nickel-chromium-based superalloy), which is there as a wear coating so not separable from the main body and has therefore been included with the steel figure. [2]consists of packing material and armouring within the umbilical.

Figure 2-7: Inventory for subsea installations

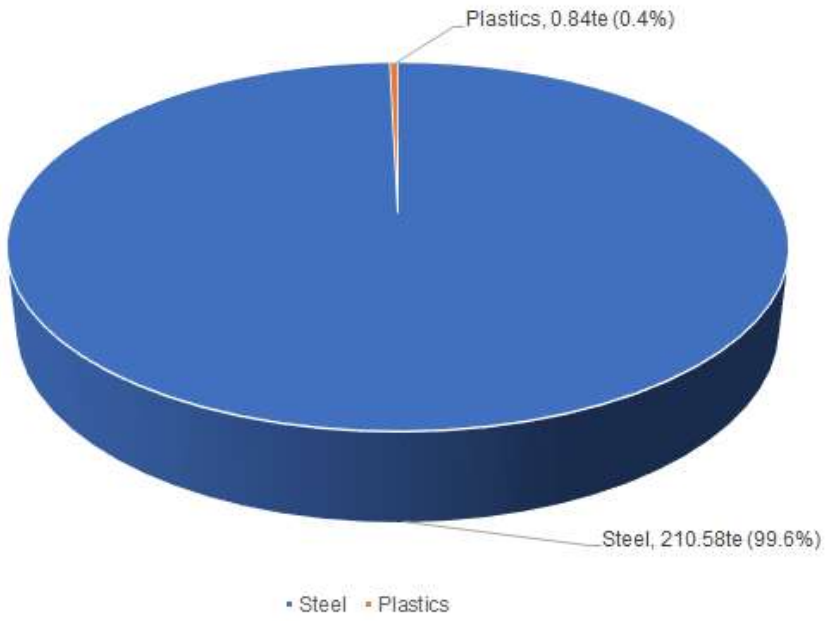
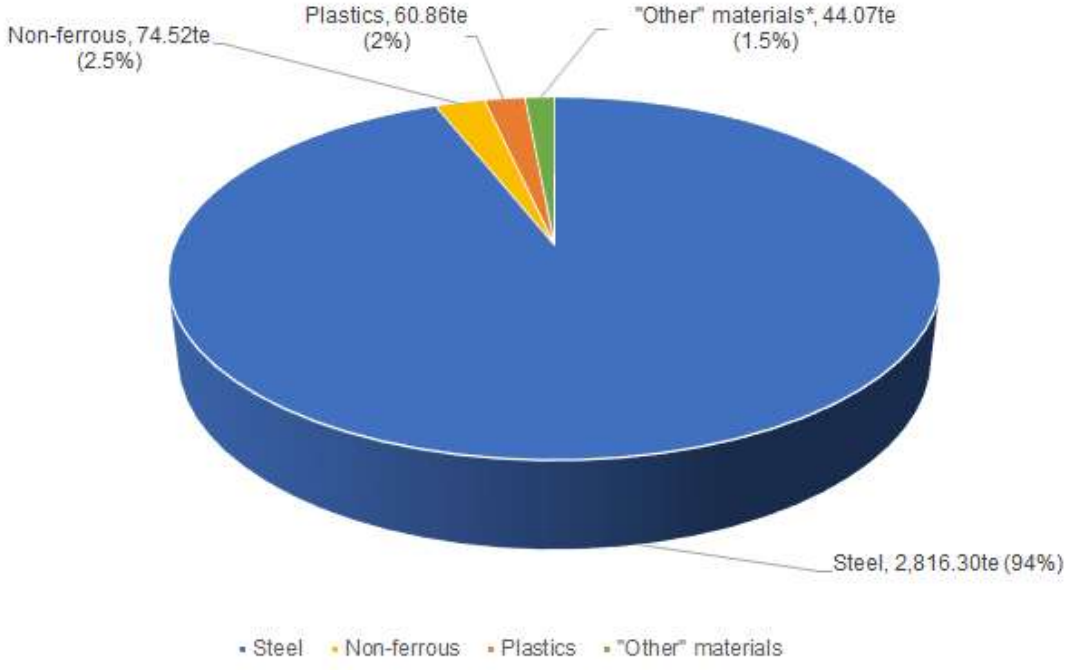
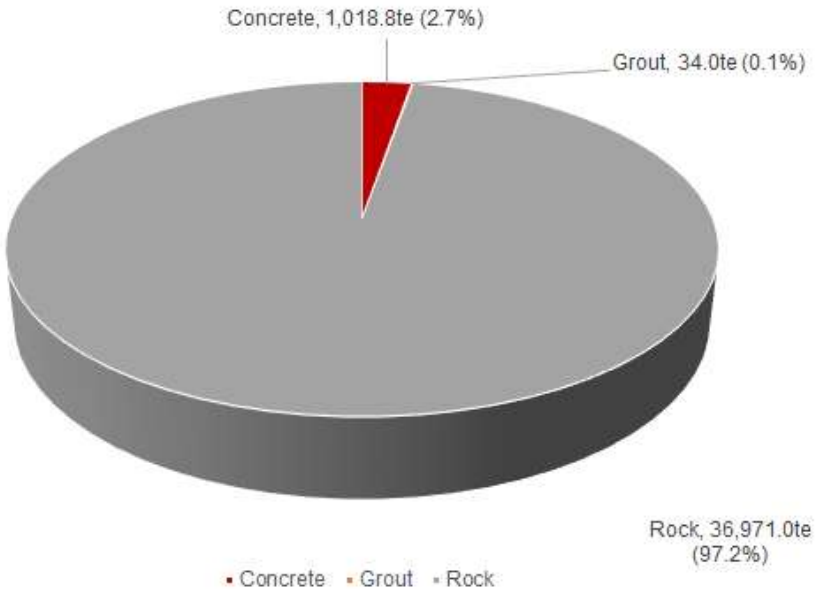


Figure 2-8: Inventory for submarine pipelines



*Note: *Other materials consist of packing material and armouring within the umbilical*

Figure 2-9: Inventory for stabilisation/protection features



3.0 Removal and Disposal Methods

Waste will be dealt with in accordance with the Waste Framework Directive. The re-use of an installation, pipeline, or umbilical or parts thereof, is first in the order of preferred decommissioning options and such options are currently under investigation. However, re-use or re-purposing, given Orlando's location and surrounding infrastructure and opportunities, is not envisaged. The Orlando reservoir will be depleted, with no further use for the single development well and no other fields are expected to have a purpose for the Orlando pipeline or umbilical (both to be left *in situ*) or subsea structures. It is understood that there are no plans for NCP to be re-purposed for CCUS, hydrogen or renewables and, hence, Orlando also has no opportunity in these areas either.

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 from the Orlando subsea installations and pipelines (Figures 2.5 and 2.6 above).

The Orlando infrastructure does not include any topside or jacket structures, therefore, a relatively small amount of material will be returned to shore on its removal. While the receiving port for this is still to be determined, this is expected to be in the UK and the *Transfrontier Shipment of Waste Regulations 2007* (as amended) should not be applicable. In the unlikely event that material is taken to a non-UK port, Serica will comply with the applicable Regulations for the transport of waste. Early engagement with the relevant waste regulatory authorities will ensure that any issues with TFSW are addressed.

Removal activities will be performed using all available techniques and methods will be in line with current guidance and Best Available Techniques (BAT) and Best Environmental Practice (BEP). All necessary permits will be applied for.

3.1 Subsea Installation(s) and Stabilisation Feature(s)

Table 3.1: Subsea Installations and Stabilisation Feature(s) Decommissioning Options

Subsea installation(s) and stabilisation feature(s)	Number	Option	Disposal Route (if applicable)
Production Xmas Tree including WHPS (and attached Wellhead Valve Spool Structure)	1	Full recovery	Removed as part of well abandonment activities and returned to shore for reuse, recycling, or disposal as appropriate.
Production Riser Base Structure (and clump weight)	1	Full recovery	Returned to shore for reuse, recycling or disposal as appropriate[1]
Umbilical Riser Base Structure (and clump weight)	1	Full recovery	Returned to shore for reuse, recycling or disposal as appropriate[1]

Note: [1]While CNRI will undertake recovery of these facilities, Serica will compile a full waste inventory of all materials returned to shore and ensure appropriate waste segregation and treatment is undertaken by a fully licenced waste contractor. Serica will complete a close out report to the Regulator when all decommissioning work including debris clearance and post-decommissioning surveys and all materials related to the Orlando DP have been disposed of appropriately. This will be submitted to the regulator within one year of the completion of all offshore work, noting that CNRI will be recovering the Clause 16.2 facilities as part of a wider Ninian decommissioning offshore campaign.

3.2 Pipelines

Decommissioning Options

In accordance with the regulatory requirements, Table 3.2 details all risers, spools and surface laid items that will be subject to full removal and hence were not assessed in the CA.

Table 3.2: Pipeline or Pipeline Groups Decommissioning Options – Full Removal

Pipeline or Group (as per PWA) (see Table 2.3)	**Condition of line/group** (Surface laid/trenched/ buried/spanning)	**Disposal route (if applicable)**
PL4383 Ident. No. 1	N/A as housed within Wellhead Valve Spool Structure attached to the Xmas Tree	The Wellhead Valve Spool Structure will be removed with the Xmas Tree (see Table 3.1 above), and returned to shore for reuse, recycling, or disposal as appropriate..
PL4383 Ident. No. 2	Lowered below seabed and covered with log mattresses	Recover and return to shore for reuse, recycling, or disposal as appropriate.
PL4383 Ident. No. 4	Laid on seabed and protected via concrete mattresses	Recover and return to shore for reuse, recycling, or disposal as appropriate.
PL4383 Ident. No. 5	N/A as part of SSIV structure	SSIV Structure; recover and return to shore for reuse, recycling, or disposal as appropriate[1].
PL4383 Ident. No. 6	Dynamic riser spanning between NCP and SSIV structure	Disconnected and initially laid temporarily on seabed before being recovered and returned to shore for reuse, recycling, or disposal as appropriate[1].
PLU4384 Ident No. 1	Dynamic riser umbilical spanning between NCP and SSIV structure	Disconnected and initially laid temporarily on seabed before being recovered and returned to shore for reuse, recycling, or disposal as appropriate[1].

Note: [1]While CNRI will undertake recovery of these facilities, Serica will compile a full waste inventory of all materials returned to shore and ensure appropriate waste segregation and treatment is undertaken.

Comparative Assessment Method

The approach to CA used for Orlando drew from OSPAR 98/3 and regulator and industry guidance (OGUK 2015, BEIS 2018). Serica conducted a two stage CA process with an initial option screening process to narrow options to a manageable number that were then assessed in more detail following the comparative assessment framework (BEIS 2018). The option screening process reviewed and screened out unrealistic options for pipeline decommissioning due to clear technical issues and/or clearly unacceptable safety risks.

The subsequent comparative assessment workshop used a methodology and scoring system (described in Section 5 of the supporting Comparative Assessment report (ORL-SECL-HSE-DOC-0007)), to assess the relative performance of each of the potential decommissioning options for the pipeline and umbilical, considering qualitative and quantitative data to evaluate alternative decommissioning options.

***Key to Options:**

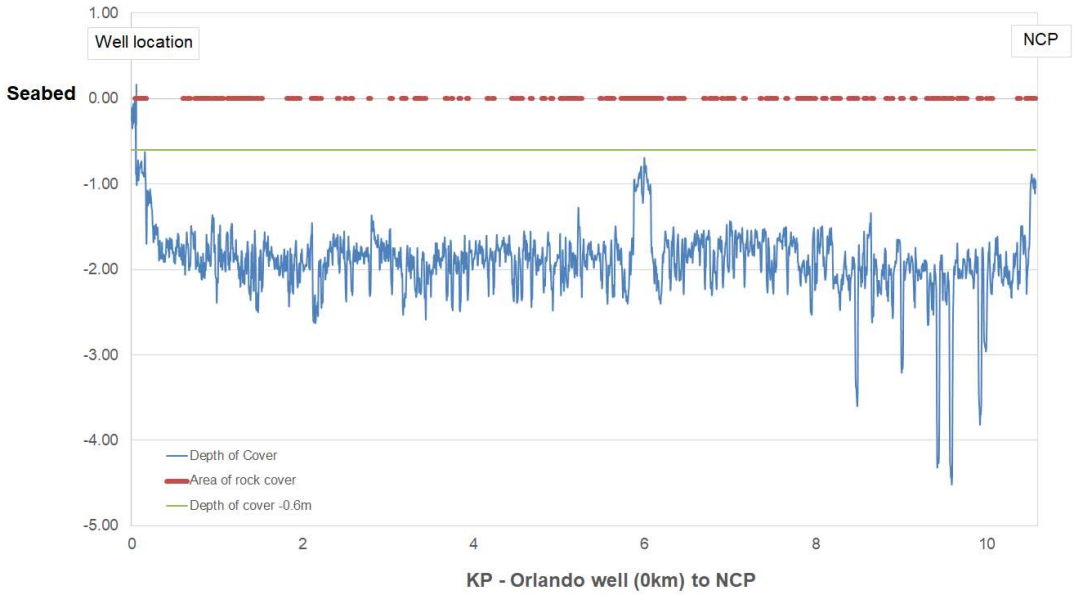
- Pipeline Option A: Leave *in situ* all sections, including sections under existing rock. Cut ends remediated to a minimum depth of 0.6m.
- Pipeline Option B: Partial recovery by reverse reel, sections currently under rock (e.g. crossings), along with spot rock cover, would be decommissioned *in situ*. Cut ends remediated to a minimum depth of 0.6m.
- Umbilical Option A: Leave *in situ* all sections, including sections under existing rock. Cut ends remediated to a minimum depth of 0.6m.
- Umbilical Option B1: Partial recovery by reverse reel. Sections currently under rock (e.g. crossings), along with spot rock cover, would be decommissioned *in situ*. Cut ends remediated to a minimum depth of 0.6m.
- Umbilical Option B2: Partial recovery by cut and lift. Sections currently under rock (e.g. crossings), along with spot rock cover, would be decommissioned *in situ*. Cut ends remediated to a minimum depth of 0.6m.

Table 3.3: Pipeline or Pipeline Groups Decommissioning Options

Pipeline or Group (as per PWA) (see Table 2.3)	**Condition of line/group** (Surface laid/trenched/ buried/spanning)	**Whole or part of pipeline/group**	**Decommissioning options considered***
PL4383 Ident. No. 3	Trenched and backfilled (except transitions / crossings where rock covered).	Part	Pipeline Option A, Pipeline Option B
PLU4384 Ident No. 2	Trenched and backfilled (except transitions / crossings where rock covered).	Part	Umbilical Option A, Umbilical Option B, Umbilical Option C

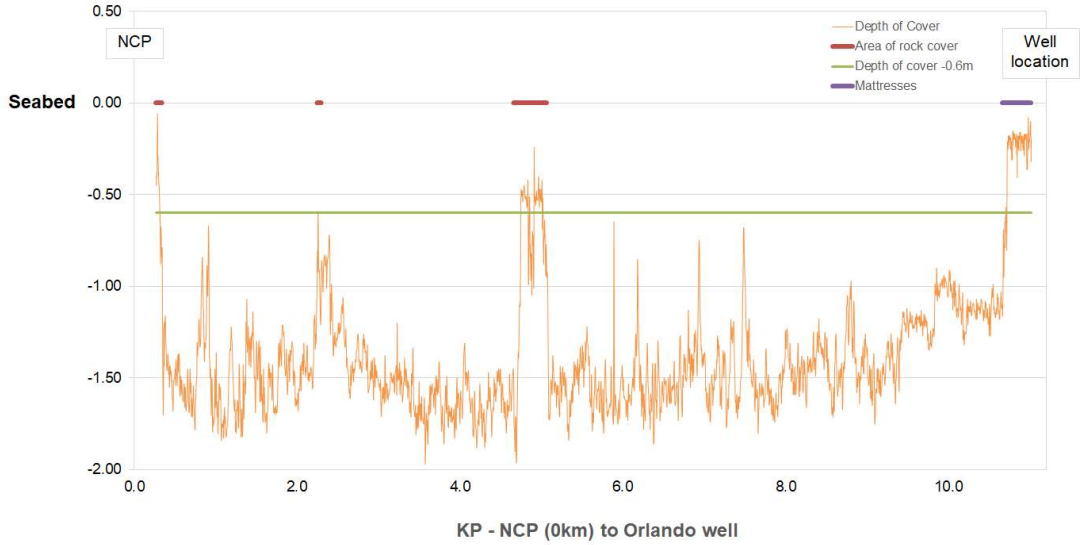
No areas of free-spanning pipeline, or pipeline exposure were recorded in the recent 2024 pipeline inspection (see Figure 3-1 and Figure 3-2 which indicate depth of burial from the same inspection).

Figure 3-1: Pipeline depth of cover and location of protection materials



Note: At approximately KP 6.0 where depth of cover approaches 0.6m, pipeline crosses the 12" Alwyn to South Cormorant oil pipeline (PL1526) and there is associated rock cover over the crossing location.

Figure 3-2: Umbilical depth of cover and location of protection materials



Note: At approximately KP 5.0 where depth of cover <0.6m, the umbilical crosses the 12" Alwyn to South Cormorant oil pipeline (PL1526) and there is associated rock cover over the crossing location.

Outcome of Comparative Assessment

Table 3.4: Outcome of Comparative Assessment

Pipeline or Group (as per PWA)	Recommended Option	Justification
PL4383 Ident. No. 3	1. Pipeline Option A: Leave *in situ* – the pipeline is decommissioned *in situ* except surface laid sections which are recovered. Cut ends remediated to a minimum depth of 0.6m. The remediation of cut ends will be by rock placement which due to the permanent nature of the deposits is considered worst case. An estimated total of 470 tonnes of rock (worst case and includes 100% contingency) will be required to remediate the pipeline cut ends at both the well and SSIV.	Both the pipeline and umbilical are good candidates for *in situ* decommissioning as both are adequately trenched and buried (minimum depth of 0.6m above top of pipeline and umbilical) and have not been subject to the development of freespans or exposures. This is expected to remain so due to the relatively low energy environment (minimal seabed sediment movement). Leaving the pipeline and umbilical *in situ* results in significantly lower risks in terms of: • Safety of personnel • Seabed disturbance • Greenhouse gas emissions • Potential impacts on protected habitats and species or those of conservation concern • Technical feasibility • Cost With respect to the residual liability in terms of future monitoring and remediation, all options have the same risk score, but with a greater level of certainty with respect to the residual liability associated with the leave *in situ*
PLU4384 Ident No. 2	3. Umbilical Option A: Leave *in situ* – the umbilical is decommissioned *in situ* except surface laid sections which are recovered. Cut ends remediated to a minimum depth of 0.6m. The remediation of cut ends	

Table 3.4: Outcome of Comparative Assessment		
Pipeline or Group (as per PWA)	**Recommended Option**	**Justification**
	will be by rock placement which due to the permanent nature of the deposits is considered worst case. An estimated total of 470 tonnes of rock (worst case and includes 100% contingency) will be required to remediate the umbilical cut ends at both the well and SSIV.	options. This is associated with monitoring data during field operation, which indicates that the pipeline and umbilical have remained adequately buried since installation, while being exposed to demersal fishing activities without incident. This suggests that leaving the pipeline/umbilical *in situ* would be unlikely to result in increased risk with respect to residual liability.

3.3 Pipeline Stabilisation Feature(s)

Table 3.5: Pipeline Stabilisation Feature(s)			
Stabilisation features	**Number**	**Option**	**Disposal Route (if applicable)**
Concrete mattresses	129 exposed	Full recovery at end of field life. (If practical difficulties are encountered, Serica will consult with OPRED to agree an alternative approach).	Returned to shore for reuse, recycling or disposal to landfill.
	12 fully buried	Mattresses completely covered by rock decommissioned *in situ*.	N/A
	3 partly buried	Where used at trench transitions and partially buried, full recovery at end of field life. (If practical difficulties are encountered, Serica will consult with OPRED to agree an alternative approach).	Returned to shore for reuse, recycling or disposal to landfill.
Grout bags	1,360 (25kg) bags	Full recovery at end of field life. (If practical difficulties are encountered, Serica will consult with OPRED to agree an alternative approach).	Returned to shore for reuse, recycling or disposal to landfill.
Rock deposits	36,971 Tonnes	Leave *in situ*.	N/A

3.4 Wells

Table 3.6: Well Plug and Abandonment
Well 3/3b-13Y will be plugged and abandoned using a semi-submersible drilling rig in accordance with the OEUK Well Decommissioning Guidelines Issue 7 (November 2022). As part of the well abandonment operations, the Xmas Tree and integrated WHPS and attached Wellhead Valve Spool Structure will be recovered. The conductor will be severed -3m below seabed. Consent to abandon the well will be sought through the NSTA Well Operations and Notification System (WONS). All required environmental permits will be applied through OPRED's permit portal, prior to any offshore activity being carried, out, and this will include a full assessment of chemical use and discharge.

3.5 Drill Cuttings

As indicated in Section 2.4, there is no drill cuttings pile at the well location. Not applicable.

3.6 Waste Streams

Table 3.7: Waste Stream Management Methods

Waste Stream	Removal and Disposal method
Bulk liquids	The subsea system including pipeline and SSIV will be cleaned and flushed to an agreed acceptable level. The fluids will either be flushed from the NCP platform downhole via the Orlando well or from the well back to NCP. Contents of umbilical includes operational chemicals and hydraulic fluid; the base case for these will be that chemical cores will be flushed through into the pipeline via the tree and dropdown spool, with hydraulic fluid discharged to sea when cores are cut. The hydraulic fluid is expected to dissipate from the area (overall quantities will be relatively small and these will be one off and final discharges from the lines).
Marine growth	Minimal marine growth present. Any marine growth that is removed offshore will be disposed of according to guidelines, otherwise residual marine fouling will be removed onshore to appropriately licenced sites and disposed of according to guidelines, company policies and under the appropriate permit.
NORM/LSA Scale	There is no specific record of NORM from Orlando. NORM/LSA checks will continue as part of the removal, clean-up/disposal process and any NORM encountered will be dealt with and disposed of in accordance with guidelines.
Asbestos	There is no specific record of asbestos from Orlando. Any asbestos that is present will be contained and taken onshore for disposal in accordance with regulations and under appropriate permits.
Wax	A wax deposition study has been undertaken which has modelled historical operations and future operations to CoP. The model has been validated against pressure/temperature data and includes wax property parameters based on laboratory testing. The conclusion of the wax deposition study is there will be minimal wax deposition in the pipeline (between wellhead & SSIV) at CoP (<0.9% of pipeline volume). The SSIV and riser section are predicted to have slightly higher levels of wax deposition but these sections are to be removed to shore. There are no anticipated issues with regards to deposited wax in the pipeline upon decommissioning. As part of relevant permit applications, Serica will apply BAT/BEP to minimise any discharges of wax to the marine environment.
Other hazardous wastes	No other hazardous materials have been identified. The coating systems utilised on subsea infrastructure components (to be recovered onshore) are in accordance with NORSOK M-501. No lead based or Chromium (VI) Paint has been used within the infrastructure. Should any other hazardous waste be identified, the material will be recovered onshore to appropriately licenced sites and disposed of according to guidelines, company policies and under the appropriate permit.

Table 3.7: Waste Stream Management Methods	
Waste Stream	**Removal and Disposal method**
Onshore Dismantling sites	Only appropriately licenced sites will be considered as part of the selection process, in addition the facility chosen must demonstrate proven track record of waste stream management throughout the decommissioning process and have sufficient capacity to accept the waste.

Table 3.8: Inventory Disposition			
	Total Inventory Tonnage	**Planned tonnage to shore**	**Planned left *in situ***
Installations	211.42	211.42	0
Pipelines	2,995.75	218.42	2,777.33

Serica's waste management procedure will be adhered to in all operations. An active Waste Management Plan will be used by the vessel and agreed with by Serica to identify and record optimal management for each waste stream based on the hierarchy for reduce, reuse, recycle, dispose. Licensed waste contractors/sites will be used who will document waste management, transfer and end use / disposal.

Recovered spools and pipeline / umbilical ends will predominantly be composed of metals (*ca*. 96%) which will be recycled following processing to remove plastic coatings and/or cores. Similarly, the recovered subsea installations will predominantly be composed of steel which will also be recycled.

4.0 Environmental Appraisal Overview

Table 4.1: Environmental Sensitivities

Environmental Receptor	Main Features
Conservation interests	None of the Orlando infrastructure is within, or near a marine protected area (i.e. Nature Conservation Marine Protected Area (NCMPA), Special Area of Conservation (SAC) or Special Protected Area (SPA). The closest of these is the Pobie Bank Reef SAC, located *ca*. 81km to the west of Orlando. All other designated sites, e.g. North-East Faroe-Shetland Channel NCMPA, the Faroe-Shetland Sponge Belt NCMPA and the Central Fladen NCMPA are >100km distant. The OSPAR listed habitat 'Sea pen and burrowing megafauna communities' is likely to be present in the Orlando area, with a 2021 seabed survey habitat assessment recording qualifying megafaunal burrows as being at least 'frequent' on the Marine Nature Conservation Review (MNCR) superabundant, abundant, common, frequent, occasional, rare (SACFOR) scale at most transects.
Seabed	Seabed is generally flat at the Orlando well location, with a gradient of less than 0.1º towards the north west. The sediments within the 2021 seabed survey area were dominated by the sand fraction, with the sediment composition indicating a largely homogenous sediment type throughout. All stations were classed as 'very fine sand' with the exception of one station (closest to the well), which was classed as 'fine sand'. The highest gravel content was observed at stations closest to the well, suggesting that the sediment around the well was modified. Stations around the well displayed evidence of a mixed input of an oil based mud (OBM) and a low toxicity oil based mud (LTOBM) discharge. The highest total hydrocarbon content (THC) value was observed at station G03 (73µg/g), exceeding the OSPAR ecological effects threshold (EET) (50 µg/g). There was a decrease in total barium concentrations with distance from the well, with station G03 also displaying the highest total barium concentration. The higher barium concentrations were likely to be from the redistribution of cuttings materials (including drilling fluids) from drilling activities. Stations closer to well also had slightly higher concentrations of some metals (e.g. copper, nickel, lead and zinc) which often associated with drill cuttings.
Fish	The Orlando infrastructure lies within ICES rectangle 50F1 which overlaps with reported spawning grounds of: whiting (Feb-Jun, low intensity); sandeel (Nov-Feb, low intensity); Norway pout (Jan-Apr); saithe (Jan-Apr); cod (Jan-Apr, high intensity), and haddock (Feb-May). With the exception of haddock, all of these are priority marine features (PMF) in Scottish waters. Nursery grounds for species are also reported from ICES rectangle 50F1: haddock, whiting, Norway pout, sandeels, mackerel, blue whiting, spurdog, herring, ling, hake and monkfish.

Table 4.1: Environmental Sensitivities	
Environmental Receptor	**Main Features**
Fisheries	Demersal species represented the highest total weight and value of landings from the Orlando area in 2022, followed by pelagic and shellfish species. However, pelagic catches have varied significantly between the years, with the sector representing the highest total weight and value of landings in both 2023 and 2024. Fishing effort in the area is low to moderate with demersal gear the predominant type used. Species dominating the demersal catches include whiting, hake, saithe and cod, while herring and mackerel, dominate pelagic catches and *Nephrops* represents the largest landing of shellfish. There is relatively limited fishing activity in 50F1 (primarily bottom trawl), with less than 400 days a year recorded for two of the last three years of data (i.e. 2023 and 2024).
Marine Mammals	Harbour porpoise was the most abundant cetacean species recorded in the most recent SCANS-IV regional survey (0.4393 per km^2), followed by white-beaked dolphin (0.3056 per km^2), and a low density of minke whale (0.0271 per km^2) (Gilles *et al.* 2023). Harbour porpoise are present year-round, although sightings peak in this area in July and August. All the cetacean species recorded are also listed as Scottish Priority Marine Features (PMF) and European Protected Species (EPS). The Orlando area is distant from seal breeding colonies and haul-out sites; very low densities of both grey and harbour seal are likely in the area.
Birds	The Orlando area may be considered to be of low importance for seabirds in the context of the North Sea as a whole. This is related to the distance from breeding colonies (Orlando is >120km from shore) and the availability of prey species; although Orlando is within the maximum foraging ranges of some bird species (e.g. northern fulmar, northern gannet, black-legged kittiwake and puffin) breeding at colonies on Shetland. Birds present vary seasonally, and being far offshore, those present are likely to be (predominately) those transiting through the area during migration, and during post-breeding dispersion from colonies. Seabird oil spill sensitivity is low in Block 3/03 for those months with data, with the exception of September (medium). Where no data coverage is available, JNCC guidance was used, to reduce the extent of coverage gaps; this has also resulted in October having a medium sensitivity. All of the surrounding blocks also record low sensitivity, with some month with no coverage, with the exception of Blocks 3/02, with medium sensitivity in Sept (and Oct, with the JNCC method applied).
Onshore Communities	At this stage of the project, the onshore dismantling and disposal yards are not yet chosen and it is not possible to describe the specific locations where activities will take place. The quantity of material taken onshore will be relatively small (see Table 3.9), and will be managed through Serica's waste management system. Serica intends to engage approved dismantling contractors to handle the recovered materials. In addition, approved waste management contractors will be selected to handle, store and dispose of any materials that cannot be recycled or reused.

Table 4.1: Environmental Sensitivities	
Environmental Receptor	**Main Features**
Other Users of the Sea	The Orlando area is within a wider mature oil and gas province, with considerable infrastructure in adjacent Blocks and the wider area; much of the oil and gas infrastructure is in the process of being decommissioned. There is no renewable energy associated infrastructure within the Orlando area, the closest lease area being >200km to the west. From the Innovation and Targeted Oil and Gas (INTOG) leasing round, thirteen projects (out of 19) have been offered initial agreements (exclusivity agreements), which would now enable them to proceed with offshore wind development work; the closest of these to the Orlando location is 323km away. The shipping density information provided as part of the 29th Licensing Round, indicates Block 3/03 is categorised as having a moderate shipping density, most likely from traffic associated with servicing oil and gas installations. Vessel density over the Orlando area is focussed on the NCP. There are no dredging areas, or marine disposal sites in the vicinity and no telecommunication cables cross the proposed inspection survey area the closest cable is in the Norwegian sector (Martin Linge power cable), at 55km from Orlando and 49km from NCP. There are no designated protected wrecks in the area, with the closest wrecks being *ca*. 9km from Orlando (Blagdon, possibly) and an unknown wreck *ca*. 5km from the NCP.

4.1 Potential Environmental Impacts and their Management

Environmental Impact Assessment Summary

Serica held an Environmental Impact Identification (ENVID) workshop to identify activity/environment interactions, and raise awareness within the decommissioning team of the baseline environment and potential sources of environmental effects from decommissioning activities. At the workshop, the decommissioning activities were systematically considered for their potential interactions with the environment and in the context of legislative and policy requirements. Sources of effects related to activities associated with the decommissioning of Orlando were subsequently subject to assessment, the results of which are presented in the Environmental Appraisal (EA) report (ORL-SECL-HSE-DOC-0009). While a range of sources of effect were considered, including physical and other disturbance, emissions and other discharges, waste generation and accidental events, those effects considered significant and requiring detailed assessment were from seabed disturbance, and atmospheric emissions, with transboundary and cumulative effects also being considered. The main environmental impacts and their management are listed in Table 4.2 below. As outlined in Section 3, Orlando is a subsea tie-back with no surface facilities, and with no cuttings piles present. The environmental assessment concluded that the decommissioning of the Orlando field would not result in significant effects.

Prior to any decommissioning activities being undertaken, all relevant permits and consents, where required, will be applied for.

Overview

Table 4.2: Environmental Impact Management

Activity	Main Impacts	Management
Well plug and abandonment	A semi-submersible rig will be used to plug and abandon the Orlando P1 well. The mooring system anchor chains and anchors will interact with the seabed, with each of the eight lines generating disturbance along an estimated seabed contact length of 750m. Additionally, there will be some localised seabed disturbance from the removal of the upper well casings, and the P1 well tree. Seabed disturbance will result in direct physical effects on benthic communities which will include mortality as a result of physical trauma, smothering by excavated and re-suspended sediments.	There will be a single deployment of the mooring system for well plug and abandonment, as Orlando is a single well development. No specific additional mitigation was considered necessary beyond application of established operational controls. A consent to locate application will be applied for siting the rig and all required notifications will be provided to relevant parties (e.g. SFF).

Table 4.2: Environmental Impact Management

Activity	Main Impacts	Management
	The rig will be located within the existing 500m exclusion zone centred on the Orlando well, although the anchors and a section of the mooring lines will extend beyond this.	
Recovery of spool pieces, jumpers and pipeline and umbilical end remediation	The preferred option identified in the Comparative Assessment (CA) was to leave the pipeline and umbilical *in situ* and to remediate the cut ends of the pipeline and umbilical. The remediation will be by the use of rock placement which due to the permanent nature of the deposits is considered worst case. Exposed protection materials (e.g. concrete mattresses, grout bags) located on the seabed and also all jumpers and pipeline spools will be recovered. In each case, this will cause some seabed disturbance, the majority of which will be within the physical footprint of the original development. While initial disturbance will result in direct physical effects on benthic communities which may include mortality as a result of physical trauma, smothering by excavated and re-suspended sediments, the use of rock will introduce new hard substrate and could result in a very localised change of seabed habitat type.	The approach to decommissioning the pipelines was influenced, amongst other factors, by the relatively low level of seabed disturbance from leaving the pipeline and umbilical *in situ*, for example, it is significantly less than the disturbance that would be generated by excavating the pipeline and umbilical, and subsequent removal and remediation. Applications will be made to deposit rock to cover the pipeline/umbilical ends, with the rock quantity to be minimised and placed as accurately as possible from the vessel. Serica will liaise with OPRED and SFF on seabed verification requirements.
Subsea infrastructure removal	The SSIV, riser bases, and risers, will be removed. These are located within the 500m zone of the NCP, and either entirely or partly in contact with the seabed. The structures are all of gravity-based design, and no cutting of piles is required for their removal. Associated disturbance from removal will result in direct physical effects on benthic communities which may include mortality as a result of physical trauma, smothering by excavated and re-suspended sediments. No remediation will be required on removal.	The complete removal of the SSIV, riser bases, and risers, is within the NCP 500m zone, and any disturbance associated with their removal will be limited to the area of the infrastructure, and a small surrounding area. No specific additional mitigation was considered necessary beyond application of established operational controls. Disconnection, laydown and recovery timelines and laydown location(s) for the catenary risers will be discussed between CNRI and OPRED during work preparation phase utilising BAT/BEP studies and

Table 4.2: Environmental Impact Management

Activity	Main Impacts	Management
		awareness of the proximity of the drill cuttings to the risers to inform the discussions, laydown and removal methodology, and applications for the necessary permitting.
Energy use and atmospheric emissions	Atmospheric emissions, including greenhouse gases (GHGs) will be generated by the drilling rig and related helicopter traffic, vessels, and from the recycling of materials returned to shore. Additionally, there will be some emissions relating to the lost opportunity to recycle the materials left *in situ.* Well abandonment was estimated to be the primary source of emissions (5,234tCO_2eq), and together with all other sources of vessel emissions would result in approximately 7,252tCO_2eq. Emissions from recycling are mainly related to steel, though are negligible given the small volume of material to be returned to shore. Conversely the leaving of some components *in situ* results in a loss of future use of that material, and the emissions associated with generating the equivalent materials from primary source were calculated. However, the leaving of the material *in situ* negates additional vessel time in the field to recover and transport these to shore, emissions from which would be greater than the lost opportunity of recycling these materials.	Serica will look to minimise vessel time in the field as far as practicable and will make use of vessel and rig synergies where possible. Serica are exploring options for the Orlando well plug and abandonment to form part of a wider programme of well decommissioning in the northern North Sea to minimise rig timing. Emissions from material flows are minimised by using a waste hierarchy approach. The selected decommissioning options have minimised the need for material returns to shore for reuse, recycling or disposal, and the net emissions associated with alternative removal options (e.g. complete removal) would likely be the same or greater than that associated with any energy and emissions saving from their recycling, and also involve additional impacts (i.e. seabed disturbance, see above). It is considered that there is limited scope for additional mitigation measures to reduce the residual effect on atmospheric GHG loading, or any local effects on air quality.

5.0 Interested Party Consultations

Consultations Summary

Table 5.1: Summary of Stakeholder Comments		
Who	**Comment**	**Response**
1. Informal Stakeholder Consultations		
2. Public		
3. Statutory Consultations		
National Federation of Fishermen's Organisations		
Scottish Fishermen's Federation		
Northern Ireland Fish Producers Organisation		
Global Marine Group		
North Sea Transition Authority - In response to NSTA letter dated 26th July 2024 - Petroleum Act 1998 ('Act') - Obligation to consult with the NSTA before submitting an abandonment programme inc. S29(2A) of the Petroleum Act 1998. Serica has engaged with NSTA via online meetings – on 16 September 2024, 16 April 2025 and 1 September 2025). Serica has also demonstrated prior to commencing the planning of decommissioning, all viable options for continued use, including reuse or repurposing, of infrastructure, have been considered.		

6.0 Programme Management

6.1 Project Management and Verification

Serica have established a project management team (The team) to manage the planning and execution of these decommissioning programmes for the Orlando field. The Team will ensure decommissioning activities are undertaken in accordance with relevant legislation and Serica's Operations Management System (OMS), which provides a framework for systematic management of health, safety, environment and quality (HSEQ) across the organisation, including interfaces with other operators and appointment of suitable sub-contractors.

The Team will control and manage all relevant permits and consents and the consultations required as part of this process.

Any changes in detail to the decommissioning programmes will be discussed and agreed with OPRED.

6.2 Post-Decommissioning Debris Clearance and Seabed Clearance Verification

A post decommissioning survey, centred on the 500m safety zone at the Orlando well location, and along the full pipeline/umbilical route (50m either side of the pipeline/umbilical), including the approaches to Ninian Central, in consultation with CNRI, will be conducted when the decommissioning activity has been concluded; in the event any Orlando related debris is identified, this will be recovered and returned to shore for recycling or disposal. This will be undertaken using non-intrusive methods, such as muti-beam echosounder (MBES). An over-trawl survey will be undertaken if deemed necessary to confirm no snagging hazards are present post-decommissioning and a targeted environmental survey will be conducted post-decommissioning.

Results of these surveys will be available once the work is completed and a copy forwarded to OPRED.

Verification of a clear seabed will be obtained in accordance with current guidance, taking into account a risk based assessment and in consultation with OPRED and the Scottish Fisheries Federation.

6.3 Schedule

Project Plan

The main milestones in the decommissioning of Orlando are anticipated to be:

- Orlando Cessation of Production (CoP) — Q1-Q2 2027
- DP/CA/EA approval — Q2-Q3 2026
- Orlando Pipeline and Umbilical (spools etc) removal — Q1-Q2 2027 – Q3 2028
- Orlando well plug and abandonment — Q4 2027 – Q3 2029
- Orlando Risers, Riser Bases and SSIV removal — Q1 2029 – Q2 2030[1]
- Clear seabed verification — Q3-Q4 2030 – Q4 2031[1]

Notes: [1]The Orlando dynamic riser and dynamic riser umbilical, associated riser bases and SSIV will be removed by CNRI (these facilities will be included in CNRI Subsea DP), and a final clear seabed verification will also be undertaken by CNRI. The final dates of these are to be determined, but the indicative dates have been described here and in Figure 6-1.

The schedule may change to exploit synergies by combining decommissioning activities with other campaigns i.e. combining Orlando Area decommissioning operations with third party operations e.g. CNRI, or there may be unavoidable constraints e.g. semi-submersible or vessel availability. To accommodate this, activity windows have been included in the overall schedule.

Figure 6-1: Gantt Chart- Orlando Decommissioning Project Plan (indicative decommissioning plan)

Orlando Pipeline Decommissioning	2025		2026				2027				2028				2029				2030				2031			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Orlando CoP																										
NCP CoP																										
DP/CA/EA OPRED Review																										
DP/CA/EA OPRED Approval																										
Orlando Pipeline Flush																										
Orlando Pipeline & Umbilical Removal																										
Orlando Well P&A																										
Orlando Risers/Riser Bases & SSIV Removal																										
Clear Seabed Verification																										
Decommissioning Close-Out Report																										

6.4 Costs

Decommissioning costs associated with the activities described in this DP will be provided separately to OPRED.

6.5 Close Out

Serica will submit a close out report to OPRED, in accordance with guidance, detailing all variations from the Decommissioning Programmes, within twelve months of the completion of the offshore decommissioning scopes, including debris removal, verification of seabed clearance, a targeted post-decommissioning environmental survey and the first post-decommissioning survey.

6.6 Post-Decommissioning Monitoring and Evaluation

The purpose of the post-decommissioning monitoring is to ensure any material left in place, remains suitably buried and does not pose, or lead to posing (i.e. through its degradation) a snagging hazard to other users of the marine environment.

A copy of the survey results will be forwarded to OPRED. After the survey results have been reviewed by OPRED, a post-decommissioning survey regime will be agreed with OPRED.

The pipeline and umbilical materials to be left in place, will be subject to ongoing monitoring; the programme (scope and frequency) for this will be agreed between Serica and OPRED, taking into consideration previous survey data and a risk-based approach. This will be undertaken using non-intrusive methods, such as muti-beam echosounder (MBES) in the first instance with an overtrawl sweep used where results are inconclusive. Residual liability for infrastructure which has been decommissioned *in situ* will lie with the parties as listed in the Section 29 Notices.

7.0 Supporting Documents

Table 7.1: Supporting Documents

Document Number	Title
ORL-SECL-HSE-DOC-0007	Orlando Field Decommissioning – Comparative Assessment
ORL-SECL-HSE-DOC-0009	Orlando Field Decommissioning – Environmental Appraisal

8.0 Section 29 Notice Holders Letter(s) of Support

Letters of support are being sought from previous Section 29 Holders. These will be included here once they are received.

Appendix

A copy of the Public Notice will be added once received.