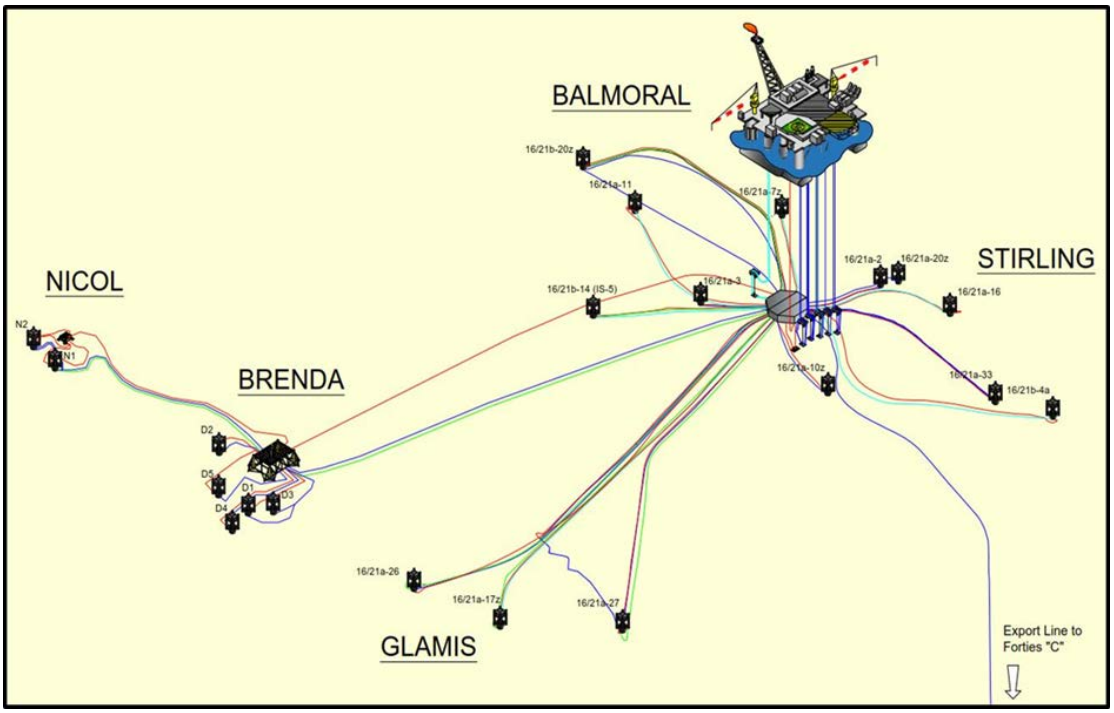

GLAMIS

Decommissioning Programmes

FINAL VERSION – 11 January 2021

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B03	Issued for Use (Final)		Jan 2021

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Contents

Terms and Abbreviations

Abbreviation	Explanation
CA	Comparative Assessment
Chem	Chemical
CoP	Cessation of Production
Dia	Diameter
DoB	Depth of Burial
DP	Decommissioning Programme
DSV	Diving Support Vessel
EA	Environment Appraisal
EMT	Environmental Management Team
ENE	East-Northeast
FPSO	Floating Production Storage and Offloading
FPV	Floating Production Vessel
HSE	Health & Safety Executive
HSES	Health, Safety, Environment & Security
Hyd	Hydraulic
in	Inch
JNCC	Joint Nature Conservation Committee
KCl	Potassium Chloride
Km	Kilometer
LAT	Lowest Astronomical Tide
LSA	Low Specific Activity Scale
LTOBM	Low Toxicity Oil Base Mud
m	Metre
MCA	Maritime and Coastguard Agency
MCDA	Multi Criteria Decision Analysis
mm	Millimetre
MS	Marine Scotland
n/a	Not Applicable
N	North
NCMPA	Nature Conservation Marine Protected Areas
NE	Northeast
NORM	Naturally Occurring Radioactive Material
NSP	Norwegian Boundary Sediment Plain
NW	Northwest
OBM	Oil Base Mud
ODU	Offshore Decommissioning Unit
OGA	Oil & Gas Authority
OGUK	Oil & Gas UK

Abbreviation	Explanation
OPRED	Offshore Petroleum Regulator for Environment & Decommissioning
OSPAR	Oslo Paris Convention – Convention for the Protection of the Marine Environment of the North East Atlantic
OIW	Oil in Water
P&A	Plug and Abandon (Wells)
PL	Pipeline
PON	Petroleum Operations Notice
Premier Oil	Premier Oil E&P UK Limited
PWA	Pipeline Works Authorisation
RB	Riser Base
Repsol Sinopec	Repsol Sinopec North Sea Limited
ROV	Remotely Operated Vehicle
SAC	Special Area of Conservation
SCAP	Supply Chain Action Plan
SE	Southeast
SEPA	Scottish Environmental Protection Agency
SFF	Scottish Fishermen's Federation
SIMOPS	Simultaneous Operations
SPA	Special Protection Areas
Te	Tonne
TFSW	Trans Frontier Shipment of Waste
THC	Total Hydrocarbon Concentration
UKCS	United Kingdom Continental Shelf
UKOOA	United Kingdom Offshore Operators Association
Umb	Umbilical
WBM	Water Base Mud
WHPS	Wellhead Protection Structure

Figures and Tables

Appendices

1 EXECUTIVE SUMMARY

1.1 Decommissioning Programmes

This document contains the Decommissioning Programmes for the Glamis Field subsea installations and pipelines.

Note that the Glamis Field decommissioning is part of a programme of decommissioning activities for the Greater Balmoral Area. Each field comprising the Greater Balmoral Area has its own Decommissioning Programmes.

1.2 Requirement for Decommissioning Programmes

Installations:
In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Glamis subsea installations are applying to the Offshore Petroleum Regulator for Environment & Decommissioning (OPRED) to obtain approval for decommissioning the installations detailed in Section 2.1 and 2.2 of this programme. (See also Section 8 - Partner Letter of Support).

Pipelines:
In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Glamis pipelines (see Table 1.4) are applying to OPRED to obtain approval for decommissioning the pipelines detailed in Section 2.3 of this programme. (See also Section 8 – Partner Letter of Support).

In conjunction with public, stakeholder and regulatory consultation, the Decommissioning Programmes are submitted in compliance with national and international regulations and OPRED guidelines. The schedule outlined in this document is for an eight year decommissioning project plan due to begin in 2021.

1.3 Introduction

The Decommissioning Programmes have been prepared to support the decommissioning of the Glamis Field, which is part of a wider suite of Decommissioning Programmes for the Greater Balmoral Area.

The licensees have submitted to the Oil & Gas Authority (OGA) for consideration a Cessation of Production (CoP) document which demonstrates that all economic development opportunities have been pursued for; the field and associated infrastructure, current and future development opportunities, and consideration of access to current infrastructure.

A Cessation of Production application for the field has been discussed with and submitted to the Oil and Gas Authority, and was approved on the 23rd April 2018.

The Greater Balmoral Area consists of the Premier Oil operated subsea Fields; Balmoral, Brenda, Nicol, Stirling and Glamis, all of which are tied-back to the Balmoral Floating Production Vessel (FPV). Two further subsea Fields, Burghley and Beauly, which are operated by Repsol Sinopec North Sea Ltd, are also tied-back to the Balmoral FPV. Repsol Sinopec North Sea Limited, as operator, will submit Decommissioning Programmes for Burghley and Beauly.

The Glamis Field is a subsea development located approximately 220 km to the northeast of Aberdeen in UKCS Block 16/21a, where the water depth is approximately 142m at LAT. Glamis lies approximately 7km south-southwest of the Balmoral FPV. The Glamis field is tied back to the Balmoral FPV, and production came online during July 1989. The Balmoral FPV is the processing centre for the produced fluids, and hydrocarbons are exported via pipeline to the Forties Pipeline System.

The main components of the Glamis subsea field consist of; one water injection and two production wells, three wellhead protection structures (WHPS), several pipelines, umbilicals and cables.

Following public, stakeholder and regulatory consultation, the Decommissioning Programmes are submitted without derogation and in full compliance with OPRED and Oil & Gas UK guidelines[1, 2]. The Decommissioning Programmes explain the principles of the decommissioning activities and are supported by a Comparative Assessment (CA) of decommissioning options and an Environmental Appraisal (EA).

1.4 Overview of Installations/Pipelines Being Decommissioned

1.4.1 Installations

Table 1.1: Installations Being Decommissioned			
Field:	Glamis	**Production Type (Oil/Gas/Condensate)**	Oil/Gas
Water Depth (m)	142	**UKCS block**	16/21a
Surface Installations			
Number	**Type**	**Topsides Weight (Te)**	**Jacket Weight (Te)**
N/A	N/A	N/A	N/A
Subsea Installations		**Number of Wells**	
Number	**Type**	**Platform**	**Subsea**
3	Wellhead Protection Structure	N/A	3
Drill Cuttings pile(s)		**Distance to median**	**Distance from nearest UK coastline**
Number of Piles	**Total Estimated volume (m^3)**	**km**	**km**
Please refer to Section 3.7 Drill cuttings		35.4 (UK/NOR median)	183.4

Table 1.2 Installations Section 29 Notice Holders Details		
Section 29 Notice Holders	**Registration Number**	**Equity Interest (%)**
Premier Oil E&P UK Limited	02761032	85 %
Repsol Sinopec North Sea Limited	01061863	15 %
Premier Oil PLC	SC234781	0 %
Premier Oil UK Limited	SC048705	Exited
Repsol Sinopec Resources UK Limited	00825828	0 %

1.4.2 Pipeline(s)

Table 1.3: Pipelines Being Decommissioned		
Number of Pipelines	**7**	(See Table 2.3)
Number of Umbilicals	**4**	(See Table 2.3)

Table 1.4: Pipelines Section 29 Notice Holders Details		
Section 29 Notice Holders	**Registration Number**	**Equity Interest (%)**
Premier Oil E&P UK Limited	02761032	85 %
Repsol Sinopec North Sea Limited	01061863	15 %
Premier Oil PLC	SC234781	0 %
Premier Oil UK Limited	SC048705	Exited
Repsol Sinopec Resources UK Limited	00825828	0 %
PL646 Section 29 Notice Holders Details		
Premier Oil E&P UK Limited	02761032	85 %
Repsol Sinopec North Sea Limited	01061863	15 %

1.5 Summary of Proposed Decommissioning Programmes

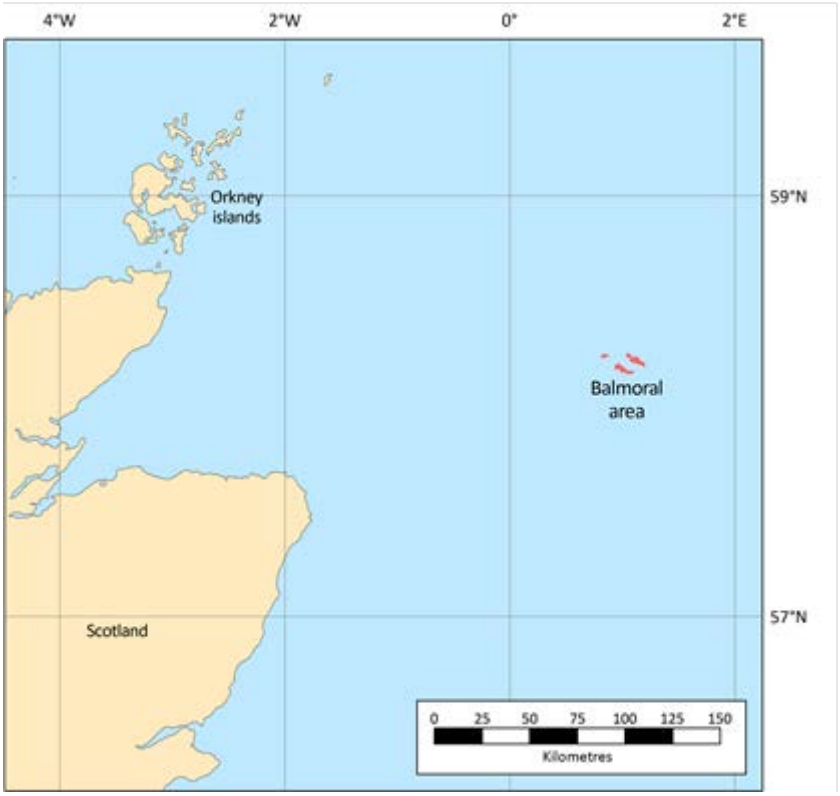
Table 1.5 Summary of Decommissioning Programmes		
Selected Option	**Reason for Selection**	**Proposed Decommissioning Solution**
1. Topsides		
N/A	N/A	N/A
2. Floating Facility		
N/A	N/A	N/A
3. Subsea Installations		
Group 12*: Small Subsea Installations: 3 x WHPS Full removal.	Leaves a clear seabed and meets regulations.	Full Removal. Returned to shore for recycling or appropriate treatment and disposal.
4. Pipelines, Flowlines & Umbilicals		
Group 1*: Surface Laid Flowlines & Umbilicals Full Removal.	Leaves a clear seabed and meets regulations.	Full Removal. Returned to shore for recycling or appropriate treatment and disposal.
Group 2*: Trenched but not backfilled Umbilicals Full Removal.	Assessed under Group 4	
Group 3*: Trenched & Buried Rigid Flowlines Leave In-Situ.	Comparatively assessed as preferred option. The rigid flowlines are sufficiently trenched and buried and stable posing no risk to marine users. Minimal seabed disturbance, lower energy use, reduced risk to personnel engaged in the activity.	Leave in-situ. Exposed ends & areas of exposure to be removed & returned to shore for recycling or other waste treatment as appropriate. Local rock placement to mitigate snag hazard from cut ends.
Group 4*: Trenched & Buried Flexible Flowlines & Umbilicals Full removal.	Leaves a clear seabed and meets regulations.	Full Removal. Returned to shore for recycling or appropriate treatment and disposal.
Group 5*: Flexible Jumpers Full Removal.	Leaves a clear seabed and meets regulations.	Full Removal. Returned to shore for recycling or appropriate treatment and disposal.
Group 6*: Flexible Jumpers at Balmoral Template Full Removal.	Leaves a clear seabed and meets regulations.	Full Removal. Returned to shore for recycling or appropriate treatment and disposal.
Group 13*: Subsea Mattresses – flexible concrete mattresses with polypropylene rope Full removal.	Leaves a clear seabed and meets regulations.	Full Removal. Returned to shore for recycling or appropriate treatment and disposal.

Table 1.5 Summary of Decommissioning Programmes		
Selected Option	**Reason for Selection**	**Proposed Decommissioning Solution**
Group 14*: Subsea Mattresses Other – Grout Bags Full Removal.	Leaves a clear seabed and meets regulations.	Full removal. Returned to shore for recycling or appropriate treatment and disposal. Mattresses that are proved to be difficult to remove will be discussed with OPRED.
5. Wells		
Wells will be plugged and abandoned to Premier Oil E&P UK Limited standards which comply with "Offshore Installations and Wells (Design and Construction, etc.) Regulations 1996" and align with Oil & Gas UK Guidelines for the Suspension and Abandonment of Wells (Issue 6, June 2018).	Meets HSE regulatory requirements in accordance with O&G UK and OGA guidelines.	A Master Application Template (MAT) and the supporting Subsidiary Application Template (SAT) will be submitted in support of activities carried out. Applications to abandon the wells will be submitted through the Well Operations Notification System (WONS). Additionally, planned work will be reviewed by a well examiner to Premier Oil E&P UK Limited standards, then submitted to the HSE for review.
6. Drill Cuttings		
Screening of cuttings requirements based on desktop exercise and pre-decommissioning environmental survey data.	Compliance with OSPAR Recommendation 2006/5 requirements.	As there are no multi-well locations where OBM contaminated cuttings have been discharged in the Glamis field, no visual indication of a cuttings pile being present and survey data indicates no significant sources of contamination, any cuttings should be left to degrade naturally.
7. Interdependencies		
Subsea infrastructure flushing and cleaning to be completed prior to removal of the Balmoral FPV, and prior to commencement of subsea decommissioning operations. Decommissioning activities to be coordinated to minimise simultaneous operations (SIMOPS).		

* Refers to the Inventory Group Categories as defined in the Comparative Assessment Report.

1.6 Field Location Including Field Layout and Adjacent Facilities

Figure 1.1: Field Location in UKCS



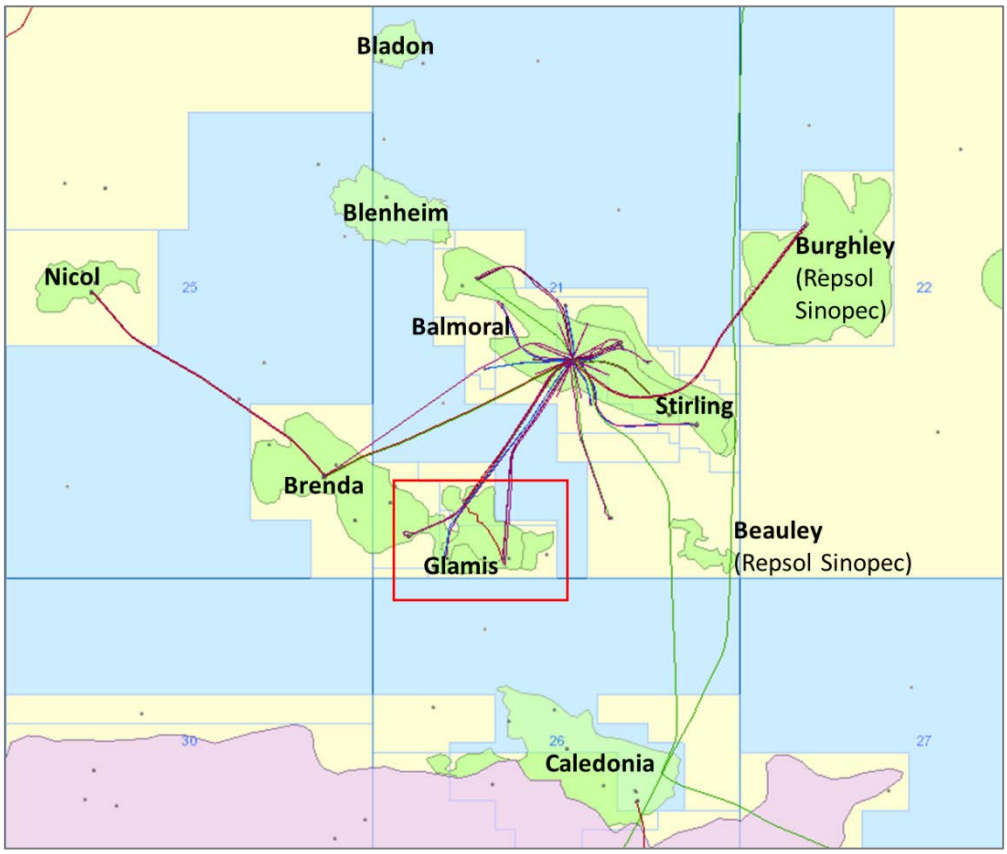
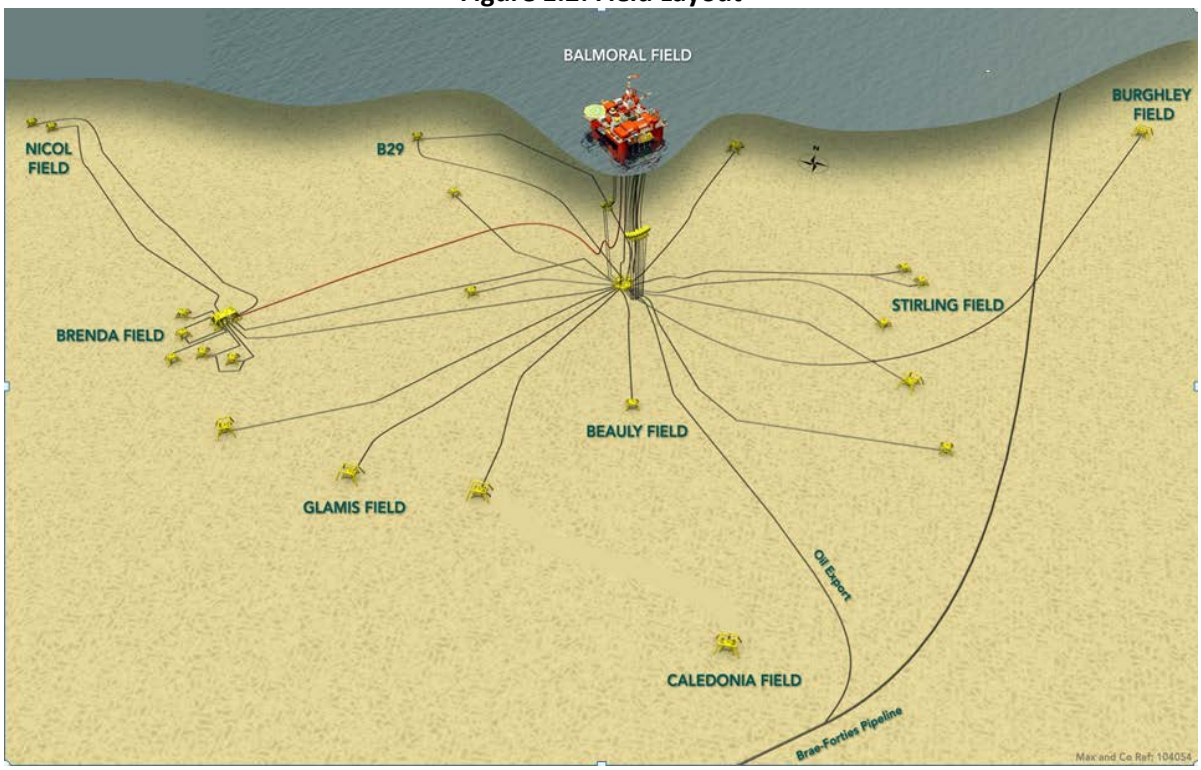


Figure 1.2: Field Layout



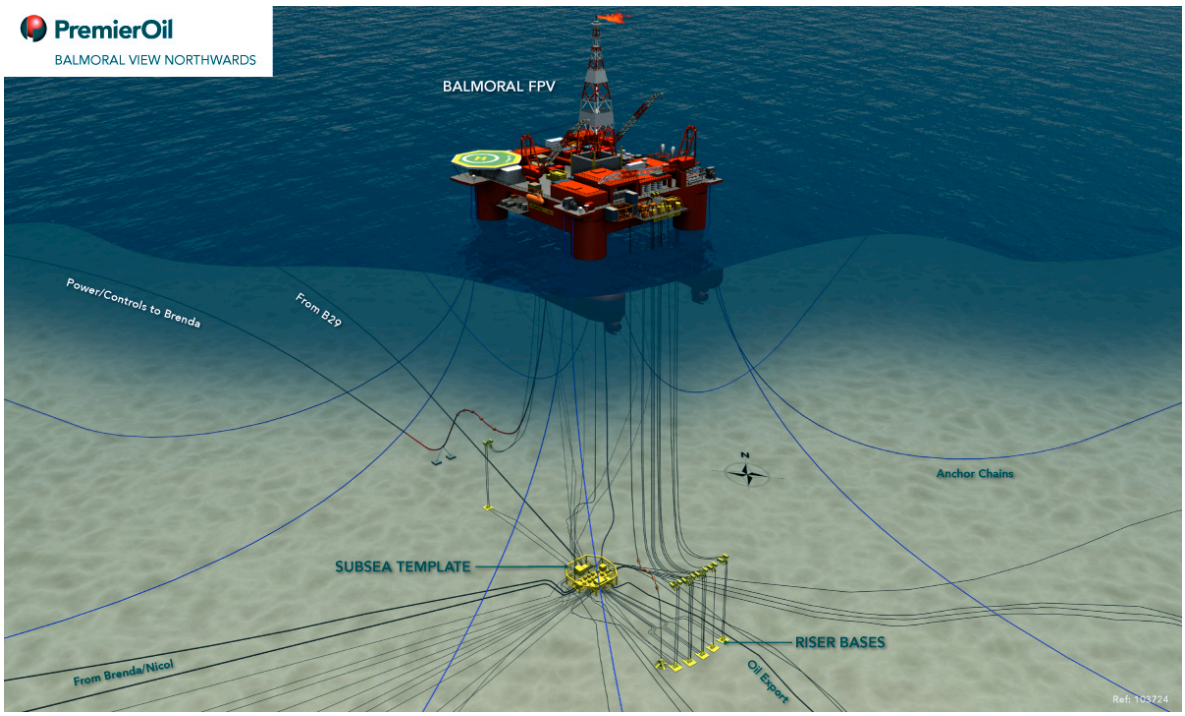
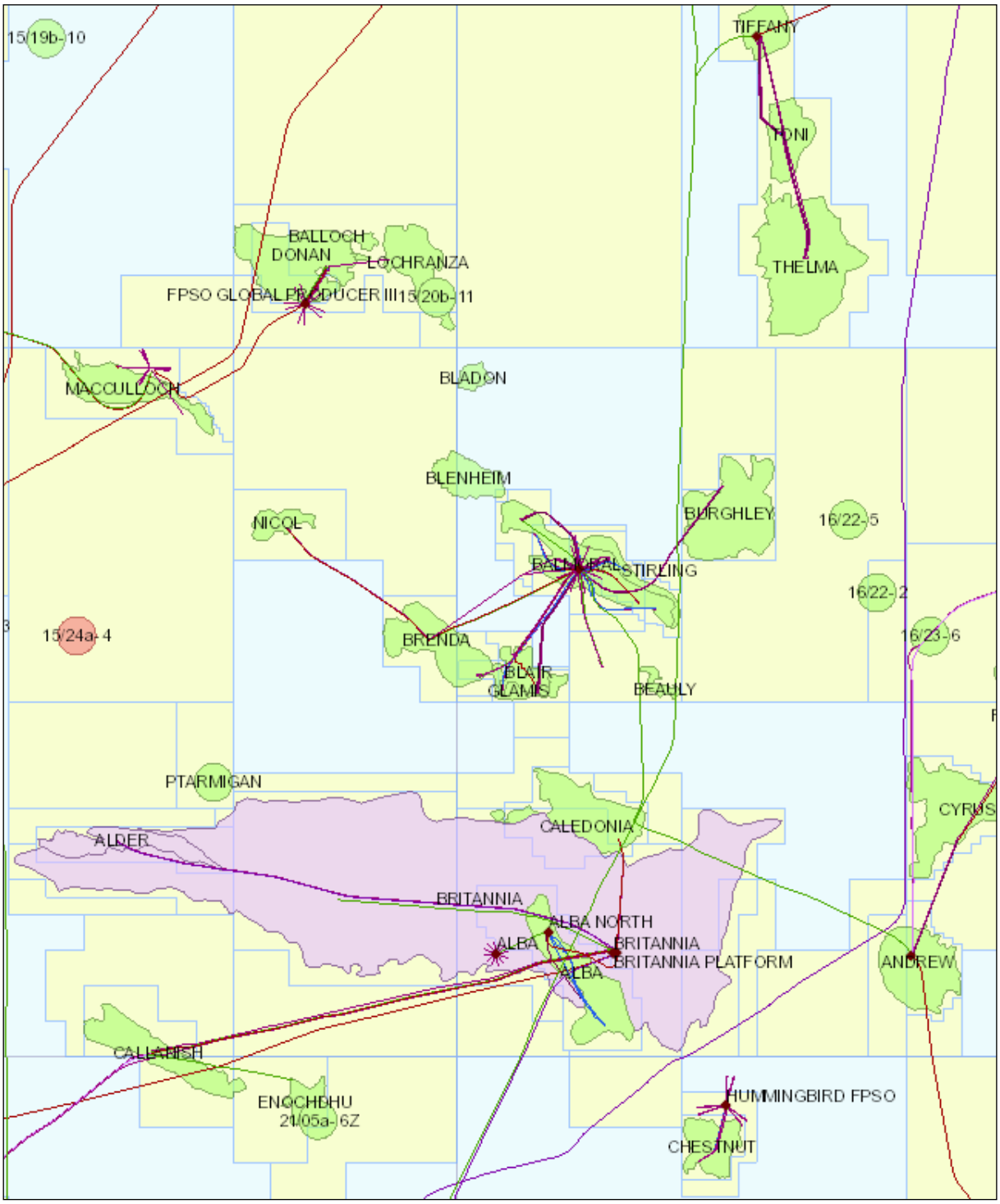


Table 1.6 Adjacent Facilities					
Operator	**Name**	**Type**	**Distance/ Direction**	**Information**	**Status**
Premier Oil E&P UK Limited	Nicol	Subsea	14.2 km, NW 308°	Oil & gas production co-mingled with Brenda	Operational
Premier Oil E&P UK Limited	Balmoral	Subsea/ FPV	7.5 km, NE 34°	Oil & gas production tied back to Balmoral FPV	Operational
Premier Oil E&P UK Limited	Brenda	Subsea	4.8 km, NW 305°	Oil & gas production tied back to Balmoral FPV	Operational
Premier Oil E&P UK Limited	Stirling	Subsea	8.7 km, NE 52°	Oil & gas production tied back to Balmoral FPV	Operational
Premier Oil UK Limited	Caledonia	Subsea	9.9 km, SE 144°	Oil & gas production tied back to Britannia platform	Shut-In
Repsol Sinopec North Sea Limited	Beauly	Subsea	5.4 km, ENE 78°	Oil & gas production tied back to Balmoral FPV	Operational
Repsol Sinopec North Sea Limited	Burghley	Subsea	15.6 km, NE 49°	Oil & gas production tied back to Balmoral FPV	Operational
Impacts of Decommissioning Proposals					
The Glamis field will be decommissioned in a programme of activities comprising the Balmoral, Stirling, Nicol and Brenda Fields. Decommissioning activities are planned so they will not affect the decommissioning of other fields or the operation of other developments in the area. The environmental appraisal will consider the potential cumulative implications of decommissioning activities in context of other oil and gas / other industry activities in the area.					

Note: Adjacent facilities refer to those potentially impacted by this programme.

Figure 1.3: Adjacent Facilities



1.7 Industrial Implications

The Glamis decommissioning activities are part of the Balmoral Area Decommissioning Project which will be managed by Premier Oil in Aberdeen. All decommissioning activities will be planned to realise synergies and efficiencies in offshore execution.

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

2 DESCRIPTION OF ITEMS TO BE DECOMMISSIONED

2.1 Installations: Surface Facilities (Balmoral FPV)

The Glamis subsea field is tied back to the Balmoral FPV. The Balmoral Decommissioning Programmes are separate Decommissioning Programmes, and are not included in this document.

2.2 Installations: Subsea including Stabilisation Features

Table 2.1: Subsea Installations and Stabilisation Features

Subsea installations including Stabilisation Features	Number	Size (m)/ Weight (Te)	Location		Comments/Status
Wellhead Protection Structure (A27)	3	17.5x17.5x8 m 47.5 (Te)	WGS84 Decimal	58.172694	All wells are shut-in and will undergo plug and abandonment. None of the installations are piled to the seabed.
				1.071111	
			WGS84 Decimal Minute	58° 10.309' N	
				01° 04.168' E	
Wellhead Protection Structure (A26)		17.5x17.5x9 m 50 (Te)	WGS84 Decimal	58.178861	
				1.019056	
			WGS84 Decimal Minute	58° 10.695' N	
				01° 01.046' E	
Wellhead Protection Structure (A17z)		17.5x17.5x7 m 45(Te)	WGS84 Decimal	58.172583	
				1.04075	
			WGS84 Decimal Minute	58° 10.318' N	
				01° 02.347' E	

2.3 Pipelines Including Stabilisation Features

Table 2.2: Pipelines / Flowlines / Umbilicals Information										
Description	Pipeline No. (as per PWA)	Diameter (in)	Length (km)	Description of Component Parts	Product Conveyed	End Points		Burial Status	Pipeline Status	Current Contents
						From	To			
Production Flowline	PL638	6.675	7.921	Steel	Produced Fluids	A26 well to Balmoral Manifold template		Trenched (Not backfilled)	Out of Use	Inhibited Seawater
Production Flowline	PL639	8.8774	6.9435	Steel	Produced Fluids	A27 well to Balmoral Manifold template		Trenched (Not backfilled)	Out of Use	Corrosion inhibited produced water
Water Injection Flowline	PL640	8.874	7.61327	Steel	Water	Balmoral Manifold template to A17z well		Trenched (Not backfilled)	Out of Use	Inhibited Seawater
Chemical Injection Umbilical	PL644	3.8	7.995	Umbilical	Various	Balmoral Manifold template to A26 well		Trenched & Buried	Out of Use	Corrosion and Scale inhibitors
Chemical Injection Umbilical	PL645	3.8	7.098	Umbilical	Various	Balmoral Manifold template to A27 well		Trenched & Buried	Out of Use	Corrosion and Scale inhibitors
Chemical Injection Umbilical	PL646	3.8	5.841	Umbilical	Various	Balmoral Manifold template to Blair A13 well		Trenched & Buried	Out of Use	Chem/Hyd Fluid
Scale squeeze / Gas Lift Flowline	PL980	4.5/2	8.14915	Steel / Composite Flexible	Lift Gas	Balmoral Manifold template to A27 well		Trenched / Partially buried	Out of Use	Filtered Seawater
Logging Cable	PLU4353	0.98	7.900	Logging Cable	Electrical	A26 well to Balmoral Manifold template		Surface Laid	Out of Use	Electric
Logging Cable	PLU4354	0.75	7.900	Logging Cable	Electrical	A27 well to Balmoral Manifold template		Surface Laid	Out of Use	Electric
Logging Cable	PLU4355	0.75	7.700	Logging Cable	Electrical	A17z well to Balmoral Manifold template		Surface Laid	Out of Use	Electric
Control Umbilical	PLU4356	2.665	7.714	Umbilical	Hydraulic Fluid	Balmoral Manifold template to A17z well		Trenched & Buried	Out of Use	Hydraulic Fluid

Table 2.3: Subsea Pipelines Stabilisation Features				
Stabilisation Feature	**Total Number**	**Weight (Te)**	**Location(s)**	**Exposed/Buried/Condition**
Concrete mattresses (5 x 2 x 0.15)	33	86.5	Various locations (span mitigation and pipeline crossing) on PL638 and PL640	Partially covered in sediment, in good condition
Concrete mattresses (Armourflex)	53	162.4	Various locations (span mitigation and pipeline crossing) on PL980, PL638, PL640 and PL645	Partially covered in sediment. A number of there mattresses are in bad condition, due to wire rope issues.
Grout bags	Estimated 1200	30	Various location across field infrastructure	Exposed, often covered in sediment, condition varies
Rock Dump	N/A	Estimated 2,000	PL638, PL644, PL646	Exposed

2.4 Wells

Table 2.4 Well Information					
Platform Wells		**Designation**	**License**	**Status**	**Category of Well**
N/A		N/A	N/A	N/A	N/A
Subsea Wells					
WONS Name Current bore	**Premier Oil Well Name**	**Designation**	**License**	**Status**	**Category of Well**
16/21a-17Z	16/21a-17Z	Water Injector	P201	Completed (Shut In)	SS-4-4-2
16/21a-26Z	16/21a-26Z	Producer	P201	Completed (Shut In)	SS-4-4-2
16/21a-27	16/21a-27	Producer	P201	Completed (Shut In)	SS-4-4-2

The well categories are indicative and require to be evaluated in accordance with the OGUK Well Decommissioning Guidelines, Issue 6, June 2018. This work is ongoing at the time of submission.

2.5 Drill Cuttings

(See Section 3.7 for further information)

Table 2.5: Drill Cuttings Pile(s) Information		
Location of Pile Centre (Latitude/Longitude)	**Seabed Area (m^2)**	**Estimated volume of cuttings (m^3)**
N/A	N/A	N/A

2.6 Inventory Estimates

Tables 2.6 and 2.7 provide an estimate of the total weight of materials associated with the Glamis installations and pipelines.

A further breakdown of the inventory estimates for the subsea installations and pipelines is provided in Figure 2.1 and Figure 2.2 respectively.

Table 2.6: Inventory of materials associated with Glamis installations		
Item	**Description**	**Weight Te**
Metals	Ferrous (steel - all grades)	199.3
	Non-Ferrous (copper, aluminium, etc.)	2.7
Concrete	Aggregates (mattresses)	0
Plastic	Rubbers, polymers	0
Hazardous	Residual fluids (hydrocarbons, chemicals)	0
	NORM scale	0
Other		0
	Total (Tonnes)	202

Table 2.7: Inventory of materials associated with Glamis pipelines		
Item	**Description**	**Weight Te**
Metals	Ferrous (steel - all grades)	2,379
	Non-Ferrous (copper, aluminium, etc.)	15
Concrete	Aggregates (mattresses)	249
Plastic	Rubbers, polymers	116
Hazardous	Residual fluids (hydrocarbons, chemicals)	trace
	NORM scale	trace
Other		0
	Total (Tonnes)	2,759

Figure 2.1: Pie Chart of Estimated Inventories (Installations)

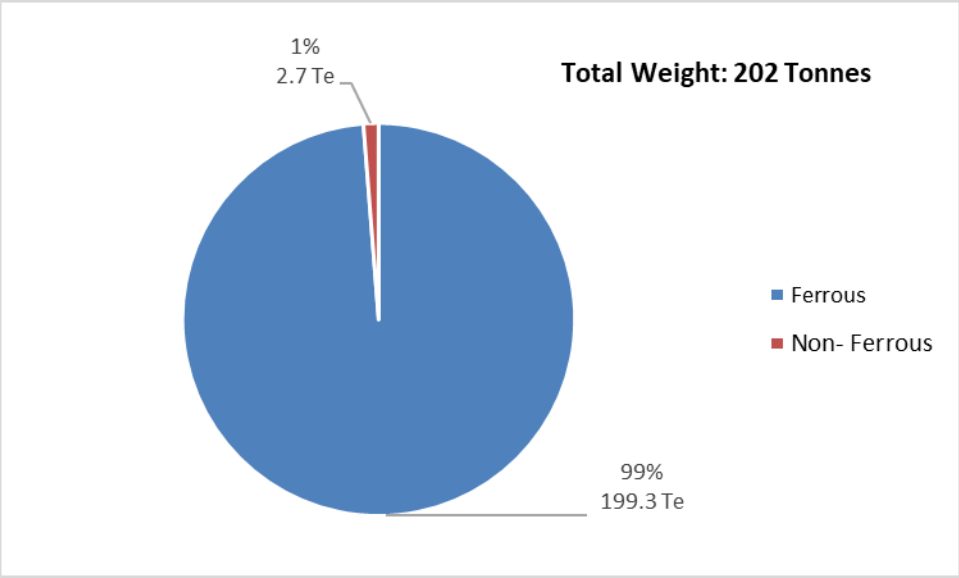
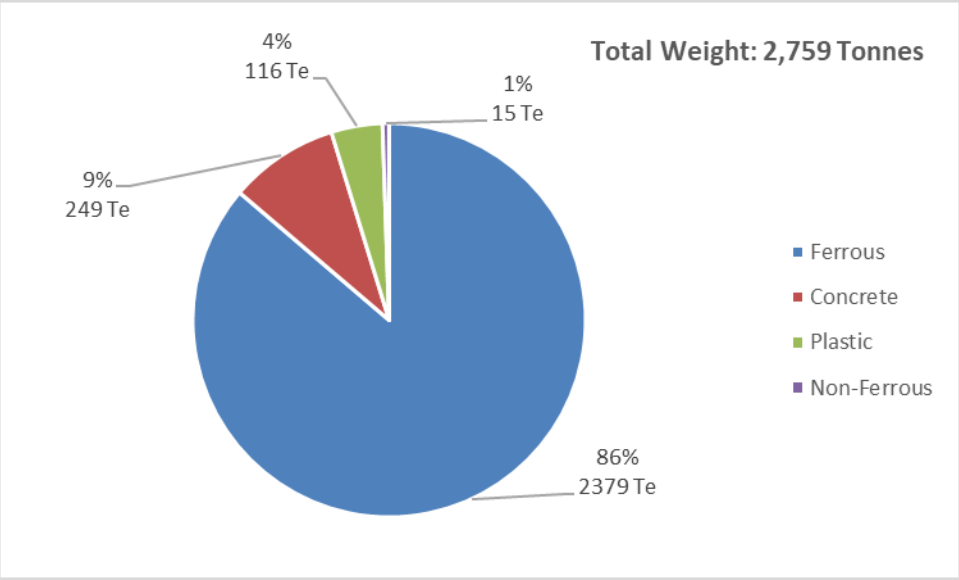


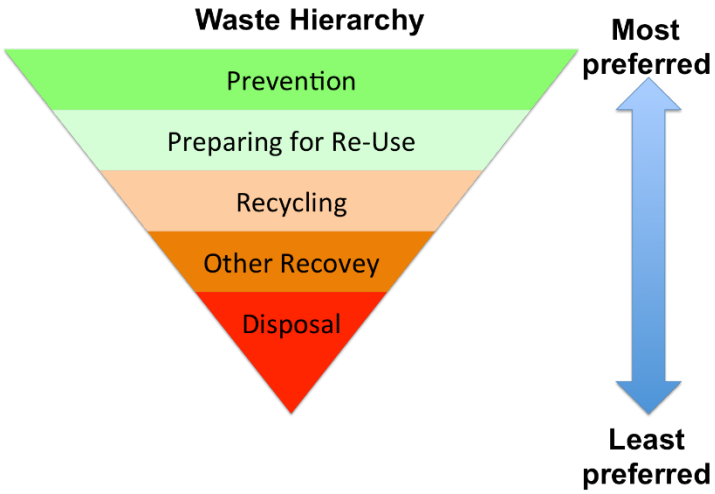
Figure 2.2: Pie Chart of Estimated Inventory (Pipelines)



Please refer the Greater Balmoral Decommissioning Environmental Appraisal for further details.

3 REMOVAL AND DISPOSAL METHODS

Decommissioning of the Glamis field will generate a quantity of waste. Premier Oil is committed to establishing and maintaining environmentally acceptable methods for managing wastes in line with the principles of the waste hierarchy:



Recovered infrastructure will be returned to shore and transferred to a suitably licenced decommissioning facility. It is expected that the recovered infrastructure, i.e. flowlines, umbilicals, and jumpers will be cleaned before being largely recycled.

Concrete mattresses and grout bags that are recovered, will be cleaned of marine growth if required, and either reused, recovered as aggregate for infrastructure projects or disposed of in landfill sites.

An appropriately licensed disposal company and yard will be identified through a selection process that will ensure that the chosen facility demonstrates a proven track record of waste stream management throughout the deconstruction process, the ability to deliver innovative reuse / recycling options, and ensure the aims of the waste hierarchy are achieved.
Geographic locations of potential disposal yard options may require the consideration of Trans Frontier Shipment of Waste (TFSW), including hazardous materials. Early engagement with the regulatory authorities will ensure that any issues with TFSW are addressed.

Premier Oil will engage with other companies and industries to identify potential reuse opportunities. However Premier Oil believes that such opportunities are best achieved through the tendering and selection of a waste management contractor with the expert knowledge and experience in this area.

3.1 Floating Production Vessel (FPV)

Not applicable to the Glamis Field Decommissioning Programmes.

The decommissioning of the Balmoral Field, including the Balmoral FPV, are separate Decommissioning Programmes.

3.2 Jacket(s)

Not applicable to Glamis subsea field decommissioning.

3.3 Subsea Installations and Stabilisation Features

Table 3.1: Subsea Installations and Stabilisation Features			
Subsea installations and stabilisation feature(s)	**Number**	**Option**	**Disposal Route (if applicable)**
Manifold(s)	0	N/A	N/A
Template(s)	0	N/A	N/A
Protection Frames	3	Full recovery as part of decommissioning campaign.	Return to shore for recycling or disposal.
Concrete mattresses	0	N/A	N/A
Grout bags	0	N/A	N/A
Rock Dump	0	N/A	N/A

3.4 Pipelines

Decommissioning Options:

1A - Leave as-is	2A – Remove Exposed Ends/Exposures & Rock Placement	3A – Disconnect & Retrench Entire Line	5B – Reverse Reel No Deburial
1B - Remove Exposed Ends & Local Rock Placement	2B – Remove Exposed Ends/Exposures & Burial	3B – Disconnect & Full Rock Placement	5C – Deburial & Cut and Lift
1C - Remove Exposed Ends & Trench/Bury	2C – Trench/Bury Ends & Exposures	4 – Re-use in New Development	5D – Deburial Lift & Cut on Vessel
1D - Accelerated Decomposition	2D – Rock Placement Ends & Exposures	5A – Deburial & Reverse Reel	5E – Lift & Cut on Vessel

Table 3.2: Pipeline or Pipeline Groups Decommissioning Options			
Pipeline or Group (as per PWA)	**Condition of line/group (Surface laid/Trenched/ Buried/ Spanning)**	**Whole or part of pipeline/group**	**Decommissioning Options considered**
Group 1: Surface Laid Flowlines & Umbilicals PLU4353, PLU4354, PLU4355	Surface Laid	Whole	1A, 3A, 3B, 4, 5A, 5B and 5C
Group 3: Trenched & Buried Rigid Flowlines PL638, PL639, PL640, PL980	Trenched & Buried (See burial profile in Appendix II)	Whole	1B, 2A, 3A, 3B and 5C
Group 4: Trenched & Buried Flexible Flowlines & Umbilicals PL644, PL645, PLU4356, PL646, PL980	Trenched & Buried	Whole	1B, 2A, 3A, 3B, 5A and 5C
Group 5: Flexible Jumpers PL638, PL639, PL640, PL980	Surface Laid	Whole	Full Removal

Comparative Assessment Method:
Comparative Assessment is integral to the overall planning and approval of decommissioning options. Premier Oil's strategy for the Comparative Assessment process is aligned with the Oil & Gas UK Guidelines for Comparative Assessment in Decommissioning Programmes and OPRED Guidance Notes for the Decommissioning of Offshore Oil & Gas Installations and Pipelines.

Premier Oil has scoped all of the infrastructure into logical groupings. All feasible decommissioning options for each of the infrastructure groups have been identified, assessed, ranked and screened, utilising the OPRED Guidance Notes: Decommissioning of Offshore Oil and Gas Installations and Pipelines to carry forward credible decommissioning options to be assessed through the Comparative Assessment process.

The Comparative Assessment process uses five assessment criteria, which are: Safety, Environment, Technical, Societal and Economic to compare the relative merits of each credible decommissioning option for each group of infrastructure. The assessment criteria are equally weighted to balance and represent the views of the each of the stakeholders.

An independent consultancy utilising its bespoke Multi Criteria Decision Analysis (MCDA) process was employed to facilitate Comparative Assessment workshops. The workshops were attended by specialists from the Operator, Field Partners and representatives from key stakeholders namely:

- Scottish Fishermen's Federation
- Joint Nature Conservation Committee
- Marine Scotland
- Oil and Gas Authority
- OPRED EMT
- OPRED ODU (observers)
- Premier Oil E&P UK Limited
- Repsol Sinopec North Sea limited
- Rockrose UKCS4 Limited
- ConocoPhillips (U.K.) Limited now Chrysaor Production (U.K.) Limited

At each workshop, each decommissioning option for each infrastructure grouping was assessed against each of the assessment criteria utilising a pairwise comparison system. The relative importance of each of the criteria was assessed in a qualitative way, supported by quantification where appropriate.

The process provides for differentiation between decommissioning options in each infrastructure group taking account of stakeholder views.

Outcome of Comparative Assessment:

Table 3.3: Outcomes of Comparative Assessment		
Pipeline or Group	**Recommended Option**	**Justification**
Group 1: Surface Laid Flowlines & Umbilicals PLU4353, PLU4354, PLU4355	Full Removal	Overall, option 5A is assessed as the most preferred option. It was clearly preferred against Technical, Societal and economic criteria and marginally preferred against the Safety and Environmental criteria. Given that option 5A is also the full removal option, this will form the decommissioning option for this group.
Group 3: Trenched & Buried Rigid Flowlines PL638, PL639, PL640, PL980	Leave in place and remedial rock dump.	Overall, options 1B and 2A are assessed as the most preferred options. The scores obtained are so close it is impossible to separate them. They have been assessed as the equal most preferred option against the Environmental, Technical, Societal and Economic criteria. Overall given that option 2A eliminates exposures as well as exposed ends, this will form the decommissioning option for this group.
Group 4: Trenched & Buried Flexible Flowlines & Umbilicals PL644, PL645, PLU4356, PL646, PL980	Full Removal	Overall, Option 5A is assessed as the most preferred option. It has been assessed as the equal most preferred option against the Technical, Societal and Economic criteria. Whilst overall it is only marginally preferred to options 1B and 2A, given that option 5A is a full removal option, this will form the decommissioning option for this group.
Group 5: Flexible Jumpers PL638, PL 639, PL640	Full Removal	Items are surface laid and recoverable
Group 6: Flexible Jumpers at Balmoral Template PL638, PL639, PL640, PL980	Full Removal	Items are surface laid and recoverable

3.5 Pipeline Stabilisation Features

Table 3.4: Pipelines Stabilisation Features			
Stabilisation features	**Number**	**Option**	**Disposal Route (if applicable)**
Concrete mattresses	33	Full recovery - It is intended that the mattresses be recovered to shore, however, in the event of practical difficulties OPRED will be consulted.	Recover and transport ashore for recycling or other waste treatment as appropriate.
Armourflex mattresses	53	Full recovery - It is intended that the mattresses be recovered to shore, however, in the event of practical difficulties OPRED will be consulted.	Recover and transport ashore for recycling or other waste treatment as appropriate.
Rock Dump (Te)	2000	To remain in place	N/A
Grout bags	1200	Full removal is intended with an option to reuse on location.*	Recover and transport ashore for recycling or other waste treatment as appropriate.

*A number of grout bags may be redeployed/repurposed locally as snagging hazard mitigation.

3.6 Wells

Table 3.5: Well Plug and Abandonment
The wells for the Field covered by this Decommissioning Programme will be plugged and abandoned, as listed in Section 2.4 (Table 2.4), in accordance with the Oil & Gas UK Well Decommissioning Guidelines, Issue 6, June 2018. A WONS application update will be submitted along with an appropriate suite of permit applications, via the UK Energy Portal, in support of each well abandonment.

3.7 Drill Cuttings

Drill Cuttings Decommissioning Options:

Table 3.6 Drill Cuttings Decommissioning Options				
How many drill cuttings piles are present?				See below for further details
Tick options examined: ☐Remove and re-inject ✓ Leave in place ☐Cover ☐Relocate on seabed ☐Remove and treat onshore ☐Remove and treat offshore ☐Other				
Review of Pile characteristics	**Pile 1**	**Pile 2**	**Pile 3**	**Pile 4**
How has the cuttings pile been screened? See below for further details.	Y	N/A	N/A	N/A
Dates of sampling (if applicable)	2016			
Sampling to be included in pre-decommissioning survey?	N			
Does it fall below both OSPAR thresholds?	Y			
Will the drill cuttings pile have to be displaced in order to remove the jacket?	N/A			
What quantity (m^3) would have to be displaced/removed?	N/A			
Will the drill cuttings pile have to be displaced in order to remove any pipelines?	N/A			
What quantity (m^3) would have to be displaced/removed?	N/A			
Have you carried out a Comparative Assessment of options for the Cuttings Pile?	N/A			

Comparative Assessment Method:

No Comparative Assessment is required under Stage 2 of OSPAR Recommendation 2006/5 on a Management Regime for Offshore Cuttings Piles in relation to decommissioning of the Glamis field, as discussed further below.

The Glamis satellite development consist of two production wells and a water injection well, three wells in total. The first of the production wells, Well 16/21a-26Z was originally drilled in 1982 (as Well 16/21a-6) using a water base mud (WBM) system throughout. A 12¼" section was drilled in 1993, using a KCl WBM. A sidetrack was then drilled, also using KCl WBM.

The second production well was first drilled as Well 16/21a-8 in 1983. The uppermost sections of this well were drilled with seawater and sweeps (spud mud). The lower sections of the well were drilled with low toxicity oil base mud (LTOBM). As this well was drilled before January 2001 when the prohibition of oil base mud discharged to sea under OSPAR Decision 2000/3 came into force, it is assumed that the OBM contaminated cuttings generated were discharged to sea. Well 16/21a-27 was then drilled in 1993 using WBM throughout. However, it should be noted that these wells are situated around 3 km apart, so

accumulation of cuttings between them is unlikely regardless of the type of mud used or other sources of contamination.

The injection well, 16/21a-17Z, was drilled in 1986 with the original Well 16/21a-17 drilled in 1985. Well 16/21a-17Z was drilled using spud mud for the tophole sections, while low toxicity oil base mud (LTOBM) was used for the deeper sections. As this well was also drilled before the prohibition of OBM, it is also assumed that the OBM contaminated cuttings generated were discharged to sea. However, the Glamis injection well is also situated around 1.5 km from both production wells, so these discharges are also unlikely to have overlapped with the other oil contaminated cuttings discharged. Isolated single wells, with oil-based drilling discharges, such as Well 16/21a-17Z and Well 16/21a-27 (16/21a-8), are exempt from the cuttings pile management requirements of OSPAR Recommendation 2006/5.

The desk based collective screening process undertaken on by Oil and Gas UK (then UKOOA) on behalf of the industry in response to the Stage 1 screening requirements of Recommendation 2006/5 determined that any cuttings pile related to the Glamis development would fall beneath the key thresholds of rate of oil loss to the water column and persistence over the area of seabed contaminated. However, the OPRED decommissioning guidance notes (May 2018) require that the results of any desk-based extrapolation of data should be verified by survey data. Subsea imagery gathered from the Glamis area during pre-decommissioning habitat assessment survey work undertaken in 2016 observed no physical evidence of drill cuttings. Environmental sampling from the Glamis field also undertaken in 2016 observed that the total hydrocarbon concentration (THC) was below the threshold outlined in Recommendation 2006/5 (50 mg/kg) and heavy metal concentrations were all below the OSPAR effects range low threshold. These data indicate that there are no other significant sources of contamination within any cuttings, if present.

As there are no overlapping multi-well locations where OBM contaminated cuttings have been discharged in the Glamis field, no visual indication of a cuttings pile being present and survey data indicate no significant sources of contamination, it is argued that no further sampling-based evaluation of pile characteristics or comparison of potential management regimes for cuttings is required. Any cuttings present can be allowed to degrade naturally, although as stated above, seabed imagery has not observed any notable cuttings accumulation or even deposition in this field.

Outcome of Comparative Assessment:

Not applicable - see above for details.

3.8 Waste Streams

The Premier Oil Waste Management Strategy specifies the requirements for the contractor waste management plan. The waste management plan will be developed once the contract has been awarded during the project execution phase. The plans shall adhere to the waste stream licensee conditions and controlled accordingly. Discussion with the regulator will ensure that all relevant permits and consents are in place.

Table 3.7: Waste Stream Management Methods	
Waste Stream	**Removal and Disposal method**
Bulk liquids	Bulk flushing/de-oiling by either round-trip flushing from/to the Balmoral FPV or utilising DSVs to flush to the Balmoral FPV. Waste fluids will be processed by the Balmoral FPV and may be discharged to sea under appropriate permit.
Marine growth	Some marine growth may be removed offshore. Onshore disposal will be managed by the selected waste management contractor.
NORM/LSA Scale	NORM contaminated material may be removed and discharged offshore under appropriate permit, or returned to shore to be disposed of by the selected onshore waste management contractor.
Asbestos	N/A
Other hazardous wastes	Will be recovered to shore and will be managed by the selected waste management contractor and disposed of under appropriate permit. The inventory of hazardous materials will identify hazardous materials present and Premier Oil's risk management process will be used to prevent spills offshore.
Onshore Dismantling sites	Appropriate licenced contractor and sites will be selected. Facility selected must demonstrate competence and proven disposal track record and waste stream management & traceability throughout the deconstruction process and (preferably) demonstrate their ability to deliver innovative recycling options.

Table 3.8 Inventory Disposition			
	Total Inventory Tonnage (Te)	**Planned tonnage to shore (Te)**	**Planned left *in situ (Te)***
Subsea Pipelines	2154.7	52.3	2102.4
Subsea Umbilicals	355.2	355.2	0
Subsea Installations	202	202	0

All recovered material will be brought onshore for re-use, recycling or disposal. It is not possible to predict the market for reusable materials with any confidence; so, the figures in Table 3.9 are disposal aspirations.

Table 3.9 Recovered Inventory Reuse, Recycle, Disposal Aspirations			
	Reuse	**Recycle**	**Disposal**
Pipelines	<5%	>95%	<5%
Subsea Umbilical	<5%	>95%	<5%
Subsea Installations	<5%	>95%	<5%

Please refer to the Greater Balmoral Decommissioning Environmental Appraisal for further details.

4 ENVIRONMENTAL APPRAISAL

4.1 Environmental Sensitivities (Summary)

Table 4.1: Environmental Sensitivities	
Environmental Receptor	**Main Features**
Conservation interests	The project area is located outside of any conservation sites, and the nearest such sites are the Scanner Pockmark SAC (9 km) and the Norwegian Boundary Sediment Plain MPA (29 km). Both of these conservation sites have been designated for the protection of seabed habitats and features: submarine structures formed by leaking gases and ocean quahog habitat and aggregations, respectively. Whilst there was evidence of some pockmark features and ocean quahog (Arctica islandica) presence from the site specific environmental survey data, there was no evidence of submarine structures associated with leaking gases or aggregations of ocean quahog which would constitute OSPAR or Annex I protected features. The closest known such ocean quahog aggregation is approximately 24 km west of the project area.
Seabed Habitats and Fauna	The water depths across Balmoral fall between roughly 138 m to 152 m LAT (Fugro, 2018a). The seabed generally comprises poorly sorted coarse to medium silt with moderate carbonate and low organic content. Hydrocarbon levels showed a similar distribution across the survey area and was considered typical of low level weathered petroleum residues commonly found in CNS sediments. The majority of the survey area was characterised as the European Nature Information Systems (EUNIS) biotype complex, 'Circalittoral fine mud (A5.35)' (Fugro, 2017b). The Scottish Priority Marine Feature (PMF) 'Burrowed mud' and its component habitat 'Seapens and burrowing megafauna in circalittoral fine mud' were prevalent throughout the project area (Fugro, 2018b). There are numerous seabed depressions present across the area, although none of the more than 40 depressions investigated in the Fugro (2018a) and Gardline (2005) surveys were found to support Methane-Derived Authigenic Carbonate (MDAC) or associated communities that could classify these depressions as the Annex I habitat 'Submarine structures made by leaking gases'. Assessment for the presence of the OPSAR protected/threatened habitat, 'Seapen and burrowing megafauna communities,' suggested that the seabed surrounding the project area is a strong example of this habitat and burrows generated by megafauna were 'abundant' (on the SACFOR scale) during the 24 transects run within the survey area. These burrows could possibly be attributed to Norwegian lobster (N. norvegicus), however, no individuals were observed during the surveys and thus the presence of such megafauna cannot be confirmed. Equally, other burrowing crustaceans or polychaetes could have generated the burrows; burrowing prawns (C. subterranea) were recorded during the surveys for example (Fugro, 2018a).

	Juvenile ocean quahog were found in low numbers across the majority of stations (the maximum in any single sample was seven individuals). However, no adults were identified nor any aggregations of the quahog, indicating the survey area is not of particular importance to this species (Fugro, 2018b). No other protected habitats or fauna were identified during the surveys.
Fish	The Greater Balmoral Area is located within the spawning and nursery grounds of cod, mackerel, Nephrops and Norway pout (Coull et al., 1998; Ellis et al., 2012). Additionally, the following species are likely to have nursery grounds near or within the project are: anglerfish, blue whiting, European hake, haddock, herring, ling, sandeel, spotted ray, spurdog and whiting (Coull et al., 1998; Ellis et al., 2012). However, fisheries sensitivity maps indicate that the probability of significant aggregations of juveniles of these species in the offshore project area is low (Ellis et al., 2012). Aires et al. (2014) provides modelled spatial representations of the predicted distribution of 0 age group fish. The modelling indicates the presence of juvenile fish (less than one year old) for multiple species: anglerfish, blue whiting, European hake, haddock, herring, mackerel, horse mackerel, Norway pout, plaice, sprat, and whiting. However, the probability of juvenile fish aggregations occurring across the Greater Balmoral Area is low to very low (< 0.2) for all species.
Marine Mammals	Harbour porpoise (Phocoena phocoena), white-beaked dolphin (Lagenorhynchus albirostris), white-sided dolphin (Lagenorhynchus acutus), and minke whale (Balaenoptera acutorostrata) are known to regularly occur in the waters surrounding the project area, either as residents or regular visitors (Hammond et al., 2017; Reid et al., 2003). Harbour and grey seal densities are very low across the region comprising Balmoral due to its distance from shore (SMRU and Marine Scotland, 2017).
Seabirds	The seabird species most commonly observed in the waters surrounding the project area include: northern fulmar (Fulmarus glacialis), Manx shearwater (Puffinus puffinus), European storm-petrel (Hydrobates pelagicus), northern gannet (Morus bassanus), Arctic skua (Stercorarius parasiticus), great skua (Stercorarius skua), black-legged kittiwake (Rissa tridactyla), Arctic tern (Sterna paradisaea), common guillemot (Uria aalge), razorbill (Alca torda), little auk (Alle alle) Atlantic puffin (Fratercula arctica)and pomarine skua (Stercorarius pomarinus).. Herring gulls (Larus argentatus), common gulls (Larus canus), and great and lesser black-backed gulls (Larus marinus and Larus fuscus, respectively) also use the area in winter (Kober et al., 2010). The Seabird Oil Sensitivity Index (SOSI) identifies areas at sea where seabirds are likely to be most sensitive to surface pollution; the SOSI values in Blocks 15/25 and 16/21 are classed as low throughout the year, with an increase to medium in Block 15/25 in June (Webb et al., 2016). No SOSI data is available during the months of November or December for this region.
Commercial Fisheries	Balmoral is located in International Council for the Exploration of the Seas (ICES) rectangle 45F1 (Scottish Government, 2019). Commercial fishing effort and landings were dramatically higher to the west of the project area than in 45F1, when considering totals and averages for the five most recent fishing years (2014-2018; Scottish Government, 2019). Within this time period, pelagic species comprised the greatest

	total and average live weight and shellfish made up the largest total and average value of landings for UK and foreign vessels landing into the UK (Scottish Government, 2019). According to fishing data from the Scottish Government (2019), the waters comprising the Greater Balmoral Area are fished for a variety of species by both UK and foreign vessels. ICES rectangle 45F1 is predominantly targeted for deep-water demersal and pelagic species, whilst the adjacent ICES rectangle 45F0 experiences a much greater amount of pelagic fishing. For the last five fishing years, the total landings value was greater in ICES rectangle 45F0 than 45F1 by nearly £6.4M, and the live weight of those landings were greater by approximately 10,000 Te because of this discrepancy. Trawls (both pelagic and demersal) were the most utilised gear in rectangle 45F1 and was attributable to more than 99% of total fishing effort in the ICES rectangle 45F1, with <1% of fishing effort comprising seine nets (Scottish Government, 2019). Based on the low to moderate levels of demersal trawling across the pipelines associated with Balmoral (Rouse et al., 2018), it is likely that these data primarily characterise midwater trawling effort targeting pelagic and some demersal species.
Other Users of the Sea	Across the region comprising Balmoral, sea users other than commercial fisheries mainly relate to offshore Oil and Gas. There are nine surface installations located within 40 km of the Balmoral FPV, the closest of which is the Alba North platform located 19 km to the southwest. Shipping density across the project area is very low and consists mainly of cargo and supply vessels. The closest submarine cable to the Greater Balmoral Area is the TAMPNET CNSFTC cable, which is located 40 km to the south of the project area (KIS-ORCA, 2019). The NorthConnect power cable, a subsea HVAC power cable connecting Long Haven Bay, Scotland (near Peterhead) to Norway will be located several kms north of the project area. Construction works for this North Sea spanning cable are due to take place between 2021 and 2024. As cable installation will be on a prescribed route outwith the project area, there is minimal potential for interactions with the proposed decommissioning activities within the Greater Balmoral Area. There are two unknown wrecks in the vicinity of the project area, approximately 5km southeast and 4 km northwest of the project area; additionally, there is one named wreck (Elhanan T) located approximately 8 km from the project area. This wreck is classified as a non-dangerous wreck (NMPi, 2019). There are no military restrictions or known military or renewables activities within the vicinity of the project area.
Atmosphere	The majority of atmospheric emissions for the decommissioning of the five fields and FPV associated with the Greater Balmoral Area are attributable to vessel use or are associated with the recycling of material returned to shore. The worst case estimate for total CO2 emissions generated by the decommissioning activities for all of the assets in the Greater Balmoral Area is 83,380 Te, of which 50,757 Te is related to vessel emissions. This equates to 0.65% of the total annual UKCS vessel emissions (excluding fishing vessels) when considering 2017 data (7,800,000 Te; BEIS, 2019). The remaining 32,623 Te CO2 will be generated through the life cycle of the project materials; those recovered and not reused or left in situ.

Onshore Communities	Waste generated during decommissioning will be transported to shore in an auditable manner through licensed waste contractors, as managed under the Balmoral Late Life Project (BLLP) waste management plan. Wastes will be treated using the principles of the waste hierarchy, as defined in the BLLP, focusing on the reuse and recycling of wastes where possible. Raw materials will be returned to shore with the expectation to recycle the majority of the returned material. There may be instances where infrastructure returned to shore is contaminated (e.g. by NORM, hazardous, and/or special wastes) and cannot be recycled. In these instances, the materials will require disposal. However, the weight and/or volume of such material is not expected to result in substantial landfill use.

4.2 Potential Environmental Impacts and their Management

Environmental Appraisal Summary:
The EA addresses potential environmental and societal impacts by characterising the likelihood and significance of interactions between the proposed decommissioning activities and the local environment, whilst considering stakeholder response. The EA also details mitigation measures designed to abate potential impacts in accordance with Premier's Environmental Management System (EMS) and Health, Safety, Environment and Security (HSES) Policy.
Key potential environmental and societal impacts which were considered to be 'potentially significant', and thus requiring further assessment, were identified through an environmental issues identification (ENVID) workshop; they include: impacts to water quality; seabed impacts; and impacts to commercial fisheries. These potential impacts have undergone detailed assessment within the EA. The following environmental and societal impacts were screened out from further assessment due to existing controls limiting the likelihood of potential significant impacts: emissions to air; vessel presence; underwater noise emissions; resource use; onshore activities; waste; and unplanned events. The justifications for screening out these impact pathways are detailed in the accompanying EA.

The EA concludes that the recommended options to decommission the Glamis Field subsea installations and pipelines can be completed without causing significant impact to environmental or societal receptors.

Overview:
Table 4.2 describes the potential impact pathways identified from the relevant infrastructure to be decommissioned, alongside the proposed management measures in place to mitigate against them.

Table 4.2: Environmental Impact Management		
Activity	**Main Impacts**	**Management**
Small Subsea Installations Removal (incl. Stabilisation Features)	Seabed impacts from: • cutting of piles below the seabed; • cut and lift removal; and • removal of grout bags and stabilisation materials. Impacts to commercial fisheries from project activities excluding access to fishing grounds.	Vessel use will be optimised/minimised for the decommissioning activities and managed per Premier's existing vessel management procedures, including a vessel work programme. The 500 m safety exclusion zone will remain in operation during the decommissioning activities reducing risk of non-project related vessels entering into the area where decommissioning activities are taking place. This safety exclusion zone will be removed following the completion of the relevant decommissioning activities enabling fisheries to regain access to grounds. Fishing activities have the potential to increase in the area once the 500 m safety zones surrounding the existing substructures are re-assessed. Use of established contractors with appropriate capability, licences and maintenance procedures will be selected and audited. Other sea users will be notified in advance of activities occurring and Premier keeps manned bridges. The infrastructure is currently shown on Admiralty Charts and the FishSafe system. When decommissioning activity has been competed, updated information will be made available to update Admiralty Charts and FishSafe system. All pipeline routes and installation sites will be the subject of oilfield debris clearance and as-left verification surveys when decommissioning activity has concluded.
Decommissioning Rigid Flowlines (incl. Stabilisation Features)	Seabed impacts from decommissioning of rigid flowlines *in situ*: • cutting ends and recovery of lengths of flowlines; • deposition of new rock armour to protect ends and previously cut exposures (where required); and • clear seabed verification which may require direct intervention (e.g. overtrawling).	Operations will be conducted as carefully as possible to minimise sediment disturbance, avoiding dragging of items on the seabed where possible. Rock dumping will be carefully managed, e.g. through use of an ROV to limit the areas covered (reducing unnecessary spreading) and depth of coverage to that required to ensure no snagging hazards remain. The infrastructure is currently shown on Admiralty Charts and the FishSafe system. When decommissioning activity has been competed, updated information will be made available to update Admiralty Charts and FishSafe system. Any snagging risk to other sea users will be minimised by continual monitoring of degrading structures or free spans (type and frequency to be determined through a risk-based approach but will be agreed with OPRED).

	Snagging risk associated with pipelines decommissioned *in situ*.	All pipeline routes and installation sites will be the subject of oilfield debris clearance and as-left verification surveys when decommissioning activity has concluded.
Decommissioning Surface-laid and Buried Flexible Flowlines and Umbilicals (incl. Stabilisation Features)	Seabed impacts from: • removal of surface laid flexible flowlines, umbilicals and jumpers, rigid spoolpieces and flexible risers; • reverse-reeling of buried flexible flowlines; • removal of stabilisation features; and • clear seabed verification which may require direct intervention (e.g. overtrawling). Impacts to commercial fisheries from project activities excluding access to fishing grounds.	Operations will be conducted as carefully as possible to minimise sediment disturbance, avoiding dragging of items on the seabed where possible. Excavated areas remediated and any berms created profiled to mitigate snagging risks to other sea users. Vessel use will be optimised/minimised for the decommissioning activities and managed per Premier's existing vessel management procedures, including a vessel work programme. The 500 m safety exclusion zone will remain in operation during the decommissioning activities reducing risk of non-project related vessels entering into the area where decommissioning activities are taking place. This safety exclusion zone will be removed following the completion of the relevant decommissioning activities enabling fisheries to regain access to grounds. Use of established contractors with appropriate capability, licences and maintenance procedures will be selected and audited. Other sea users will be notified in advance of activities occurring and Premier keeps manned bridges. The infrastructure is currently shown on Admiralty Charts and the FishSafe system. When decommissioning activity has been competed, updated information will be made available to update Admiralty Charts and FishSafe system. All pipeline routes and installation sites will be the subject of oilfield debris clearance and as-left verification surveys when decommissioning activity has concluded.
Decommissioning Other – Mattresses and Grout Bags (Difficult Recovery)	Legacy impacts from mattresses and grout bags decommissioned *in situ* include: • snagging risk to commercial fisheries; and • seabed impacts, including from the deposition of new rock armour (where required).	The infrastructure is currently shown on Admiralty Charts and the FishSafe system. When decommissioning activity has been competed, updated information will be made available to update Admiralty Charts and FishSafe system. Rock dumping will be carefully managed, e.g. through use of an ROV to limit the areas covered (reducing unnecessary spreading) and depth of coverage to that required to ensure no snagging hazards remain.

5 INTERESTED PARTY CONSULTATIONS

Consultations Summary:

Table 5.1 Summary of Stakeholder Comments		
Who	**Comment**	**Response**
Informal Consultations		
Various Stakeholders	Premier Oil has engaged with interested parties and stakeholders who participated in comparative assessment workshops, held 16th November 2017, including: Scottish Fishermen's Federation (SFF), Joint Nature Conservation Committee, Marine Scotland, Oil and Gas UK, OPRED EMT, OPRED ODU (observers), Repsol Sinopec North Sea Limited, Rockrose UKSC4 Ltd, Chrysaor Production (U.K.) Limited, Premier Oil E&P UK Ltd. In addition, meetings held with SEPA and the SFF.	N/A
Statutory Consultations		
Various Statutory Consultees	Following statutory consultation (21st September – 8th November 2020), Premier received a number of guidance notes, questions and actions relating to the five Greater Balmoral Area Decommissioning Programmes and supporting documents from the consultees.	All consultee comments have been satisfactorily addressed throughout OPRED's process and minor updates to the Decommissioning Programmes and supporting documents have been implemented where appropriate.
Public	No comments received.	N/A

6 PROGRAMME MANAGEMENT

6.1 Project Management and Verification

A Project Management team will be appointed to manage suitable contractors for the decommissioning of the Glamis subsea infrastructure. Standard procedures for operational control and hazard identification and management will be used. The work will be coordinated with other decommissioning operations in the Greater Balmoral Area. The Project Management team will monitor and track the process of consents and the consultations required as part of this process. Any changes in detail to the offshore removal programme will be controlled by the Premier Oil Management of Change processes and discussed and agreed with OPRED.

6.2 Post-Decommissioning Debris Clearance and Verification

During site clearance activities, reasonable endeavours will be made to recover any dropped objects and items subject to any outstanding Petroleum Operations Notices. All recovered seabed debris related to offshore oil and gas activities will be returned for onshore disposal or recycling in line with existing disposal arrangements. A post decommissioning site survey, to verify decommissioning activities have been completed, will be carried out across the designated 500m safety zones of installation sites and 100m corridor (50m either side) along each pipeline over its length.

The clear seabed will be validated by an independent verification trawl over the installation sites and pipeline corridors, non over-trawl techniques such as Side Scan Sonar (SSS) / ROV or by the post decommissioning survey. A dialogue will be opened with OPRED at the appropriate time to establish the most suitable method for completing this task.

6.3 Schedule

Project Plan:
The high level Gantt chart Figure 6.1 provides the overall schedule for the Greater Balmoral programme of decommissioning activities which include the following Fields operated by Premier Oil: Brenda, Nicol, Glamis, Stirling, and Balmoral.
Prior to the removal of the FPV, Premier Oil will also flush the subsea pipelines associated with the Repsol Sinopec North Sea Limited operated Burghley and Beauly fields.

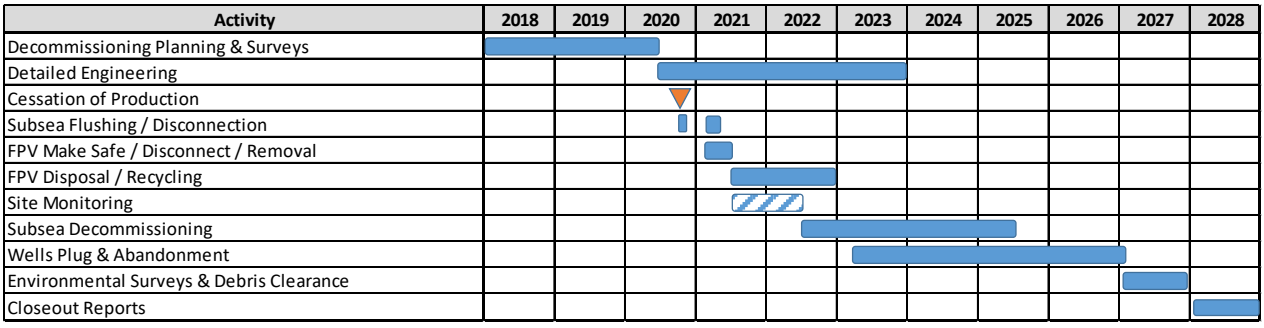


Figure 6.1: Gantt Chart of Project Plan

6.4 Costs

An overall cost estimate following UK Oil & Gas Guidelines on Decommissioning Cost Estimation (Issue 3, October 2013) will be provided to OPRED.

6.5 Close Out

In accordance with the OPRED Guideline Notes, a close out report will be submitted to OPRED and posted on the Premier Oil website, reconciling any variations from the Decommissioning Programmes within one year of the completion of the offshore decommissioning scope. This will include debris removal and, where applicable independent verification of seabed clearance, and the first post-decommissioning environmental survey.

6.6 Post-Decommissioning Monitoring and Evaluation

A post-decommissioning environmental seabed survey, centred around the well locations, will be carried out. The survey will focus on chemical, physical and biological changes disturbances and be compared with the pre decommissioning survey. Results of this survey will be available once the work is complete, with a copy forwarded to OPRED.

All pipeline routes and installation sites will be the subject to oilfield debris clearance and as-left verification surveys when decommissioning activity has concluded. All snag hazards created by drilling and/or production related activities will be removed or mitigated as part of the execution of the Decommissioning Programmes.

The main risk from infrastructure remaining in situ is the potential for interaction with other users of the sea, specifically from fishing related activities. Where the infrastructure is trenched below seabed level or trenched & buried below, the effect of interaction with other users of the sea is considered to be negligible.

The infrastructure is currently shown on Admiralty Charts and the FishSafe system. When decommissioning activity has been completed, updated information will be made available to update Admiralty Charts and FishSafe system.

When decommissioning activities have been completed, and where applicable, the safety zones around offshore infrastructure will be removed.

The licence holders recognise their commitment to undertake post-decommissioning monitoring of infrastructure left in situ. After the post-decommissioning survey reports have been submitted to OPRED and reviewed, a post-decommissioning monitoring survey regime, scope and frequency, will be agreed with OPRED.

7 SUPPORTING DOCUMENTS

Table 7.1: Supporting Documents	
Document Number	**Title**
AB-BL-XGL-LL-SE-RP-0001	Greater Balmoral Area Decommissioning Environmental Appraisal
AB-BL-XGL-LL-ZZ-RP-0004	Greater Balmoral Area Decommissioning Comparative Assessment Report

8 PARTNER LETTERS OF SUPPORT

Repsol Sinopec North Sea Limited

REPSOL SINOPEC NORTH SEA LIMITED

163 Holburn Street
Aberdeen
AB10 6BZ

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F +44 (0)1224 353400
W www.repsolsinopecuk.com

8 February 2021
Our Ref: 20GEN001/LC

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

Dear Sir or Madam

GLAMIS DECOMMISSIONING PROGRAMMES
PETROLEUM ACT 1998

We acknowledge receipt of your letters dated 8th January 2021.

We, Repsol Sinopec North Sea Limited confirm that we authorise Premier Oil E&P UK Limited to submit on our behalf abandonment programmes relating to the Glamis installations and pipelines as directed by the Secretary of State on 8th January 2021.

We confirm that we support the proposals detailed in the Glamis Decommissioning Programmes dated 11th January 2021, which is to be submitted by Premier Oil E&P UK 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

For and on behalf of **Repsol Sinopec North Sea Limited**

Director

Repsol Sinopec Resources UK Limited

REPSOL SINOPEC RESOURCES UK LIMITED

163 Holburn Street
Aberdeen
AB10 6BZ

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

Dear Sir or Madam

GLAMIS DECOMMISSIONING PROGRAMMES
PETROLEUM ACT 1998

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We confirm that we support the proposals detailed in the Glamis Decommissioning Programmes dated 11th January 2021, which is to be submitted by Premier Oil E&P UK 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

For and on behalf of **Repsol Sinopec Resources UK Limited**

Director

Premier Oil UK Limited

DocuSign Envelope ID: 2EE45D21-A3AD-4B9E-A94B-02CE2B4FEFDC

Premier Oil UK Limited
Upper Denburn House
Prime Four Business Park
Kingswells Causeway
Kingswells
Aberdeen AB15 8PU

Telephone +44 (0)1224 618 900
Fax +44 (0)1224 615 999
Email premier@premier-oil.com
Website www.premier-oil.com

Offshore Petroleum Regulator for Environment and Decommissioning
Department for Business, Energy and Industrial Strategy
Crimon Place
Aberdeen
AB10 1BJ

FAO: Mrs. Debbie Taylor

15 January 2021

Dear Sirs,

Letter of Support: Glamis Decommissioning Programmes

Premier Oil UK Limited hereby confirm that Premier Oil E&P UK Limited ("Premier") is authorised to submit, on our behalf, the abandonment programmes relating to the Glamis Field subsea installations and pipelines, as detailed in document no. AB-BL-PMO-LL-PM-PG-0004 revision B03, dated January 2021 and titled "Glamis Decommissioning Programmes", as directed by the Secretary of State in your letters of 8 January 2021.

We confirm our agreement to the proposals detailed in the Glamis Decommissioning Programmes dated 11 January 2021, which is to be submitted by Premier, in so far as they relate to those facilities in respect of which we are instructed to submit a programme under Section 29 of the Petroleum Act 1998.

Yours faithfully

DocuSigned by:
2DB602C4676144B...

Gareth Webster
Director
Premier Oil UK Limited

Premier Oil PLC

DocuSign Envelope ID: 5FC48648-1097-46EB-AEDC-E78764B88F62

Premier Oil plc
Upper Denburn House
Prime Four Business Park
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Kingswells
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Website www.premier-oil.com

Offshore Petroleum Regulator for Environment and Decommissioning
Department for Business, Energy and Industrial Strategy
Crimon Place
Aberdeen
AB10 1BJ

FAO: Mrs. Debbie Taylor

15 January 2021

Dear Sirs,

Letter of Support: Glamis Decommissioning Programmes

Premier Oil PLC hereby confirm that Premier Oil E&P UK Limited ("Premier") is authorised to submit, on our behalf, the abandonment programmes relating to the Glamis Field subsea installations and pipelines, as detailed in document no. AB-BL-PMO-LL-PM-PG-0004 revision B03, dated January 2021 and titled "Glamis Decommissioning Programmes", as directed by the Secretary of State in your letters of 8 January 2021.

We confirm our agreement to the proposals detailed in the Glamis Decommissioning Programmes dated 11 January 2021, which is to be submitted by Premier, in so far as they relate to those facilities in respect of which we are instructed to submit a programme under Section 29 of the Petroleum Act 1998.

Yours faithfully

DocuSigned by:
Richard Rose
BAD7772600CC479...

Richard Rose
Director
Premier Oil PLC

APPENDIX I – COPIES OF THE PUBLIC NOTICES

The Press and Journal:

PUBLIC NOTICE

The Petroleum Act 1998

Decommissioning Programmes for the Balmoral Area installations and pipelines

In accordance with the provisions of the Petroleum Act 1998, Premier Oil E&P UK Limited (Premier) has submitted, for the consideration of the Secretary of State for Business, Energy & Industrial Strategy, the draft Decommissioning Programmes for the installations and pipelines associated with the Balmoral, Glamis, Stirling, Brenda and Nicol Fields (the "Balmoral Area Fields"). It is a requirement of the Act that interested parties be consulted on such decommissioning proposals.

The Balmoral Area Fields are located in blocks 15/25a, 15/25b, 16/21a and 16/21b of the Central North Sea, approximately 225km northeast of Aberdeen. The Balmoral Area Fields were developed as subsea tiebacks to a Floating Production Vessel (FPV), with produced oil exported to shore via the Forties Pipeline System.

The facilities covered by the five Balmoral Area Decommissioning Programmes are:

- The Balmoral FPV facility,
- All subsea installations, and
- All subsea pipelines associated with the Balmoral, Glamis, Stirling, Brenda and Nicol Fields.

Premier hereby gives notice that the Decommissioning Programmes for the Balmoral Area Fields are available on its website at www.premier-oil.com, or alternatively a hard copy of the documents may be requested by contacting Premier during office hours on 01224 618900.

Representations regarding these Decommissioning Programmes should be submitted in writing to the person named at the address below, or via email to abzdecommissioning@premier-oil.com, by the consultation closing date of 1st November 2020. Submissions should state the grounds upon which any representations are being made.

Date: 21st September 2020
Pieter voor de Poorte
Premier Oil,
Upper Denburn House,
Prime Four Business Park,
Kingswells Causeway, Kingswells,
Aberdeen, AB15 8PU

The Daily Telegraph:

PUBLIC NOTICE

The Petroleum Act 1998

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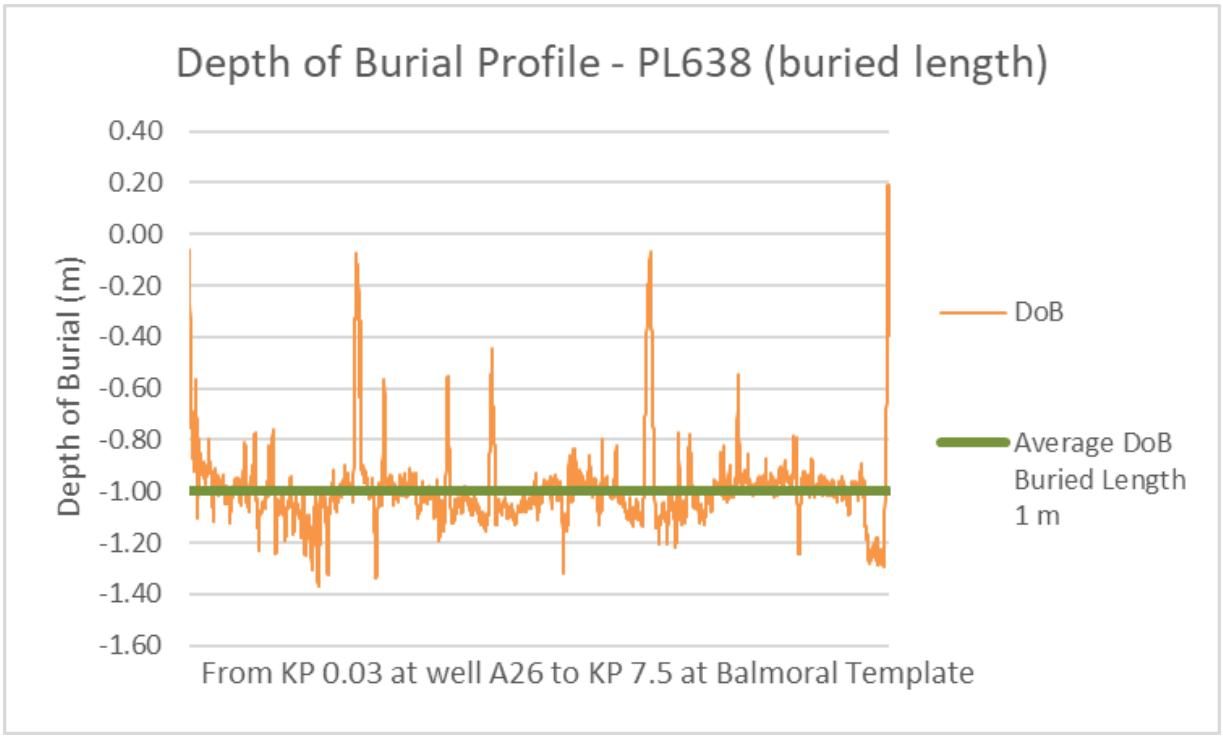
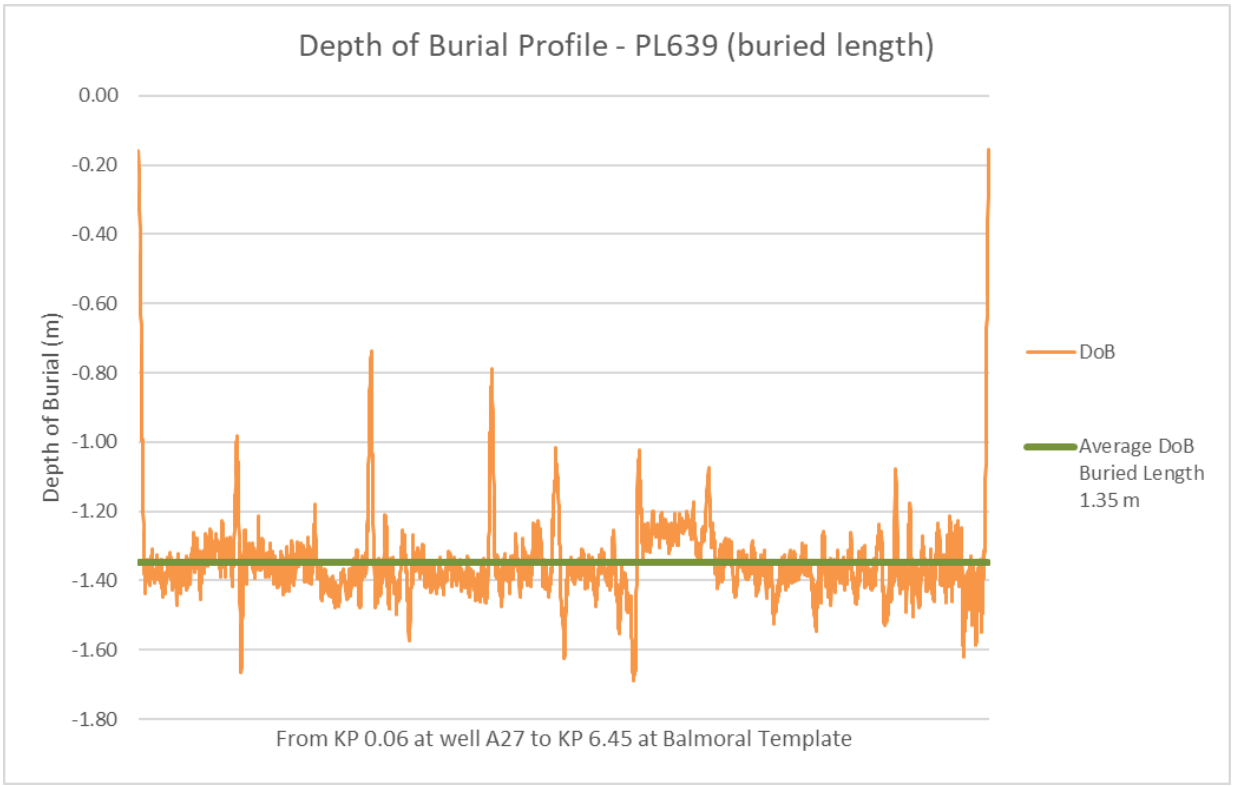
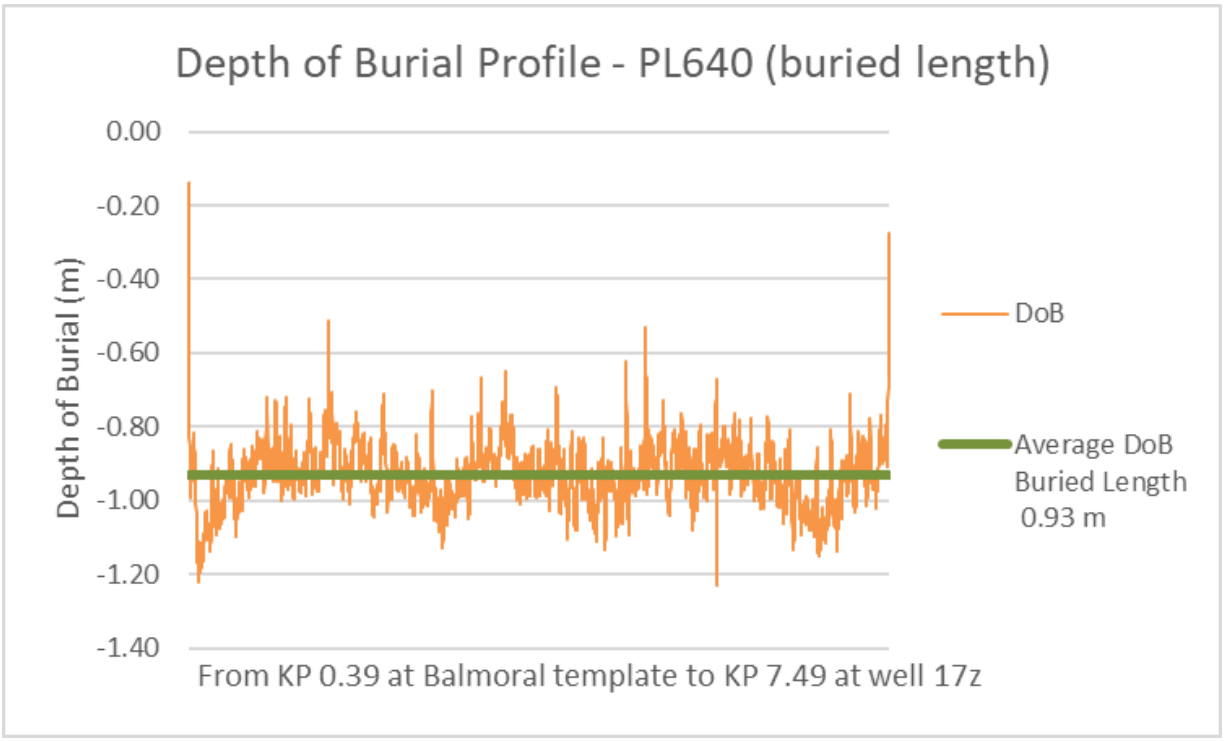
Date: 21st September 2020

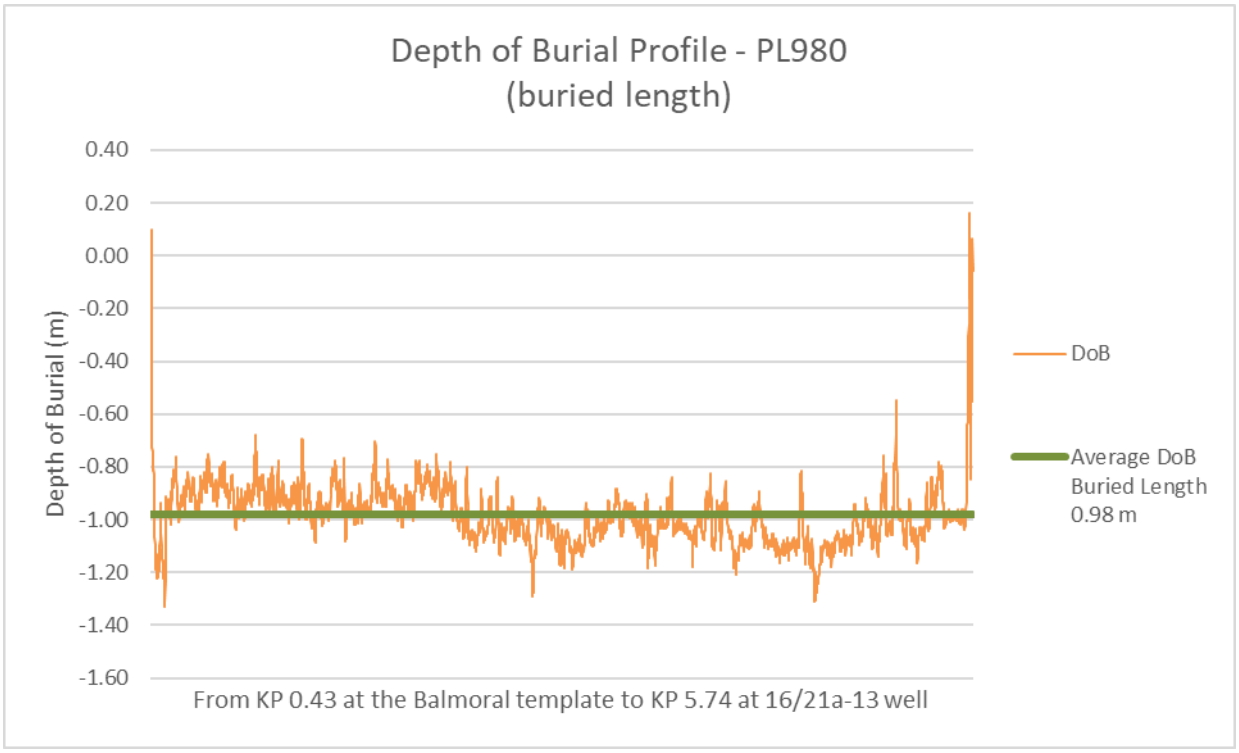
Pieter voor de Poorte
Premier Oil,
Upper Denburn House, Prime Four Business Park,
Kingswells Causeway, Kingswells,
Aberdeen, AB15 8PU

APPENDIX II – DEPTH OF BURIAL PROFILES






Depth of Burial Profile - PL640 (buried length)
0.00
-0.20
-0.40
-0.60
-0.80
-1.00
-1.20
-1.40
Depth of Burial (m)
DoB
Average DoB Buried Length 0.93 m
From KP 0.39 at Balmoral template to KP 7.49 at well 17z


Depth of Burial Profile - PL980 (buried length)
0.40
0.20
0.00
-0.20
-0.40
-0.60
-0.80
-1.00
-1.20
-1.40
-1.60
Depth of Burial (m)
DoB
Average DoB Buried Length 0.98 m
From KP 0.43 at the Balmoral template to KP 5.74 at 16/21a-13 well