



CHRYSAOR



Decommissioning Programme LOGGS Satellites Jupiter Area: LDP3b

Ganymede ZD Topside

FINAL
6th April 2020

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A. Table of Terms and Abbreviations

Abbreviation	Explanation
CA	Comparative Assessment
CSV	Construction Support Vessel
BEIS	Department for Business, Energy and Industrial Strategy
EIA	Environmental Impact Assessment
EMS	Environmental Management System
ES	Environmental Statement
ESDV	Emergency Shutdown Valve
EZ	Europa EZ Satellite Platform
FPAL	First Point Assessment Limited (UK)
HLV	Heavy Lift Vessel
ICES	International Council for the Exploration of the Sea
kg	kilogram
km	kilometre
KP	Kilometre Point
KPI	Key Performance Indicator
LAT	Lowest Astronomical Tide
LDPE	Low Density Polyethylene
LOGGS	Lincolnshire Offshore Gas Gathering System
m	meters
MAT	Master Application Template
MCZ	Marine Conservation Zone
MeOH	Methanol
NORM	Naturally Occurring Radioactive Material
NUI	Normally Unattended Installation
OGA	Oil and Gas Authority
OGUK	Oil and Gas United Kingdom
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
P&A	Plug and Abandon
PMT	Project Management Team
PA	LOGGS PA Accommodation Platform
PC	LOGGS PC Compression Platform
PP	LOGGS PP Processing Platform
PD	North Valiant PD Platform, bridge linked to LOGGS PP Processing Platform
PR	LOGGS PR Platform
PWA	Pipeline Works Authorisation
R2S	Return to Scene
RBA	Risk Based Assessment
SAC	Special Areas of Conservation
cSAC	Candidate Special Areas of Conservation
SAT	Subsidiary Application Template
SLV	Shear Leg Vessel
SNS	Southern North Sea
SPA	Special Protection Areas
Te	Tonne
TGT	Theddlethorpe Gas Terminal
Tscf	Trillion standard cubic foot
UKCS	United Kingdom Continental Shelf
ZD	Ganymede ZD Platform
ZM	Callisto Subsea Tieback
ZX	NW Bell Subsea Tieback

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Appendix No	Description
1	Public Notice
2	Consultee Responses

Preface

Proposals for the decommissioning of the Jupiter fields were submitted to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) and subjected to formal consultation in January 2020. Following this consultation period, and in agreement with OPRED, it has been decided to split the Jupiter Decommissioning Programmes (LDP3) into two separate programmes. These are:

- Jupiter Decommissioning Programmes, LDP3 (full Jupiter Area excluding the Ganymede Topsides: Ganymede ZD jacket only, Europa EZ, Callisto ZM and NW Bell ZX & Associated Infield Pipelines)
- Ganymede ZD Topside, LDP3b (this document)

These programmes are both supported by the LOGGS Area Environmental Appraisal and the LOGGS Area Comparative Assessment Report.

Responses to the consultation draft Decommissioning Programme (LDP3) have been considered and are addressed, where applicable, in this document.

There is no feasible option for the re-use of the Ganymede ZD topside, and the removal of the topside is not prejudicial to the jacket and substructure.

1 Executive Summary

1.1 Decommissioning Programme

The Jupiter fields were developed in two phases to support the production from the Jupiter area using the LOGGS Gathering Station to transport the produced oil and gas from the field to TGT for further processing and sale. The first phase was the development of the Ganymede ZD NUI platform and Callisto subsea tie-back to Ganymede in 1995. The second phase was the development of the Europa EZ NUI platform and NW Bell ZX subsea tie-back to Callisto ZM in 2000. Decline in production led to the cessation of production that was approved by OGA in 2016, enabling decommissioning activities to commence on the facilities in 2017. The platforms are in cold suspension, awaiting removal and disposal.

The Jupiter facilities consist of:

- 2 Jupiter Surface Installations Ganymede ZD and Europa EZ
- 1 subsea tee at the intersection of the Europa EZ to Callisto ZM - Ganymede ZD pipelines
- 2 Jupiter subsea tiebacks with wellhead protection structures: Callisto ZM and NW Bell ZX
- The inter-field pipelines

This document contains a decommissioning programme for the Ganymede ZD topside.

1.2 Requirement for Decommissioning Programme

Installation:

In accordance with the Petroleum Act 1998, Chrysaor Production (U.K.) Limited as Operator of the Jupiter Fields and on behalf of the Section 29 notice holders (see Table 1.2 and Section 8) is applying to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) to obtain approval for decommissioning of the following:

- Jupiter installations: Ganymede ZD topsides

The details of this are in Section 2 of this document.

In conjunction with public, stakeholder and regulatory consultation, the original Jupiter Area (LDP3) decommissioning programmes were submitted in compliance with national and international regulations and with consideration of OPRED guidelines. The schedule outlined in this document is for a decommissioning project which commenced with the well plugging and abandonment in 2016 and will span approximately 7 years till completion.

1.3 Introduction

The Jupiter Fields were discovered in 1972 by the 49/16-4 well which encountered 325 ft of gas column in the Rotliegendes Group Leman Sandstone Formation in what became the Ganymede Field. The exploration and appraisal programme continued through the 1990s with discoveries in the Europa, Callisto and Sinope Fields.

The Jupiter Fields were developed in two phases. The strategy of phase 1 was to develop the fields that had been adequately appraised, including flexibility in the initial facilities design to accommodate future development. For phase 1, the development was based on a ten-slot platform at Ganymede located in block 49/22 with Callisto developed from a subsea template and tied back to the Ganymede platform.

Further appraisal of the Europa and Sinope Fields took place in 1994 and the second phase of development was approved in 1998. Phase 2 was developed through a platform located 1km SW of the 49/22-8 Sinope exploration well, called Europa EZ, with a 12” tie-in to the pipeline between the Callisto subsea development and the Ganymede platform and a subsea tie-back. One of the development wells drilled from Europa EZ was an extended reach well, 49/22-N03, into the Sinope North area. The NW Bell well was also drilled from Europa EZ platform via an extended reach well, with a tieback to the Callisto ZM subsea manifold.

The Jupiter Fields consist of several separate gas accumulations which lie within blocks 49/16a, 49/17a, 49/22a, 49/22c, 49/22d and 49/23a (licences P.025 and P.033) in the Southern North Sea of the UKCS. The Ganymede field is located approximately 132km east of the TGT terminal.

First production from the Ganymede Field and Callisto Field was in September 1995. In 2000, NW Bell and Europa came online. This backed out Ganymede and some wells were shut in. When NW Bell and Europa declined in 2001, the Ganymede wells were reinstated.

Production from the Ganymede platform was routed to the existing LOGGS complex via a new 18” pipeline and then commingled with other LOGGS gas and transported to TGT via the existing 36” trunkline. A 12” line connected the Callisto subsea development to Ganymede.

Production from Europa EZ was tied back to the pipeline between the Callisto subsea development and the Ganymede platform.

The Jupiter Field was net cash flow negative in 2014 which initiated decommissioning activities on the Jupiter installations to commence and production to cease from the Jupiter Field in November 2016. In 2017, the Ganymede ZD and Europa EZ unmanned platforms were put into cold suspension, having had their wells plugged and abandoned and the topsides cleaned of hydrocarbons.

The Jupiter satellites Ganymede ZD, Europa EZ and subsea tiebacks Callisto ZM and NW Bell ZX, produced 494 Bscf of gas up to the termination of production in 2016.

Cessation of Production applications were submitted and approved as follows:

Installation	Submission Date	Approval Date
Jupiter (Ganymede, Callisto, Europa, Sinope Fields)	May 2016	June 2016

The Ganymede Topside has a weight of 1,082Te and the installation stands in 33.5m of water. The small size, shallow water depth and design life of the Ganymede Satellite, has determined the philosophy for decommissioning, which will be to:

- Well Plug and Abandon (P&A)
- Remove the topside

The other installations (including the Ganymede ZD jacket) and pipelines in the Jupiter Area will be decommissioned at an appropriate time and covered by their own Decommissioning Programmes.

The installation covered by this document is in the following Quad/block:

- Ganymede ZD: 49/22

1.4 Overview of Installation Being Decommissioned

1.4.1 Installation

Table 1.1a Installation Being Decommissioned - Ganymede			
Field Names		Quad / Block	
Fields	Ganymede	Production Type	Gas / Condensate
Water Depth	33.5m (Ganymede)	UKCS block	Quad 49 Blocks 22a

Surface Installations			
Number	Type	Topsides Weight (Te)	Jacket Weight (Te)
1	Topside only	1082	

Subsea Installations		Number of Wells	
Number	Type	Number	Type
-	N/A	8	Platform

Drill Cuttings Piles		Distance to Netherlands Median	Distance from nearest UK coastline
Number of Piles	Total Est volume m ³	km	km
0	0	Ganymede ZD 54km	Ganymede ZD 73km

See Figure 1.1 for further details.

Table 1.2a Installation Section 29 Notice Holders Details - Ganymede		
Section 29 Notice Holders	Registration Number	Equity Interest
Chrysaor Production (U.K.) Limited (Operator)	00524868	20%
Equinor UK Limited	01285743	30%
Esso Exploration and Production UK Limited	00207426	50%

1.5 Summary of Proposed Decommissioning Programme

Table 1.3 Summary of Decommissioning Programme		
Selected Option	Reason for Selection	Proposed Decommissioning Solution
1. Topsides (in respect of Ganymede ZD)		
Complete removal, dismantlement and reuse/recycling and disposal.	Topsides equipment obsolete and degraded, or recovery no longer economic.	Removed by Heavy Lift Vessel (HLV) transported to appropriate land-based facility for dismantlement, recycling and disposal. Equipment that cannot be re-used will be recycled or disposed of as appropriate.
2. Jackets		
<i>Addressed in the LOGGS Jupiter Area – Ganymede ZD Jacket, Europa EZ, Callisto ZM and NW Bell ZX & Associated Infield Pipelines Decommissioning Programmes</i>		
3. Subsea Installations		
<i>Addressed in the LOGGS Jupiter Area – Ganymede ZD Jacket, Europa EZ, Callisto ZM and NW Bell ZX & Associated Infield Pipelines Decommissioning Programmes</i>		
4. Pipelines, Flowlines and Umbilicals		
<i>Addressed in the LOGGS Jupiter Area – Ganymede ZD Jacket, Europa EZ, Callisto ZM and NW Bell ZX & Associated Infield Pipelines Decommissioning Programmes</i>		
5. Well Abandonment Operations		
Permanent well Plug and Abandonment (P&A).	Meets OGA and HSE regulatory requirements.	Abandonment in accordance with Oil and Gas UK Well Decommissioning Guidelines.
6. Drill Cuttings (in respect of Ganymede ZD)		
None required.	No Drill Cuttings Piles have been identified by seabed survey.	None required.
7. Interdependencies		
None		

1.6 Field Location including Field Layout and Adjacent Facilities

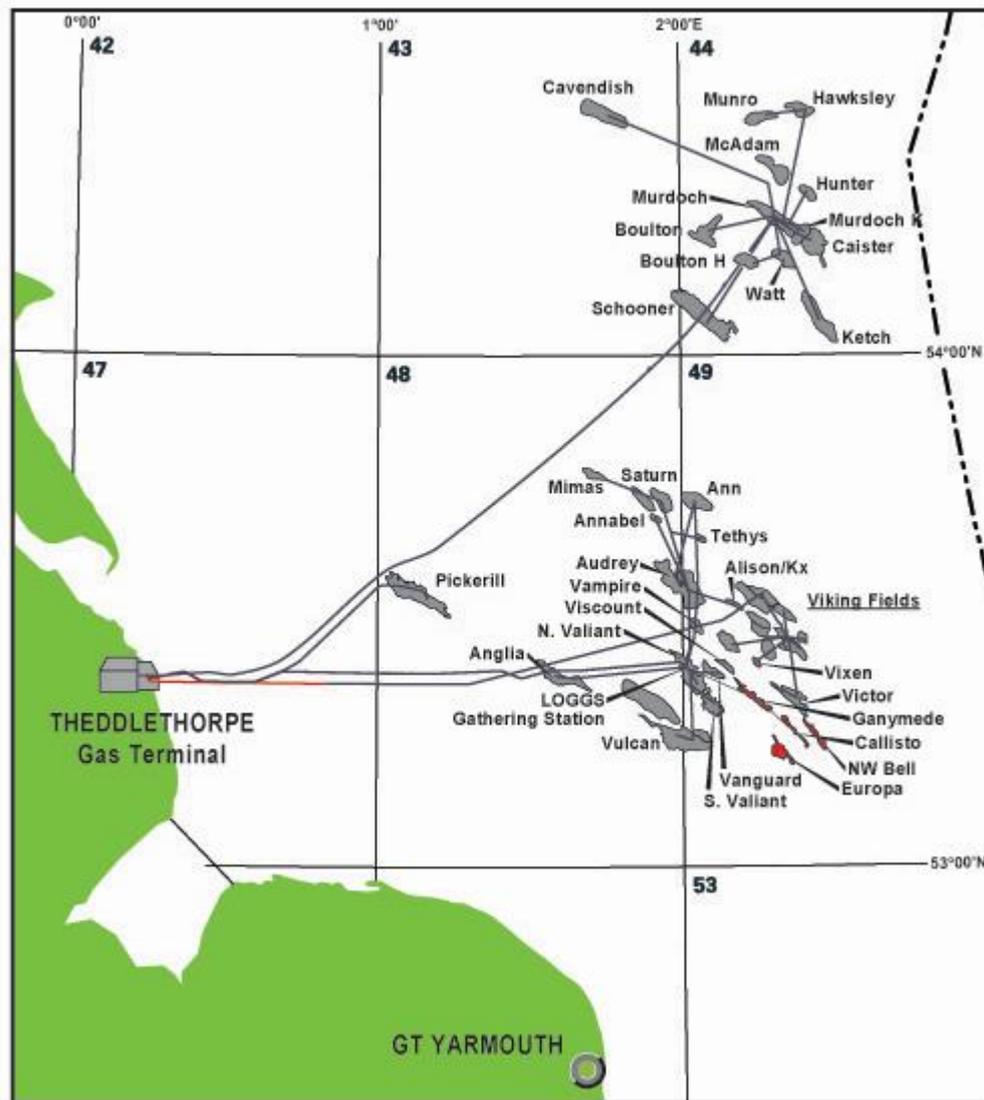


Figure 1.1 – Jupiter Field Location in UKCS

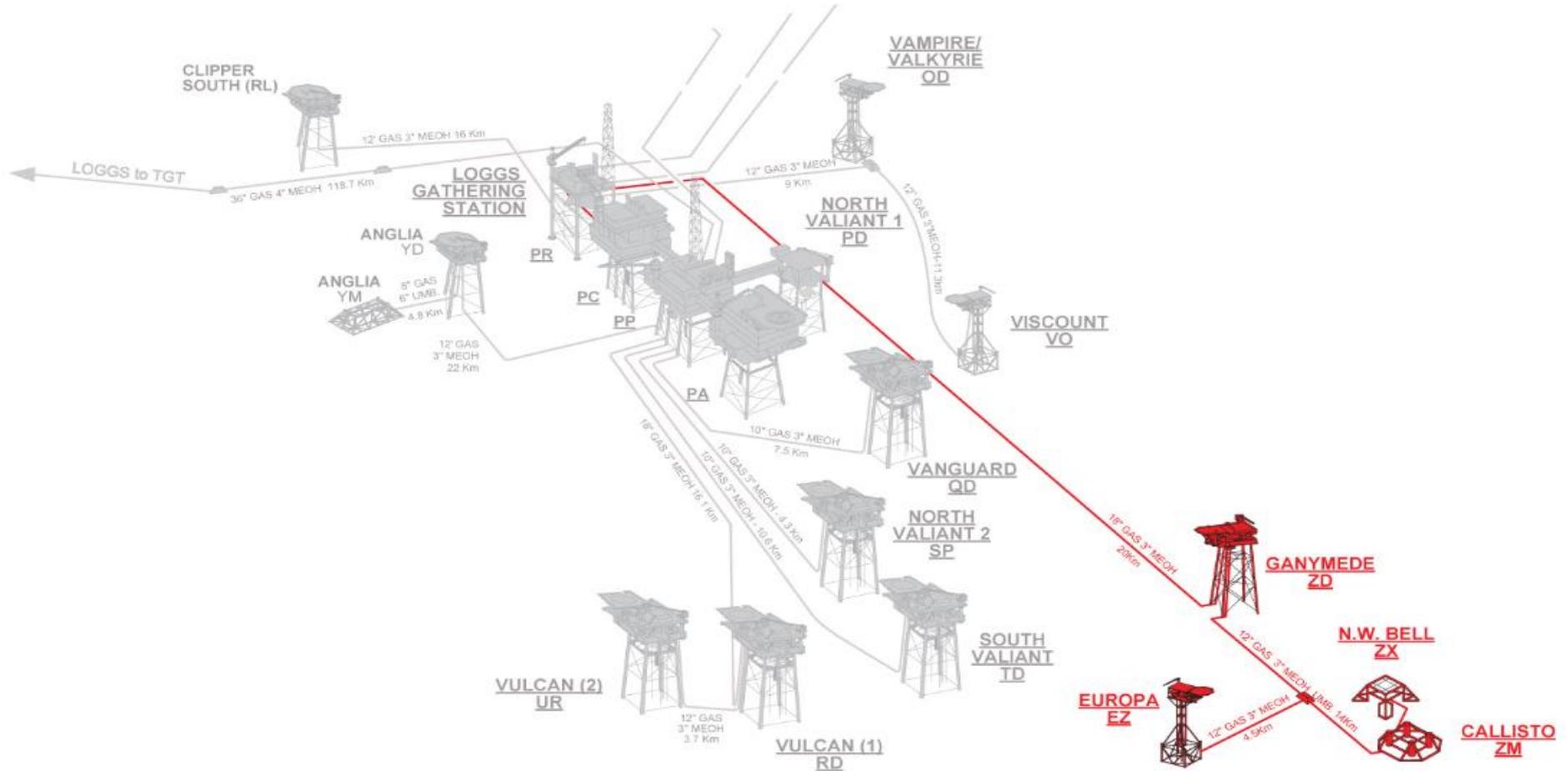


Figure 1.2 – Complete LOGGS Jupiter Development Layout (only Ganymede Topsides covered by this DP approval)

Facilities adjacent to the Ganymede Topside that are potentially impacted by this decommissioning programme are listed below in Table 1.6 and highlighted in red in Figure 1.3.

Table 1.4 List of Adjacent Facilities					
Owner	Name	Type	Distance / Direction	Information	Status
Pipelines					
Chrysaor Production (U.K.) Limited / Chrysaor Petroleum Limited/ BP Exploration (Alpha) Limited / BP Exploration Beta Limited	PL1692	12" Gas Pipeline	Vampire OD to LOGGS PR 9km	Pipeline adjacent to Ganymede ZD PL1093 and PL1094 as it approaches PR	Out of use
Chrysaor Production (U.K.) Limited / Chrysaor Petroleum Limited/ BP Exploration (Alpha) Limited / BP Exploration Beta Limited	PL1693	3" MeOH Pipeline	LOGGS PR to Vampire OD to 9km	Pipeline adjacent to Ganymede ZD PL1093 and PL1094 as it approaches PR	Out of use
Chrysaor Production (U.K.) Limited / Britoil Limited	PL2643	16" Gas Pipeline	Viking BP to LOGGS PR 26.9km	Pipeline adjacent to Ganymede ZD PL1093 and PL1094 as it approaches PR	Out of use
Chrysaor Production (U.K.) Limited / Britoil Limited	PL2644	3" MeOH Pipeline	LOGGS PR to Viking BP 26.9km	Adjacent to Ganymede ZD PL1093 and PL1094 as it approaches PR	Out of use

Table 1.4 List of Adjacent Facilities					
Owner	Name	Type	Distance / Direction	Information	Status
Chrysaor Production (U.K.) Limited / Ineos UK SNS Limited / Spirit North Sea Gas Limited	PL2107	14" Gas Pipeline	Saturn ND to LOGGS PR 43km	Adjacent to Ganymede ZD PL1093 and PL1094 as it approaches PR	Out of use
Chrysaor Production (U.K.) Limited / Ineos UK SNS Limited / Spirit North Sea Gas Limited	PL2108	3" MeOH Pipeline	LOGG PR to Saturn ND 43km	Adjacent to Ganymede ZD PL1093 and PL1094 as it approaches PR	Out of use
Chrysaor Production (U.K.) Limited / Chrysaor Petroleum Limited / BP Exploration (Alpha) Limited / BP Exploration Beta Limited	PL454	36" Gas Pipeline	LOGGS PP to TGT 118.7km	Pipeline crosses Ganymede ZD PL1093 and PL1094 as it approaches PR	Out of use
Chrysaor Production (U.K.) Limited / Chrysaor Petroleum Limited / BP Exploration (Alpha) Limited / BP Exploration Beta Limited	PL455	4" MeOH Pipeline	TGT to LOGGS PP 118.7km	Pipeline crosses Ganymede ZD PL1093 and PL1094 as it approaches PR	Out of use
Third Party Crossings					
Spirit Energy North Sea Limited	PL947	12" Gas Pipeline	Ann to LOGGS PR 42km	Adjacent to Ganymede ZD PL1093 and	Out of use

Table 1.4 List of Adjacent Facilities					
Owner	Name	Type	Distance / Direction	Information	Status
				PL1094 as it approaches PR	
Spirit Energy North Sea Limited	PL496	20" Gas Pipeline	Audrey WD to LOGGS PP 16.8km	Pipeline crosses Ganymede ZD PL1093 and PL1094 as it approaches PR	Out of use
Spirit Energy North Sea Limited	PL497	3" MeOH Pipeline	LOGGS PP to Audrey WD 16.8km	Pipeline crosses Ganymede ZD PL1093 and PL1094 as it approaches PR	Out of use
Surface Installations					
Chrysaor Developments Limited / BP Exploration (Alpha) Limited	North Valiant PD	Unmanned Platform	Ganymede ZD to LOGGS PD 17km	Adjacent to Ganymede ZD – LOGGS PR: PL1093 and PL1094 pipelines	Active
Chrysaor Production (U.K.) Limited / Chrysaor Petroleum Limited / BP Exploration (Alpha) Limited / BP Exploration Beta Limited	LOGGS PR	LOGGS Complex	Ganymede ZD to LOGGS PR 17km	Connected to Ganymede ZD – LOGGS PR: PL1093 and PL1094 pipelines	Active

Impacts of Decommissioning Proposals
No anticipated impact on adjacent facilities

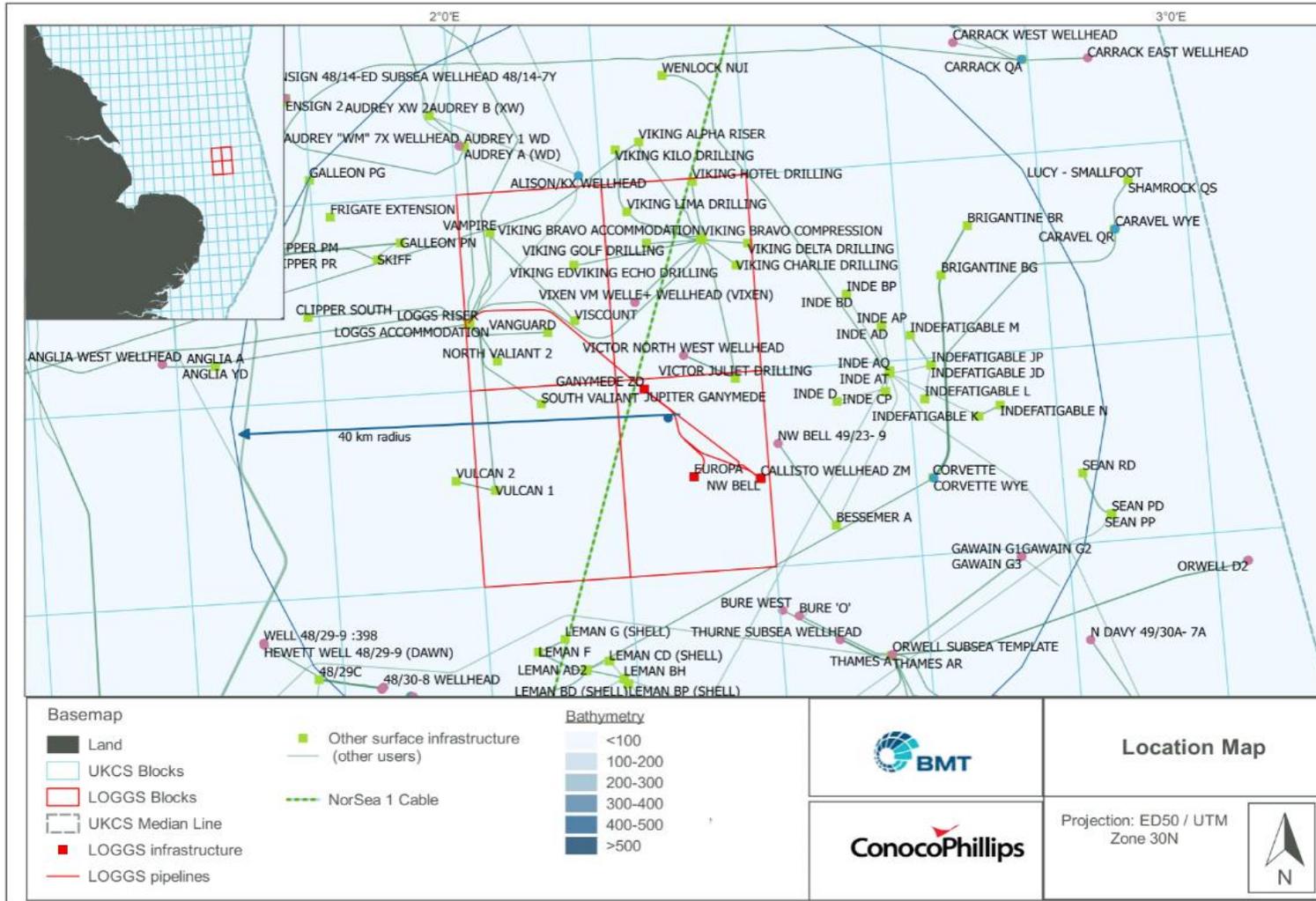


Figure 1.3 – Adjacent Facilities in Relation to Oil & Gas Infrastructure (Jupiter infrastructure and pipelines in red)



Figure 1.4 – Adjacent Facilities in Relation to Other Non Oil & Gas Features

1.7 Industrial Implications

Principles of the contracting and procurement strategies to be utilised by Chrysaor as operator and on behalf of the other Section 29 notice holders, for the decommissioning of the Ganymede ZD Topside are listed below:

1. Chrysaor participates in the PILOT Share Fair events providing one to one sessions with the UK supply chain on the SNS decommissioning programmes and timeline.
2. The First Point Assessment (FPAL) database is the primary source for establishing tender lists for contracts / purchases valued at US\$ 100,000 and above, although it is also used under this limit.
3. Chrysaor is committed to competitively bidding all of its major contracts where possible and practicable. We are supporters of the UK Supply Chain Code of Practice and our performance in this regard has been acknowledged through Excellence Awards from Oil & Gas UK.
4. Chrysaor are active participants in various industry initiatives including:
 - a. Oil & Gas UK Supply Chain Forum;
 - b. Inventory sharing initiative (Ampelius);
 - c. OGA Decommissioning Board - Supply Chain sub-group.

2 Description of Items to be Decommissioned

2.1 Surface Facilities (Ganymede Topside)

Table 2.1 Surface Facilities Information								
Name	Facility Type	Location	Topsides / Facilities		Jacket (if applicable)			
		WGS84 Decimal/ WGS84 Decimal Minute	Weight (Te)*	No of modules	Weight (Te)**	No of Legs	No of piles	Weight of piles (Te)***
Ganymede ZD	Topside only of Fixed Steel Jacket	53.3240° N / 53° 19.4393' N 02.2367° E / 02° 14.2027' E	1082	1				

*Note** Weights are based on structural designs and review of the Return to Scene (R2S) footage

*Note*** Weights are based on design drawings



Figure 2.1.1 Photograph of Ganymede ZD

2.2 Wells

Table 2.2 Well Information			
CM Platform Wells	Designation	Status	Category of Well
49/22-Z01Z - Ganymede Field	Gas Production	AB3	PL 3-3-3
49/22-Z02Z - Ganymede Field	Gas Production	AB3	PL 3-3-3
49/22-Z03 - Ganymede Field	Gas Production	AB3	PL 3-3-3
49/22-Z04 - Ganymede Field	Gas Production	AB3	PL 3-3-3
49/22-Z05Z - Ganymede Field	Gas Production	AB3	PL 3-3-3
49/22-Z06 - Ganymede Field	Gas Production	AB3	PL 3-3-3
49/22-Z07 - Ganymede Field	Gas Production	AB3	PL 3-3-3
49/22-Z08 - Ganymede Field	Gas Production	AB3	PL 3-3-3
Subsea Wells	Designation	Status	Category of Well
None			

For further details of well categorisation see OGUK guidelines “Well Decommissioning Guidelines” – Issue 6 – June 2018.

2.3 Drill Cuttings

Table 2.3 Drill Cuttings Pile Information		
Location of Pile Centre (Latitude / Longitude)	Seabed area (m ²)	Estimated volume of cuttings (m ³)
None of the facilities has a cuttings pile present	0	0

No drill cuttings have been identified on the seabed adjacent to the installations in subsea inspections conducted in 1994, 2000 and 2015. The dynamic marine environment has resulted in the redistribution of drill cuttings.

2.4 Inventory Estimates

Table 2.4 Current Installation Material Functional Category Summary							
Installation	Haz Mat / NORM	Concrete	Ferrous Metal	Non-Ferrous Metal	Plastics	Other Non-Haz	Total
	Te	Te	Te	Te	Te	Te*	Te
Ganymede ZD Topside	19	-	994	-	1	68	1082
Total	19	-	994	-	1	68	1082

3 Removal and Disposal Methods

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

Options considered for re-use of the Ganymede Topside were:

- Further Hydrocarbon production from development local to the satellite
- Relocation elsewhere to produce hydrocarbons
- Sale for reuse to others

No economic hydrocarbon developments local to the Ganymede Topside were identified. The Ganymede Topside requires refurbishment and contains obsolete control systems and components. Their re-use is uneconomic.

The selected option for the Ganymede Topside is to remove, dismantle and dispose of them, ensuring a high level of material recycling.

3.1 Topside

3.1.1 Topside Description

Ganymede ZD

The Ganymede ZD topsides are a minimal facility designed for use as a NUI. The facilities extend 29m above Lowest Astronomical Tide (LAT) to the Helideck. The Topsides weigh 1082 Te, has a deck size of 20.4m by 34.2m and comprises of a Helideck, Main Deck, Mezzanine Deck, Cellar Deck and an ESDV access platform below the Cellar Deck.

Ganymede Isometric Structure

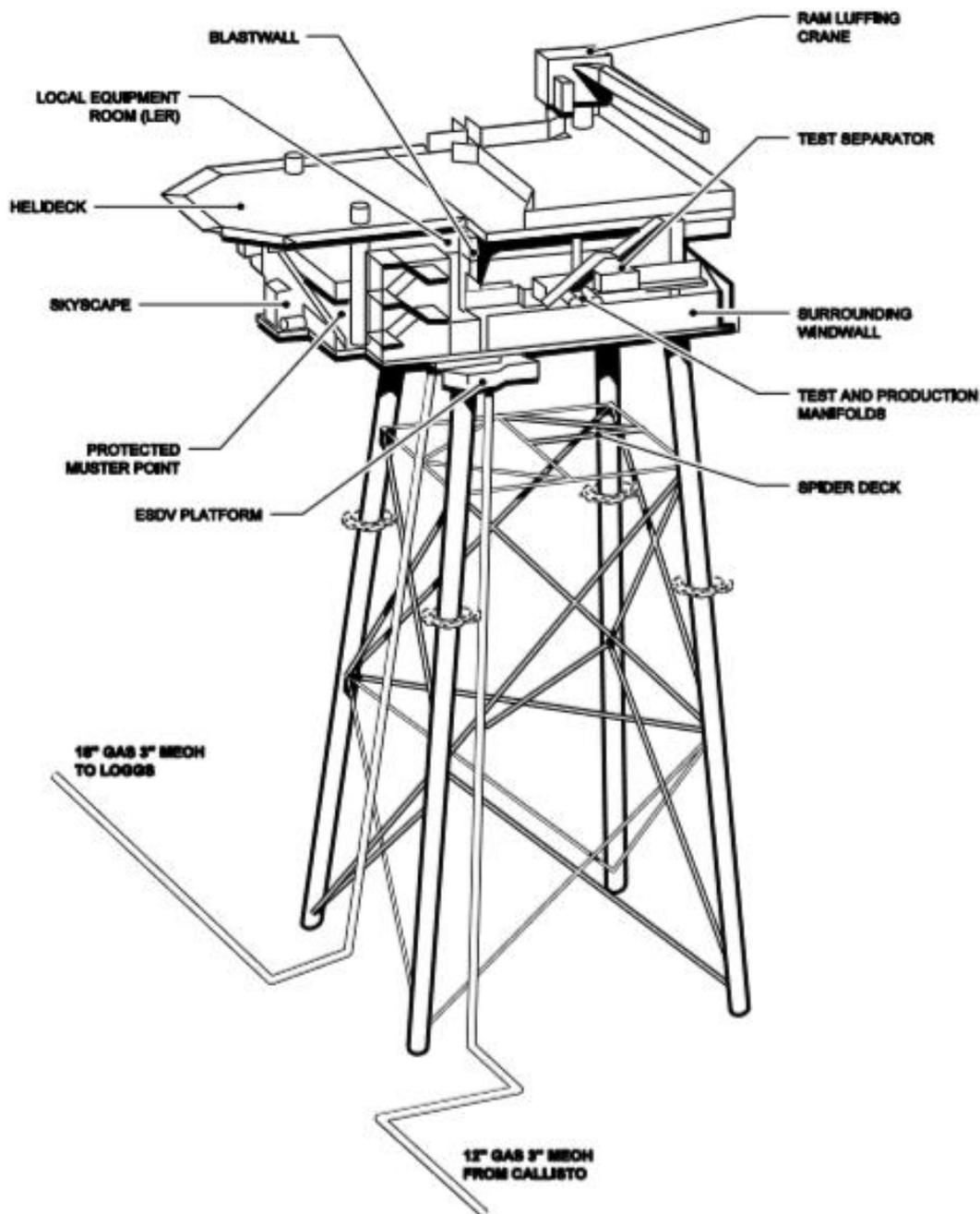


Figure 3.1.1 ZD Topsides Elevation

Preparation / Cleaning: Table 3.1 describes the methods that will be used to flush, purge and clean the Ganymede topsides offshore, prior to removal to shore.

Table 3.1 Cleaning of Topside for Removal		
Waste Type	Composition of Waste	Disposal Route
Hydrocarbons	Process fluids	Will be flushed, Nitrogen purged vented and made liquid free.
Produced solids	Sand, NORM	Any pipeline debris captured in filter packages, will be returned onshore for disposal. Any solids remaining in vessels will be removed and disposed of during the dismantlement of the Topsides onshore.
Diesel	Bunkered Diesel fuel	Bunkered Diesel will be drained and returned onshore for re-use or disposal.
Lubricating oils	Lubricants for equipment e.g. gearboxes, pumps, pedestal crane compressor skid	Lubricating oils will be drained and returned onshore for re-use or disposal.

3.1.2 Ganymede Topside Removal Methods

Given the size and combined weight of the Ganymede Topsides and Jacket, the topsides will be removed separately from the jacket.

Table 3.2 Topsides Removal Methods	
<input checked="" type="checkbox"/> 1) HLV (semi-submersible crane vessel) <input checked="" type="checkbox"/> 2) Monohull crane vessel <input checked="" type="checkbox"/> 3) SLV <input checked="" type="checkbox"/> 4) Piece small <input checked="" type="checkbox"/> 5) Other Simultaneous removal of Topsides with Jacket	
Methods Considered	Description
Single lift removal complete with Jacket by HLV / Monohull crane vessel / SLV	Removal of Topsides complete with Jacket in a single lift and transportation to shore for dismantlement, disposal and recycling.
Modular lift removal of Topsides by HLV / Monohull crane vessel / SLV	Removal of Topsides for transportation to shore for dismantlement, disposal and recycling.
Offshore removal "piece small" for onshore disposal	Removal of Topsides and dismantlement offshore for transportation onshore for disposal and recycling.
Proposed removal method and disposal route.	ZD Topside will be removed in one or more lifts. Transportation to shore for dismantlement, disposal and recycling. Trans-frontier shipments will not be required

Note: Option Considered

3.2 Wells

Table 3.3 Well Plug and Abandonment

The Ganymede ZD platform wells have been plugged and abandoned using a Mobile Offshore Drilling Rig.

Master Application Templates (MATs) and the supporting Subsidiary Application Templates (SATs) have been submitted in support of all well plug and abandonment activities.

3.3 Drill Cuttings

3.3.1 Drill Cuttings Decommissioning Options

Not applicable. No drill cuttings have been identified on the seabed adjacent to the installations in subsea inspections conducted in 1994, 2000 and 2015. The dynamic marine environment has resulted in the redistribution of drill cuttings.

3.4 Waste Streams

Table 3.4 Waste Stream Management Methods	
Waste Stream	Removal and Disposal method
Bulk liquids	Pipeline flushing fluids will be injected into redundant gas production wells. Bulk liquids removed from vessels and transported to shore. Vessels and pipework will be drained prior to removal to shore and shipped in accordance with maritime transportation guidelines. Bulk fluids taken onshore for handling at an appropriately permitted facility prior to onshore treatment and disposal.
Marine growth	To be taken onshore with the infrastructure identified for removal for handling at the appropriately permitted decontamination and disposal facility prior to onshore disposal via landfill or composting.
NORM	To be taken onshore with the infrastructure identified for removal and decontamination at the appropriately permitted decontamination and disposal facility prior to onshore disposal. NORM not removed as part of pipeline cleaning will be left in situ and is considered to have a negligible impact on the receiving marine environment (EA Section 5.19).
Asbestos	To be taken onshore with the infrastructure identified for removal for handling at the appropriately permitted decontamination and disposal facility prior to onshore disposal.
Other hazardous wastes	To be taken onshore with the infrastructure identified for removal for handling at the appropriately permitted decontamination and disposal facility prior to onshore disposal.
Onshore Dismantling sites	<p>Appropriately permitted sites have been selected through the Chrysaor procurement process.</p> <p>The decontamination and disposal facility selection considered the suitability of the facility, systems in place for the safe and efficient segregation and storage of waste in accordance with operational site permits, proven materials re-use and recycling performance including the use of innovative materials management practices to minimise the quantity of materials disposed of.</p> <p>The Ganymede Topside is to be consigned to the Veolia Petersons Outer Harbour Decommissioning Facility, Great Yarmouth, United Kingdom. Trans-frontier shipment of waste will not be required.</p>

Table 3.5 Inventory Disposition			
	Total Inventory Tonnage	Planned Tonnage to shore*	Planned Tonnage Decommissioned in situ
Installations	1082	1082	0

It is not currently possible to predict the market for re-usable materials with confidence however there is a target that >95% of the materials will be recycled.

In accordance with the Chrysaor Waste Management Standard, all facilities receiving waste are to be approved by the Company prior to use. Approval requires a favourable assessment of a waste facility’s ability to avoid environmental harm through protective designs, operations, monitoring, financial integrity and institutional controls. Post approval, the facility will be audited to confirm operations are undertaken within the conditions of associated site permits and to confirm its ongoing suitability for continued use and to identify opportunities for improvement.

Chrysaor will collaborate with the operator of the waste facility to communicate the proposed consignment of the waste to the local regulatory authority in accordance with the site permits.

4 Environmental Appraisal Overview

4.1 Environmental Sensitivities (Summary)

Table 4.1: Environmental Sensitivities	
Environmental Receptor	Main Features
Conservation interests	<p>Sites of Conservation Importance</p> <p>The LOGGS infrastructure included within the scope of all the Jupiter Area Decommissioning Programmes is located within two sites of conservation importance; the North Norfolk Sandbanks and Saturn Reef Special Area of Conservation (SAC) and the Southern North Sea SAC.</p> <p>The North Norfolk Sandbanks and Saturn Reef SAC site has been selected for designation due to the presence of the Annex I habitats: sandbanks which are slightly covered by water at all times and biogenic reef habitats formed by <i>Sabellaria spinulosa</i>. The Conservation Objectives for the North Norfolk Sandbanks and Saturn Reef SAC are for the features to be in favourable condition, thus ensuring site integrity in the long term and contribution to Favourable Conservation Status of Sandbanks and Reefs. This contribution would be achieved by maintaining or restoring, subject to natural change:</p> <ul style="list-style-type: none"> • The extent and distribution of the qualifying habitats in the site; • The structure and function of the qualifying habitats in the site; and • The supporting processes on which the qualifying habitats rely. <p>The Southern North Sea SAC has been identified as an area of importance for the Annex II species the harbour porpoise. This site includes key winter and summer habitat for this species. The Conservation Objectives of the site are to ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for Harbour Porpoise in UK waters. In the context of natural change, this will be achieved by ensuring that:</p> <ul style="list-style-type: none"> • Harbour porpoise is a viable component of the site; • There is no significant disturbance of the species; and • The condition of supporting habitats and processes, and the availability of prey is maintained. <p>Annex II species likely to be sighted within the area of the proposed decommissioning activities include bottlenose dolphins, harbour porpoise, grey seals and common or harbour seals (EA Section 4.3).</p> <p>Marine Conservation Zones (MCZs)</p> <p>The installations and pipelines included within the scope of the decommissioning programmes do not transect any MCZs.</p>

Table 4.1: Environmental Sensitivities	
Environmental Receptor	Main Features
	<p>Special Protection Areas (SPAs) The installations and pipelines included within the scope of the decommissioning programmes do not transect any SPAs.</p>
Seabed	<p>The seabed in the vicinity of the LOGGS infrastructure is predominantly composed of sand with shells and shell fragments, with some gravel and cobbles. Sediments are generally well sorted and uniform.</p> <p>The Bathymetry across the area is relatively flat with mega-ripples and sand formations (EA Section 4.1).</p> <p>There is no evidence of bedrock, pockmarks or unusual or irregular bedforms.</p> <p>The infaunal community is generally dominated by crustacea and polychaete worms. The species are typical of the sandy sediments of southern North Sea.</p> <p>Whilst epifauna are generally sparse across the area due to the lack of hard substrata, polychaete worms, hermit crabs, fish including sand eels and flatfish, starfish including the common starfish and the sea star, and the soft coral dead mans' fingers are all observed.</p> <p>In terms of habitat classification, most stations within the associated pre-decommissioning baseline survey were categorised as 'infralittoral fine sand', which corresponds to clean sands occurring in shallow water (generally shallower than 20 m), either on open coast or in tideswept channels of marine inlets. This is consistent with the protected Annex I habitat 'sandbanks slightly covered by seawater all the time'.</p> <p>There is a high probability of <i>Sabellaria spinulosa</i> across the region. A small fragment of tube structure recovered in a sieve during sampling at the Ganymede ZD location was considered to have possibly been made by the Ross worm <i>Sabellaria spinulosa</i> aggregations of such tubes can sometimes create reef structures which are of conservation concern. However, no <i>Sabellaria spinulosa</i> were evident either as individuals or as tube aggregations from the survey, and none of the geophysical data suggested the presence of such structures. Seabed imagery did not provide any evidence of any threatened and/or declining species and habitats on the OSPAR (2008) list or any species on the International Union for Conservation of Nature Global Red List of threatened species (Gardline, 2015).</p>
Fish	<p>The area is located within the spawning grounds of cod (January to April, [peak spawning February to March]), lemon sole (April to September), Norway lobster (January 20 December [peak spawning April to June]), plaice (December to March [peak spawning January to February]), sandeels (November to February), sole (December and March to May [peak spawning in April]), sprat (May to August [peak spawning May to June]), thornback ray (February to September [peak spawning April to August]) and whiting (February to June).</p> <p>Within the decommissioning area is an area of high intensity spawning for plaice.</p>

Table 4.1: Environmental Sensitivities	
Environmental Receptor	Main Features
	<p>The following species have nursery grounds in the vicinity of the project: anglerfish, cod, herring, lemon sole, plaice, sandeel, sprat, mackerel, spurdog, herring, Norway lobster, sole, tope, thornback ray and whiting.</p> <p>Within the decommissioning area is an area of high intensity nursery grounds for cod, herring and whiting.</p>
Fisheries	<p>Across wider LOGGS Area (North and South), fishing grounds are fished at varying degrees by the following fleets (Chrysaor, 2017b):</p> <ul style="list-style-type: none"> • Dutch beam trawlers, demersal otter trawlers, and fly seiners; • UK potters, shrimp beam trawlers, shellfish dredgers, otter trawlers, long-liners, and netters; • Belgian beam trawlers and demersal otter trawlers; • Danish sandeelers, midwater and demersal trawlers and seine netters; • Norwegian purse seiners and midwater otter trawlers; • German beam trawlers and demersal otter trawlers; • French otter trawlers (demersal and pelagic); and • French purse seine netters. <p>The main species targeted are shellfish, with demersal species dominate catch in some areas. The highest number of effort days takes place in the summer months (July-September). Activity is low to moderate except at the Europa platform where fishing intensity is higher (EA Section 4.5).</p>
Marine Mammals	<p>Cetaceans regularly recorded in the North Sea include the harbour porpoise, bottlenose dolphin, minke whale, killer whale, Atlantic white-sided dolphin and white-beaked dolphin. Rarer species that are occasionally observed in the North Sea include fin whale, long-finned pilot whale, Risso’s dolphin and the short beaked common dolphin. However, harbour porpoise and white-beaked dolphin are the only cetaceans considered as regular visitors in the Southern North Sea throughout most of the year, and minke whale as a frequent seasonal visitor (EA Section 4.3.1).</p> <p>Pinnipeds sighted in the area include grey seals, and harbour seals. Grey seals may travel past the infrastructure towards foraging grounds, but densities generally reduce with distance offshore. Harbour seals are more likely to be sighted further offshore, travelling to this area from breeding and haul out sites in The Wash to forage for food (EA Section 4.3.2).</p>
Birds	<p>The most common species of seabird found in these areas of the SNS include fulmar, gannet, guillemot, kittiwake, razorbill, puffin and little auk, as well as numerous species of gull, tern and skua.</p> <p>In the decommissioning area the sensitivity of seabirds to oil pollution, reflected by the Seabird Oil Sensitivity Index, is low between July and September.</p>

Table 4.1: Environmental Sensitivities	
Environmental Receptor	Main Features
	Between November and March, the Seabird Oil Sensitivity Index is very high to extremely high. There is no data for April to June for many of the blocks, and again for October and November.
Onshore Communities	An onshore decontamination and dismantlement facility will be used that is deemed able to comply with all relevant permitting and legislative requirements.
Other Users of the Sea	<p>Shipping Shipping density in the area of the infrastructure to be decommissioned ranges from very low to high. The main contributing factor of very high vessel density in the area closer to shore is the number of large international ports within the region including Hull, Immingham, Grimsby and Great Yarmouth (EA Section 4.7).</p> <p>Oil & Gas Industry The infrastructure is located in the SNS gas basin which is densely populated by various installations. See table 1.6, figure 1.3 and figure 1.4 for information regarding adjacent facilities.</p> <p>Offshore Renewables The nearest windfarms are Hornsea zone and East Anglia zone located approximately 35 km SE from LOGGS facilities, and the Dundgeon windfarm site which is located approximately 36 km W.</p>
Atmosphere	Atmospheric emissions during decommissioning activities will occur in the context of the cessation of production. As such, almost all future emissions (from Project operations and vessels) will cease (EA Section 3.1).

4.2 Potential Environmental Impacts and their Management

4.2.1 Environmental Impact Assessment Summary

The potential environmental impacts associated with the decommissioning activities have been assessed and it is concluded that the proposed decommissioning of the infrastructure can be completed without causing significant adverse impact to the environment. The results of the Environmental Impact Assessment (EIA) are presented in an Environmental Appraisal (EA) accompanying the Jupiter Area Decommissioning Programmes.

The EA makes an assessment of the potential environmental impacts by identifying interactions between the proposed decommissioning activities and the associated environmental receptors. The EA also describes the proposed mitigation measures designed to avoid or reduce the identified potential environmental impacts and how these will be managed in accordance with Chrysaor’s Environmental Management System (EMS) while considering responses from stakeholders.

Table 4.2: Environmental Impact Management		
Activity	Main Impacts	Management
Topsides Removal	Energy use and atmospheric emissions (EA Section 3.1)	All engines, generators and combustion plant on the vessels will be well maintained and correctly operated to ensure that they are working efficiently to minimise energy use and gaseous emissions. Vessel operations will be minimised where practical.
	Underwater noise (EA Section 5.3)	A noise assessment has been 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.
	Accidental hydrocarbon release (EA Section 3.1)	Hydrocarbon inventories are to be removed from the topsides prior to commencing removal operations. The SNS Oil Pollution Emergency Plan has been updated in agreement with OPRED to include all planned decommissioning operations.
Decommissioning Drill Cuttings Piles	No drill cuttings piles present	No drill cuttings piles present.

Note: The verification of the seabed state within the Ganymede installation’s 500m zones will be conducted at the time of decommissioning.

5 Interested Party Consultations

Table 5.1 Summary of Stakeholder Comments		
Stakeholder	Comment	Response
Statutory Consultees (NFFO, SFF, NIFPO)	NFFO: The Federation would advise over trawl surveys where possible should be carried out to ascertain that the areas are free of snagging hazards post decommissioning.	Comments Noted
Statutory Consultees (GMS)	No comments received	N/A
Other (VisNed)	No comments received	N/A
Public	No comments received	N/A

6 Programme Management

6.1 Project Management and Verification

Chrysaor has established a UK Decommissioning organisation as a department to manage and execute decommissioning projects. Chrysaor’s existing processes for Operations, Planning, Project Management, Procurement, Health Safety and Environment, will be used and tailored to meet the specific requirements of decommissioning projects. Chrysaor will manage all permitting, licences, authorisations, notices, consents and consultations.

Any changes to this decommissioning document will be discussed and agreed with OPRED.

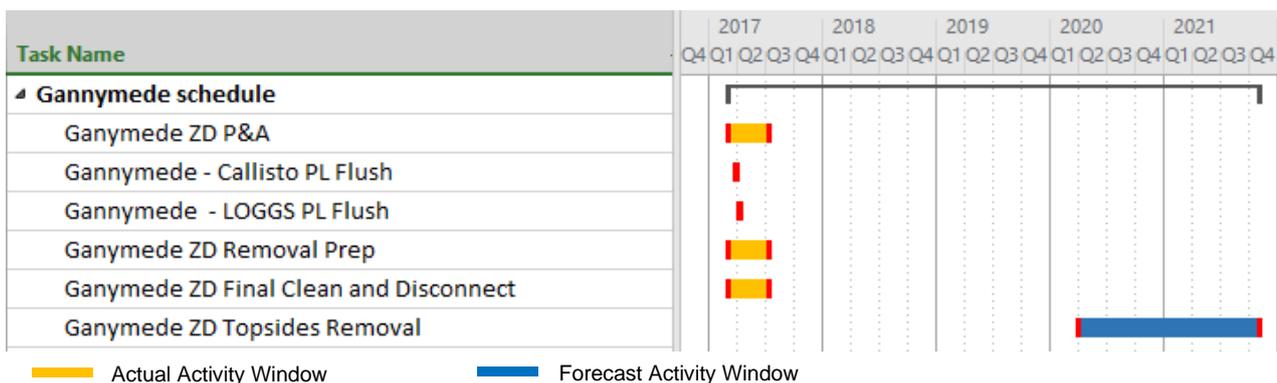
6.2 Post-Decommissioning Debris Clearance and Verification

During site clearance activities, Chrysaor will make best endeavours to recover any dropped objects subject to any outstanding Petroleum Operations Notices (PON). All recovered seabed debris related to offshore oil and gas activities will be returned for onshore disposal or recycling in line with existing disposal methods. A post-decommissioning site survey will be carried out around a 500m radius of the installation site following completion of the decommissioning of the overall LOGGS Jupiter Area (LDP3). This will be followed by verification and provision of a statement of seabed clearance to all relevant authorities. The LDP3 Decommissioning Programmes and associated documents will be subject to a separate approval.

The outcomes of the seabed clearance and verification will be reported in the Close Out Report.

6.3 Schedule

Schedule of debris clearance activities and close out reporting to be agreed as part of the greater SNS-wide decommissioning campaign. Debris clearance to be undertaken in a suitable timeframe following installation removal. Post-removal surveys and close-out reporting to follow debris clearance of the 500m zone.



Note:
 Debris clearance activity will follow removal, and environmental survey will follow debris clearance activity.
 This is an indicative schedule and is subject to change based on technical, market, and commercial, factors.

Figure 6.1: Gantt Chart of Project Plan

6.4 Costs

Table 6.1 – Provisional Decommissioning Programme costs*												
Asset Name	TOTAL	Operator Project Management	Facility Running / Owner Costs	Wells Abandonment	Facilities / Making Safe	Topsides Preparation	Topsides Removal*	Sub-structure Topsides Removal	Topsides Onshore Recycling	Subsea Infrastructure (pipelines, umbilicals, mattresses, SSIV)	Site Remediation	Monitoring
	£million	£million	£million	£million	£million	£million	£million	£million	£million	£million	£million	£million
Ganymede ZD Topside												
LDP3b Total												

Note: * An estimate of the overall cost has been provided separately to OPRED

Table 6.1: Decommissioning Costs

6.5 Close Out

In accordance with OPRED guidance notes, a close out report will be submitted to OPRED within 12 months of the overall completion of the LOGGS Jupiter Area decommissioning scope. In the interim, quarterly reports on progress of the decommissioning operation will be provided to OPRED. The close out report will contain debris removal and verification of seabed clearance, the first post-decommissioning environmental survey and explanation of any variations to the approved Decommissioning Programmes.

6.6 Post Decommissioning Monitoring and Evaluation

The arrangements for post-decommissioning monitoring and evaluation, including a post removal environmental survey campaign, will be covered in the overall LOGGS Jupiter Area Decommissioning Programmes.

7 Supporting Documents

Table 7.1 : Supporting Documents	
Document Number	Title
XOD-SNS-L-XX-X-HS-02-00005	Environmental Appraisal LOGGS Area Decommissioning (Decommissioning Programmes LDP2, LDP3, LDP4, LDP5)
J/1/20/2342	Fugro EMU Limited, 2013. Decommissioning Environmental Survey Report Viscount VO, Vulcan UR, and Vampire / Valkyrie OD (LOGGS)
J/1/20/2342-2	Fugro EMU Limited, 2013. Habitat Assessment Report Viscount VO, Vulcan UR, and Vampire / Valkyrie OD (LOGGS)
10553.2	Gardline Environmental Limited, 2015. Pre-decommissioning Survey Report LOGGS Gas Fields (LOGGS Hub, Mimas MN, Ganymede ZD, South Valiant TD and Europa EZ)
10553.2	Gardline Environmental Limited, 2015. Habitat Assessment Report LOGGS Gas Fields (LOGGS Hub, Mimas MN, Ganymede ZD, South Valiant TD and Europa EZ)

8 Partner Letters of Support



To:

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

Date: 09 April 2020

Dear Sir or Madam,

LOGGS Satellites Jupiter Area - Ganymede ZD Topside Decommissioning Programme: LDP3b

PETROLEUM ACT 1998

We acknowledge receipt of your letter dated 6th April 2020.

We, Equinor UK Limited confirm that we hereby authorise Chrysaor Production (U.K.) Limited to submit on our behalf an abandonment programme relating to the Ganymede ZD Topside, as directed by the Secretary of State on 6th April 2020.

We confirm that we support the proposals detailed in the LOGGS Satellites Jupiter Area - Ganymede ZD Topside Decommissioning Programme dated 6th April 2020, which is to be submitted by Chrysaor Production (U.K.) Limited in so far as they relate to those facilities in respect of which we are required to submit an abandonment programme under section 29 of the Petroleum Act 1998.

Yours faithfully,

(approved by email)

Nigel Gamblin
VP Asset Management

For and on behalf of Equinor UK Limited

Esso Exploration and Production UK Limited
Union Plaza
1 Union Wynd
Aberdeen
AB10 1SL

Telephone: +44 (0)1224 651914
Email: margaret.m.rogacki@exxonmobil.com

Margaret Rogacki
Asset Manager
Central/Northern North Sea

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

8th April 2020

Dear Sir or Madam,

LOGGS Satellites Jupiter Area - Ganymede ZD Topside Decommissioning Programme: LDP3b

PETROLEUM ACT 1998

We acknowledge receipt of your letter dated 6th April 2020.

We, Esso Exploration and Production UK Limited, confirm that we hereby authorise Chrysaor Production (U.K.) Limited to submit on our behalf an abandonment programme relating to the Ganymede ZD Topside, as directed by the Secretary of State on 6th April 2020.

We confirm that we support the proposals detailed in the LOGGS Satellites Jupiter Area - Ganymede ZD Topside Decommissioning Programme dated 6th April 2020, which is to be submitted by Chrysaor Production (U.K.) Limited in so far as they relate to those facilities in respect of which we are required to submit an abandonment programme under section 29 of the Petroleum Act 1998.

Yours faithfully,

(approved by e-mail)

Margaret M. Rogacki
Asset Manager

For and on behalf of Esso Exploration and Production UK Limited

9 Appendix 1 – Public Notice



THE GAZETTE

OFFICIAL PUBLIC RECORD

Notice details

Type:

Planning

> Pipe-Lines

Publication date:

29 January 2020, 12:00

Edition:

The London Gazette

Notice ID:

3478682

Notice code:

1608

Pipe-Lines

CHRYSAOR PRODUCTION (U.K.) LIMITED

PUBLIC NOTICE

THE PETROLEUM ACT 1998

LOGGS SATELLITES JUPITER AREA - GANYMEDE ZD, EUROPA EZ, CALLISTO ZM, NW BELL ZX AND ASSOCIATED INFIELD PIPELINES DECOMMISSIONING PROGRAMMES

Chrysaor Production (U.K.) Limited has submitted, for the consideration of the Secretary of State for Business, Energy & Industrial Strategy, the draft Decommissioning Programmes for the Ganymede ZD and Europa EZ satellites, subsea tiebacks Calisto ZM and NW Bell ZX and their associated infield pipelines, in accordance with the provisions of the Petroleum Act 1998. It is a requirement of the Act that interested parties be consulted on such decommissioning proposals.

The items/facilities covered by the Decommissioning Programmes are:

The Ganymede ZD infrastructure lies 73 km east of the UK Lincolnshire coast in Block 49/22a, the Europa EZ infrastructure lies 67 km east of the Lincolnshire coast in Blocks 49/22a, 49/22c and 49/22d, the subsea tiebacks Callisto ZM and NW Bell ZX lie 73 km east of the UK Lincolnshire coast in Block 49/22a. The facilities include two infield satellite platforms, each comprising a topside and a jacket structure, two subsurface installations and one subsea tee and 10 infield pipelines (4 gas, 4 piggy-backed methanol and 2 umbilicals) and associated subsea stabilisation features.

Chrysaor Production (U.K.) Limited hereby gives notice that a summary of the LOGGS Satellites Jupiter Area - Ganymede ZD, Europa EZ, Callisto ZM, NW Bell ZX and Associated Infield Pipelines Decommissioning Programmes can be viewed at this address: www.chrysaor.com.

Alternatively, a hard copy of the programmes can be inspected at the following location during office hours:

Chrysaor Production (U.K.) Limited

Rubislaw House

Anderson Drive

Aberdeen AB15 6FZ

Contact: Michael Burnett, Decommissioning Strategy and Integration Manager

Representations regarding the LOGGS Satellites Jupiter Area - Ganymede ZD, Europa EZ, Callisto ZM, NW Bell ZX and Associated Infield Pipelines Decommissioning Programmes should be submitted in writing to the person named at the above address by the consultation closing date of 28 February 2020. Submissions should state the grounds upon which any representations are being made.

Date: 29 January 2020

PUBLIC NOTICE

The Petroleum Act 1998

LOGGS Satellites Jupiter Area - Ganymede ZD, Europa EZ, Callisto ZM, NW Bell ZX and Associated Infield Pipelines Decommissioning Programmes

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Rubislaw House
Anderson Drive
Aberdeen AB15 6FZ**

Contact: Michael Burnett

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Date: 29 January 2020

**Chrysaor Production (U.K.) Limited
Rubislaw House
Anderson Drive
Aberdeen AB15 6FZ**

**Michael Burnett
Decommissioning
Strategy and
Integration Manager**

The Petroleum Act 1998

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Date: 29 January 2020

Chrysaor Production (U.K.) Limited Michael Burnett
Rubislaw House, Anderson Drive Decommissioning Strategy and
Aberdeen Integration Manager
AB15 6FZ

10 Appendix 2 – Consultee Responses

NFFO Services Ltd



30 Monkgate
York
YO31 7PF
Tel:01904 635 432
29th March 2020.

Michael Burnett
Decommissioning Strategy and Integration Manager
Chrysaor Production (UK) Ltd
Rubislaw House
Anderson Drive
Aberdeen
AB15 6FZ

Dear Michael

In reference to the decommissioning program for the Loggs Jupiter decommissioning program and associated infield pipelines.

The National Federation Fisherman's Organisation would like to thank Chrysaor for the detailed documentation explaining the planned methodology on planned decommissioning of these assets

The Federation would advise Over trawl surveys where possible, should be carried out to ascertain that the areas are free of snagging hazards post decommissioning.

NFFO Services department look forward to working closely with Chrysaor throughout the decommissioning process.

Kind Regards

Ian Rowe

Ian Rowe (General Manager)

NFFO Services Ltd