# Decommissioning Programmes

***Draft for Consultation***


# Jacky Wellhead Platform

## Subsea Installation and Associated Pipelines

## Document Control

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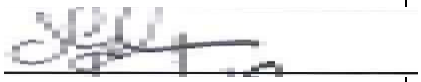
| Updated by | **J Gordon** |  | 21/12/2017 |
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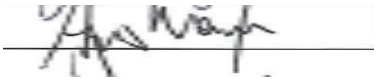
| Approved by | **A Bertram** |  | 21/12/2017 |

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| INST = Installations P/L = Pipelines | | Page Number | INST | P/L |
|---|---|---|---|---|
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| Abbreviation | Explanation |
|---|---|
| BEIS | Department for Business, Energy and Industrial Strategy |
| CA | Comparative Assessment |
| CoP | Cessation of Production |
| CSV | Construction Support Vessel |
| DCR | Design and Construction Regulations 1996 |
| DSV | Diving Support Vessel |
| EIA | Environmental Impact Assessment |
| ES | Environmental Statement |
| ESP | Electrical Submersible Pump |
| GMS | Global Marine Systems Limited |
| GOR | Gas Oil Ratio |
| HLV | Heavy lift Vessel |
| HSE | Health and Safety Executive |
| IPR | Interim Pipeline Regime |
| LAT | Lowest Astronomical Tide |
| LSA | Low Specific Activity |
| MEG | Monoethylene Glycol |
| MLT | Mid Line Tee |
| MODU | Mobile Offshore Drilling Unit |
| MPA | Marine Protected Areas |
| NFFO | The National Federation of Fishermen's Organisations |
| NIFPO | The Northern Ireland Fish Producer's Organisation |
| NORM | Naturally Occurring Radioactive Material |
| NUI | Normally Unattended Installation |
| OGA | Oil and Gas Authority |
| OGUK | Oil & Gas United Kingdom |
| OSPAR | Oslo and Paris Commission |
| OIW | Oil in Water |
| P and A | Plug and Abandon |
| PETS | Portal Environmental Tracking System |
| PMT | Project Management Team |
| PON | Petroleum Operations Notice |

| Abbreviation | Explanation |
|---|---|
| PPL | Polypropylene |
| PWA | Pipeline Works Authorisation |
| SFF | The Scottish Fishermen's Federation |
| SAC | Special Areas of Conservation |
| SCI | Site of Community Importance |
| SPA | Special Protection Areas |
| te | Tonne |
| UKCS | United kingdom Continental Shelf |
| WBM | Water Based Mud |
| WI | Water Injection |

Figures and Tables

Appendices

# 1.0 EXECUTIVE SUMMARY

## 1.1 Combined Decommissioning Programmes

This document contains two decommissioning programmes for each set of associated notices served under Section 29 of the Petroleum Act 1998. The Decommissioning Programmes are for:

- 2 Jacky Field Installations
- 5 Jacky Field Pipelines

## 1.2 Requirement for Decommissioning Programmes

In conjunction with public, stakeholder and regulatory consultation, the decommissioning programmes are submitted in compliance with national and international regulations and BEIS guidelines. The schedule outlined in this document is for a 7 year decommissioning project plan due to begin in 2017 with the detailed engineering for removal of the Jacky Wellhead Platform and associated subsea equipment.

**Installations:**

In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Jacky Field (see Table 1.2) are applying to the Department for Business, Energy and Industrial Strategy for approval to decommission 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 Jacky Field pipelines (see Table 1.4) are applying to the Department for Business, Energy and Industrial Strategy for approval to decommission the pipelines detailed in Section 2.3 of this programme. (See also Section 8 – Partner Letter of Support).

## 1.3 Introduction

Jacky is a low GOR Oil reservoir lying in block 12/21c of the UK sector of the Central North Sea, and was proven by the drilling and testing of the 12/21c-6 appraisal well in May 2007. Jacky Field was developed as a tie back to the existing Beatrice Area facilities in 2008-09 when the appraisal well was re-entered and completed as production well (12/21c - J01) with first oil achieved in April 2009. Production ceased in 2014 due to declining rates and equipment failures (ESPs). The Cessation of Production notification was submitted in 2014 and approved on the 20th August 2014 by the Oil & Gas Authority.

The facilities in the Jacky Field comprise the Jacky Wellhead Platform which is a normally unattended installation (NUI) positioned over the well locations with a topsides production tree and production manifold in 40m water depth. Production was exported through a platform riser and subsea pipeline to the Beatrice Alpha (AP) platform. The installation also included a water injection well (12/21c - J02) with facilities consisting of a water injection tree and header with injection water provided from Beatrice Alpha (AP) by subsea pipeline. A further appraisal well (12/21c - J03) was drilled and was suspended. There are also production and water injection spur pipelines via a mid-line tee structure which supported the Beatrice Bravo installation

Following public, stakeholder and regulatory consultation the decommissioning programmes will be submitted in full compliance with BEIS guidelines. The decommissioning programmes explain the principles of the removal activities and are supported by an environmental impact assessment. The decommissioning programmes for the pipelines and power cable are supported by a comparative assessment.

## 1.4 Overview of Installations/Pipelines Being Decommissioned

### 1.4.1 Installations

| Table 1.1: Installations Being Decommissioned | | | |
|---|---|---|---|
| **Field:** | **Jacky** | **Production Type (Oil/Gas)** | **Oil & Gas** |
| **Water Depth (m)** | **40m** | **UKCS block** | **12/21c** |
| **Surface Installations** | | | |
| **Number** | **Type** | **Topsides Weight (Te)** | **Jacket including suction piles Weight (Te)** |
| 1 | Wellhead Platform (NUI) | 663 | 950 |
| **Subsea Installations** | | **Number of Wells** | |
| **Number** | **Type** | **Platform** | **Subsea** |
| 1 | Midline tee Structure including protection frame, Ballast weights, isolation valves and piping. | 3 | 0 |
| **Drill Cuttings piles** | | **Distance to median** | **Distance from nearest UK coastline** |
| **Number of Piles** | **Total Estimated volume ($m^3$)** | **km** | **km** |
| 3 | 800 | 262 | 19 |

| Table 1.2 Installations Section 29 Notice Holders Details | | |
|---|---|---|
| **Section 29 Notice Holders** | **Registration Number** | **Equity Interest (%)** |
| DYAS UK LIMITED | 04024945 | 47.5% |
| ITHACA ENERGY (UK) LIMITED | SC272009 | 52.5% |

### 1.4.2 Pipelines

| Table 1.3: Pipelines Being Decommissioned | | |
|---|---|---|
| **Number of Pipelines / Umbilicals** | 4/1 | (See Table 2.3) |

| Table 1.4: Pipelines Section 29 Notice Holders Details | | |
|---|---|---|
| **Section 29 Notice Holders** | **Registration Number** | **Equity Interest (%)** |
| DYAS UK LIMITED | 04024945 | 47.5% |
| ITHACA ENERGY (UK) LIMITED | SC272009 | 52.5% |

## 1.5 Summary of Proposed Decommissioning Programmes

| Table 1.5: Summary of Decommissioning Programmes | | |
|---|---|---|
| **Selected Option** | **Reason for Selection** | **Proposed Decommissioning Solution** |
| **1. Topsides** | | |
| Complete removal for re-use or recycling. | Possible re-use for similar development | Topsides facilities are flushed to remove hydrocarbons < 10mg/l.<br>Topsides will be separated from monopile jacket by removing/cutting the bolts at the flange connection and lifting the topsides structure clear of the monopile jacket and placing on a barge for transportation onshore for re-use or recycling. |
| **2. Jackets** | | |
| Complete removal for possible re-use or recycling (Including suction piles) | Possible re-use for similar development | Monopile jacket and suction piles to be completely removed by reverse installation procedure. In the event of practical difficulties the regulator will be contacted and alternative methods discussed and agreed.<br>Removal either by DSV or HLV and placing on a barge for transportation onshore for re-use or recycling. |
| **3. Subsea Installations** | | |
| Mid Line Tee structure, complete removal for reuse or recycling. | To remove all seabed structures and leave a clean seabed. Complies with OSPAR requirements | Mid Line Tee structure including protection frame and piping is flushed <10mg/l. OIW. Tie in spools will be disconnected and the structure to be completely removed in a single lift by CSV and returned onshore for reuse or recycling. |
| **4. Pipelines, Flowlines & Umbilicals** | | |
| Full or partial removal of:<br>6" Production pipeline, including spur from MLT to Beatrice Bravo<br>8" WI pipeline, including spur from MLT to Beatrice Bravo<br>6" Power Cable | Minimal seabed disturbance, lower energy usage, reduced risk to personnel | The 6" production pipeline, including the spur from the MLT to Beatrice Bravo, 8" water injection pipeline including the spur from MLT to Beatrice Bravo and 6" Power Cable will be disconnected and left in situ, with the ends re-buried as indicated by the CA and recommended by the SFF. Surveys indicate pipelines and power cable will remain buried to > 1m depth. Degradation will occur over a long period within seabed sediment, not expected to represent a hazard to other users of the sea. |
| **5. Wells** | | |
| Abandon Wells in accordance with HSE DCR 1996 and OGUK Guidelines for the Suspension and Abandonment of Wells Issue 5 July 2015. | Meets BEIS and HSE regulatory requirements | Jacky wells will be plugged and abandoned using a jack up drilling rig. A PON5, Marine Licence and PETS will also be submitted to BEIS for application to abandon the wells. |

| Table 1.5: Summary of Decommissioning Programmes | | |
|---|---|---|
| **Selected Option** | **Reason for Selection** | **Proposed Decommissioning Solution** |
| **6. Drill Cuttings** | | |
| Leave in place to degrade naturally | Cuttings piles are small from top hole section only and drilled with WBM, cuttings have dispersed around each wellhead and fall below both of OSPAR 2005/6 thresholds | Left undisturbed on seabed to disperse naturally. |
| **7. Interdependencies** | | |
| Topsides, wellheads, pipeline tie in spools and MLT can only be removed after well P and A. Tie in spools at both Beatrice AP and Bravo require removal prior to the jacket decommissioning for these assets.<br><br>Monopile jacket and suction piles can only be removed after Topsides and tie in spools have been removed. | | |

## 1.6 Field Location Including Field Layout and Adjacent Facilities

**Figure 1.1: Jacky Field Location in UKCS**

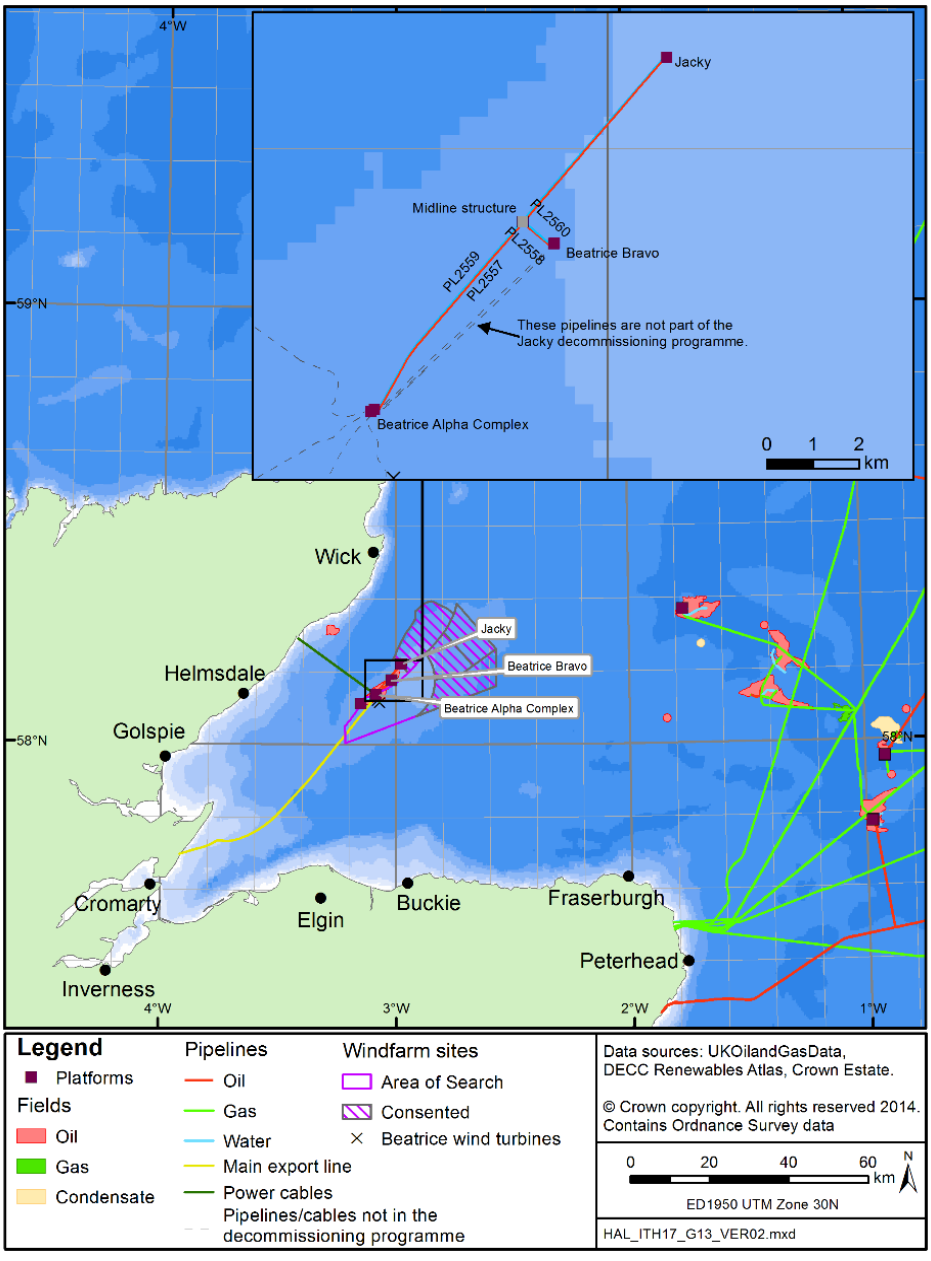
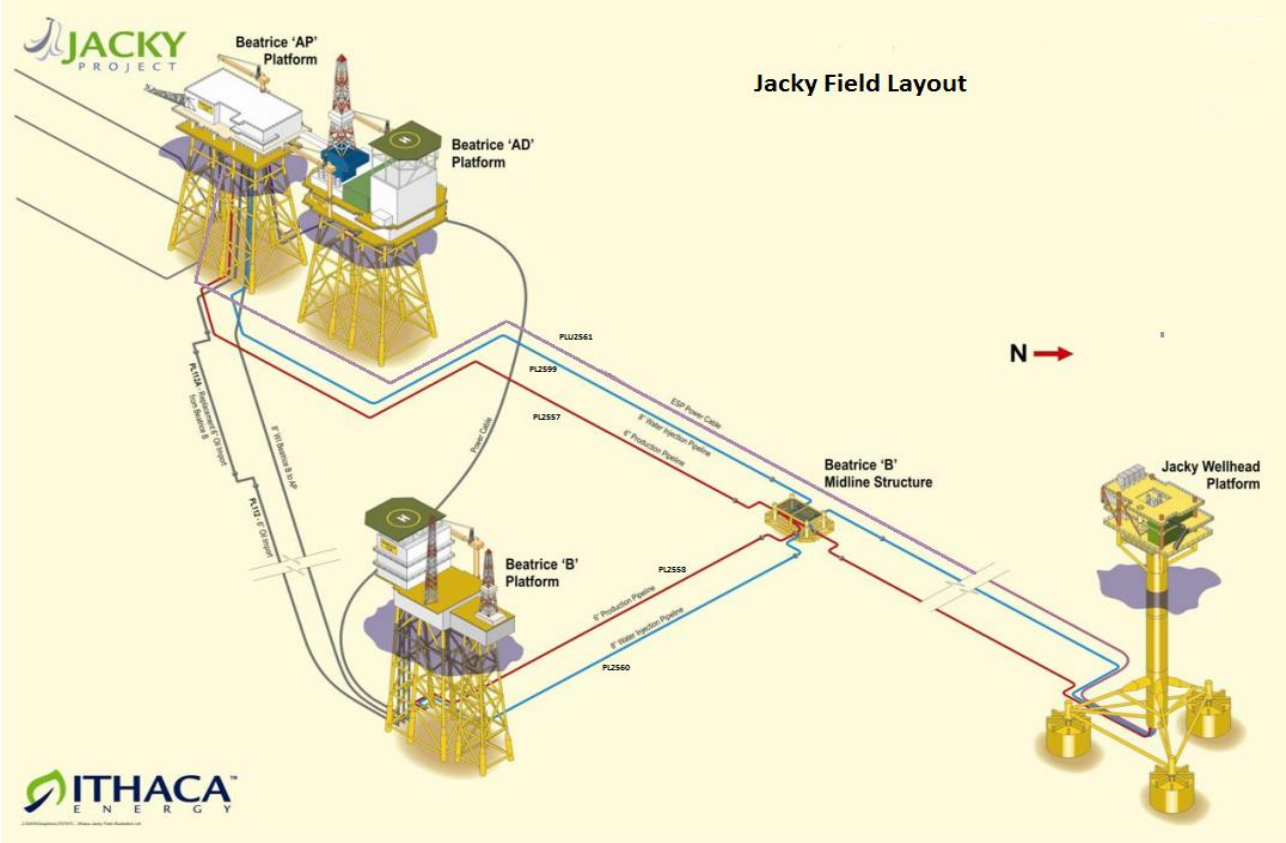
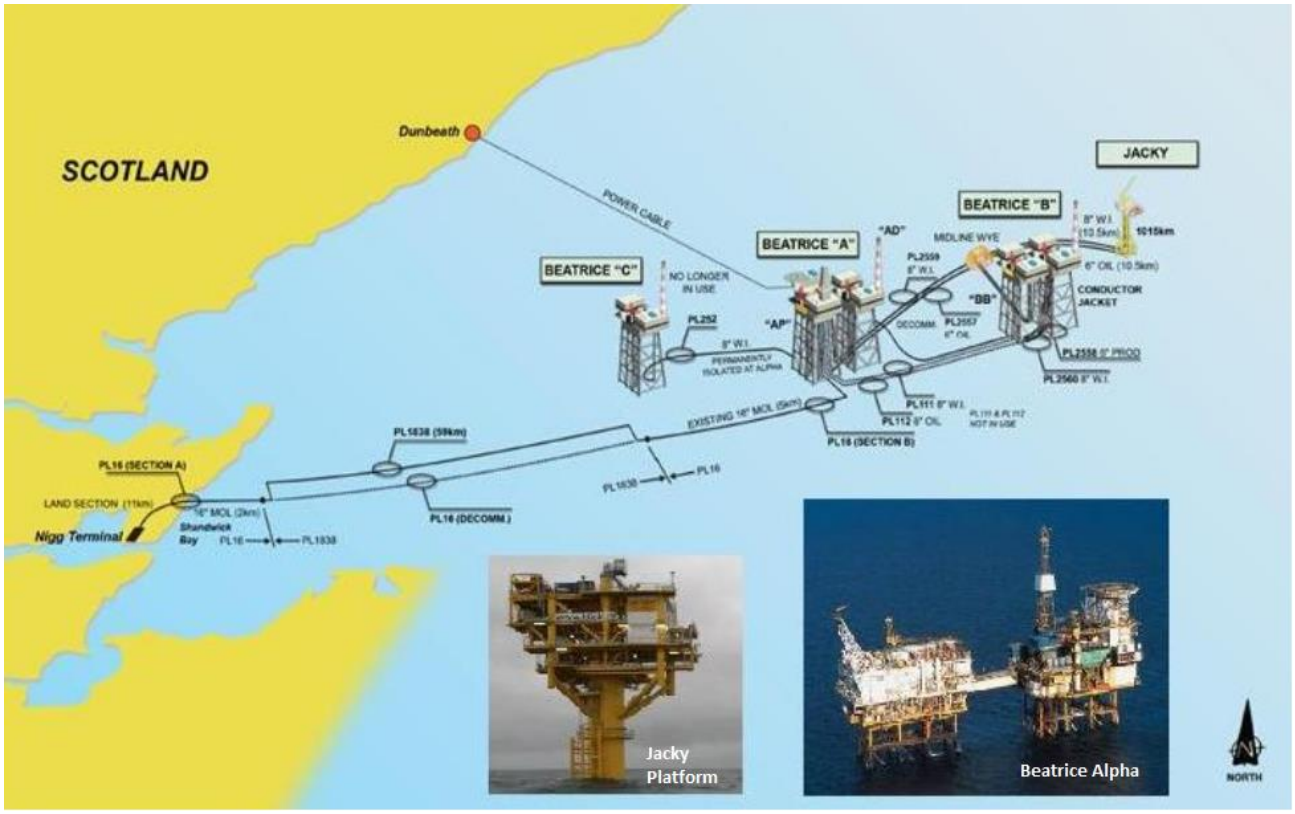


**Figure 1.2: Jacky Field Layout**




| Table 1.6 List of Adjacent Facilities | | | | | |
|---|---|---|---|---|---|
| **Owner** | **Name** | **Type** | **Distance/Direction** | **Information** | **Status** |
| Repsol Sinopec | Beatrice Alpha | Platform | 10km South West | Gas/liquids Production | Out-of-use |
| | Beatrice Bravo | Platform | 6km South | Gas/liquids Production | Out-of-use |
| | Beatrice Charlie | Platform | 15km South West | Water Injection | Out-of-use |
| | Beatrice Wind Turbines | Wind Turbines | 10km South West | Power supply | Out-of-use |
| **Impacts of Decommissioning Proposals** | | | | | |
| Jacky pipelines and power cable cross over Bravo redundant pipelines and the Bravo power supply cable.<br>Beatrice complex decommissioning activity may be in progress during planned Jacky decommissioning.<br>Beatrice offshore windfarm installation activity may be in progress during planned Jacky decommissioning.<br>Moray offshore windfarm installation activity may be in progress during planned Jacky decommissioning.<br>Ithaca has commenced disussions with the Beatrice operators – Repsol and both Wind Farm companies to identify any potential collaboration opportunities. All parties have agreed to continue discussions and keep each other appraised of activities in the area. | | | | | |

**Figure 1.3: Adjacent Facilities**




## 1.7 Industrial Implications

The work to decommission the Jacky Field installation and pipelines will be largely completed from a Diving Support Vessel (DSV) or a Heavy Lift Vessel (HLV). Well plug and abandonment operations will be completed using a jack up drilling rig.

It is Ithaca's intention to use existing framework agreements for the decommissioning of the subsea installations and stabilisation features. Ithaca will also seek to combine Jacky decommissioning activities with other development or decommissioning works should the opportunity be available. The decommissioning schedule is comprised to provide flexibility within the programme.

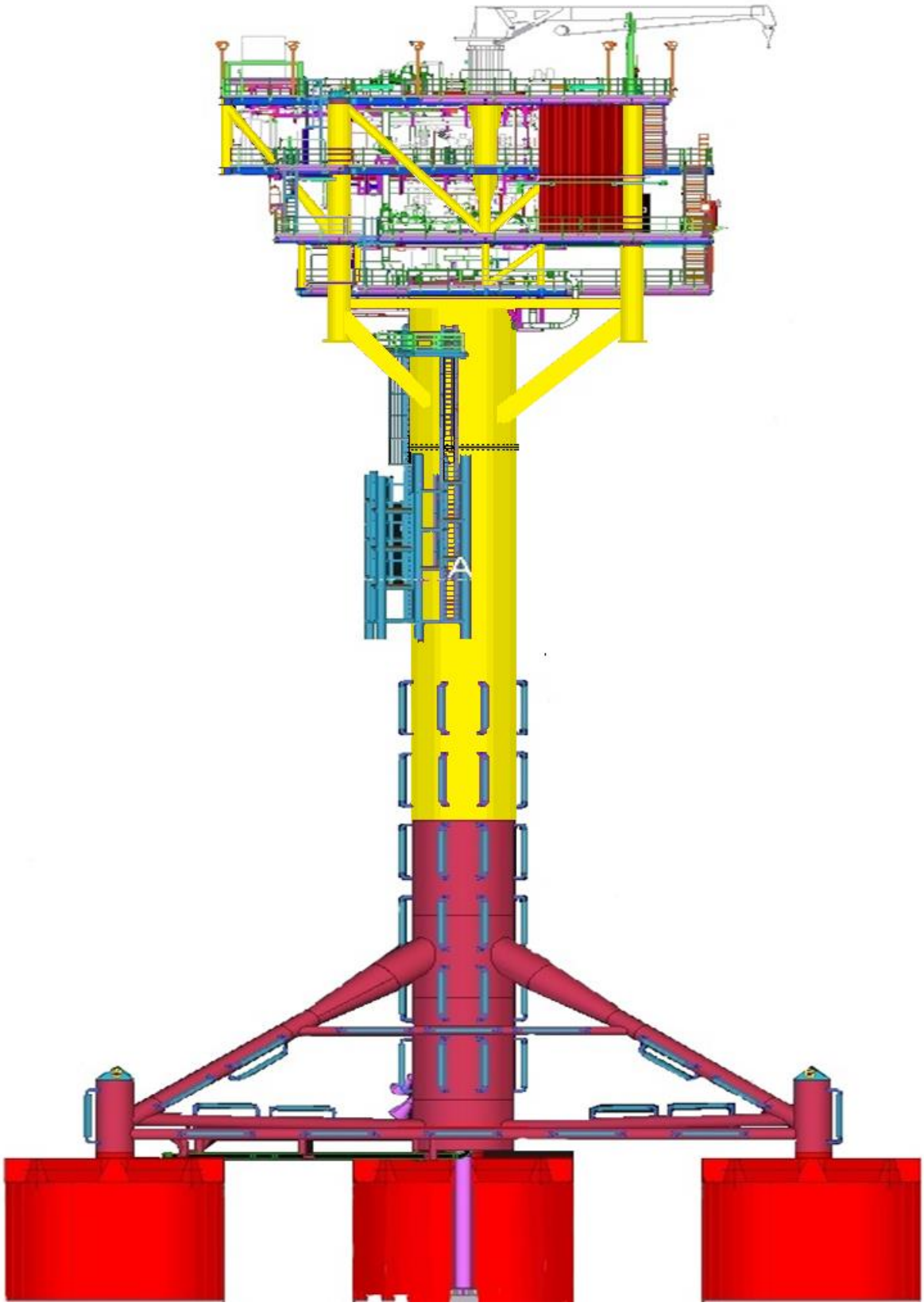
# 2. Description of Items to be decommissioned

## 2.1 Installations: Surface Facilities – Jacky Wellhead Platform

**Table 2.1: Surface Facilities Information**

| Name | Facility Type | Location | | Topsides/Facilities | | Jacket | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Weight (Te) | No of modules | Weight (Te) | Number of legs | Number of piles | Weight of piles (Te) |
| Jacky | Small fixed Steel | WGS84 Decimal | 58.184° 2.980° | 663 | 1 | 596 | Mono pile | 3 Suction Piles | 354 |
| | | WGS84 Decimal Minute | 58°11.037'N 2°58.794'W | | | | | | |

**Figure 2.1 Jacky Wellhead Platform**



## 2.2 Installations: Subsea including Stabilisation Features

| Table 2.2: Subsea Installations and Stabilisation Features | | | | | |
|---|---|---|---|---|---|
| **Subsea installations including Stabilisation Features** | **Number** | **Size/Weight (Te)** | **Location** | | **Comments/Status** |
| Midline Tee Structure including protection frame.<br><br>Ballast weights | 1<br><br>4 | 11.5m x 8m x 2.6m<br>Total 75te<br><br>4 x 3.14te<br>Total 12.56te | WGS84 Decimal<br>WGS84 Decimal Minute | 58.152°<br>3.033°<br>58° 09.096'N<br>03° 01.986'W | Production lines flushed with treated seawater to <20mg/l OIW.<br>Midline tee structure will be disconnected, recovered and returned onshore for re-use or recycling. (Including ballast weights) |
| Concrete mattresses | N/A | | | | |
| Grout bags | N/A | | | | |
| Frond Mats | 28 | 140kg each<br>4te | WGS84 Decimal<br>WGS84 Decimal Minute | 58.184°<br>2.980°<br>58°11.037'N<br>2°58.794'W | Exposed |

**Fig 2.2 Jacky Mid line T Structure**

## 2.3 Pipelines Including Stabilisation Features

| Table 2.3: Pipelines/Umbilical Information | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Description | Pipeline Number (as per PWA) | Diameter (inches) | Length (km) | Description of Component Parts | Product Conveyed | From – To End Points | Burial Status | Pipeline Status | Current Content |
| Production Pipeline | PL2557 | 6" | 10.5 | Rigid steel pipe with 40mm SPU insulation<br>Midline tee structure | Oil; Gas | Jacky riser connection to Beatrice Alpha (AP) riser | Trenched and buried | IPR | Flushed <10mg/l OIW<br>Treated sea water |
| Production Pipeline Spur | PL2558 | 6" | 0.8 | Rigid steel pipe with 40mm SPU insulation | Oil; Gas | Beatrice Bravo riser to Midline tee structure | Trenched & Buried | IPR | Flushed <10mg/l OIW<br>Treated sea water |
| Water injection pipeline | PL2559 | 8” | 10.5 | Rigid steel pipe with 3 layers PPL Insulation<br>Manifold | Treated sea water | Beatrice Alpha (AP) Riser to Jacky riser | Trenched and buried | IPR | Treated sea water |
| Water injection pipeline spur | PL2560 | 8” | 0.8 | Rigid steel pipe with 3 layers PPL Insulation | Treated sea water | Midline structure to Beatrice Bravo Riser | Trenched & Buried | IPR | Treated sea water |
| Power Cable | PLU2561 | 3” | 10.5 | Flexible armoured cable | Power | Beatrice Alpha (AP) to Jacky Wellhead Platform | Trenched and buried | Isolated | N/A |

| Table 2.4 Subsea Pipelines Stabilisation Features | | | | |
|---|---|---|---|---|
| **Stabilisation Feature** | **Total Number** | **Weight (Te)** | **Locations** | **Exposed/Buried/Condition** |
| Concrete mattresses | 145 | 5te each<br>725te | Jacky wellhead platform, mid line T structure, Beatrice Bravo and Alpha approaches. | Exposed<br>A total of 47 mattresses at the Jacky WHP (8), MLT (4) and Beatrice AP approaches (35) are buried under rock |
| Grout bags | 113 | 20kg each<br>2.3te | Jacky wellhead platform, midline tee structure, Beatrice Bravo and Alpha approaches. | Exposed |
| Gabion bags | 2 | 2te | Mid line T | Exposed |
| Rock Dump | 44 | 11882te | Jacky wellhead platform, midline tee structure, Beatrice Bravo and Alpha approaches. | Exposed |
| Formwork | 0 | 0 | Not applicable | Not applicable |
| Frond Mats | 0 | 0 | Not applicable | Not applicable |
| Other:<br>Power cable tether and clump weight | 1 | 75te | Beatrice Alpha approach | Exposed |

## 2.4 Wells

| Table 2.5 Well Information | | | |
|---|---|---|---|
| **Wells** | **Designation** | **Status** | **Category of Well** |
| 12/21c - J01 | Oil/Gas Production | Shut in | PL 3/3/3 |
| 12/21c - J02 | Water Injection | Shut in | PL 3/3/3 |
| 12/21c - J03 | Suspended | Shut in | PL 3/3/3 |

For details of well categorisation see OGUK Guidelines for the Suspension or Abandonment of Wells Issue 5, July 2015

## 2.5 Drill Cuttings

(See Section 3.7 for further information)

| Table 2.6 Drill Cuttings Piles Information | | | | |
|---|---|---|---|---|
| **Wells** | **Location of Pile Centre (Latitude/Longitude)** | | **Seabed Area ($m^2$)** | **Estimated volume of cuttings ($m^3$)** |
| 12/21c-J01 | 58.184°<br>2.980° | 58°11.037'N<br>2°58.794'W | 28 | 231 |
| 12/21c-J02 | 58.184°<br>2.980° | 58°11.037'N<br>2°58.794'W | 32 | 268 |
| 12/21c-J03 | 58.184°<br>2.980° | 58°11.037'N<br>2°58.794'W | 36 | 301 |

Note: Drill cuttings from water based mud for each well top hole sections, cuttings from lower sections were drilled using oil based mud and were disposed of onshore therefore no oil release potential possible.

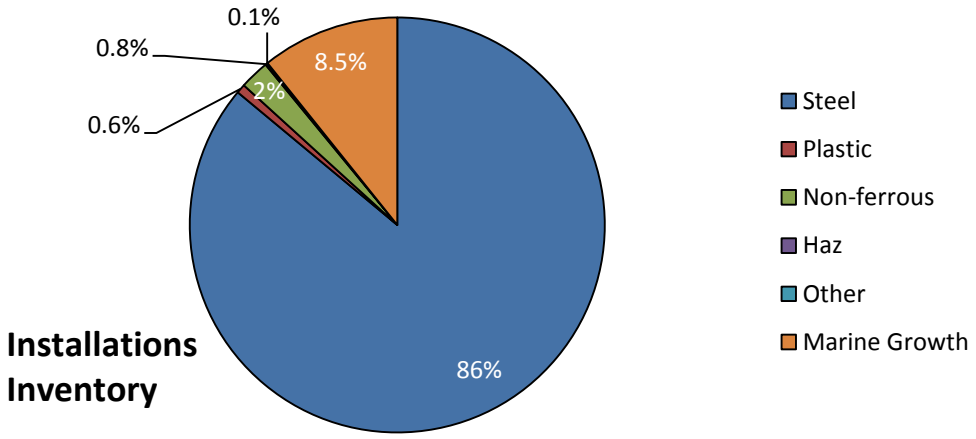
## 2.6 Inventory Estimates

| Table 2.7 Installations Inventory Estimates | | | |
|---|---|---|---|
| **Material** | **Mass (te)** | **Material** | **Mass (te)** |
| Steel | 1644 | Rubber | 1 |
| Aluminium | 26 | PCBs | None |
| Stainless Steel | 4 | Residual oils | 0.05kg |
| Copper | 9 | Other | 1* |
| Lead | 1 | Paint | 1** |
| Zinc | 1 | Marine growth | 205 |
| Plastics | 11 | Mercury | 0.012kg |
| Rockwool | 1 | Hazardous | 3 |
| | | **Total** | 1909 |

* *Butyl Rubber, Ceramics, CFCs, Sulphuric acid and wood.*

** Estimate

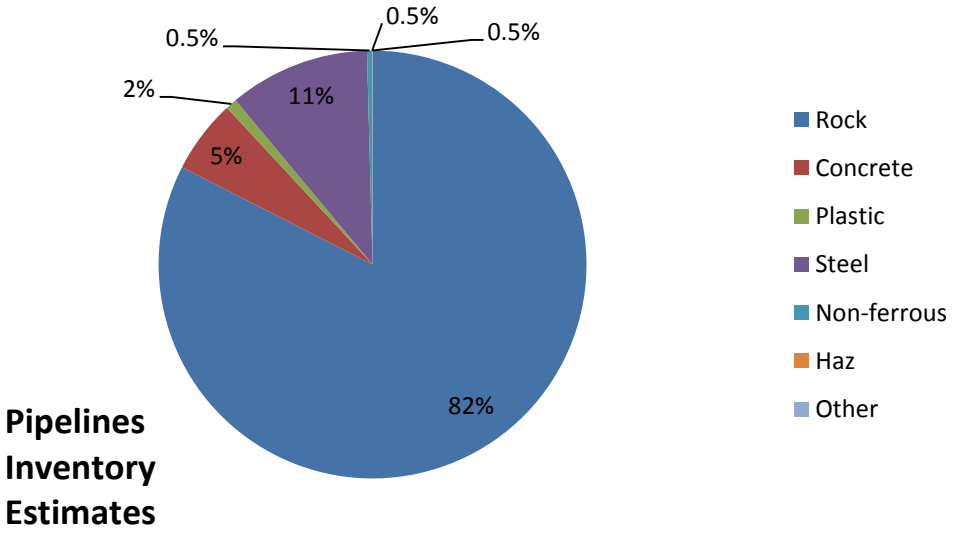
**Figure 2.6.1 Pie Chart of Installations Inventory Estimates**




**Total Tonnage = 1909te**

| Table 2.8 Pipelines Inventory Estimates | | | |
|---|---|---|---|
| **Material** | **Mass (te)** | **Material** | **Mass (te)** |
| Steel | 1534 | Rock | 11884 |
| Aluminium | 1 | Concrete | 802 |
| Copper | 54 | Hazardous | 2 |
| Other non ferrous | 1 | Residual Oil | 1kg |
| Plastics | 122 | Paint | 1* |
| *Estimate | | **Total** | 14401 |

**Figure 2.6.2 Pie Chart of Pipelines Inventory Estimates**




**Total Tonnage 14401te**

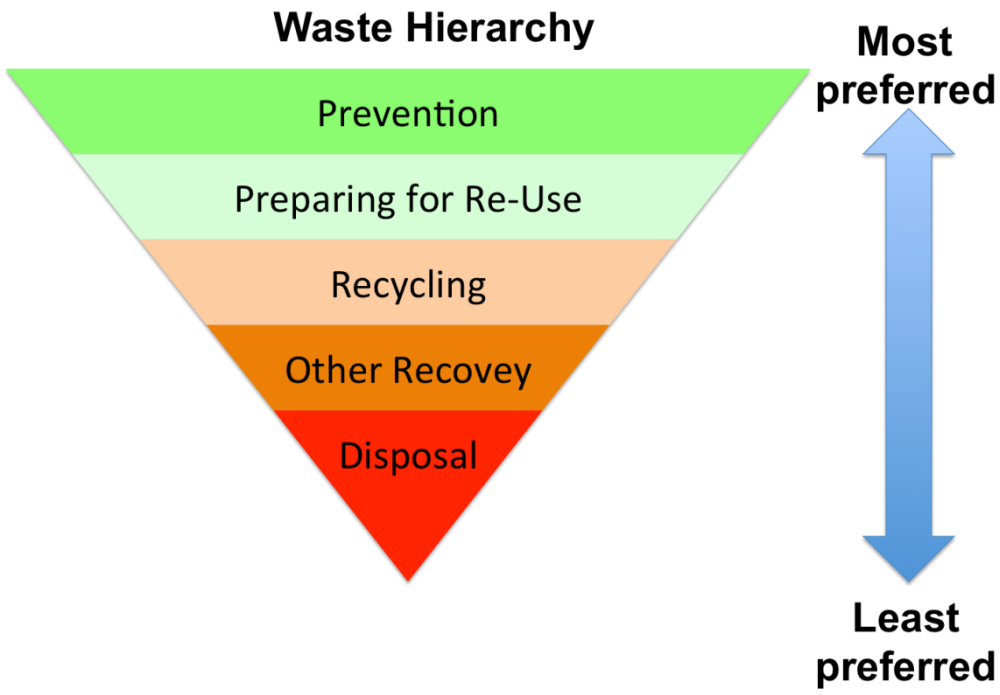
## 3.0 Removal and Disposal Methods

Potential for reuse of the Jacky wellhead platform and mid line tee structures are being actively pursued.

Wastes generated during decommissioning will be segregated and recorded by type and periodically transported onshore to licensed waste contractors. Steel and other recyclable metals are estimated to account for the greatest proportion of the materials inventory.

Ithaca has adopted a waste hierarchy that aligns with the principles of the EU Waste Framework Directive and associated legislation, see figure 3.0 for details. With the "reduce" option unavailable at this stage in the Jacky development, in line with the waste hierarchy, the re-use of an installation (or parts thereof) is therefore first in the order of preferred disposal options considered.

**Fig 3.0 Ithaca Waste Hierarchy**




The subsea production equipment is relatively modern and it may be possible to re-use elsewhere.

## 3.1 Topsides decommissioning Overview

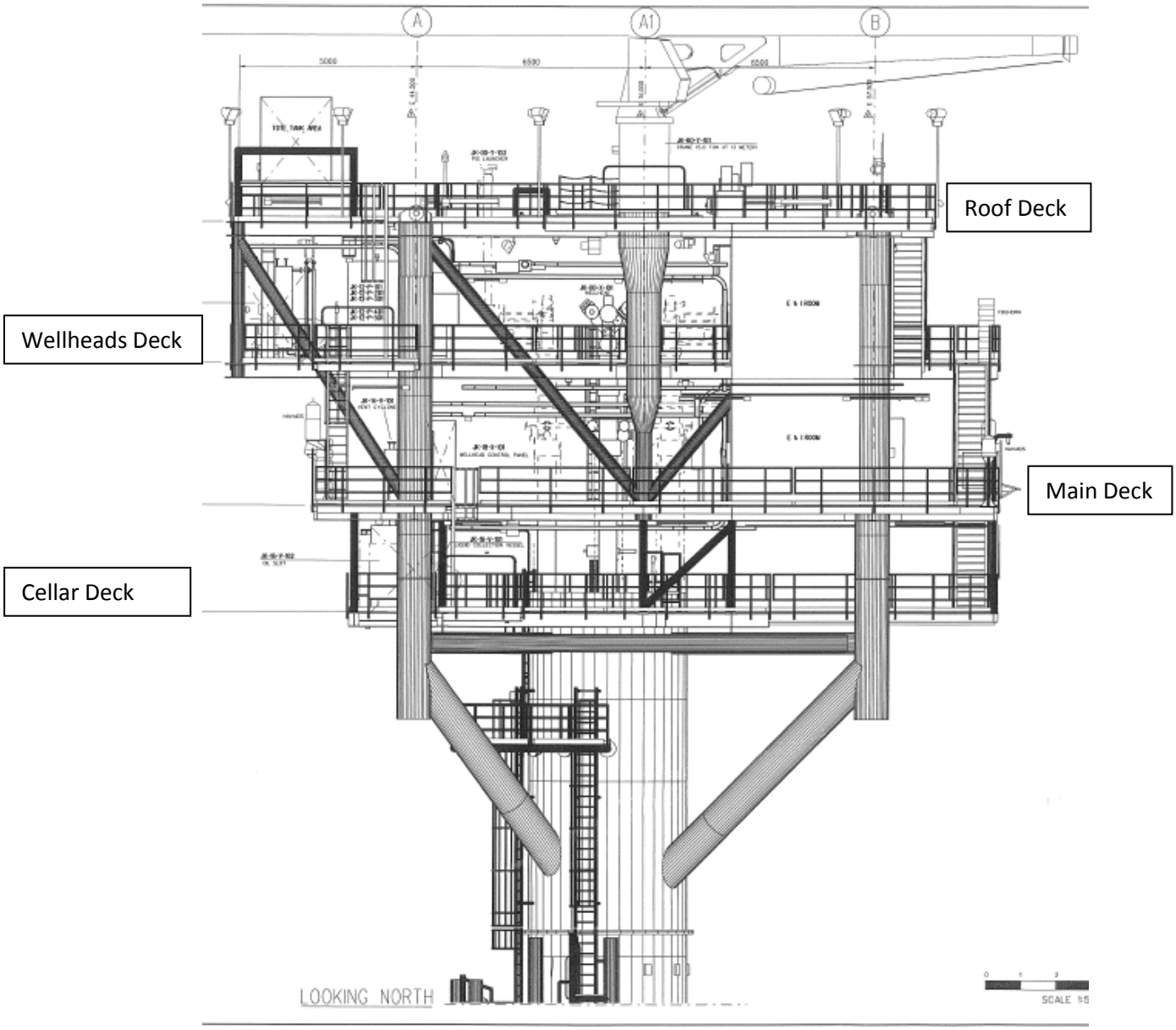
The Jacky WHP is a normally unmanned tripod platform with a central column platform. It is positioned over the well location with a topsides tree and production manifold, see figure 3.1 for illustration.
In preparation for CoP the topsides production pipework was flushed with treated seawater to <10mg/ml OIW content.
All chemicals and hydraulic fluids were decanted and sent onshore for disposal at a licensed site.

| Table 3.1 Cleaning of Topsides for Removal | | |
|---|---|---|
| **Waste Type** | **Composition of Waste** | **Disposal Route** |
| Onboard Hydrocarbons | Process Fluids | Hydrocarbons were removed during pipeline flushing to Beatrice Alpha for processing. |
| Other Hazardous Materials | Chemicals and Lubricants | Chemicals and lubricants were flushed, decanted and transported to Nigg Oil Terminal for treatment and disposal.<br>NORM is not expected, if present will be disposed of in accordance with the appropriate permit. |
| Original paint coating | The presence of lead based paints will be identified | May cause toxic fumes/dust if cutting/blasting or grinding. Appropriate safety measures will be employed. Painted items will be disposed of onshore with consideration given to any toxic components. |
| Asbestos and ceramic fibre | Asbestos is not present on the installation, Ceramic fibre may be present in small quantities | Ceramic fibre will be disposed of via an appropriately licenced waste management contractor |

**Removal methods:** the topsides will be completely removed and returned to shore. Possible methods of removal are outlined in Table 3.2.

| Table 3.2 Topsides Removal Method | |
|---|---|
| 1) Semi-Submersible Crane vessel ☑; 2) Monohull Crane Vessel ☑; 3) Sheer Leg Vessel ☑; 4) Jack up Work Barge ☑; 5) Piece small or large ☑; 6) Complete with jacket ☑; | |
| **Proposed Method** | **Description** |
| Removal and disposal onshore. | Single lift removal by HLV/ barge Removal of topsides separately as complete unit and transportation to onshore for preparation for re-use or recycling. A final decision on the disposal route will be made following a commercial tendering process. |

**Fig 3.1 Jacky Topsides**

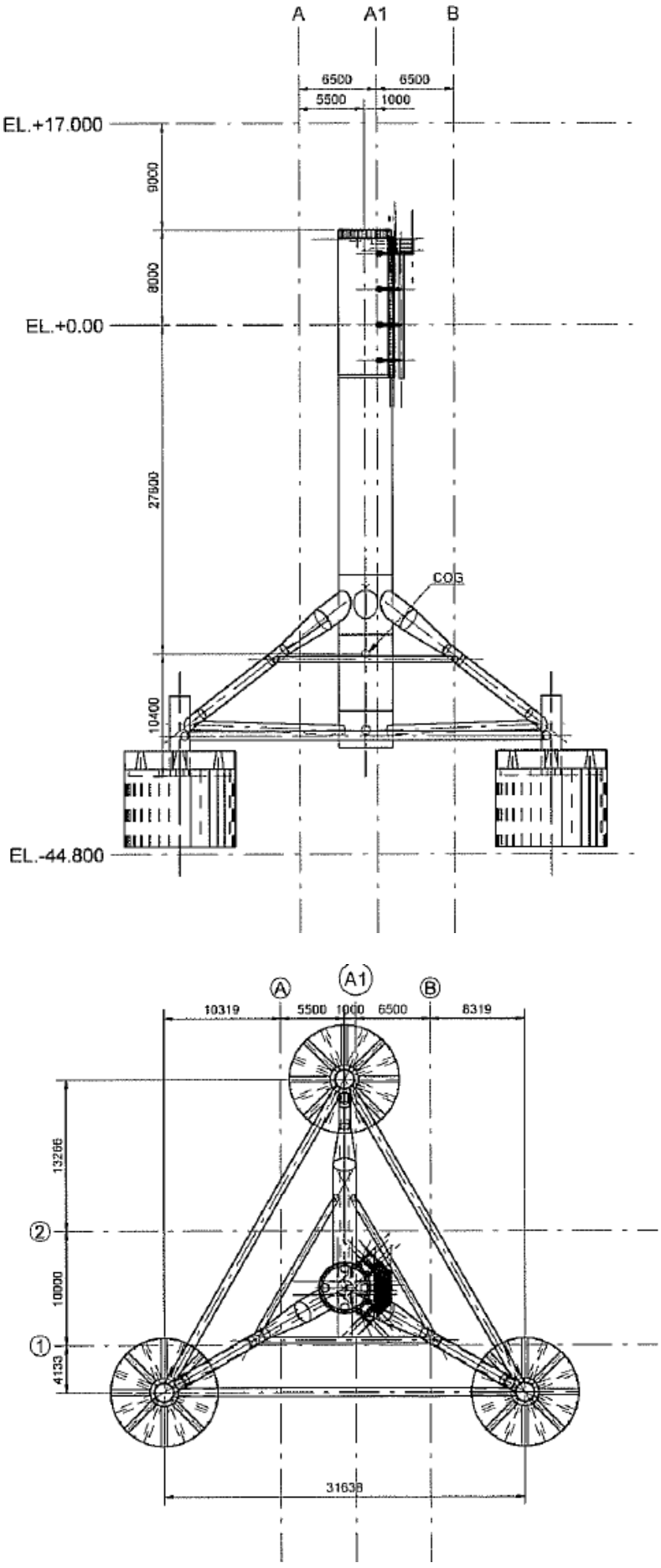



## 3.2 Monopile/Jacket Decommissioning Overview

In preparation for CoP the production riser was flushed with treated seawater to <10mg/ml OIW content.

| Table 3.3 Jacket Removal Method | |
|---|---|
| 1) Semi-Submersible Crane vessel ☑; 2) Monohull Crane Vessel ☑; 3) Sheer Leg Vessel ☑; 4) Jack up Work Barge ☑; 5) Piece small or large ☑; 6) Complete with jacket ☑; | |
| **Proposed Method** | **Description** |
| Removal and disposal onshore. | Single lift removal by HLV/ barge. Removal of monopile jacket by reverse installation, will be recovered complete with the suction piles and transported onshore for preparation for re-use or recycling. The top of the monopile is rigged to the crane and the suction piles are released by pumping water into the top of each can. The removal of the suction piles is not expected to result in either large depressions in, or mounds on, the seabed, with only minimum seabed disturbance expected Refer to section 3 of the EIA for full explanation. A final decision on the disposal route will be made following a commercial tendering process. |

**Fig 3.2 Jacky Monopile, Base and Suction Piles**



## 3.3 Installations: Subsea and Stabilisation Features

| Table 3.4: Installations: Subsea and Stabilisation Features | | | |
|---|---|---|---|
| **Subsea installations and stabilisation features** | **Number** | **Option** | **Disposal Route (if applicable)** |
| Well completions including ESP's, Cables, Tubing and top 4.5m section of casings. | 3 | Fully recovered (UK) as part of MODU (Jack up) campaign to P and A wells | Return to shore for re-use or recycling. Destination will be dependant on contracts. |
| Midline Tee Structure including ballast weights. | 1 | Fully Recovered (UK) | Return to shore for re-use or recycling. Destination will be dependant on contracts. |
| Template | n/a | | |
| Wellhead protection structure | n/a | | |
| Tree | n/a | | |
| Concrete mattresses | n/a | | |
| Sand and grout bags | n/a | | |
| Formwork | n/a | | |
| Frond Mats | 28 | Fully recovered (UK) It is intended that the frond mats be recovered to shore, however in the event of practical difficulties BEIS will be consulted and a comparative assessment submitted. | Recover to onshore for re-use or recycling. Destination will be dependant on contracts. |
| Rock emplacement | n/a | | |
| Other | n/a | | |

## 3.4 Pipelines

Decommissioning Options:

*Key to Options:

1) Remove - reverse reeling
2) Remove - Reverse S lay
3) Trench and bury
4) Remedial removal
5) Remedial trenching
6) Partial Removal
7) Leave in place
8) Other
9) Remedial rock-dump

| Table 3.5 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** |
| PL2557 | Trenched/Buried | Whole | 1,4,5,6,9 |
| PL2558 | Trenched/Buried | Whole | 1,4,5,6,9 |
| PL2559 | Trenched/Buried | Whole | 1,4,5,6,9 |
| PL2560 | Trenched/Buried | Whole | 1,4,5,6,9 |
| PLU2561 | Trenched/Buried | Whole | 1,4,5,6,9 |

**Comparative Assessment Method:**

Ithaca developed a framework for conducting a Comparative Assessment using qualitative and quantitative data to evaluate the alternative decommissioning options outlined in table 3.5. This framework draws from OSPAR 98/3 and BEIS's Decommissioning guidance. A methodology and scoring system was used to assess the relative performance of each of the potential decommissioning options for the pipelines and power

cable, with results presented in the Matrix in Appendix A and discussed in Section 6 of the Jacky Decommissioning Comparative Assessment.

Initially all decommissioning options were considered at a screening meeting to establish potential options to consider for risk assessment: Options 2, 3, 7 & 8 were discounted during screening as unsuitable as discussed in the CA report.
The assessment workshop objectives were to assess the technical feasibility and risk of major operations failure for all identified decommissioning options for the associated pipelines.

The list below contains the options considered during the multidisciplinary assessment workshop consisting of experienced in house and external participants.

1) Remove - reverse reeling
4) Remedial removal
5) Remedial Trenching
6) Partial Removal
9) Remedial rock-dump

**Outcome of Comparative Assessment:**
Following the above exercise the table below catalogues the preferred options for the decommissioning of the pipelines.

| Table 3.6: Outcomes of Comparative Assessment | | |
|---|---|---|
| **Pipeline or Group** | **Recommended Option*** | **Justification** |
| PL2557 | 6 | Sections between Jacky – Mid Line T and Alpha are trenched and buried, (to > 0.6.m) with rock dump and will be left in situ. All exposed tie-in spools matresses and grout bags will be disconnected/recovered and removed by crane to DSV or support vessel and returned onshore for re-use or recycling (where possible) or disposal. Pipeline ends will be buried, (to > 0.6m). This will cause some minor disturbance to the seabed local to the removal site, however the environmental effect is judged to be minimal. Alpha riser will be removed with the jacket by Repsol Sinopec. |
| PL2558 | 6 | Section between Mid Line T and Bravo is trenched and buried (to > 06.m) with rock dump and will be left in situ. All exposed tie-in spools matresses and grout bags will be disconnected/recovered and removed by crane to DSV or support vessel and returned onshore for recycling (where possible) or disposal. Pipeline ends will be buried (to > 0.6m). This will cause some minor disturbance to the seabed local to the removal site, however the environmental effect is judged to be minimal. Bravo riser will be capped and will be removed with the jacket by Repsol Sinopec. |
| PL2559 | 6 | Sections between Jacky – Mid Line T and Alpha are trenched and buried (to > 0.6m) with rock dump and will be left in situ. All exposed tie-in spools matresses and grout bags will be disconnected/recovered and removed by crane to DSV or support vessel and returned onshore for recycling (where possible) or disposal. Pipeline ends will be buried (to > 0.6m). This will cause some minor disturbance to the seabed local to the removal site, however the environmental effect is judged to be minimal. Alpha riser will be removed with the jacket by Repsol Sinopec. |
| PL2560 | 6 | Section between Mid Line T and Bravo is trenched and buried (to > 0.6m) with rock dump and will be left in situ. All exposed tie-in spools matresses and grout bags will be disconnected/recovered and removed by crane to DSV or support vessel and returned onshore for recycling (where possible) or disposal. Pipeline ends will be buried (to > 0.6m). This will cause some minor disturbance to the seabed local to the removal site, however the environmental effect is judged to be minimal. Bravo riser will be removed with the jacket by Repsol Sinopec. |
| Table 3.6: Outcomes of Comparative Assessment | | |

| Pipeline or Group | Recommended Option* | Justification |
|---|---|---|
| PLU2561 | 6 | Power cable will be cut at both ends. The end sections along with the exposed matresses grout bags and tether/clump weight will be recovered to a CSV for return onshore for re-use or recycling (where possible) or disposal. The free ends will be buried > 0.6m and protected by repositioned rock dump. |

## 3.5 Pipeline Stabilisation Features

| Table 3.7 Pipeline Stabilisation Features | | | |
|---|---|---|---|
| **Stabilisation features** | **Number** | **Option** | **Disposal Route** |
| Concrete mattresses | 145 | Fully recovered (UK)<br>It is intended that the exposed mattresses be recovered to shore, however in the event of practical difficulties BEIS will be consulted and a comparative assessment submitted. | Recover onshore for recycling (where possible) or disposal. |
| Grout bags | 113 | Fully recovered (UK)<br>It is intended that the grout bags be recovered to shore, however in the event of practical difficulties BEIS will be consulted and a comparative assessment submitted. | Recover onshore for re-use recycling (where possible) or disposal. |
| Gabion bags | 2 | Full recovered (UK)<br>It is intended that the gabion bags be recovered to shore, however in the event of practical difficulties BEIS will be consulted and a comparative assessment submitted. | Recover onshore for re-use or recycling. |
| Frond mats | 20 | | N/A |
| Rock Dump | 11882te | To remain in place | N/A |
| Other<br>Power cable tether and clump wieght | 1 | Fully recovered (UK) | Recover onshore for re-use or recycling. |

## 3.6 Wells

| Table 3.8: Well Plug and Abandonment |
|---|
| The Jacky field consists of one production well, one water injection well and one previously drilled well that is currently suspended. The wells which remain to be abandoned, are listed in Section 2.4 (Table 2.5) will be plugged and abandoned in accordance with HSE DCR 1996 and Oil and Gas UK Guidelines for Abandonment of Wells. Issue 5, July 2015.<br>A PON5/Portal Environmental Tracking System (PETS)/Marine Licence application will be submitted in support of any such work that is to be carried out. |

## 3.7 Drill Cuttings

**Drill Cuttings Decommissioning Options:**

| Table 3.9 Drill Cuttings Decommissioning Options | | | |
|---|---|---|---|
| How many drill cuttings piles are present? | | | 3 |
| Tick options examined:<br>☐Remove and re-inject ✓Leave in place ☐Cover ☐Relocate on seabed<br>✓Remove and treat onshore ☐Remove and treat offshore ☐Other | | | |
| **Review of Pile characteristics** | **Pile 1** | **Pile 2** | **Pile 3** |
| How has the cuttings pile been screened? Desktop exercise | Y | Y | Y |
| Dates of sampling (if applicable) | N/A | N/A | N/A |
| Sampling to be included in pre-decommissioning survey? | N | N | N |
| Does it fall below both OSPAR thresholds? | Y | Y | Y |
| Will the drill cuttings pile have to be displaced in order to remove the jacket? | N | N | N |
| What quantity ($m^3$) would have to be displaced/removed? | N/A | N/A | N/A |
| Will the drill cuttings pile have to be displaced in order to remove any pipelines? | N | N | N |
| What quantity ($m^3$) would have to be displaced/removed? | N/A | N/A | N/A |
| Have you carried out a Comparative Assessment of options for the Cuttings Pile? | Y | Y | Y |

**Comparative Assessment Method:**

The well programme for the Jacky field was developed to allow discharge of drill cuttings for the top hole sections only which were completed using water based mud. Lower hole sections that required oil based mud systems utilised a skip and ship regime. All lower hole sections completed had the drill cuttings removed to onshore for treatment and disposal

The discharged drill cuttings at each of the wellheads were from the top hole sections of the wells only which were completed using a water based mud. These piles do not contain any oil based mud cuttings and the piles have dispersed.

It was therefore accepted to consider the options to either to leave in place or remove and treat onshore.

**Outcome of Comparative Assessment:**
Given the evidence that localised repopulation by incumbent flora and fauna had effectively reclaimed the area. The decommissioning team chose the option to leave in place as this was considered the most environmentally friendly option.

## 3.8 Waste Streams

| Table 3.10 Waste Stream Management Methods | |
|---|---|
| **Waste Stream** | **Removal and Disposal method** |
| Bulk liquids | Production system including pipelines, manifold and risers are flushed with treated sea water <10mg/l OIW Pipeline ends will be capped and any residual fluids from within the subsea facilities will be released to the marine environment under permit prior to removal to shore. Further cleaning and decontamination will take place onshore prior to re-use/recycling. |
| Marine growth | Removed offshore and disposed of according to BEIS guidelines. Residual marine fouling will be removed onshore at a recognised and certified disposal contractor's base. Disposed as waste according to SEPA guidelines. |
| NORM/LSA | NORM is not expected, however NORM/Benzene checks will continue as part of the clean- |

| | |
|---|---|
| Scale | up/disposal process. Any NORM encountered will be dealt with and disposed of in accordance with guidelines. |
| Asbestos Waste | N/A |
| Other hazardous wastes | Will be recovered to shore and disposed of according to guidelines, company policies and under the appropriate permit. |
| Onshore Dismantling sites | Appropriate licensed sites will be selected. Facility chosen by removal contractor must demonstrate proven disposal track record and waste stream management throughout the deconstruction process and demonstrate their ability to deliver innovative recycling options. |

**Table 3.11 Inventory Disposition**

| Inventory | Region | Total Inventory Tonnage | Planned Tonnage to shore | Planned Left in Situ |
|---|---|---|---|---|
| Installations | UK | 1909 | 1756 | 155* |
| Pipelines | UK | 14403 | 639 | 13763** |

* Assumed 75% of Marine growth removed during offshore cleaning is left in situ
**Includes Rock Dump 11882te

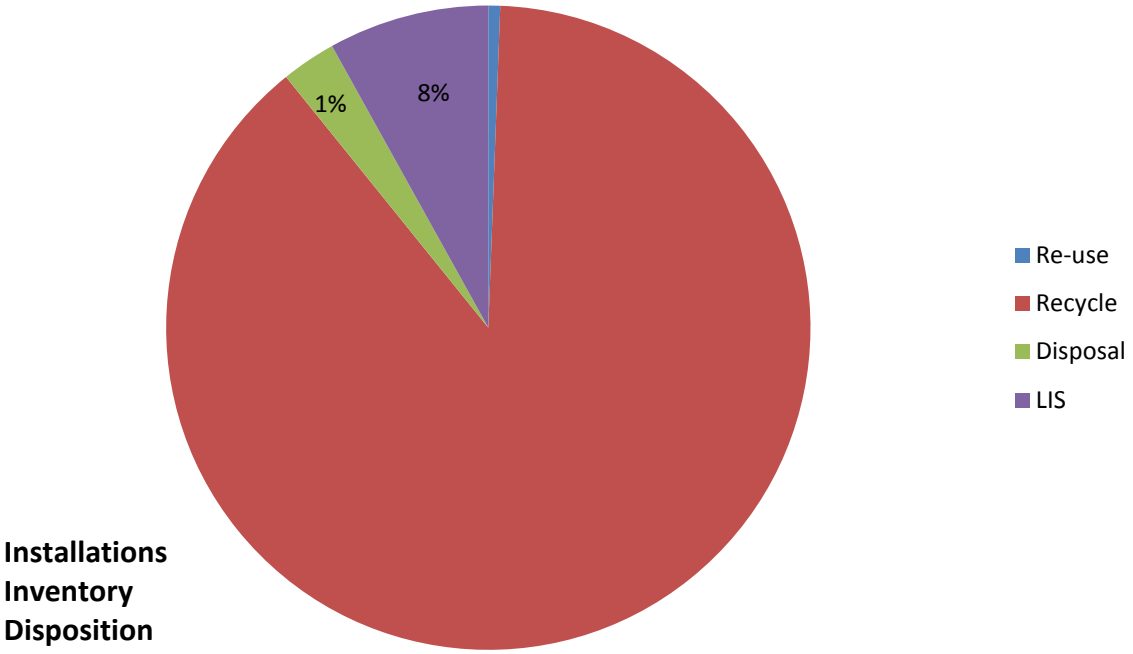
All removed materials will be returned onshore for re-use or recycling. Ithaca actively pursued a possible re-use opportunity for some of the topsides , risers, monopile jacket (complete with suction piles) and the Mid Line T structure which is currently no longer considered viable however these will be revisited closer to actual disposal date.

All recovered material will be transported onshore for re-use recycling or disposal. It is not possible to predict the quantity of materials that will be re-used as this will depend entirely on market conditions. The figures in Table 3.12 are best case.

**Table 3.12 Re-use, Recycle & Disposal Aspirations for Material Recovered Onshore**

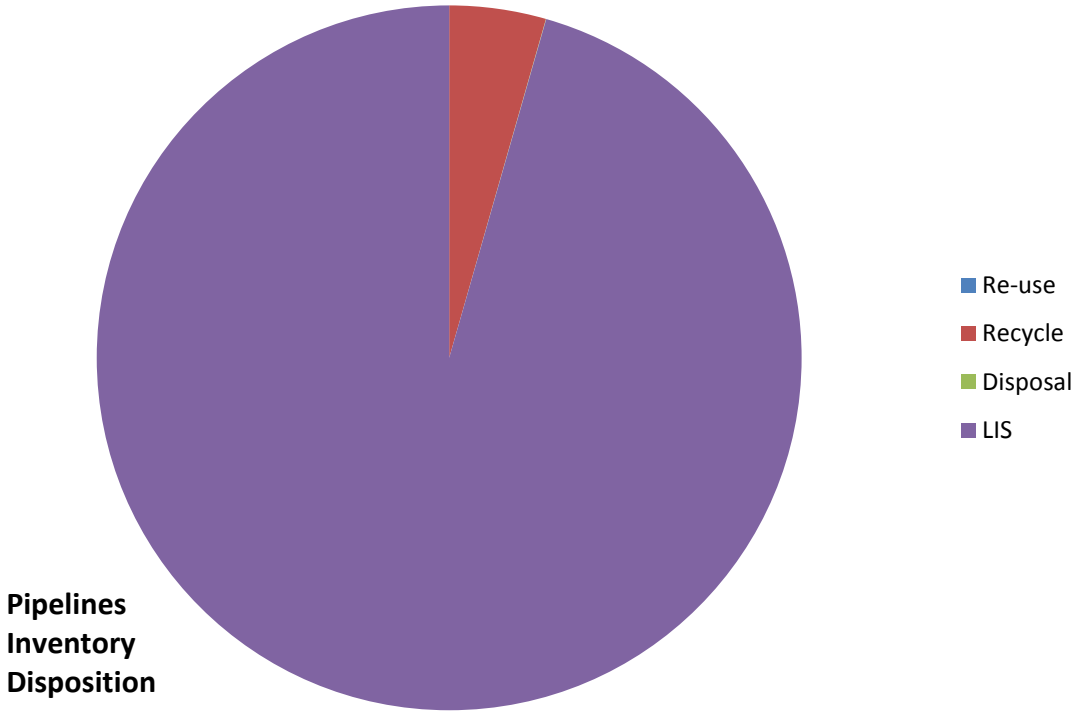
| Inventory | Region | Re-use | Recycle | Disposal |
|---|---|---|---|---|
| Installations | UK (1,909 Tonnes) | Approx. 1% | Approx. 96% | 3% |
| Pipelines | UK (639 Tonnes) | Approx. 0% | Approx. 99.7% | 0.3% |

**Fig 3.8.1 Installations Inventory Disposition**




**Total Tonnage 1909te**

**Fig 3.8.2 Pipelines Inventory Disposition**




**Total Tonnage 14403te**

# 4.0 Environmental Impact Assessment (Environmental Statement)

## 4.1 Environmental Sensitivities (Summary)

**Table 4.1 Environmental Sensitivities**

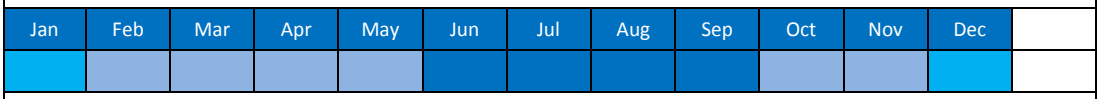
| Environmental Receptor | Main Features |
|---|---|
| Conservation interests | The importance of the area for breeding seabirds, wintering and migratory water birds, marine mammals and other features is reflected in the number and variety of designated sites, protected under a variety of national, international and non-statutory provisions. The Inner Moray Firth area has also been designated a marine SAC for the presence of bottlenose dolphin. (Year round importance).<br>It is possible that the Inner Moray Firth could be impacted should a large hydrocarbon release occur. However the likelihood of such an event is extremely low and the control and mitigation measures in place will minimise the impact therefore the residual risk to the area is low. No additional conservation management is required. |
| Seabed | Seabed sediments at the Jacky installation and along the pipeline route are predominantly medium to coarse sand with shell fragments, but extensive patches of coarse sand, gravel, pebbles and shells are also present. The latter showed minor troughs and ridges, with bands of coarser sediment oriented approximately northwest to southeast. Moving southwest towards Beatrice, sediments in the slightly deeper water (>40m) consisted of medium to fine sand with shell fragments. Along the pipeline route, Station 3 showed a notably coarser substrate, with abundant pebbles and some cobbles. Three boulders/debris were found within 50m of the pipeline route; the closest being some 6.5km from the Jacky installation. The boulders/debris did not exceed 0.5m measurable height.<br>The pipelines and connections have been flushed with treated sea water, therefore only residual volumes of chemicals/hydrocarbons will be released and the quantities covered by permit. The potential impact on the marine environment will be small and changes to the chemical composition of the sediment are low.<br>Impact on the seabed and its associated ecosystem will be short term with rapid recovery. An assessment of the potential impact on the seabed concluded that the significance of the impact is low. |
| Fish | The Jacky installation overlaps or abuts reported spawning grounds of eight commercially important fish and shellfish species (cod, herring, lemon sole, plaice, sandeels, sprat, whiting and *Nephrops*) – see below for summary of periods of spawning. The area also overlaps or abuts reported nursery grounds of eight commercially important species (herring, haddock, lemon sole, sprat, whiting, saithe, sandeels and *Nephrops*). Nursery ground for plaice are present throughout many of the coastal waters of the Moray Firth.<br>These fish populations could be affected by chemical/hydrocarbon releases to the marine environment and of the increased noise. The pipelines and connections have been flushed with treated sea water, therefore only relatively small volumes of chemicals/hydrocarbons will be released and the quantities covered by permit. The potential impact on the fish population has been assessed as of low significance.<br>Given the existing background noise levels and the relatively short duration of the decommissioning activities, the underwater noise levels generated by vessels are unlikely to lead to physiological damage to fish. While the fish may be disturbed by the noise generated in the immediate vicinity of the decommissioning area the noise will be short term and has been assessed as low significance. |
| Fisheries | Impacts on fishing industry have been assessed as low significance as the decommissioning activities will be relatively short term. The area will be over trawled to ensure there are no snag hazards post decommissioning. The safety exclusion zone at the wellhead platform will be removed on completion of the project, thereby returning the area available for fishing. |

| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 5 | 4 | 4 | 4 | 4 | 3 | 4 | 3 | 1 | 2 | 3 |

Key: 1 = 1 species spawning, 2 = 2 species spawning, 3= 3 species spawning

**Table 4.1 Environmental Sensitivities**

<table>
<tr><th>Environmental Receptor</th><th>Main Features</th></tr>
<tr><td>Marine Mammals</td><td>The Moray Firth area is important for bottlenose dolphin, harbour porpoise and to a lesser extent white-beaked dolphin and Minke whale. The area supports the only known resident population of bottlenose dolphin in the North Sea and although present year round, highest numbers are seen in coastal waters between May and September. Risso's dolphin and killer whale are also recorded in the outer Moray Firth area. The area also supports important breeding and haul out sites for common and grey seal and both species are likely traverse through the block.<br>Given the existing background noise levels and the relatively short duration of the decommissioning activities, the underwater noise levels generated by vessels are unlikely to lead to physiological damage to marine mammals. While the cetaceans & pinnipeds sighted in the area may be disturbed by the noise generated in the immediate vicinity of the decommissioning area the noise will be short term and has been assessed as low significance.
<table>
<tr><td>Jan</td><td>Feb</td><td>Mar</td><td>Apr</td><td>May</td><td>Jun</td><td>Jul</td><td>Aug</td><td>Sep</td><td>Oct</td><td>Nov</td><td>Dec</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
Key: Darker colour reflects months when marine mammals most frequently observed</td></tr>
<tr><td>Birds</td><td>The Jacky area and surrounding region are of very high importance for seabirds; their vulnerability to surface pollution is very high throughout the year. The region is important for breeding, wintering and migratory birds and contains important feeding areas. The Moray Firth coasts support a number of designated sites for their bird assemblages (breeding and wintering).<br>Seasonal seabird vulnerability to surface pollution in the proposed development area:<br>Seabird vulnerability to surface pollution for block 12/21c. The greatest risk to birds would be an accidental large release of hydrocarbons. Oil spill modelling has shown that should a worst case diesel release occur, only small volumes can be expected to remain on the sea surface after 10 days. Although birds could be affected the relatively short duration that diesel would be expected to remain on the sea surface the potential impact is of low significance.
<table>
<tr><td>Jan</td><td>Feb</td><td>Mar</td><td>Apr</td><td>May</td><td>Jun</td><td>Jul</td><td>Aug</td><td>Sep</td><td>Oct</td><td>Nov</td><td>Dec</td></tr>
<tr><td>5</td><td>5</td><td>5</td><td>5</td><td>5</td><td>5</td><td>5</td><td>5</td><td>5</td><td>5</td><td>5</td><td>5</td></tr>
</table>
Key 1=Very Low – 5 Very High.</td></tr>
<tr><td>Other Users of the Sea</td><td>The Jacky area lies within ICES rectangle 44E6 this area receives considerable fishing effort, primarily from demersal trawlers targeting Nephrops and demersal fish. In 2015, UK landings into Scotland from rectangle 44E6 were worth approximately £2.1m. Fishing effort fluctuates considerably between months and years, although effort seems to be greatest from Jun-Sep and Dec-Jan. Nine shipping routes pass within 10nm of the Jacky platform, although traffic density is low. The development overlaps one Air Force Department area, which may periodically be used for air combat training and high-energy manoeuvres. The Beatrice field contains the closest offshore energy production facilities to the proposed development; the Beatrice B/CSS platform lies 5km to the southwest, while the proposed pipeline route passes 800m northwest of the B/CSS platform and alongside water and oil pipelines before meeting the A platforms to the southwest. Two wind turbines lie 1.6 and 2.3km south-southeast of the Beatrice AP platform. The closest telecommunication cable to the proposed development lies approximately 24km to the east, and an electricity cable runs from the coast near Helmsdale to the Beatrice facility. There are no designated protected wrecks in the area, but several wrecks are known.<br>There is potential for construction activities in the area with the Beatrice offshore windfarm and Moray offshore windfarm developments discussions with both parties are underway to identify any areas of collaboration to reduce vessel activity in the area.<br>In addition decommissioning activities related to the Beatrice field may also provide areas for collaboration and discussions have commenced.</td></tr>
</table>

<table>
<tr><th colspan="2">Table 4.1: Environmental Sensitivities</th></tr>
<tr><th>Environmental Receptor</th><th>Main Features</th></tr>
<tr><td>Other Users of the Sea</td><td>There will be a relatively short period when decommissioning vessels will be operating around the Jacky area and there will be a higher than normal level of shipping activity. However the associated effects will be short term. All material with the exception of rock dump will be removed from the seabed therefore the long term impact on other users of the sea has been assessed as low.<br><br>  <br>Key: Darker colour reflects months when fishing effort is typically greater</td></tr>
<tr><td>Onshore Communities</td><td>The impact of the disposal of waste from the decommissioning activities on onshore communities would be slightly beneficial as it will contribute to job continuation. However this is expected to be small as the disposal sites already exist and the volume of waste is relatively small.</td></tr>
<tr><td>Atmosphere</td><td>Generally conditions offshore provide an environment which leads to the rapid dispersion and dilution of any emissions to atmosphere. The majority of decommissioning activities will be conducted at the field location and emissions can mainly be attributed diesel fuel from the various vessels required. These are likely to be short term durations, highly localised and assessed as low significance. The emission of combustion gases will contribute to global effects (e.g. global warming and acid rain). However given the relatively small volume of gases to be emitted and the control and mitigation measures that will be implemented the significance of the impact is low.</td></tr>
</table>

## 4.2 Potential Environmental Impacts and their Management

**Environmental Impact Assessment Summary:**

**Overview:** Although there is expected to be some environmental impact during the decommissioning of the Jacky infrastructure 12/21c. Long term environmental impacts from the decommissioning activities are expected to be negligible. In addition, incremental cumulative impacts and trans-boundary effects associated with the planned decommissioning activities are expected to be negligible. There will be no planned use of explosives during these activities. We acknowledge that there will be a requirement for an environmental protection plan to be produced and submitted to BEIS should this plan change.

**Table 4.2: Environmental Impact Management**

| Activity | Main Impacts | Management |
|---|---|---|
| Topsides Removal | Removal of the topsides will cause some localised environmental impact while the lifting and support vessels are active due to noise. This will be a short duration activity. | Removal is a reverse of the installation methodology. Minimal disturbance is caused to the surrounding areas, activities will be planned to be executed as efficiently as possible. Vessels will be manged to minimise the durations required while on board practices will address fuel efficiency, noise and waste management. |
| Jacket Removal | Removal of the monopile jacket and suction piles will cause some localised environmental impact at the individual suction can sites. Vessel noise will also have an impact. The effects are expected to be short term and the seabed and associated ecosystem is expected to recover rapidly once activities are complete. Indents on the seabed are not expected as a result of the removal of Jacky. | Removal is a reverse of the installation methodology. Minimal disturbance is caused to the seabed, activities will be planned to be executed as efficiently as possible. Vessels will be manged to minimise the durations required while on board practices will address fuel efficiency, noise and waste management. In the event of practical difficulties in removing the suction piles by reverse installation alternative methods of removal will be discussed and agreed with the regulator. |
| Subsea Installations Removal | Removal of Mid line tee structure will cause some localised environmental impact on the seabed due to lifting and temporary laydown of equipment. Vessel noise will also have an impact. The effects are expected to be short term and the seabed and associated ecosystem is expected to recover rapidly once activities are complete. | Decommissioning activities will be planned to be executed as efficiently as possible, minimising disturbance of the seabed in order to reduce the impact on the affected areas. Vessels will be manged to minimise the durations required while on board practices will address fuel efficiency, noise and waste management. |
| Decommissioning Pipelines | Removal of the pipeline tie-in spools and Power cable ends will have a localised impact on the seabed.<br>Removal of the tie in spools will require temporary laydown on the seabed. Vessel noise will also have an impact. The effects are expected to be short term and the seabed and associated ecosystem is expected to recover rapidly once activities are complete. | Decommissioning activities will be planned to be executed as efficiently as possible, minimising disturbance of the seabed in order to reduce the impact on the affected areas. Vessels will be manged to minimise the durations required with on board practices will address fuel efficiency, noise and waste management. |

| Table 4.2: Environmental Impact Management | | |
|---|---|---|
| **Activity** | **Main Impacts** | **Management** |
| Decommissioning Stabilisation Features | There will be some localised disturbance of the seabed by relocating mattresses and grout bags prior to recovery.<br>Impacts will also be noise from the attendant vessels. The effects are expected to be short term and the seabed and associated ecosystem is expected to recover rapidly once activities are complete. | Decommissioning activities will be planned to be executed as efficiently as possible, minimising disturbance of the seabed in order to reduce the impact on the affected areas.<br>Vessels will be manged to minimise the durations required with on board practices will address fuel efficiency, noise and waste management. |
| Decommissioning Drill Cuttings | Minimal – drill cuttings will remain in place to degrade naturally | Drill cuttings do not contain any oil and fall below the OSPAR 2005/6 threshold limits |

## 5.0 Interested Party Consultations

**Consultations Summary:**

A scoping document was circulated to interested parties in the Moray Firth area for comment and input to the Environmental Impact Assessment. All comments received are identified and actioned in the Environmental Statement.

During the public consultation period, copies of the Decommissioning Programmes and supporting documents were forwarded to the following Statutory Consultees:

1. The Scottish Fishermen's Federation (SFF):
2. The National Federation of Fishermen's Organisations (NFFO);
3. The Northern Ireland Fish Producer's Organisation (NIFPO):
4. Global Marine Systems Limited (GMS).

Meetings and telephone calls have been held with SFF to advise of progress and to provide more detail of the proposals.

Copies of the Decommissioning Programmes were made available for inspection at the: -
BEIS Website https://www.gov.uk/guidance/oil-and-gas-decommissioning-of-offshore-installations-and-pipelines and at the following location during office hours.

7-8 Rubislaw Terrace, Aberdeen, AB10 1XE Contact, Angus Bertram 01224 650814 for appointments.

A public notice was published in the Times and Aberdeen Evening Express on xxth xx 2018 (please refer to Appendix A.1 for a copy of the public notice). The public notice gives instructions for representations to be made in writing by Monday xx$^{th}$ xx 2018

Copies were also submitted for consideration to BEIS.

**Table 5.1 Summary of Stakeholder Comments**

| Who | Comment | Response |
|---|---|---|
| **Informal Consultations** | | |
| Scottish Fisherman's Federation | Informal telephone conversations and a meeting at Ithaca office to present the outline decommissioning programmes | |
| Partners | High level presentation to partner on the decommissioning programmes | Minor comments on content and decommissioning programmes updated accordingly |
| **Statutory Consultations** | | |
| National Federation of Fishermen's Organisations | | |
| Scottish Fishermen's Federation | | |
| Northern Irish Fish Producers Organisation | | |

| Table 5.1 Summary of Stakeholder Comments | | |
|---|---|---|
| **Who** | **Comment** | **Response** |
| **Statutory Consultations** | | |
| Global Marine Systems Limited | | |
| Public | Invitation published in local and national newspapers for public notification of decommissioning including offer of decommissioning programmes and updated environmental assessment copies available for review and comment at Ithaca office and on the BEIS website. | |

# 6 Programme Management

## 6.1 Project Management and Verification

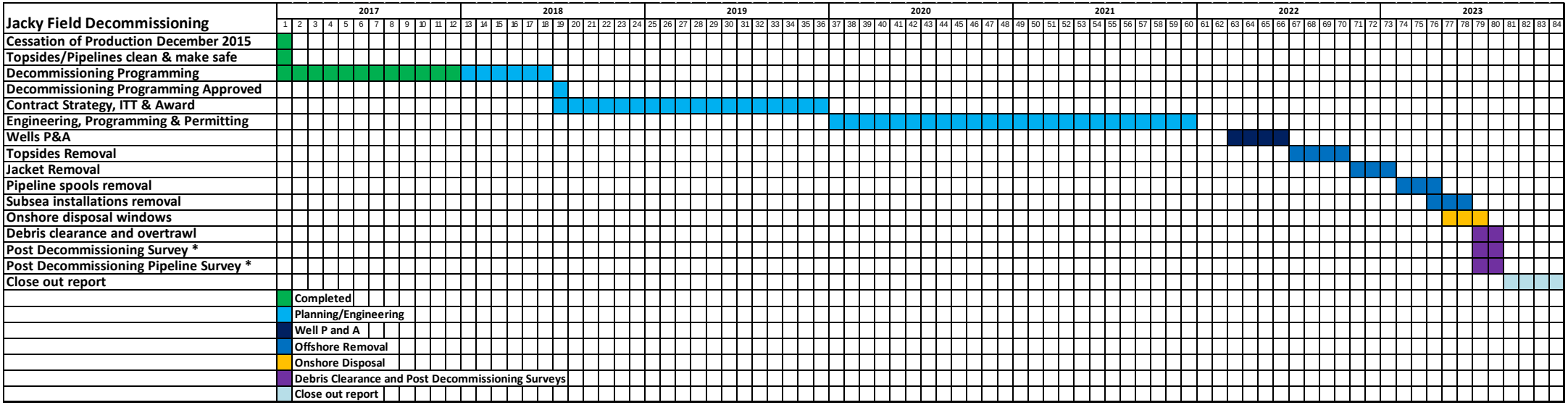
A Project Management team will be appointed to manage suitable sub-contractors for the removal of the installations and pipelines. Standard procedures for operational control and hazard identification and management will be used. The Management team will monitor and track the process of consents and the consultations required as part of this process. Any changes in detail to the offshore removal programme will be discussed and agreed with BEIS.

## 6.2 Post-Decommissioning Debris Clearance and Verification

A post decommissioning site survey will be carried out around 500m radius of installation sites and 200m corridor along each existing pipeline route. Any seabed debris related to offshore oil and gas activities 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 sites and pipeline corridors. This will be followed by a statement of clearance to all relevant governmental departments and non- governmental organisations.

## 6.3 Schedule

**Figure 6.1: Gantt chart of Project Plan**




**The timing of future surveys will be discussed and agreed with BEIS*

## 6.4 Costs

| Table 6.1 – Provisional Decommissioning Programmes costs | |
|---|---|
| **Item** | **Estimated Cost (£m)** |
| Topsides and Jacket preparation for removal | Provided to BEIS* |
| Pipelines Decommissioning | Provided to BEIS* |
| Subsea Installations and Stabilisation Features | Provided to BEIS* |
| Well Abandonment | Provided to BEIS* |
| Continuing Liability – Future Pipeline and Environmental Survey Requirements | Provided to BEIS* |
| **TOTAL** | Provided to BEIS* |

** An estimate of the overall cost has been provided separately to BEIS*

## 6.5 Close Out

In accordance with the BEIS Guidelines, a close out report will be submitted to BEIS explaining any variations from the Decommissioning Programmes 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 on sites of the wellhead platform and midline tee, will be conducted. The survey will focus on chemical and physical disturbances of the decommissioning 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 BEIS. All pipeline routes and installation sites will be the subject of surveys when decommissioning activity has concluded. After the surveys have been sent to BEIS and reviewed, a post monitoring survey regime will be agreed by both parties.

## 6.7 Management of Residual Liability

A full statement on legacy and liability management will be provided in the close out report;

- Ithaca recognises that the parties to the decommissioning programmes will continue to retain ownership of and residual liability for all decommissioned items allowed to remain in-situ through a comparative assessment.
- Ithaca will engage with BEIS on all future legacy and liability matters and requirements.

## 7.0 Supporting Documents

| Table 7.1: Supporting Documents | |
|---|---|
| Document Number | Title |
| ITH-JKY-DCOM-ENS-0001 | Environmental Statement |
| ITH-JKY-DCOM-ANA-0001 | Comparative Assessment |
| ITH-JKY-DCOM-STU-0001 | Review of Seabed Information |

## 8.0 Partner Letter of Support

**DYAS UK LIMITED**

## Appendix A.1 Public Notice

PUBLIC NOTICE
The Petroleum Act 1998

Jacky Field Decommissioning Programmes

Ithaca Energy (UK) Limited has submitted, for the consideration of the Secretary of State for Business, Energy and Industrial Strategy, draft Decommissioning Programmes for the Jacky Field facilities, associated pipelines and midline tee structure, in accordance with the provisions of the Petroleum Act 1998.

It is a requirement of the Act that interested parties be consulted on such decommissioning proposals. The items/facilities covered by the Decommissioning Programmes are:

Surface Installations;

- Topsides Wellhead platform with/including Monopile Jacket and Suction Piles

Subsea Installations;

- Mid Line Tee Structure

Pipelines;

- Mid Line Tee tie in spools
- Beatrice Alpha, Bravo and Jacky tie in spools
- Power supply cable

Copies of the Decommissioning Programmes can be inspected at the: - BEIS Website https://www.gov.uk/guidance/oil-and-gas-decommissioning-of-offshore-installations-and-pipelines and at the following location during office hours.

7-8 Rubislaw Terrace, Aberdeen, AB10 1XE Contact, Angus Bertram 01224 650814 for appointments

Representations regarding the Jacky Decommissioning Programmes should be submitted in writing to applicant's nominated contact at the above address, where they should be received by closing date xx 2018 and should state the grounds upon which any representations are being made.

Date: xx 2018

Angus Bertram Projects General Manager
Ithaca Energy (UK) Ltd
7-8 Rubislaw Terrace
Aberdeen
AB10 1XE

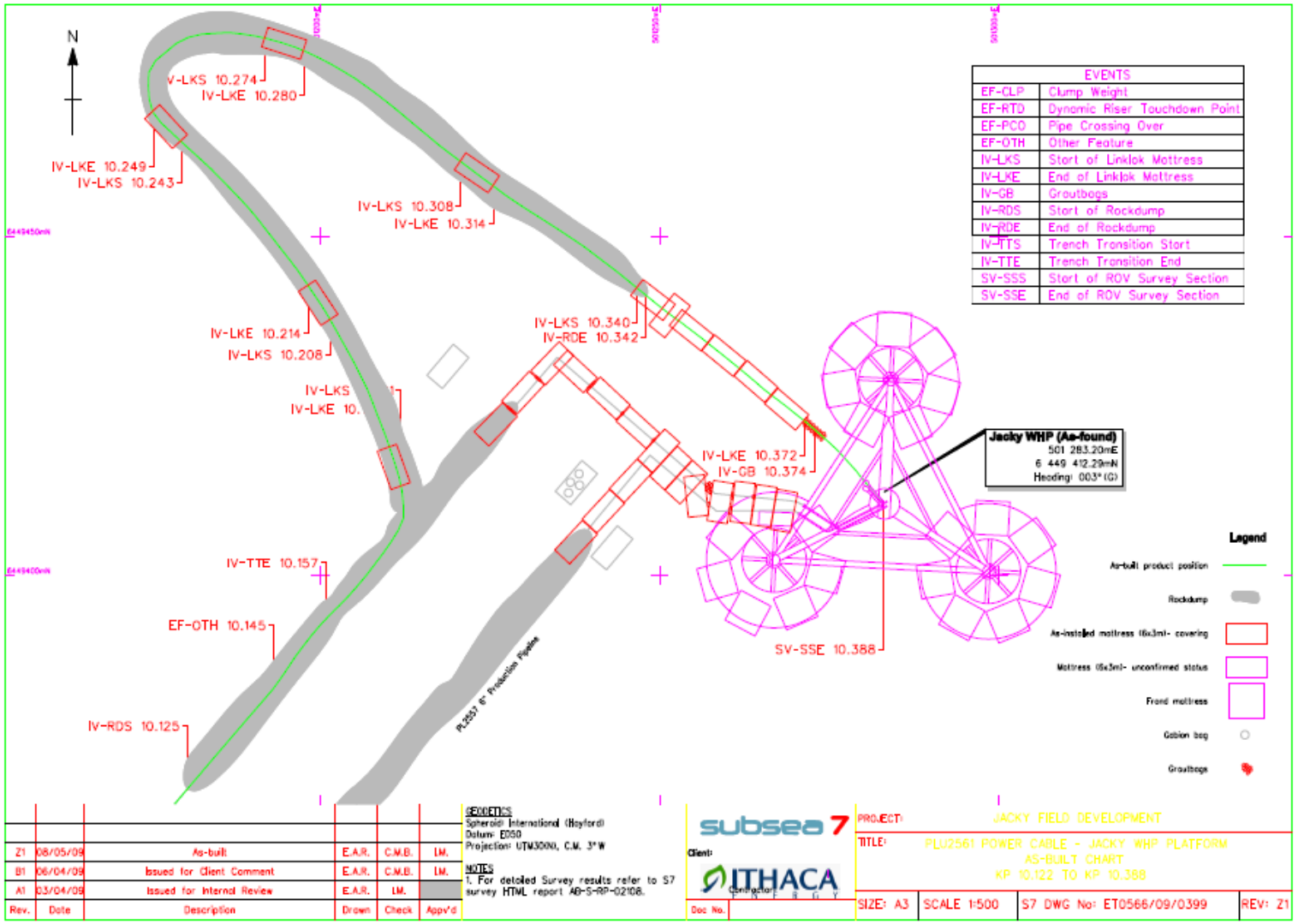
Copies of Public Notices

The Times

Aberdeen Evening Express

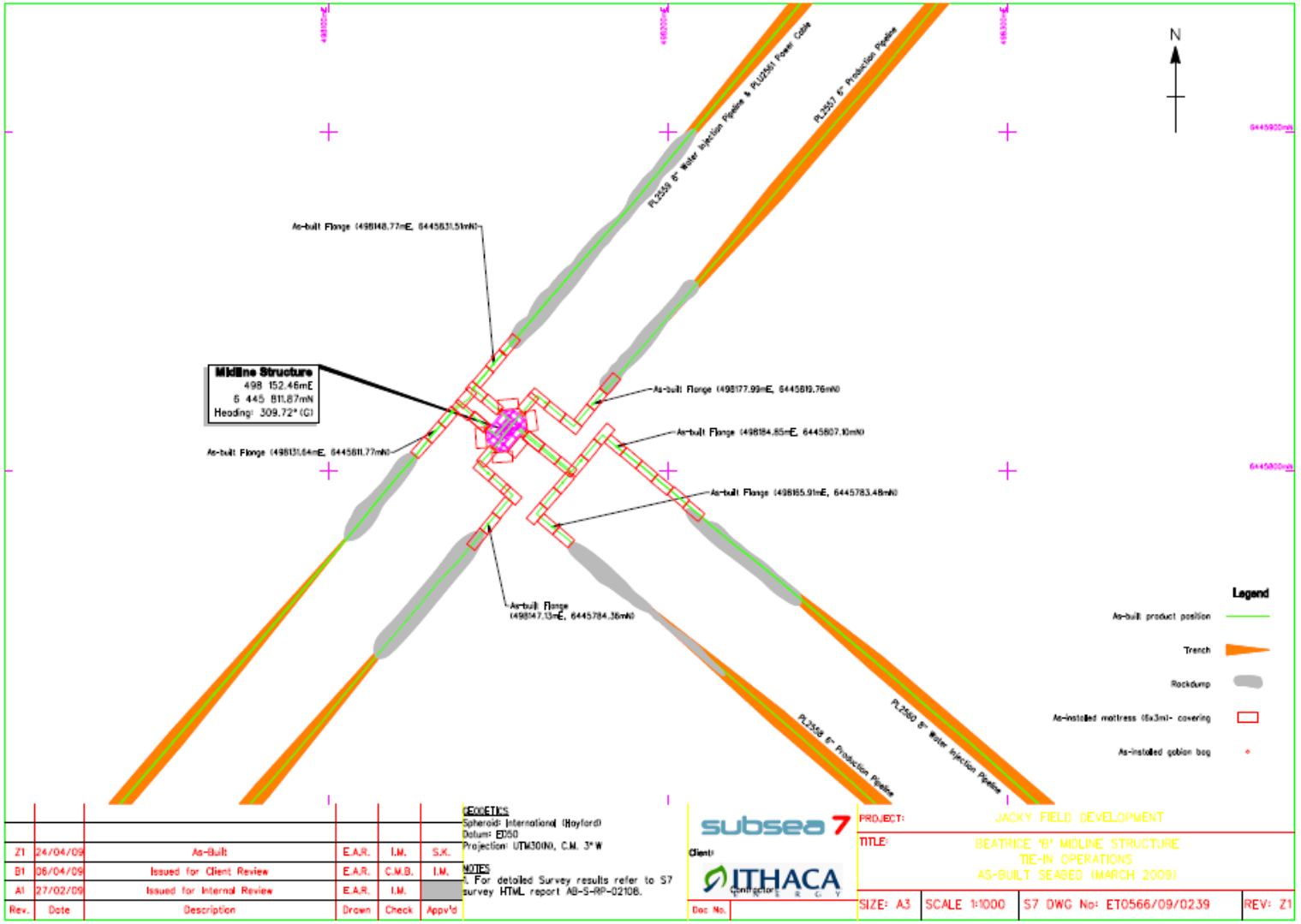
# Appendix B.1

## Pipeline Approaches at Jacky Platform as Built Drawing



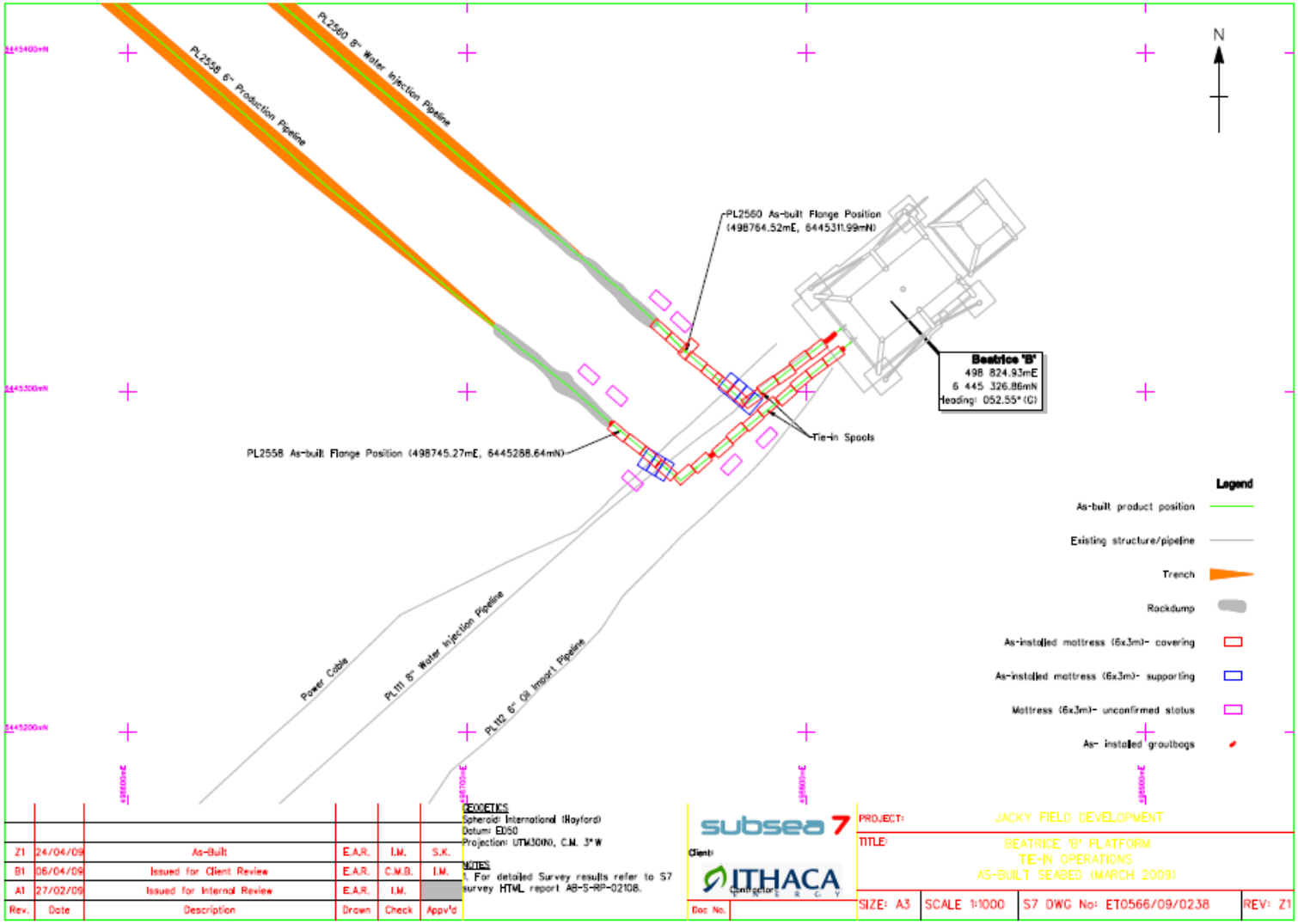
# Appendix B.2

## Pipeline Approaches at Mid Line T Structure As Built Drawing



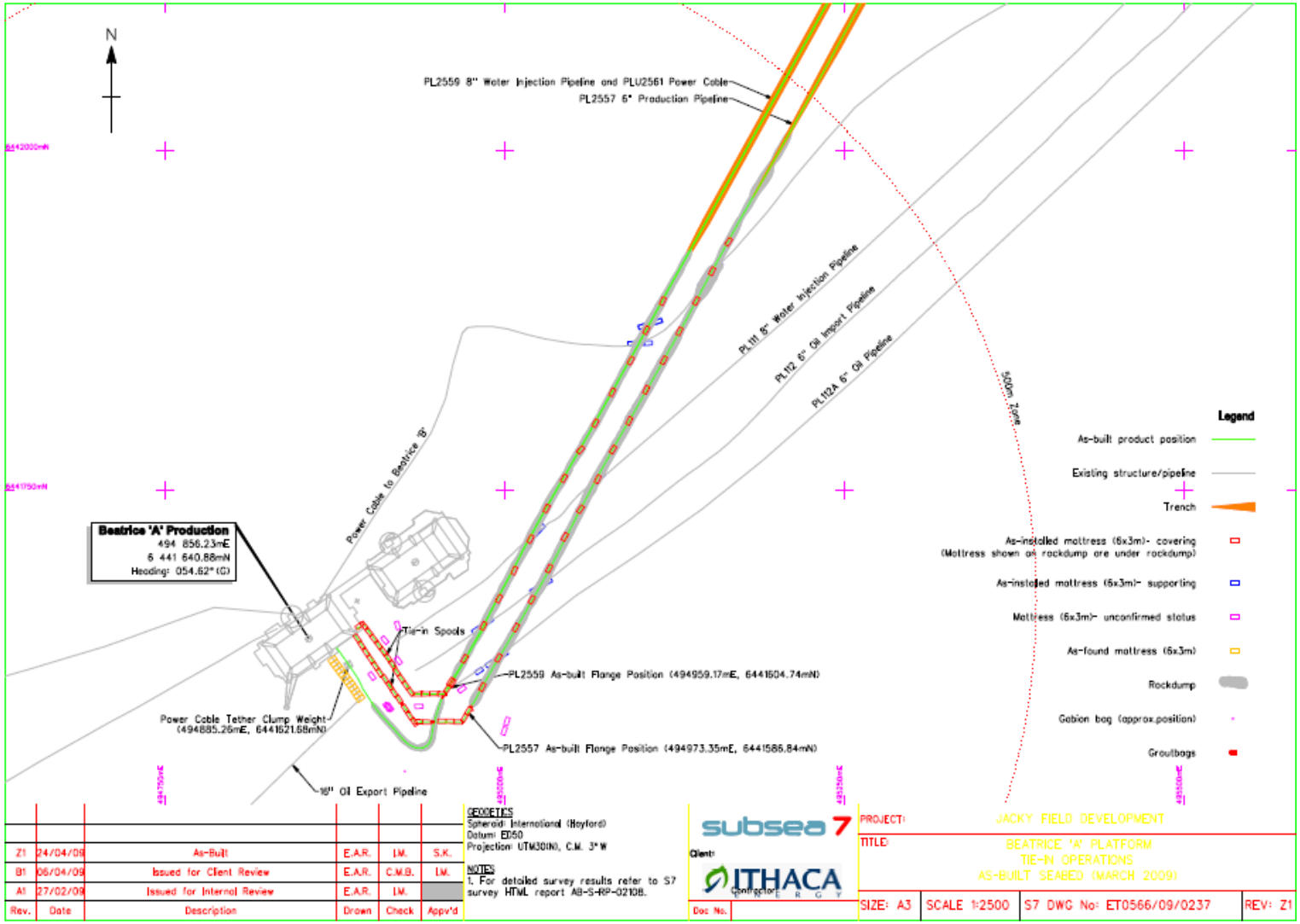
# Appendix B.3

## Pipeline Approaches at Beatrice Bravo Platform as Built Drawing



# Appendix B.4

## Pipeline Approaches at Beatrice Alpha Platform as Built Drawing



## Appendix C

## Waste Inventory

| Material | Approximate Quantity Tonnes | Location |
|---|---|---|
| ABS Plastic | 0.13 | Topsides junction boxes |
| Ac 228 | 0.00 | None |
| Alloy Steel Inconel | 0.10 | Pipeline gaskets |
| Aluminium | 0.12 | VSD Heat sinks |
| Aluminium Bronze | 0.00 | None |
| Americium-241 | | Present in smoke detectors* |
| Anodes (total) | 27.69 | Jacket/MLT/Pipelines |
| Asbestos Blue | 0.00 | None |
| Asbestos White/Brown | 0.00 | None |
| Asbestos Total | 0.00 | None |
| Batteries NiCd | 0.00 | None |
| Batteries Lead | 0.00 | UPS. Nav aids, see lead |
| Biocides by type (including TBT) | 0.00 | None |
| Brass | 0.21 | Topsides cable glands |
| Bronze | 0.00 | None |
| Buna | 0.00 | None |
| Butyl Rubber | 0.09 | Topsides cable gland shrouds |
| Carbon Steel | 3178 | Combined topsides, jacket, suction piles and subsea installations/pipelines |
| Cement Powder | 0.00 | None |
| Cement | 12688 | Grout bags, matresses, rock dump and cable clump weight |
| Ceramics (all types) | 0.15 | VSD SCR's, HV insulators |
| CFC/HCFC | 0.01 | TR HVAC |
| Chartex/fire protection | 0.00 | None |
| Chloro paraffins | | * |
| Chromium | | Well tubing * |
| Copper | 63.15 | Power and control cables |
| Copper nickel alloys | 1.04 | Cable connectors |
| Cork | 0.00 | None |
| Cotton | 0.00 | None |
| Diesel | 0.00 | None |
| Drill Cutting Residues | 0.00 | Disharged tophole cuttings using water based mud |
| EPDM | 0.00 | None |
| Ethylene/Polypropylene | 0.13 | Cables and pipeline insulation |

| Material | Approximate Quantity Tonnes | Location |
|---|---|---|
| Fire Extinguishers | | Topsides* |
| Fire Foam | 0.00 | None |
| Brominated Flame Retardants | | Fire resistant cables* |
| Fluorescent Tubes | 0.05 | Platform wide/ lighting |
| Formica | | TR |
| Glass | | TR |
| Glycol | 0.00 | None |
| Glass Reinforced Plastic (GRP) | 0.00 | None |
| Graphite/Charcoal | 0.00 | None |
| Gun Metal | 0.00 | None |
| Heli-fuel | 0.00 | None |
| Hydrocarbons | 0.00 | See residual |
| Incoloy | 0.10 | Pipeline gaskets |
| Insulation (rockwool) | 0.90 | TR |
| Iron (cast) | 0.00 | None |
| Lead | 0.67 | UPS/Navaid batteries |
| Marine Growth est. quantities soft/hard | 205.44 | Jacket structure |
| Mercury | 0.00001 | Fluorescent tubes, level switches and assumed scale in process pipework |
| Methanol | 0.00 | None |
| NORM Scale | 0.00 | Process pipework, vessels |
| Neoprene | 0.00 | None |
| Ni-Resist | 0.00 | None |
| Nylon | | * |
| Organotin | | * |
| Paint | | Paint samples positive for heavy metals, phthalates, chlorinated paraffin* |
| Pb-210 | 0.00 | N/A |
| PCB | 0.00 | N/A |
| PTFE | 0.00 | Unknown at this stage |
| Plastics | 0.13 | Polyurethene Production pipeline insulation |
| PVC | 0.78 | TR Flooring |
| Radium (Ra-226) | 0.00 | None |
| Radium (Ra-228) | 0.00 | None |
| Residual HC | 0.26 | Pipeline flushed 7.63mg/l |
| Rubber | | * |
| Sewage | 0.00 | None |

| Material | Approximate Quantity Tonnes | Location |
|---|---|---|
| Smoke Detectors | | * |
| Stainless Steel | 4.31 | Control cabinets |
| Satellite | 0.00 | None |
| Tin | 0.00 | None |
| Titanium | 0.00 | None |
| Wood | 0.39 | TR |
| Zinc | 1.23 | Anodes |
| Approximate Total Weight | 16312.17 | te |