TULLOW OIL SK LTD - WISSEY FIELD DECOMMISSIONING PROGRAMMES

PROJECT CODE: 02029

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REVISION CONTROL

Revision:	Para /Sect	Change Description

This sheet must be completed in detail, at each revision once this document has been approved. Details must include revision number, description and indication of which pages and paragraphs have been revised, date of revision approval and approval indication.

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TABLE OF TERMS AND ABBREVIATIONS

Abbreviation	Explanation
CoP	Cessation of Production
DECC	Department of Energy and Climate Change
DPs	Decommissioning Programmes
DSV	Diving Support Vessel
ES	Environmental Statement
ESDV	Emergency Shut Down Valve
HLV	Heavy Lift Vessel
LAT	Lowest Astronomical Tide
m	Meters
MEG	Monoethylene Glycol
NUI	Normally Unattended Installation
OGUK	Oil & Gas UK
OPEP	Oil Pollution Emergency Plans
ORSL	Oil Spill Response Ltd
OSPAR	Oslo and Paris Convention
Perenco	Perenco (UK) Ltd
P & A	Plug and Abandonment
PL	Pipe Line
QRA	Quantitative Risk Assessment
SLV	Sheer Leg Vessels
SNS	Southern North Sea
SWAT	Suspended Well Abandonment Tool
UKCS	UK Continental Shelf

A. TABLE OF FIGURES AND TABLES

B. TABLE OF APPENDICES

1.0 EXECUTIVE SUMMARY

1.1 Combined Decommissioning Programmes

This document contains two Decommissioning Programmes (DPs). (1) A single Wissey subsea installation and (2) the Wissey pipelines (as described in Para 1.2). A separate programme for each set of associated notices under Section 29 of the Petroleum Act 1998 is incorporated within this document.

1.2 Requirement for Decommissioning Programmes

Installation: In accordance with the Petroleum Act 1998, the Section 29 notice holders of Wissey field in 53/4d (see Table 1.2) are applying to the Department of Energy and Climate Change to obtain approval for decommissioning the installations detailed in Section 2 of this programme. (See also Section 8 - Partner(s) Letter(s) of Support).

Pipelines: In accordance with the Petroleum Act 1998, Tullow Oil SK Ltd (hereinafter referred to as Tullow Oil) as operator of the Wissey pipelines PL2491 and PLU2492 (see Table 1.4) and on behalf of the Section 29 notice holders are applying to DECC to obtain approval for decommissioning the pipelines detailed in Section 2 of this document. (See also Section 8 – Partner Letters of Support).

In conjunction with public, stakeholder and regulatory consultation, the decommissioning programmes are submitted in compliance with national and international regulations and DECC guidelines. The schedule outlined in this document is for a 30 month decommissioning project plan due to begin in Quarter 4 2014.

1.3 Introduction

The Wissey field is located in block 53/4d in the Southern North Sea approximately 100km off the coast of Norfolk, northeast of Bacton and 10km south east of the Horne and Wren NUI platform to which the Wissey pipeline delivers untreated wet gas for onward transmission to the Thames AW platform 25km to the North West. The Wissey field is produced by one subsea well.

The Wissey field was discovered in 1967 by Signal Oil & Gas the Wissey field reservoir holds and estimated GIIP resource of 28 BSc. Cumulative productions to date has totalled 18.2 BSc, yielding an estimated recovery rate of about 65%. Production from the Wissey field started in August 2008. The field was produced via a subsea development tied back the Horne and Wren platform. The Wissey field last produced in August 2012.

Wissey is a single subsea well tie-back to the Horne and Wren Platform with an integrated protection structure. The 8" flowline connecting the well back to Horne and Wren is buried for the majority of its length and covered with protective concrete mattresses where it sits on the surface of the seabed at the ends. Controls to Wissey are providing an umbilical from the Horne and Wren Platform.

As part of the COP (Approved by DECC 14/05.14) considerations, TOSK have explored all options for continuing production of Wissey but concluded none are viable, therefore the Wissey field is ready for decommissioning.

To optimise efficiency and realise synergies, the Wissey Decommissioning Programme activities will be integrated with the Thames Area that comprise the Arthur, Thames Complex (including Thurne), Horne and Wren, Orwell and Gawain fields. The operator for the Thames Complex (excluding Wissey and Horne and Wren) is Perenco UK (PUK).

Similarly, each of the Thames Area fields have reached their end of economic production and due to the interdependencies of the subsea wells on the Thames platform it was agreed with DECC to submit joint single COP and EIA documents to capture all fields and further promote integration into a single project where practicable. However, it should be noted that each operator will submit individual DPs for each field that can be undertaken independently.

1.4 Overview of Installation(s)/Pipeline(s) Being Decommissioned

1.4.1 Installations

Table 1.1: Installation(s) Being Decommissioned					
Field Name	Wissey	Quad/Block	53/4d	Number of Platforms	None
Distance from nearest UK coastline (km)	100	Distance to median (km)	245	Platform type	N/A
Number of Subsea Installation(s)	1	Number of Drill Cuttings Pile(s):	None	Topsides Weight (Te): Jacket Weight (Te):	N/A
Number of Wells: Platform: Subsea:	1 Subsea well	Production Type (Oil / Gas /Conde)	Gas	Water Depth (m)	N/A

Table 1.2 Installation(s) Section 29 Notice Holders Details		
Section 29 Notice Holder(s)	**Registration Number**	**Equity Interest (%)**
Tullow Oil SK Limited.	05287330	62.5
Faroe Petroleum (U.K.) Limited	04848017	18.75
First Oil Expro Limited	01021486	18.75
Tullow Oil Plc.	03919249	0

1.4.2 Pipeline(s)

Table 1.3: Pipeline Being Decommissioned		
Number of Pipeline/ Umbilical	1/1	(See Table 2.3)

Table 1.4: Pipeline Section 29 Notice Holders Details		
Section 29 Notice Holder(s)	**Registration Number**	**Equity Interest (%)**
Tullow Oil SK Limited.	05287330	62.5
Faroe Petroleum (U.K.) Limited	04848017	18.75
First Oil Expro Limited	01021486	18.75
Tullow Oil Plc.	03919249	0

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		
2. Jackets		
N/A		
3. Subsea Installation		
Wellhead protection frame will be removed by HLV or crane vessel	To remove all seabed structures and leave a clean seabed. To comply with OSPAR requirements.	Wellhead protection frame will be removed along with the top sections of piles. Piles will be severed 3m below the seabed level. To ensure that any remains are unlikely to become uncovered.
4. Pipelines & Umbilical		
Flush and leave buried in situ	Minimal seabed disturbance, lower energy usage, reduced risk to personnel engaged in the activity; pipelines are sufficiently buried and are stable.	The pipeline (PL2491) and umbilical (PLU2492) will be left in situ, with the cut ends re-buried below the seabed level at such a depth to ensure that any remains are unlikely to become uncovered. Surveys indicate pipelines and umbilicals will remain buried once flooded. Degradation will occur over a long period within seabed sediment and are not expected to represent a hazard to other users of the sea.
5. Well Abandonment Operations		
Abandoned in accordance with UKOG for the suspension and abandonment of wells	Meets DECC regulatory requirements	A PON5/PON15/MCAA application under the relevant regulations will be submitted in support of works carried out.
6. Drill Cuttings		
There are no drill cuttings associated with Wissey	Cuttings were widely dispersed and fall below OSPAR 2006/5 thresholds.	Not applicable
7. Interdependences		
None		

1.6 Field Location/Layout and Adjacent Facilities Figure 1.1

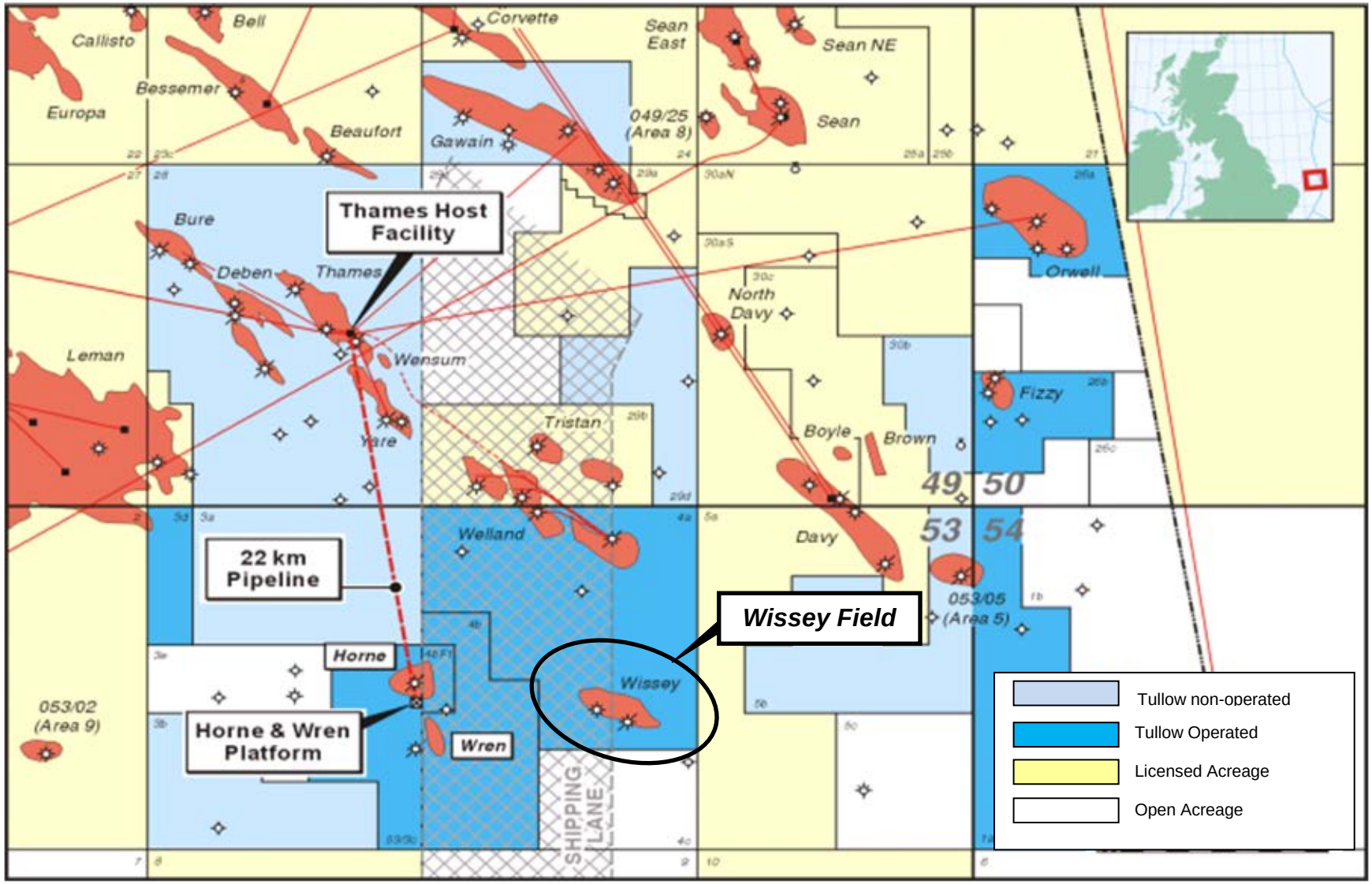


Figure 1.2: Field Layout

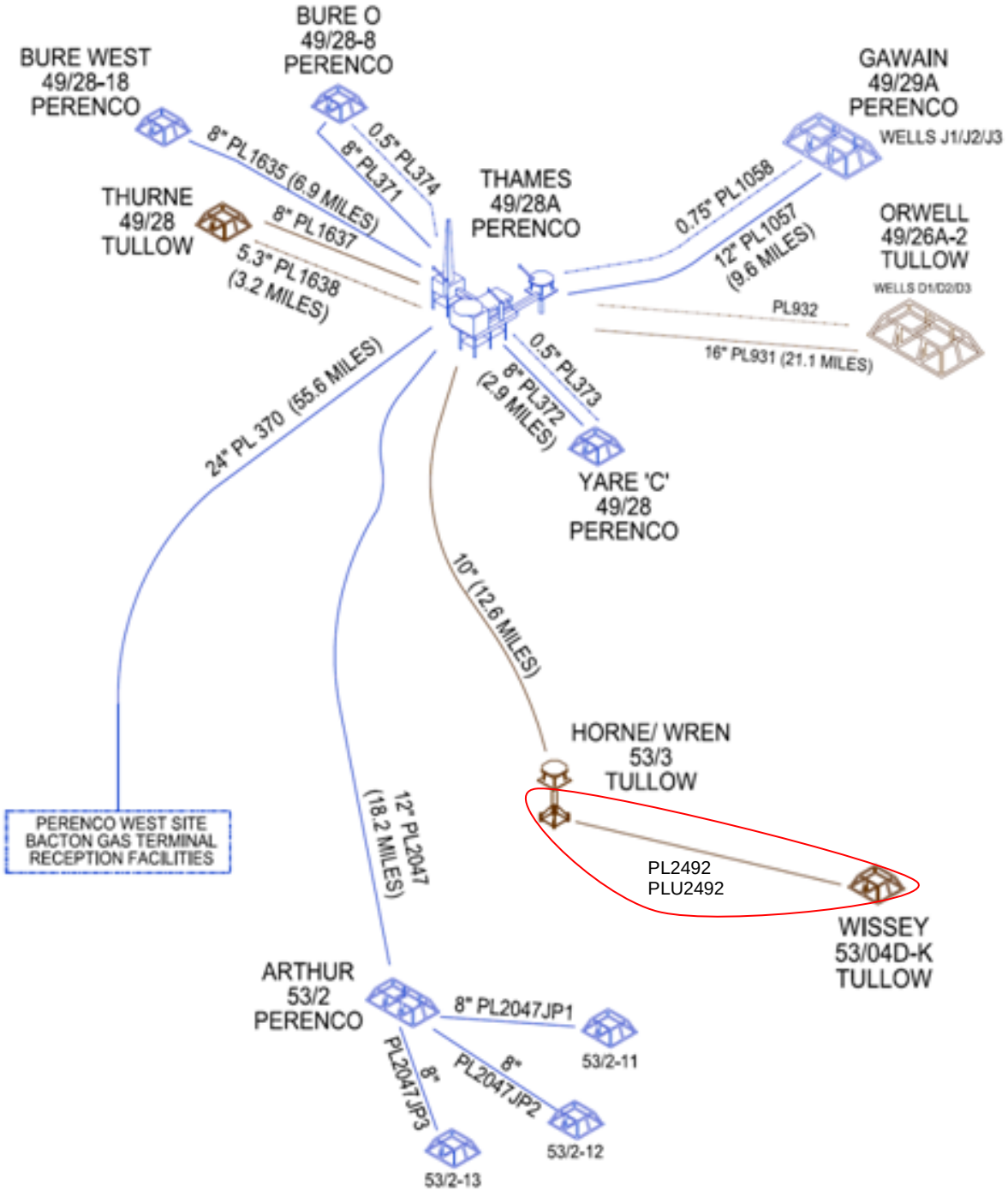
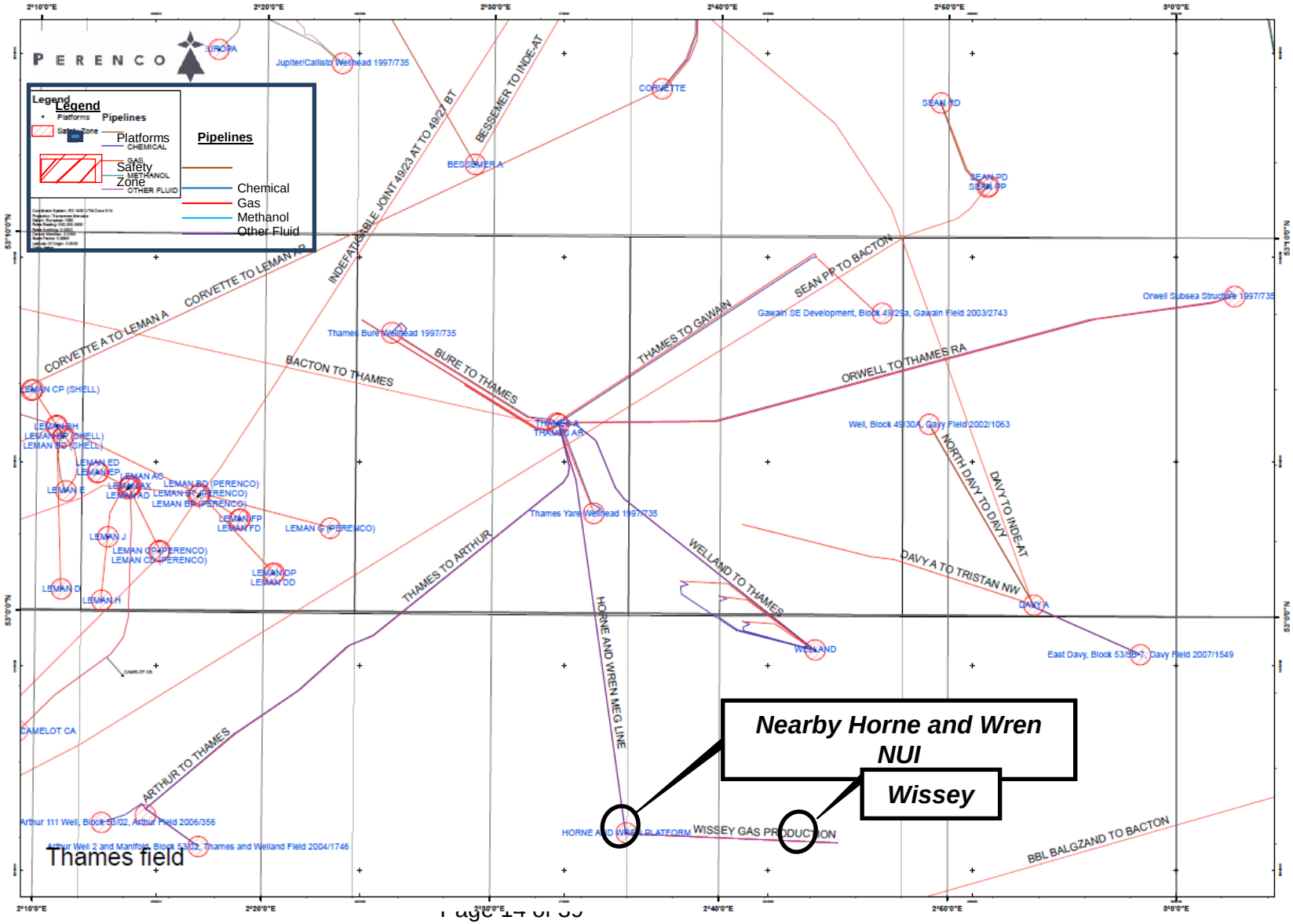


Table 1.6 List of Adjacent Facilities					
Owner	**Name**	**Type**	**Distance/Directi**	**Information**	**Status**
Tullow Oil SK Ltd	Horne and Wren	NUI Platform	From Wissey well to Horne and Wren is 10km North East.	Gas production from Wissey subsea wells flows into Horne and Wren and	All wells shut in
Perenco	Davy	NUI platform	From Wissey 15km North West	Gas production	Operational
BBL Company	Balgzand to Bacton	Pipeline	Passes approx. 20km south of Wissey	Gas pipeline	Operational
Unknown	UK-NETHERLANDS 14	Telecommunications cable	7 km south		Operational

NOTE: All Adjacent facilities will have no impact on the Decommissioning proposals.

Figure 1.3: Adjacent Facilities and Crossings



1.7 INDUSTRIAL IMPLICATIONS

The intent of this Decommissioning Program is to integrate the Wissey scope of work into the wider "Thames Area decommissioning project" which encompasses all fields that tie back to the Thames complex, into discrete manageable phases.

The phases are as follows;

- Surveys
- Pipeline cleaning (base case is to flush and clean from Thames complex back to individual fields. If this is not possible, the uncompleted scopes will be included in the DSV phase).
- DSV (pipeline severance and burial, removal of stabilisation materials).
- Well Plugging & Abandonment.
- Removal of platform

The above Phases will need to be planned carefully to recognise synergies and efficiencies, however the pre engineering will be completed to allow either individual projects to be completed or to fully integrate all work scopes.

Strategically, suppliers with working vessels and assets on the UKCS will be favoured. All contracts will be competitively tendered or novated to either party.
Current operational contracts for items such as environmental permitting, rig drilling management and logistic support will be implemented to support decommissioning activities

2 DESCRIPTION OF ITEMS TO BE DECOMMISSIONED

2.1 Surface Facilities (Topsides/Jacket(s)/FPSO etc.)

Table 2.1: Surface Facilities Information							
Name	Facility Type	Topsides/Facilities		Jacket (if applicable)			
		Weight (Te)	No of modules	Weight (Te)	Number of Legs	Number of piles	Weight of piles (Te)
N/A							

2.2 Subsea Installations and Stabilisation Features

Table 2.2: Subsea Installations and Stabilisation Features				
Subsea installations and Stabilisation Features	Number	Size/Weight (Te)	Location(s)	Comments/ Status
Wellhead	1	15	Wissey well 53/4d-11 (WGS84 - 52° 53' 58.1995 North 2° 45' 6.973 East)	
Manifolds(s)	0	NA	NA	
Template(s)	0	NA	NA	
Protection Frame(s)	1	85	Around well	Piled
Concrete mattresses	52	250	Within 100m of Wissey well head and WPS.	from as built drawings
Grout bags	100	Approx. 1m3 ~ 2t	Within 10m of well head.	from installed drawings
Rock Dump	0	N/A	N/A	

2.3 Pipelines/Flowlines/Umbilicals

Table 2.3: Pipeline/Flowline/Umbilical Information

Description	Pipeline No. (as per PWA)	Diameter (inches)	Length (km)	Composition[1]	Contents[2]	From – To End Points	Condition	Status[3]	Contents[4]
Wissey pipeline	PL2491	8	10	Steel with concrete coating	Gas	Wissey well to Horne and Wren NUI	Trenched and buried along length covered by mattresses at ends. Refer to table 2.2. There are no freespans.	Ceased production	Hydrocarbons
Wissey umbilical	PLU2492	4	10	Bundle	Chemicals/ Hydraulic Fluids	Horne and Wren NUI to Wissey well	Trenched and buried along length covered by mattresses at ends. Refer to table 2.2. There are no freespans.	Ceased production	Hydraulic fluids/copper

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

Table 2.4: Subsea Pipeline Stabilisation Features				
Stabilisation Feature	**Number**	**Weight (Te)**	**Location(s)**	**Comments/ Status**
Concrete mattresses	8	24	Within 100m H&W NUI	From As built drawings
Grout bags	40	1	Within 100m H&W NUI	From As built drawings
Frond Mats	0		N/A	
Rock Dump	0	N/A	N/A	

2.4 Wells

Table 2.5 Well Information			
Platform Wells	**Designation 1**	**Status**	**Category of Well**
N/A			
Subsea Wells			
53/4d-11	Production	Shut in	3/3/1

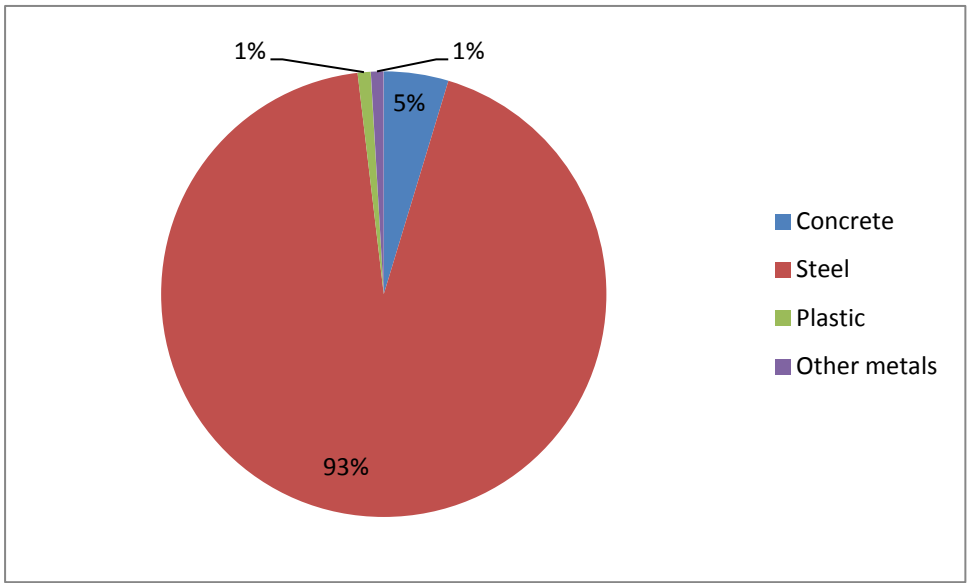
Category of well as per OGUK Guidelines for the suspension and abandonment of wells, Issue 4, July 2012.

2.5 Drill Cuttings

There are no drill cuttings associated with the Wissey subsea well. Drill cuttings that were generated during drilling activity are considered to have been distributed widely during drilling due to the local currents. There was no evidence of drill cuttings in the immediate vicinity of the wells when surveys were conducted in Q3 2013.

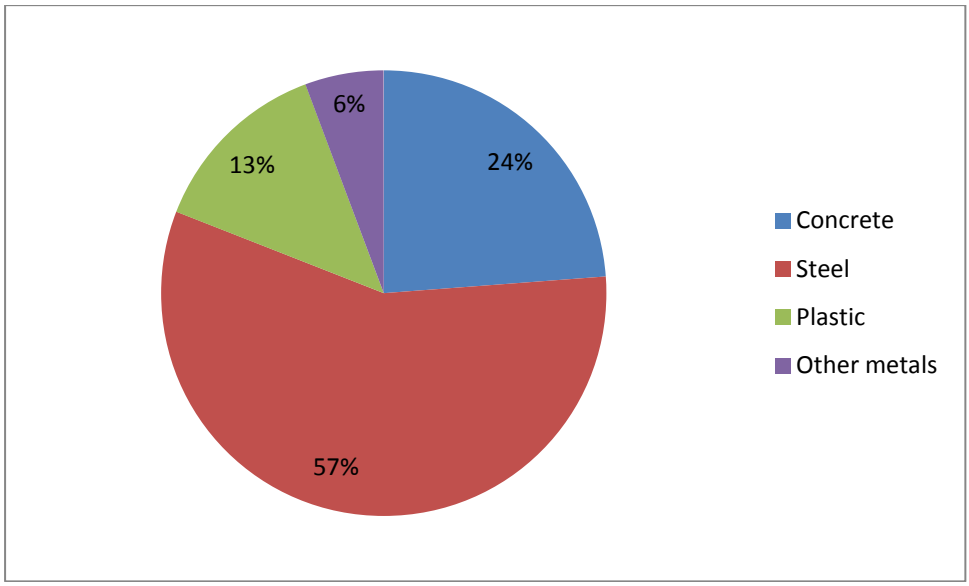
2.6 Inventory Estimates

Figure 2.1: Pie Chart of Estimated Inventories (Installations)



Total tonnes: 107

Figure 2.2: Pie Chart of Estimated Inventory (Pipelines)



Total Tonnes: 1050

3. REMOVAL AND DISPOSAL METHODS

Wastes generated during decommissioning will be segregated and recorded by type and periodically transported to shore in an auditable manner through licensed waste contractors. Steel
and other scrap metal are estimated to account for the greatest proportion of the materials inventory. The hierarchy for disposal will be:

1. Reuse
2. Reconditioning
3. Reconditioning of component parts
4. Recycling (partial or whole) components/materials
5. Disposal to landfill or other approved methods

The disposal routes for the subsea installations and pipeline infrastructure are shown in Tables 3.1 and 3.2.

Once the infrastructure is recovered to the vessels, it will be examined for the presence of NORM. If any contamination is found, the items will be sealed and delivered to specialist contractors for decontamination treatment and disposal. NORM contamination in Wissey infrastructure would require specialised waste transport and handling processes and is regulated under the Radioactive Substances Act 1993, however, the Wissey infrastructure is not expected to contain any NORM.

3.1 Topsides

N/A

3.2 Jacket(s)

N/A

3.3 Subsea Installations and Stabilisation Features

All subsea installations will be removed to shore for disposal. The pile cuts will be made below the seabed level (minimum 3m). The means of cutting will be diamond wire, high pressure water jet abrasive cutting or by explosives.

The overall recommended option for the stabilisation materials was determined through the Comparative Assessment. Leave in-situ, while further remedial actions are assessed was the preferred option.

Table 3.1: Subsea Installation and Stabilisation Features Decommissioning		
Subsea installations and stabilisation features	**Option**	**Disposal Route (if applicable)**
Wellhead	Remove	Transport ashore for disposal
Protection Frame	Remove	Transport ashore for disposal
Concrete mattresses	All mattresses will be removed to shore for disposal. If any practical difficulties are encountered Tullow Oil will consult with DECC.	Transport ashore for disposal
Grout bags	Remove	Transport ashore for disposal
Formwork	Not applicable	Not applicable
Frond Mats	All mattresses will be removed to shore for disposal. If any practical difficulties are encountered Tullow Oil will consult with DECC.	Not applicable
Rock Dump	Not applicable	Not applicable

3.4 Pipelines/Flowlines/Umbilicals

Decommissioning Options:

Table 3.2: Pipeline or Pipeline Groups/Decommissioning Options			
Pipeline or Group (as per PWA)	**Status of the line or characteristics of the pipeline group**	**Decommissioning Options considered**	**Whole or part of pipeline/group being decommissioned**
PL2491	Trenched, buried	1,2,3,4,5	Whole pipeline
PLU2492	Trenched, buried	1,2,3,4,5	Whole pipeline

*Key to Options

1) Completely remove the line(s);
2) Trench and bury the exposed / uncovered areas of the line(s);
3) Rock dump the line in specific areas where the line is uncovered;
4) Partial removal of uncovered sections of the line;
5) Leave in situ with periodic monitoring (frequency to be agreed with DECC).

Comparative Assessment Method:

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

The Comparative Assessment concluded the pipelines and umbilicals will be left in situ due to difficulty and cost to remove. They are predominantly trenched and buried; the free spans are within acceptable parameters to leave. The pipelines will be periodically monitored (frequency to be agreed with DECC) and buried as required.

Outcome of Comparative Assessment:

Table 3.3: Outcomes of Comparative Assessment		
Pipeline or Group	**Recommended Option***	**Justification**
PL2491	Option 5	Line is buried and will be safe to leave in situ (5). End sections will be removed & exposures/spans rectified as required. Monitoring will be performed to confirm pipeline remains buried. The frequency of monitoring will be agreed with DECC.
PLU2492	Option 5	Line is buried and will be safe to leave in situ (5). End sections will be removed & exposures/spans rectified as required Monitoring will be performed to confirm pipeline remains buried. The frequency of monitoring will be agreed with DECC.

*Key to Options

1) Completely remove the line(s);
2) Trench and bury the exposed / uncovered areas of the line(s);
3) Rock dump the line in specific areas where the line is uncovered;
4) Partial removal of uncovered sections of the line;
5) Leave in situ with continuous monitoring

3.5 Wells

Table 3.4: Well Plug and Abandonment
The wells which remain to be abandoned, as listed in Section 2.4 (Table 2.5) will be plugged and abandoned in accordance with Oil and Gas UK Guidelines for the suspension and abandonment of wells. A PON5/PON15/MCAA Application will be submitted in support of any such work that is to be carried out.

3.6 Drill Cuttings

Drill Cuttings Decommissioning Options: N/A
(Please refer to Section 2.5)

Comparative Assessment Method: N/A

Outcome of Comparative Assessment: N/A

3.7 Waste Streams

Table 3.5: Waste Stream Management Methods	
Waste Stream	**Removal and Disposal method**
Bulk liquids	Removed and discharged to disposal wells or sent to Bacton via the export line for disposal.
Marine growth	Removed offshore /onshore. Disposed of according to guidelines.
NORM/LSA Scale	Tests for NORM/LSA will occur offshore and will be dealt/disposed with according to guidelines and company policies.
Asbestos	N/A
Other hazardous wastes	Non identified
Onshore Dismantling sites	Appropriate licensed sites will be selected. Chosen facility must demonstrate proven disposal track record and waste stream management throughout the deconstruction process and demonstrate their ability to deliver innovative recycling options.

Table 3.6 Inventory Disposition			
	Total Inventory Tonnage	**Planned tonnage to shore**	**Planned left in situ**
Installations	70	60	10
Pipelines	600	50	550

4 ENVIRONMENTAL IMPACT ASSESSMENT

4.1 Environmental Sensitivities

The main features in this section are extracts from the Thames Area decommissioning Environmental Impact Assessment that has been prepared for the entire Thames Area decommissioning and is submitted in support of this Decommissioning Programme approval.

Table 4.1: Environmental Sensitivities

Environmental Receptor	Main Features
Conservation interests	**Marine Protected Areas (MPAs):** The Thames Infrastructure overlaps with the boundaries of three MPAs described below: • Cromer Shoal Chalk Beds rMCZ (NG2); • Haisborough, Hammond and Winterton cSAC; • North Norfolk Sandbanks and Saturn Reef cSAC. **Annex I Habitats:** Annex I shallow sandbanks may be present along some of the pipeline routes along with discrete populations of *S. spinulosa* identified in the side scan sonar mosaic and using seabed imagery. Overall the site survey identified some areas of 'low' to 'moderate reefiness' but no areas of high reefiness which has previously been found at the Saturn Reef to the north of the Thames field (outside of the current working area). Therefore, the survey data indicates that Annex I habitats from *S. spinulosa* reefs. **Annex II Species:** The Annex II species that could be present in the vicinity of the Thames Decommissioning Area include: • Harbour porpoise (*Phocoena phocoena*); • Grey seal (*Halichoerus grypus*); • The harbour (or common) seal (*Phoca vitulina*).

Table 4.1: Environmental Sensitivities	
Environmental Receptor	**Main Features**
Seabed	Seabed imagery found that much of the surveyed area comprised bare sand with some areas of gravel and shell fragments (*CMACS, 2013*). Side scan sonar data demonstrated that sand waves across large areas of the seabed. This indicates strong seabed and water column currents, and subsequently highly mobile sediments (*CMACS, 2013*) which is consistent with the southern North Sea in general. The results of the chemical testing indicate that the concentrations of the individual PAH compounds all fall below the laboratory detection limits. Similarly, the aliphatic and aromatic total petroleum hydrocarbon (TPH) compounds also fall beneath lab detection limits, along with the other organic compounds and phenols listed. The organic content of sediments was generally low, ranging from 0.47 per cent to 1.54 per cent, with no discernible trend across the survey area (*CMACS, 2013*). Of all the metal contaminants, only arsenic was present above Level 1 threshold (Cefas L1 threshold is 20 ppm) at the majority of stations. Elevated levels of arsenic can occur following geological inputs and/or industrial discharge (*CMACS, 2013*). Cadmium was the only other metal found at concentration above the Level 1 threshold with 0.4 ppm. Barium was detectable at all stations sampled with levels of between 6 and 36 ppm across the sites and no evidence of any 'hotspots' of barium concentration *(CMACS, 2013).*
Fish	There are potential fish spawning area in ICES rectangles 34F1, 34F2, 35F, 35F2 and 35F3 for cod (*Gadus morhua*), herring (*Clupea harengus*), lemon sole (*Microstomus kitt*), mackerel (*Scomber scombrus*), *Nephrops*, plaice (*Pleuronectes platessa*), sandeels (*Ammodytidae*), sole (*Solea solea*), sprat (*Sprattus sprattus*) and whiting (*Merlangius merlangus*) (*Coull et al., 1998; Ellis et al., 2012*). In addition to the spawning grounds described above, the waters of ICES rectangles 34F1, 34F2, 35F1, 35F2 and 35F3 also act as nursery areas for cod, herring, horse mackerel (*Trachurus trachurus*), lemon sole, mackerel, *Nephrops*, plaice, sandeels, sole, sprat, thornback ray (*Raja clavata*), tope shark (*Galeorhinus galeus*) and whiting (*Coull et al., 1998; Ellis et al., 2012*).

Table 4.1: Environmental Sensitivities	
Environmental Receptor	**Main Features**
Fisheries	Specific fishing effort and landings data for ICES Rectangles 34F1, 34F2, 35F1, 35F2 and 35F3 indicated that annual fish landings were greatest in 2010 for ICES Rectangle 35F3 (328.5 tonnes), 2011 for ICES Rectangles 34F1 (2,527.3 tonnes), 34F2 (411.1 tonnes), and 35F2 (217.8 tonnes) and in 2012 for ICES Rectangles 35F1 (886.8 tonnes). Conversely, annual fishing catches by tonnage were lowest during 2009 in ICES Rectangles 34F1 (93.3 tonnes) and 35F1 (326.6 tonnes), during 2008 in ICES Rectangle 34F2 (35.4 tonnes) and during 2012 in ICES Rectangles 35F2 (36.4 tonnes) and 35F3 (53.7 tonnes) (*Marine Scotland, 2013*). On the whole, fishing activity for this area is low throughout the year. When averaged, catches by weight (tonnes) between 2008 and 2012 were highest during March and April in ICES Rectangle 34F1, December in ICES Rectangle 34F2, March to July in ICES Rectangle 35F1, January in ICES Rectangle 35F2 and January and November in ICES Rectangle 35F3. Species which were routinely caught in higher quantities (tonnes) during 2012 in ICES Rectangle 34F1 were whelks (38%) and crabs (C.P. mixed sexes; 27%), in ICES Rectangle 34F2 were sprats (83%), in ICES Rectangle 35F1 were whelks (81%), in ICES Rectangle 35F2 were plaice (63%) and in ICES Rectangle 35F3 were plaice (59%) and sole (23%).
Marine Mammals	According to Reid et al. (2003) three species have been previously been sighted in the area around the Blocks of Interest. Harbour porpoise, White-beaked dolphins and minke whale.
Birds	Within these Blocks, seabird vulnerability generally peaks to high (2 out of 4 on the JNCC scale) during February, March and December. The Blocks containing only pipeline follow a similar trend. The highest seabird vulnerability on the JNCC ranked scale (1 out of 4) only occurs in Blocks 48/28 and 52/3 during October.
Onshore Communities	All waste produced during the Thames Area Decommissioning will be transferred to an onshore decommissioning and waste facility for processing. Tullow Oil will ensure the chosen facility is fully regulated and licensed with current legislation.

Table 4.1: Environmental Sensitivities	
Environmental Receptor	**Main Features**
Other Users of the Sea	**Shipping:** Shipping movements in the vicinity of Blocks of Interest are regarded as very high to low throughout the year. Blocks 49/29, 49/30 and 53/4 lie within a deep water route. **Oil & Gas:** Previously, there has been significant oil and gas activity within and around the Blocks of Interest; **Military Activity:** The Blocks of Interest do not lie within any marine military exercise areas. However, part of the pipeline PL370 does within a military low flying zone. **Dredging and Dumping Activity:** There are no offshore dredging sites within the Blocks of Interest. The nearest offshore dredging site is the Lowestoft Extension Aggregates Application site approximately 31 kilometres to the southwest of the Arthur 2 wellhead. **Wind Farms:** There are no active windfarms in close proximity to the Blocks of Interest. The nearest active wind farm site is the Round 2, Dudgeon East site approximately 32 kilometres to the north west of the Thames to Bacton (PL370) pipeline (Crown Estates, 2013). This site is in the consent/authorisation phase (4COffshore, 2013). **Archaeology:** There are two charted wreck sites located within the Blocks of Interest.
Atmosphere	Atmospherics emissions will be generated during the Thames Area Decommissioning operations. However, it is expected that the emissions will be localised to the area of release.

4.2 Potential Environmental Impacts and their Management

Environmental Impact Assessment Summary:

Decommissioning project activities with the potential to cause environmental impacts were identified from discussions with the Tullow project team, a scoping exercise with key stakeholders and from the EIA team's previous oil and gas EIA project experience.

Impacts associated with the Wissey field which is included in the Thames Area Decommissioning project have been grouped within the EIA under the following headings:

- Physical Presence;
- Seabed Impacts;
- Noise;
- Atmospheric Emissions;
- Marine Discharges;
- Unplanned Releases;
- Solid Wastes;
- Trans boundary Impacts;
- Cumulative Impacts.

Any relevant social-economic issues have been assessed within these sections.

In summary, all residual impacts are considered to be of minor significance, provided the proposed mitigation and management measures, as identified within the ES, are implemented during the Thames Area Decommissioning.

The exception to this is in the event of an accidental spill, where there would be a release of condensate from the pipeline or diesel fuel loss from the drilling rig / SLV; here the residual impact has been assessed as moderate. In addition, the assessment of potential cumulative impacts indicated that there would be no significant impacts and no significant transboundary impacts are expected to occur as a result of the decommissioning operations.'

Table 4.2 Environmental Impact Assessment Summary		
Activity	**Main Impacts**	**Management**
Topsides Removal	Not applicable	Not applicable
Jackets Removal	Not applicable	Not applicable

Table 4.2 Environmental Impact Assessment Summary		
Activity	**Main Impacts**	**Management**
Subsea Installations Removal	Energy use and atmospheric emissions Underwater noise Dropped object Accidental hydrocarbon release Production of Waste Damage or loss of fishing gear Disturbance to the Seabed	Vessels will be audited as part of selection and pre-mobilisation. Work programmes will be planned to optimise vessel time in the field. A post decommissioning debris survey will be conducted and any debris recovered. Materials are reused and recycled where possible. Compliance with UK waste legislation and duty of care. Underwater cutting could be a potential source of sound, the operation of well-maintained equipment during decommissioning will ensure noise of operating machinery is kept as low as possible. Use of explosives underwater is expected to cause a significant source of sound. Use of explosives underwater is expected to cause a significant source of sound. Consultation with JNCC and DECC will occur before agreement on any operation. Tullow Oil will also conform to 'JNCC guidelines for minimising the risk of injury to marine mammals from using explosives.' If applicable a MMO will be onboard the vessel during cutting and/or explosive operation. UK Hydrographical Office and Kingfisher will be informed of all activities. Tullow Oil will establish lines of communication to inform other sea users, including fishermen, of vessel operations during decommissioning.

Table 4.2 Environmental Impact Assessment Summary		
Activity	**Main Impacts**	**Management**
Decommissioning Pipelines (left in situ)	Energy use and atmospheric Emissions Underwater noise Damage or loss of fishing gear Disturbance to Seabed Dropped object Accidental hydrocarbon release	Pipelines have been pre-flushed with seawater and risk assessments will indicate the potential for any environmental impact. Pipeline ends and exposed areas will be buried in situ preventing the release of pipeline contents into the marine environment Rock placement will be deposited from a dedicated rock placement vessel. This will be applied for under a DEPCON application. Tullow Oil SK Ltd will apply for a Marine Licence to cover the potential disturbance of the seabed. Tullow Oil will ensure that disturbance is kept to a minimum during the operations. A post decommissioning debris survey will be conducted and any debris recovered. Underwater cutting could be a potential source of sound, the operation of well-maintained equipment during decommissioning will ensure noise of operating machinery is kept as low as possible. If applicable MMO will be onboard the vessel during cutting and/or explosive operation. UK Hydrographical Office and Kingfisher will be informed of all activities. Tullow Oil will establish lines of communication to inform other sea users, including fishermen, of vessel operations during decommissioning.

Table 4.2 Environmental Impact Assessment Summary		
Activity	**Main Impacts**	**Management**
Decommissioning Stabilisation Features	Energy use and atmospheric Emissions Underwater noise Damage or loss of fishing gear Disturbance to Seabed Dropped object Accidental hydrocarbon release	All mattresses will be removed to shore for disposal. If any practical difficulties are encountered Tullow Oil will consult with DECC (as per Para 3.3 Table 3.4).
Decommissioning Drill Cuttings	Long-term presence of hydrocarbons in sediments Leaching of hydrocarbons into the surrounding sediments and water column	There are no drill cuttings associated with the Wissey installation in the area. Should any evidence of drill cuttings be discovered, Tullow Oil will contact DECC to review findings and extent and agree any necessary remedial actions.

5 INTERESTED PARTY CONSULTATIONS

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

Table 5.1 Summary of Consultee Comments		
Who	**Comment**	**Response**
INFORMAL CONSULTATIONS		
TBA		
TBA		
TBA		
STATUTORY CONSULTATIONS		
NFFO		
SFF		
NIFPO		
Global Marine Systems		

6 PROGRAMME MANAGEMENT

6.1 Project Management and Verification

A Tullow Oil Project Management team will be appointed to manage suitable sub-contractors for the removal of the Wissey installation and execution of the Decommissioning Programme work scopes. Tullow Oil standard procedures for operational control and hazard identification and management will be used. Where possible the work will be coordinated with other decommissioning operations in the SNS. Tullow Oil 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 discussed with DECC.

6.2 Post-Decommissioning Debris Clearance and Verification

A post decommissioning site survey will be carried out around 500m radius of the Wissey installation, and a 200m corridor along each existing pipeline route. Oil and gas seabed debris will be recovered for onshore disposal or recycling in line with existing disposal methods. Independent verification of seabed state will be obtained by trawling the installation and pipeline areas. This will be followed by a statement of clearance to all relevant governmental departments and non-governmental organisations.

6.3 Schedule

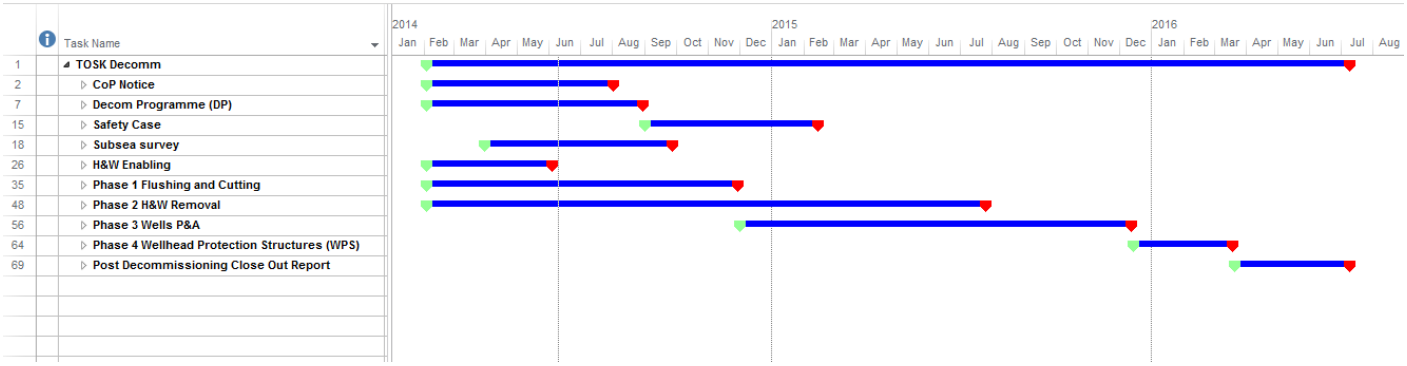
Project Plan:

The Tullow Oil plan for decommissioning Wissey and its other two operated installations in the Thames area Horne and Wren and Orwell is expected to be 30 months duration.

The plan below takes into account regulatory approvals and time to procure long lead items and equipment. Economic and operational benefits identified in detailed engineering through integration with the Perenco UK Ltd decommissioning of the Thames Area installations may require some future adjustment to the Tullow Oil planning. The market availability of key vessels including a heavy lift vessel for removing structures and rigs for wells plugging and abandonment will ultimately drive the dates for completion.

Note that Horne and Wren will require remedial works in order to facilitate the programme. This activity is shown as H&W Enabling in the level 0 Gant Chart.

Figure 6.1: Gantt chart of Project Plan



6.4 Costs

Table 6.1 – Provisional Decommissioning Programme(s) costs	
Item	**Estimated Cost (£m)**
Platform(s) /Jacket(s) - Preparation / Removal and Disposal	NA
Pipeline(s) and Umbilical(s) Infrastructure Decommissioning	Inc. in subsea
Subsea Installation(s) and Stabilisation Feature(s)	3.0
Well Abandonment	5.0
Continuing Liability – Future Pipeline and Environmental Survey Requirements	0.5
TOTAL	**8.5**

6.5 Close Out

In accordance with the DECC Guidelines, a close out report will be submitted to DECC explaining any variations, from the Decommissioning Programme (normally within 4 months of the completion of the offshore decommissioning scope) including debris removal and independent verification of seabed clearance and the first post-decommissioning environmental survey.

6.6 Post-Decommissioning Monitoring and Evaluation

A post decommissioning environmental seabed survey, centred around sites of the Wissey subsea installation, will be carried out. The survey will focus on chemical and physical disturbances of the decommissioning and compared with the pre-decommissioning survey, conducted by OSIRIS Ltd in Q3 2013 (Osiris 02029-OSI-PL-RPT-001). Results of this survey will be available once the work is complete, with a copy forward to DECC. All pipeline routes and structure sites will be the subject of surveys when decommissioning activity has concluded. The survey will include the 200 metre corridor along the pipeline routes and 500 metre radius around the installation. After the surveys have been sent to DECC and reviewed, the post-decommissioning monitoring regime to be discussed and agreed with DECC.

7 SUPPORTING DOCUMENTS

Table 7.1: Supporting Documents	
Document Number	**Title**
PER-SNS-DECOM-THA-005	Environmental Impact Assessment
PER-SNS-DECOM-THA-001	Comparative Assessment
02029-OSI-PL-RPT-001	Environmental Survey
02029–XOD–SU-RPT-RPT001	Xodus report – Facilities and pipeline removal conceptual report
02029–INR–EG-RPT-0001	Interact report – Wells plug and abandonment conceptual report

8. PARTNERS LETTERS OF SUPPORT