

# **South Morecambe DP3-DP4 Decommissioning Programmes**



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## **TERMS AND ABBREVIATIONS**

<b>ABBREVIATION</b>	<b>EXPLANATION</b>
3LPP	3-Layer Polypropylene (protection)
ANIFPO	Anglo North Irish Fish Producers Organisation
AP	Accommodation Platform (as in AP1)
CPP	Central Processing Platform (as in CPP1)
DCA	Decommissioning Activities as defined in the types of operation associated with MATs.
DP	Drilling Platform (as in DP1, DP3, DP4, DP6 & DP8)
DSV	Diving Support Vessel
EA	Environmental Appraisal
EL	Elevation (relative to LAT)
ESDV	Emergency Shutdown Valve
FBE	Fusion Bonded Epoxy
GMG	Global Marine Group
HSE	Health and Safety Executive
"	Inch; 25.4millimetres
ICES	International Council for the Exploration of the Sea
JUWB	Jack Up Work Barge
km	Kilometre
LAT	Lowest Astronomical Tide
MAT	Master Application Template
MCV	Monohull Crane Vessel
MEG	Monoethylene Glycol
N <sub>2</sub>	Nitrogen
N,S,E,W	North, South, East, West
n/a	Not Applicable
NB	Nominal Bore (refers to pipelines)
NFFO	National Federation of Fishermen's Organisations
NIFPO	Northern Ireland Fish Producers' Organisation
No.	Number
NORM	Naturally Occurring Radioactive Material
NUI	Normally Unattended Installation
OD	Outside diameter (refers to pipelines and power / fibre-optic cables)
OGA	Oil and Gas Authority
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
OSPAR	Oslo-Paris Convention
Platform	Installation comprising topsides and jacket

ABBREVIATION	EXPLANATION
PL	Pipeline (Identification Numbers); Type of Well: Platform (or subsea); refer Table 3.6.1
PLA	Pipeline Operations as defined in MAT Operation Types
PON	Petroleum Operations Notice
Power	Electrical power (using copper as a conductor) as opposed to hydraulic power
PWA	Pipeline Works Authorisation
SAT	Supplementary Application Template
SFF	Scottish Fishermen's Federation
SLV	Shear Leg Vessel
South Morecambe Hub	Includes AP1, CPP1, DP1, DP3, DP4, DP5, DP6, DP8 and Bains
SSCV	Semi-Submersible Crane Vessel
tba	To Be Advised
TBR	To Be Removed
Te	Tonne (1000kg)
TOG	Top of Grating
TOS	Top of Steel
TYP	Typical (i.e. Dimensions typical for similar structural members)
UK	United Kingdom
UKCS	United Kingdom Continental Shelf
UNO	Unless Noted Otherwise
WGS84	World Geodetic System 1984



## 1. EXECUTIVE SUMMARY

### 1.1 Combined Decommissioning Programmes

This document contains two Decommissioning Programmes, one for each set of notices under Section 29 of the Petroleum Act 1998. The Decommissioning Programmes cover:

- The **DP3** and **DP4** installations; and,
- The pipelines associated with DP3 (**PL195**, **PL205**) and DP4 (**PL194**, **PL204**);
- The power cables associated with DP3 (**IF-07E13** and **IF-07E31**) and DP4 (**IF-07E41**);
- Power & fibre-optic cables **PL2718** between CPP1 and DP3, and **IF-07E84** between DP4 and DP8.

Although decommissioning of the South Morecambe DP3 and DP4 installations are being treated in this document as a standalone project, it is possible that the operational phase will be carried out as part of a wider decommissioning campaign in the East Irish Sea area.

### 1.2 Requirement for Decommissioning Programmes

**Installations:** In accordance with the Petroleum Act 1998, Spirit Energy Production UK Limited (Spirit Energy) as operator of the South Morecambe field, and on behalf of the Section 29 notice holders (Table 1.4.2), is applying to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) to obtain approval for decommissioning the installations detailed in Section 2 of this document.

**Pipelines:** In accordance with the Petroleum Act 1998, Spirit Energy Production UK Limited as operator of the South Morecambe field, and on behalf of the Section 29 notice holders (Table 1.4.4, Table 1.4.5), is applying to OPRED to obtain approval for decommissioning the pipelines detailed in Section 2 of this document.

In conjunction with public, stakeholder and regulatory consultation, the Decommissioning Programmes are submitted in compliance with national and international regulations and OPRED guidance notes. The schedule outlined in this document is for a four-year decommissioning campaign due to begin in 2019.

### 1.3 Introduction

The South Morecambe field was discovered in 1974 and commenced production in 1985; it extends over license blocks 110/2a and 110/3a on the UK Continental Shelf. DP3 and DP4 each comprise six wells and a single installation connected via two pipelines (24" and 2" nominal bore) to the Central Processing Platform CPP1.

As production is in decline and design capacity is significantly above current production rates there is a focus on ensuring that the South Morecambe field continues to maximise economic recovery of the remaining reserves. As a result, a series of simplification projects are taking place to reduce operational expenditure, reduce maintenance and integrity burden and to optimise facilities. As part of this strategy, the decision has been made to decommission the DP3 and DP4 installations and infrastructure. As these assets form only part of License P153, it has been agreed with OGA that formal approval of Cessation of Production will not be required, but proposals are to be addressed via an addendum to the South Morecambe Field Development Plan. This will be considered by OGA as part of a wider strategy for the east Irish Sea.

The DP3 and DP4 installations and pipelines are operated by the Spirit Energy Production UK Limited. They were installed in 1985 and are normally unattended installations (NUIs) supported by four leg steel jackets in 22m - 25m water depth. Primary control is exercised from CPP1.

The export route for DP3 is via **PL195**. This is a 24" concrete-coated Gas pipeline routed to CPP1

platform, which is part of the South Morecambe platform complex. Power, controls and chemicals are supplied from the CPP1 platform using a 2" Glycol (latterly Nitrogen) line **PL205** and a power and fibre-optic cable **PL2718**. Two redundant power cables **IF-07E13** & **IF-07E31** remain installed, the latter having had its ends removed to make way for the replacement **PL2718** (whose platform approaches are covered with concrete mattresses). All these lines were trenched and buried, with no exposures (other than occasionally at platform approaches) reported in recent surveys. The final 200m approaches of **PL195** at DP3 and CPP1 platforms were stabilised with bitumen mattresses and have subsequently been covered in deposited rock.

The export route for DP4 is via **PL194**. This is a 24" concrete-coated Gas pipeline routed to CPP1 platform, which is part of the South Morecambe platform complex. Power, controls and chemicals are supplied from the CPP1 platform using a 2" Glycol (latterly Nitrogen) line **PL204** and a power cable **IF-07E41**. An additional power and fibre-optic cable to DP8 (**IF-07E84**, whose platform approaches are covered with concrete mattresses) completes a ring-main connection via DP8 and DP6 to CPP1. All these lines were trenched and buried, with no exposures (other than occasionally at platform approaches) reported in recent surveys. The final 200m approaches of **PL194** at DP4 and CPP1 platforms were stabilised with bitumen mattresses and have subsequently been covered in deposited rock.

Following public, stakeholder and regulatory consultation, the Decommissioning Programmes will be submitted without derogation and in full compliance with the OPRED guidance notes. The Decommissioning Programmes explain the principles of the removal activities and is supported by an Environmental Appraisal.



## 1.4 Overview of Installations & Pipelines Being Decommissioned

### 1.4.1 Installations

Table 1.4.1: Installations Being Decommissioned			
Field(s):	South Morecambe	Production Type	Gas
Water Depth (m)	~22m (DP3), ~25m (DP4)	UKCS Block	110/2a, 110/3a
Surface Installations			
Number	Type	Topsides Weight (Te)	Jacket Weight (Te)
1	Steel jacket (DP3)	6,763	2,739 <sup>(1)</sup>
1	Steel jacket (DP4)	6,760	2,648 <sup>(2)</sup>
Subsea Installation(s)		Number of Wells	
Number	Type	Platform	Subsea
n/a	n/a	12	0
Drill Cuttings pile(s)	Total Estimated volume (m <sup>3</sup> )	Distance to median (DP3, DP4)	Distance from nearest UK coastline (DP3, DP4)
n/a	n/a	46km, 42km	33km, 30km

Table 1.4.2: Installation Section 29 Notice Holder Details		
Section 29 Notice Holder	Registration Number	Equity Interest (%)
Spirit Energy Production UK Limited	03115179	100
BG International Limited	00902239	0

### 1.4.2 Pipelines & Cables

Table 1.4.3: Pipelines & Cables Being Decommissioned		
Number of Pipelines (DP3, DP4)	2, 2	See Table 2.2.1
Number of Cables (DP3, DP4)	3, 2	See Table 2.2.1

Table 1.4.4: Pipeline & Cable Section 29 Notice Holder Details		
Section 29 Notice Holder	Registration Number	Equity Interest (%)
Spirit Energy Production UK Limited	03115179	100
Chrysaor North Sea Limited	00958880	0

Table 1.4.5: Power & Fibre-Optic Cable Section 29 Notice Holder Details (PL2718 only)		
Section 29 Notice Holder	Registration Number	Equity Interest (%)
Spirit Energy Production UK Limited	03115179	100

<sup>1</sup> The jacket weight excludes the weight of piles. Including piles and grout, this weight increases to 5,161Te.

<sup>2</sup> The jacket weight excludes the weight of piles. Including piles and grout, this weight increases to 4,584Te.

## 1.5 Summary of Proposed Decommissioning Programmes

Table 1.5.1: Summary of Decommissioning Programmes	
Proposed Decommissioning Solution	Reason for Selection
<b>1. Topsides</b>	
<p>Complete removal and recycling. The topsides will be removed and transported to shore and recycled unless alternative options are meantime found to be viable and more appropriate.</p> <p>Any permit applications required for work associated with removal of the topsides (DCA MAT) will be submitted</p>	<p>Allows topsides to be removed and maximises recycling of materials</p>
<b>2. Jacket/Piles</b>	
<p>Complete removal and recycling. The leg and skirt piles will be cut 1m below seabed and the jacket will be removed and transported to shore for recycling; please refer section 3.2 for further justification for restricting depth to 1m below seabed.</p> <p>Any permit applications required for work associated with removal of the topsides (DCA MAT) will be submitted.</p>	<p>To comply with OSPAR requirements, leaving an unobstructed seabed. Removes a potential obstruction to fishing operations and maximises recycling of materials.</p>
<b>3. Pipelines &amp; Cables</b>	
<p><b>PL194</b> and <b>PL195</b> will be flushed and left buried <i>in situ</i>;</p> <p>On approach to the DP3, DP4 and CPP1 platforms the exposed pipelines and associated stabilisation and protection features excluding stabilisation features under deposited rock will be removed.</p> <p>Any permit applications required for work associated with pipeline pigging, flushing, cutting and removal (PLA MAT) will be submitted.</p>	<p>Outside the 500m safety zones the pipelines will already have been exposed to fishing activity.</p> <p>There is much to differentiate the completely remove and leave <i>in situ</i> decommissioning proposals from a technical, safety and cost perspective.</p> <p>The pipelines are sufficiently buried and stable - with latest survey data indicating that no spans are present, posing no hazard to marine users. Minimal seabed disturbance, lower energy usage, reduced risk to personnel engaged in the activity.</p>
<p><b>PL204</b> and <b>PL205</b> will be flushed and left buried <i>in situ</i>.</p> <p>On approach to the DP3, DP4 and CPP1 platforms the exposed pipeline ends, and associated stabilisation and protection features will be removed.</p> <p>Any permit applications required for work associated with pipeline pigging, flushing, cutting and removal (PLA MAT) will be submitted.</p>	<p>Outside the 500m safety zones the pipelines will already have been exposed to fishing activity.</p> <p>Apart from cost there is little to differentiate the completely remove and leave <i>in situ</i> decommissioning proposals. Removal maximises recycling of materials and removes legacy related threats to other users of the sea.</p> <p>Should survey data in the intervening period show that no pipeline spans have developed and that the pipelines are sufficiently buried and stable they will be left <i>in situ</i>. After almost 35 years since installation historical survey data has so far indicated that no spans are present, posing no hazard to marine users. Minimal seabed disturbance, lower energy usage, reduced risk to personnel engaged in the activity.</p>

**Table 1.5.1: Summary of Decommissioning Programmes**

Proposed Decommissioning Solution	Reason for Selection
<p>Two redundant power cables <b>IF-07E13 &amp; IF-07E31</b> will be left buried <i>in situ</i>.</p> <p>On approach to the DP3 and CPP1 platforms where present (on approach to DP3 the end of redundant cable <b>IF-07E13</b> has already been removed) the exposed cable ends and associated stabilisation and protection features will be removed. At CPP1 the cable ends will be decommissioned at the same time as the installation.</p> <p>Any permit applications required for work associated with pipeline pigging, flushing, cutting and removal (PLA MAT) will be submitted.</p>	<p>Outside the 500m safety zones the cables will already have been exposed to fishing activity.</p> <p>Apart from cost there is little to differentiate the completely remove and leave <i>in situ</i> decommissioning proposals. Removal maximises recycling of materials and removes legacy related threats to other users of the sea.</p> <p>Should survey data in the intervening period show that no cable spans have developed and that the cables are buried and stable they will be left <i>in situ</i>. After almost 35 years since installation historical survey data has so far indicated that no cable spans or exposures are present, posing no hazard to marine users. Minimal seabed disturbance, lower energy usage, reduced risk to personnel engaged in the activity.</p>
<p>The power and fibre-optic cable <b>PL2718</b> will be left buried <i>in situ</i>.</p> <p>On approach to the DP3 and CPP1 platforms the exposed ends of the cable and associated stabilisation and protection features will be completely removed.</p> <p>If exposed, the five midline mattresses will be recovered to shore.</p>	<p>Outside the 500m safety zones the cable will already have been exposed to fishing activity.</p> <p>Apart from cost there is little to differentiate the completely remove and leave <i>in situ</i> decommissioning proposals. Removal maximises recycling of materials and removes legacy related threats to other users of the sea.</p> <p>Should survey data in the intervening period show that no cable spans have developed and that the cable is buried and stable it will be left <i>in situ</i>. After almost 10 years since installation historical survey data has so far indicated that no cable spans or exposures are present, posing no hazard to marine users. Minimal seabed disturbance, lower energy usage, reduced risk to personnel engaged in the activity.</p>
<p>The redundant power cable <b>IF-07E41</b> will be left buried <i>in situ</i> at least until the wider South Morecambe Hub decommissioning campaign is undertaken sometime in future.</p> <p>On approach to the DP4 and CPP1 platforms the exposed cable ends and associated stabilisation and protection features will be removed. At CPP1 the cable ends will be decommissioned at the same time as the installation.</p> <p>Any permit applications required for work associated with pipeline pigging, flushing, cutting and removal (PLA MAT) will be submitted.</p>	<p>Outside the 500m safety zones the cables will already have been exposed to fishing activity.</p> <p>There is little to differentiate the completely remove and leave <i>in situ</i> decommissioning proposals. Removal maximises recycling of materials and removes legacy related threats to other users of the sea.</p> <p>Should survey data in the intervening period show that no cable spans have developed and that the cables are buried and stable they will be left <i>in situ</i>. After almost 35 years since installation historical survey data has so far indicated that no cable spans or exposures are present, posing no hazard to marine users. Minimal seabed disturbance, lower energy usage, reduced risk to personnel engaged in the activity.</p>
<p>The power and fibre-optic cable <b>IF-07E84</b> will be left buried <i>in situ</i>.</p> <p>On approach to the DP4 and DP8 platforms the exposed cable ends and associated stabilisation and protection features will be removed. At DP8 the</p>	<p>Outside the 500m safety zones the cables will already have been exposed to fishing activity.</p> <p>There is little to differentiate the completely remove and leave <i>in situ</i> decommissioning proposals. Removal maximises recycling of materials and</p>

**Table 1.5.1: Summary of Decommissioning Programmes**

Proposed Decommissioning Solution	Reason for Selection
<p>cable ends will be decommissioned at the same time as the installation.</p> <p>Any permit applications required for work associated with pipeline pigging, flushing, cutting and removal (PLA MAT) will be submitted.</p>	<p>removes legacy related threats to other users of the sea.</p> <p>Should survey data in the intervening period show that no cable spans have developed and that the cables are buried and stable they will be left <i>in situ</i>. After almost 35 years since installation historical survey data has so far indicated that no cable spans or exposures are present, posing no hazard to marine users. Minimal seabed disturbance, lower energy usage, reduced risk to personnel engaged in the activity.</p>
<b>4. Wells</b>	
<p>The DP3 &amp; DP4 wells will be decommissioned using a 'slant' rig from the installation with support from a JUWB. A Master Application Template (MAT) and the supporting Supplementary Application Template (SAT) will be submitted in support of activities carried out. A PON5 will also be submitted to OPRED for application to decommission the wells.</p>	<p>Meets the OGA and HSE regulatory requirements.</p>
<b>5. Drill Cuttings</b>	
<p>n/a</p>	<p>No cuttings piles exist at DP3 &amp; DP4. Cuttings are widely dispersed and fall below OSPAR 2006/5 thresholds.</p>
<b>6. Interdependencies</b>	
<p>Gas is exported to the Central Processing Platform (CPP1) in the South Morecambe platform complex. Power for both the DP3 and DP4 platforms is supplied via power cables originating from CPP1. The Bains subsea development exports gas via DP1 and CPP1. Separate decommissioning programmes have been prepared for Bains.</p> <p>The whole of the DP3 and DP4 jackets; there are no cuttings piles. The pipelines will be flushed and cleaned before being disconnected to allow each platform to be removed. The decommissioning works is currently scheduled to take place between 2019 and 2022. Current indications are that decommissioning activities associated with the wider South Morecambe Hub will occur sometime between 2025 and 2030.</p>	

# 1.6 Field Location including Field Layout and Adjacent Facilities

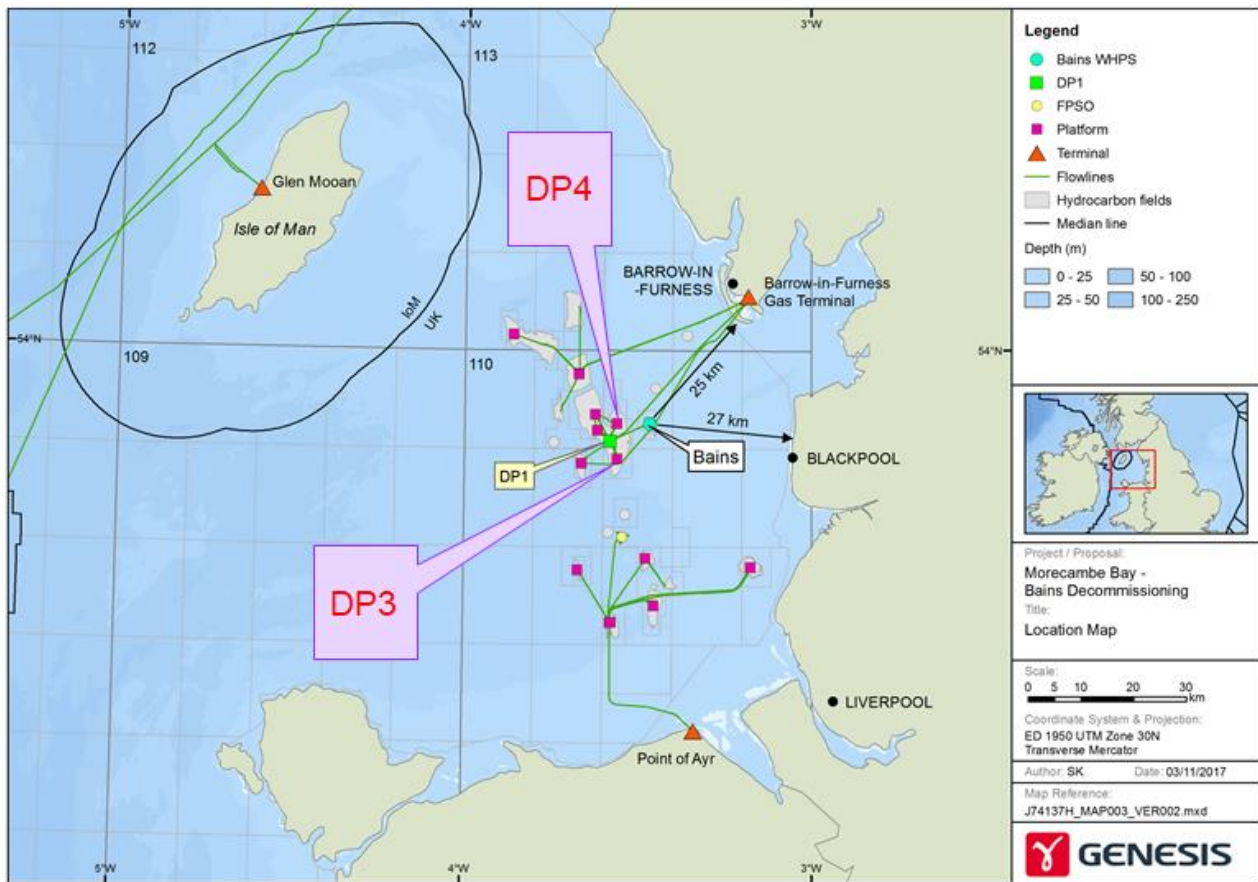


Figure 1.6.1: South Morecambe field location in UKCS

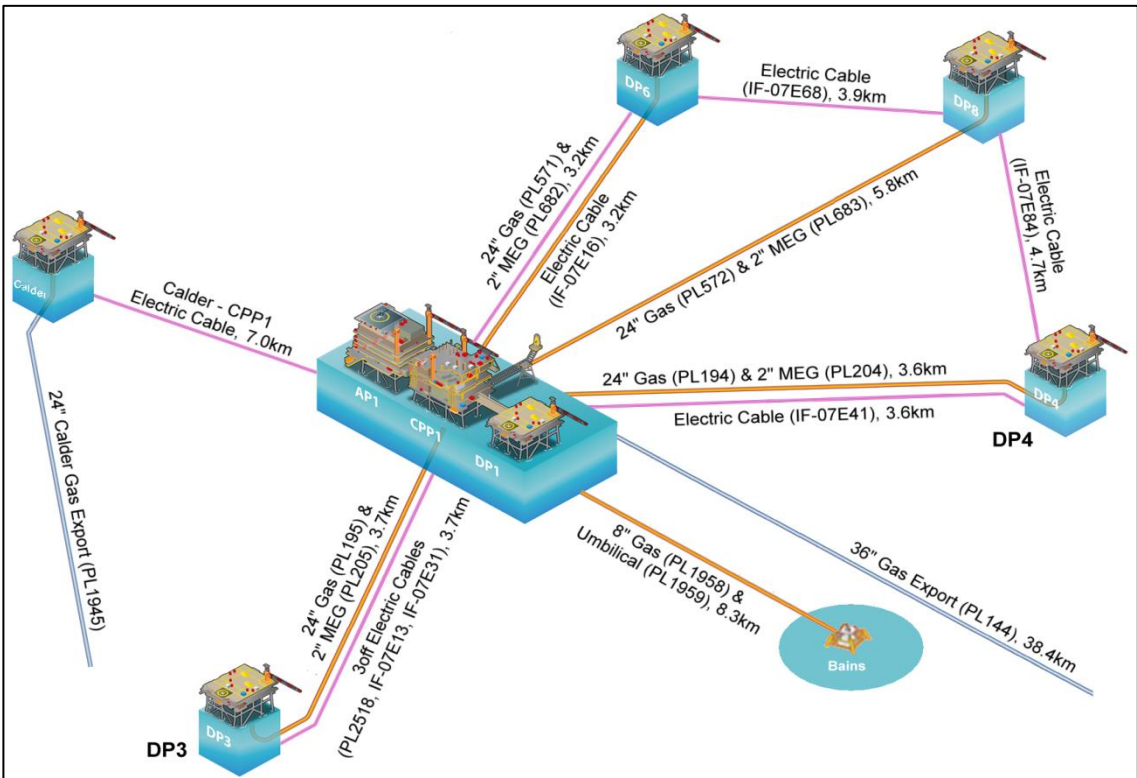


Figure 1.6.2: South Morecambe Field and adjacent facilities



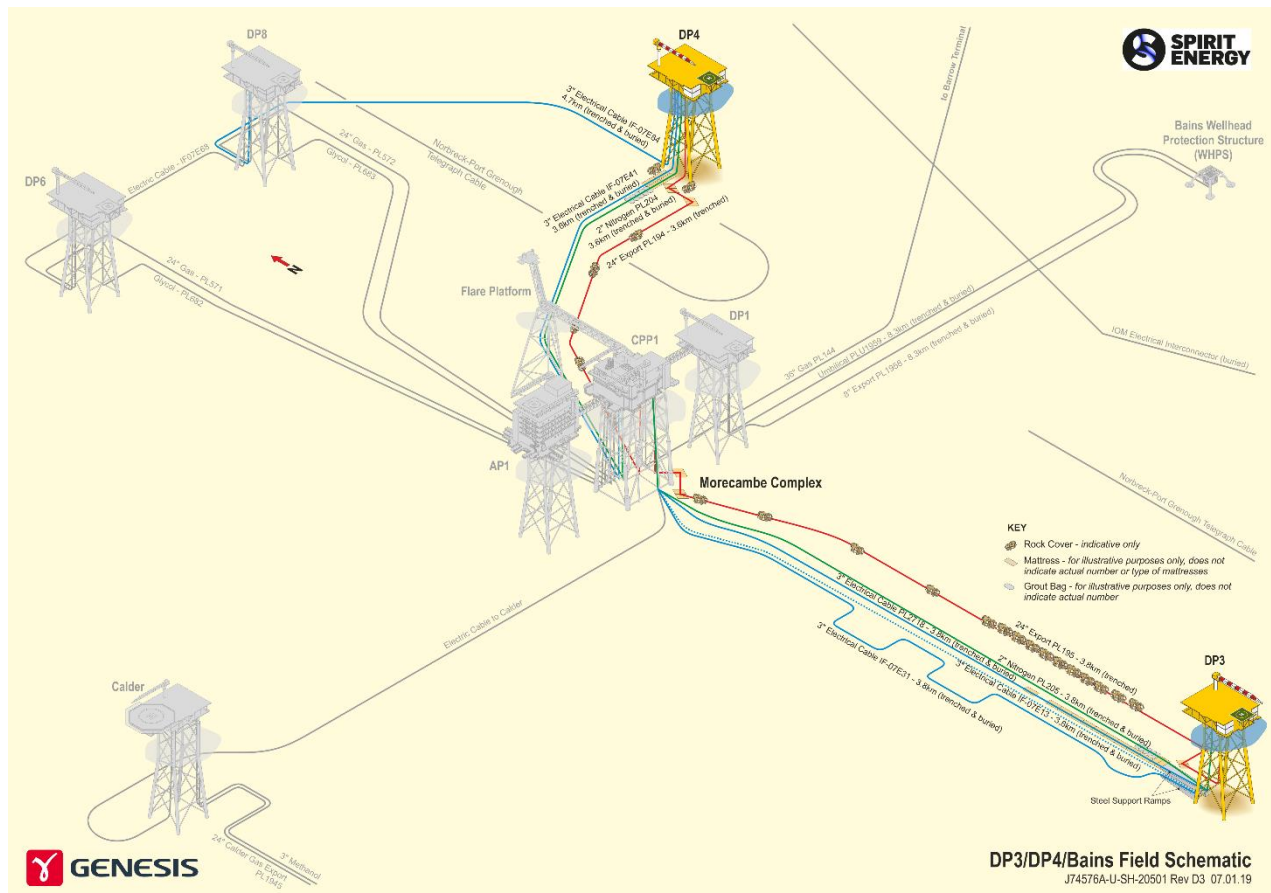


Figure 1.6.3: South Morecambe Hub and associated facilities



**Table 1.6.1: Adjacent Facilities**

Owner	Name	Type	Distance/Direction	Information	Status
Spirit Energy	CPP1 (with AP1 & DP1)	Bridge linked platforms at CCP1	Reception for DP3 & DP4 pipelines, 3.6km NNW of DP3 platform, 3.5km SSW of DP4 platform.	Host platform for various subsea gas tiebacks. Exports gas and condensate onshore to Barrow-in-Furness.	Operational
Spirit Energy	DP6	NUI platform	Production platform 6.6km NNW of DP3 platform, 4.0km WSW of DP4 platform.	Exports gas and condensate to CPP1.	Operational
Spirit Energy	DP8	NUI platform	Production platform 9.5km NNW of DP3 platform, 4.6km NW of DP4 platform.	Exports gas and condensate to CPP1.	Operational
Conoco Phillips	Calder	NUI platform	Production platform 6.8km west of DP3 platform, 10.1km SW of DP4 platform.	Exports gas and condensate to CPP1.	Operational
Spirit Energy	Bains	Subsea Well	Subsea well 9.1km NE of DP3 platform, 6.2km east of DP4 platform.	Gas import / export to/from DP1.	Operational
Spirit Energy	PL144	36" gas export pipeline	From CPP1 to shore, 38.4km long.	No pipeline crossings.	Operational
Spirit Energy	PL571 PL682	24" gas pipeline and 2" methanol line	From DP6 to CPP1, 3.2km long.	2" methanol line crosses 24" gas pipeline on route.	Operational
Spirit Energy	PL572 PL683	24" gas pipeline and 2" methanol line	From DP8 to CPP1, 3.7km long.	No pipeline crossings.	Operational
Conoco Phillips	PL1945	24" gas export pipeline	From Calder to shore.	Not connected to South Morecambe.	Operational
Spirit Energy	PL1958 PL1959	8" gas pipeline and umbilical	From DP1 to Bains, 8.3km long.	No pipeline crossings.	Operational
Spirit Energy	IF-07E68	60mm power cable	From DP8 to DP6, 3.9km long.	No pipeline crossings.	Operational
Spirit Energy	IF-07E16	60mm Power cable	From CPP1 to DP6, 3.2km long.	No pipeline crossings.	Operational

**Impacts of Decommissioning Proposals**

No impact is expected.

## **1.7 Industrial Implications**

The activities to decommission the DP3 and DP4 wells, installations, pipelines and cables will be completed using a purpose-built slant rig, as well as a jack up work barge, a crane vessel and a Diving Support Vessel (DSV).

It is Spirit Energy's intention to use a Supply Chain Action Plan that will result in an efficient and cost-effective execution of the decommissioning works. The campaign for removing the installations, and decommissioning the pipelines, and pipeline stabilisation features will be competitively tendered. Where possible Spirit Energy will also try to combine such activities with other development or decommissioning activities in the area to reduce mobilisation costs should the opportunity arise. The decommissioning schedule will be flexible to maximise opportunities for cost savings and efficiency.

## 2. DESCRIPTION OF ITEMS TO BE DECOMMISSIONED

### 2.1 Installation: Surface Facilities

**Table 2.1.1: Surface Facilities Information**

Name	Facility Type	Location		Topsides/ Facilities		Jacket			
				Weight (Te)	No. of modules	Weight (Te)	No. of legs	No. of piles	Weight of piles (Te)
DP3 Platform	Small fixed steel	WGS84 Decimal	53.815856 03.561767	6,763	3	2,739	4	4 main, 12 skirt	2,422
		WGS84 Decimal Minute	53° 48.951' N 03° 33.706'W						
DP4 Platform	Small fixed steel	WGS84 Decimal	53.875261 03.561011	6,760	3	2,648	4	4 main, 8 skirt	1,936
		WGS84 Decimal Minute	53° 52.516' N 03° 33.661'W						

## 2.2 Pipelines and Cables including Stabilisation Features

**Table 2.2.1: Pipeline/Flowline/Umbilical Information**

Description	Pipeline Number (as per PWA)	Diameter NB or OD	Length (km) <sup>2,3,4</sup>	Description of Component Parts	Product Conveyed	From – To End Points	Burial Status	Pipeline Status	Current Content
Gas pipeline	PL194	24"	3.673	Concrete weight coated and FBE coated steel pipeline	Untreated natural gas	ESDV at DP4 to ESDV at CPP1	Fully trenched and buried	Operational	Untreated natural gas, water
MEG pipeline	PL204	2"	3.578	FBE coated steel pipeline	MEG	ESDV at CPP1 to ESDV at DP4	Fully trenched and buried	Operational	N <sub>2</sub>
Gas pipeline	PL195	24"	3.461	Concrete weight coated and FBE coated steel pipeline	Untreated natural gas	ESDV at DP3 to ESDV at CPP1	Fully trenched and buried	Operational	Untreated natural gas, water
MEG pipeline	PL205	2"	3.569	FBE coated steel pipeline	MEG	ESDV at CPP1 to ESDV at DP3	Fully trenched and buried	Operational	N <sub>2</sub>
Power cable (East)	IF-07E13	84mm	3.909	Polypropylene, copper, steel	n/a	CPP1 to DP3	Fully trenched and buried	Redundant	n/a
Power cable (West)	IF-07E31	84mm	3.560	Polypropylene, copper, steel	n/a	CPP1 to DP3	Fully trenched and buried	Redundant	n/a
Power cable	IF-07E41	84mm	3.752	Polypropylene, copper, steel	n/a	CPP1 to DP4	Fully trenched and buried	Operational	n/a
Power and fibre-optic cable	IF-07E84	67mm	5.005	Polypropylene, copper, steel, fibre-optic	n/a	DP4 to DP8	Fully trenched and buried	Operational	n/a
Power and Fibre-optic cable	PL2718	79mm	3.880	Polypropylene, copper, steel, fibre-optic	n/a	CPP1 to DP3	Fully trenched and buried	Operational	n/a

**NOTES FOR TABLE 2.2.1:**

1. Platform coordinates given in original PWA application are as follows: **DP3** 53°49'00.09"N, 3°33'36.85"E; **DP4** 53°52'33.92"N, 3°33'39.43"E; **DP8** 53°54'01.25"N, 3°37'31.66"E; **CPP1** 53°50'48.23"N, 3°34'50.79"E;
2. Lengths of gas and MEG pipelines *exclude* riser lengths and are based on best available data. At DP3 the risers are 48.5m long, at DP4 risers are 51.8m long and at CPP1 the pipeline risers are 52.5m long;
3. Cable lengths are based on best available data and measured from J-Tube bellmouth to J-Tube bellmouth, except for IF-07E31 of which 50m was removed on approach to both CPP1 and DP3 J-Tube bellmouths;
4. If dimensions differ from PWA data this is because PWAs are based on design data and are not 'as-built'.

**Table 2.2.2: Subsea Pipeline & Cable Stabilisation Features**

Stabilisation Feature	Total Number	Total Weight (Te)	Location(s)	Exposed/Buried/Condition
Bitumen mattresses: Type 1: 4.62 x 2.46 x 0.45m; Type 2: 3.69 x 2.46 x 0.45m.	19	270.1	4x Type 1 in vicinity of DP3; 15x Type 2 in vicinity of DP3; Refer Figure 3.4.1.	Data suggests that 15x Type 2 bitumen mattresses are buried under deposited rock while the others will be found generally exposed.
	21	297.1	4x Type 1 in vicinity of DP4; 17x Type 2 in vicinity of DP4; Refer Figure 3.4.2.	Data suggests that 15x Type 2 bitumen mattresses are buried under deposited rock while the others will be found generally exposed.
	51	719.1	9x Type 1 and 42x Type 2 in vicinity of CPP1; Refer Figure 3.4.3 & Figure 3.4.4.	Data suggests that 35x (19+16) Type 2 bitumen mattresses are buried under deposited rock while the others will be found generally exposed.
Concrete mattresses: Type 1: 6 x 3 x 0.3m; Type 2: 6 x 2.4 x 0.3m	29	278.4	<b>PL2718</b> on approach to DP3: 29x Type 1 concrete mattresses, on top of fibre-optic cable; Refer Figure 3.4.1.	Data suggests that concrete mattresses are largely exposed.
	5	48.0	<b>PL2718</b> 'mid-line' mattresses: 2x Type 1 concrete mattresses at ~KP0.80; 3x Type 1 concrete mattresses at ~KP1.65; Refer Figure 3.4.5.	Data suggests that concrete mattresses are partly buried or partly exposed.
	14	134.4	<b>PL2718</b> on approach to CPP1: 14x Type 1 concrete mattresses, on top of fibre-optic cable; Refer Figure 3.4.3.	Data suggests that concrete mattresses are largely exposed.
	7	53.9	<b>IF-07E84</b> on approach to DP4: 1x Type 2 under end of J-tube extension; 6x Type 2 over cable; Refer Figure 3.4.2.	Data suggests that concrete mattresses are largely exposed.
	16	123.2	<b>IF-07E84</b> on approach to DP8: 16x Type 2 over cable; Refer Figure 3.4.6.	Data suggests that concrete mattresses are largely exposed.
Grout bags:	15	19.4	Support ramp and protection for <b>PL205</b> at DP3; Refer Figure 3.4.1	Data suggests that the grout bags will be found largely exposed.



**Table 2.2.2: Subsea Pipeline & Cable Stabilisation Features**

Stabilisation Feature	Total Number	Total Weight (Te)	Location(s)	Exposed/Buried/Condition
(1.5 x 0.9 x 0.4m UNO)	15	19.4	Support ramp and protection for <b>PL204</b> at DP4; Figure 3.4.2.	Data suggests that the grout bags will be found largely exposed.
	30	38.9	Support ramp and protection for <b>PL204</b> and <b>PL205</b> at CPP1. Refer Figure 3.4.3 & Figure 3.4.4.	Data suggests that the grout bags will be found largely exposed.
	13 <sup>2</sup>	1.2	25kg bags on support ramp and as protection for <b>PL205</b> at DP3.	The grout bags should be found on the support ramp and exposed.
	13 <sup>2</sup>	1.2	25kg bags on support ramp and as protection for <b>PL204</b> at DP4	The grout bags should be found on the support ramp and exposed.
	13 <sup>2</sup>	1.2	25kg bags on support ramp and as protection for <b>PL204</b> at CPP1.	The grout bags should be found on the support ramp and exposed.
	13 <sup>2</sup>	1.2	25kg bags on support ramp and as protection for <b>PL205</b> at CPP1.	The grout bags should be found on the support ramp and exposed.
	50 <sup>2</sup>	1.2	Support and protection for <b>IE-07E84</b> at DP8. Refer Figure.3.4.6.	Data suggests that the grout bags will be found largely exposed.
Rock emplacement	n/a	~4x200m	Refer Figure 3.4.1, Figure 3.4.2, Figure 3.4.3 & Figure 3.4.4	Largely exposed.
FronD Mats	n/a	n/a	None found in 'as-built' documentation	n/a
Other (describe briefly)	n/a	n/a	n/a	n/a

**NOTES:**

1. The quantity of deposited rock may differ from that described on the original PWA application. This is because the quantities quoted here are based on as-built data.
2. No definitive data has been found for the number of 25kg bags used on support ramps, so the numbers should be considered as indicative only.

## 2.3 Wells

Table 2.3.1: Well Information			
DP3 Platform Wells	Designation	Status	Category of Well
110/8a-C1-V	Gas production	Producing	PL 2-0-1
110/8a-C2-S	Gas production	Producing	PL 1-0-1
110/8a-C3-S	Gas production	Not producing	PL 1-0-1
110/8a-C4-S	Gas production	Not producing	PL 2-0-1
110/8a-C5-S	Gas production	Producing	PL 2-0-1
110/8a-C6-S	Gas production	Producing	PL 1-0-1
DP4 Platform Wells	Designation	Status	Category of Well
110/3a-D1-V	Gas production	Producing	PL 1-0-1
110/3a-D2-S	Gas production	Producing	PL 2-0-1
110/3a-D3-S	Gas production	Producing	PL 2-0-1
110/3a-D4-S	Gas production	Producing	PL 2-0-1
110/3a-D5-S	Gas production	Producing	PL 1-0-1
110/3a-D6-V	Gas production	Producing	PL 1-0-1

Well categorisation is in accordance with the Oil & Gas UK Well Decommissioning Guidelines, Issue 6, July 2018.

## 2.4 Inventory Estimates

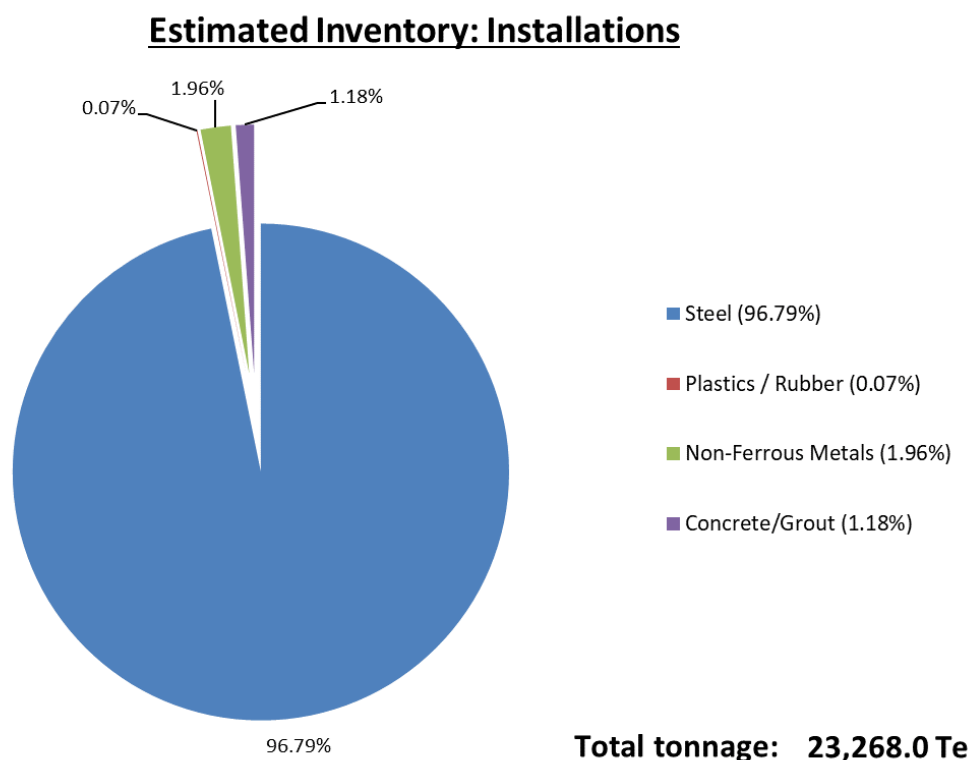
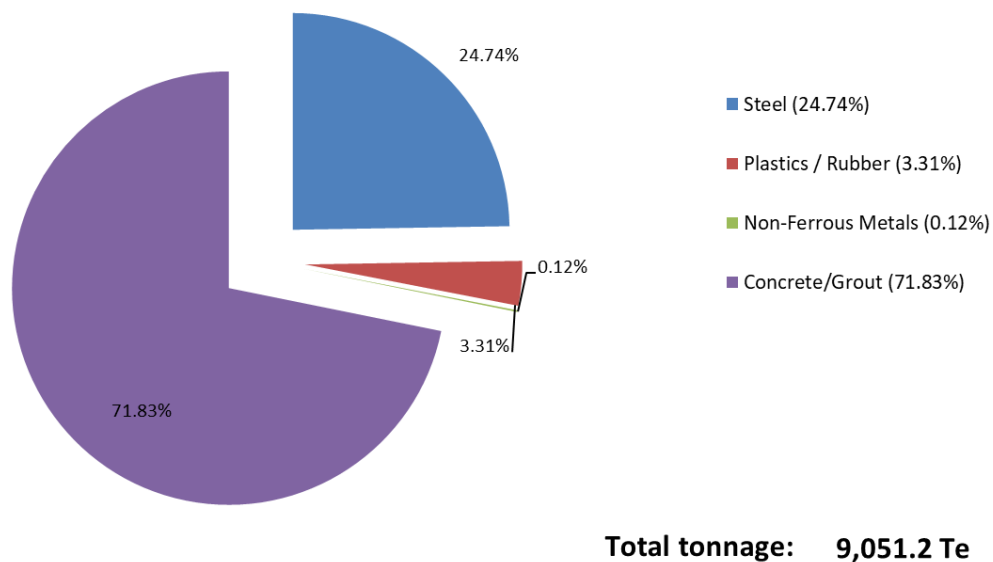


Figure 2.4.1: Pie-chart of estimated installation inventory

Refer to section 4.6 of the Environmental Appraisal [1] for further details.

### **Estimated Inventory: Pipelines & Stabilisation Features**



**Figure 2.4.2: Pie-chart of estimated pipeline and cable inventory**

Refer to section 4.6 of the Environmental Appraisal [1] for further details.

### **3. REMOVAL AND DISPOSAL METHODS**

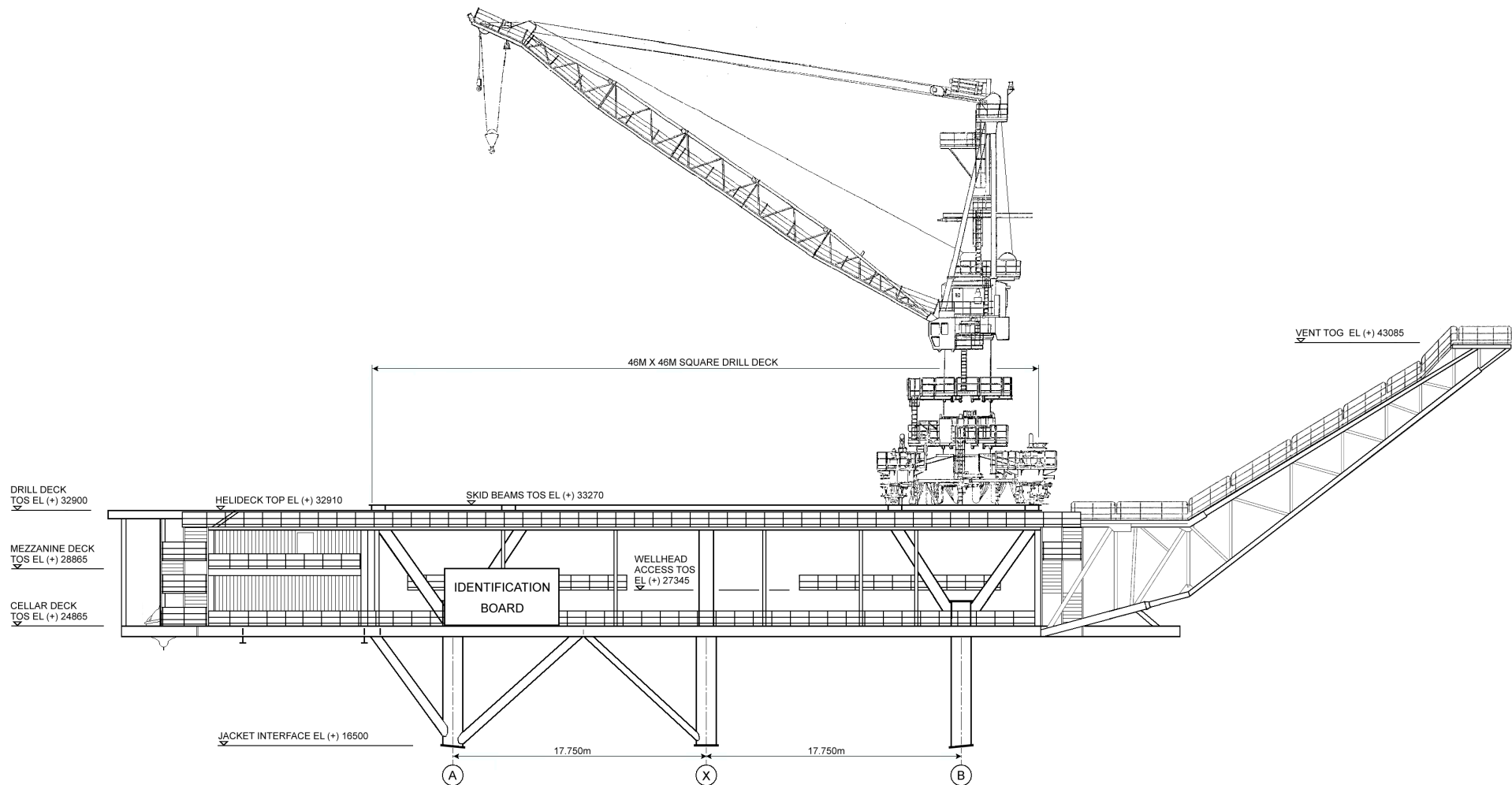
Waste will be dealt with in accordance with the Waste Framework Directive. The reuse of an installation or pipelines (or parts thereof) is first in the order of preferred decommissioning options. However, given the age of the installations and infrastructure it is unlikely that reuse opportunities will be realised. Waste generated during decommissioning will be segregated by type and periodically transported to shore in an auditable manner through licensed waste contractors. Steel and other recyclable metal are estimated to account for the greatest proportion of the materials inventory. Refer to section 4.6 of the Environmental Appraisal [1] for further details concerning disposal of waste.

#### **3.1 Topsides Decommissioning**

**Topsides description:** the DP3 and DP4 topside structures are virtually identical, comprising three levels and weighing approximately 6,763Te and 6,760Te respectively. The two main levels consist of the cellar deck EL +24.865m and the drill deck EL+32.900m, as illustrated in Figure 3.1.1; between them are a partial mezzanine deck at EL +28.865m, and wellhead and Xmas tree access platforms at EL +27.345m. The overall topsides plan dimensions are 77m (99m including vent boom) x 52m, within which the main drill deck area is 46m x 46m square. A twelve-man accommodation unit is located on the mezzanine deck and a movable pedestal crane is on the drill deck.

**Removal method:** the topsides will be completely removed and returned to shore. Possible methods are described in Table 3.1.2.

A final decision on removal methods will be made following a commercial tendering process.



**Figure 3.1.1: Schematic of DP3 / DP4 topsides looking west**

**Preparation & cleaning:** The methods that will be used to flush, purge and clean the topsides prior to removal to shore are summarised in Table 3.1.1.

Table 3.1.1: Cleaning of topsides for removal		
Waste type	Composition of Waste	Disposal Route
On-board hydrocarbons	Full recovery	Return to shore for separation and use.
Other hazardous materials	The presence of NORM will be identified	NORM, 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 give off toxic fumes / dust if flame-cutting or grinding / blasting is used so appropriate safety measures will be taken. Painted items will be disposed of onshore with consideration given to any toxic components.
Asbestos and ceramic fibre	Limited quantities of asbestos are expected on the installation	Asbestos will be disposed of via an appropriately licenced waste management contractor.

Table 3.1.2: Topside Removal Methods	
1) Semi-Submersible Crane Vessel <input checked="" type="checkbox"/> ; 2) Monohull Crane Vessel <input checked="" type="checkbox"/> ; 3) Shear Leg Vessel <input checked="" type="checkbox"/> ; 4) Jack up Work barge <input checked="" type="checkbox"/> ; 5) Piece small or large <input checked="" type="checkbox"/> ; 6) Complete with jacket <input checked="" type="checkbox"/> ;	
Method	Description
Single lift removal by SSCV / MCV / SLV	Removal of topsides and jacket as a complete unit followed by transportation to shore for re-use, recycling, and disposal as appropriate
Single lift removal with jacket by SSCV / MCV / SLV	Removal of topsides as a single unit followed by transportation to shore for re-use, recycling, disposal as appropriate
Piece-small or piece-large removal using JUWB	Removal of topsides in a series of smaller sub-units making use of the JUWB used for the well decommissioning activities, followed by transportation to shore for a programme of re-use, recycling or disposal as appropriate
<b>Proposed removal method and disposal route</b>	<b>Removal of topsides removed separately from the jacket followed by transportation to shore for re-use, recycling, and final disposal to landfill as appropriate. A final decision on the decommissioning method will be made following a commercial tendering process.</b>



## 3.2 Jacket Decommissioning

The DP3 and DP4 jackets weigh approximately 2,739Te and 2,648Te respectively, excluding foundation piles and drilling conductors (which will have been removed separately - see Section 3.3 below); jacket elevations are illustrated in Figure 3.2.1 and Figure 3.2.2 below. Data records indicate that the seabed below 1m comprises stiff clay. From a technical perspective we believe that using reasonable endeavours we would be unable to cut the piles at -3m using internal cutting equipment. Therefore, given the layout of the leg and skirt piles, to minimise disturbance to the seabed the piles will be cut internally 1.0m below the seabed, enabling the jacket to be removed in a single lift. If any difficulties are encountered in accessing the piles internally, such that external excavation, OPRED will be consulted before the piles are cut. The jacket will be returned to shore for recycling.

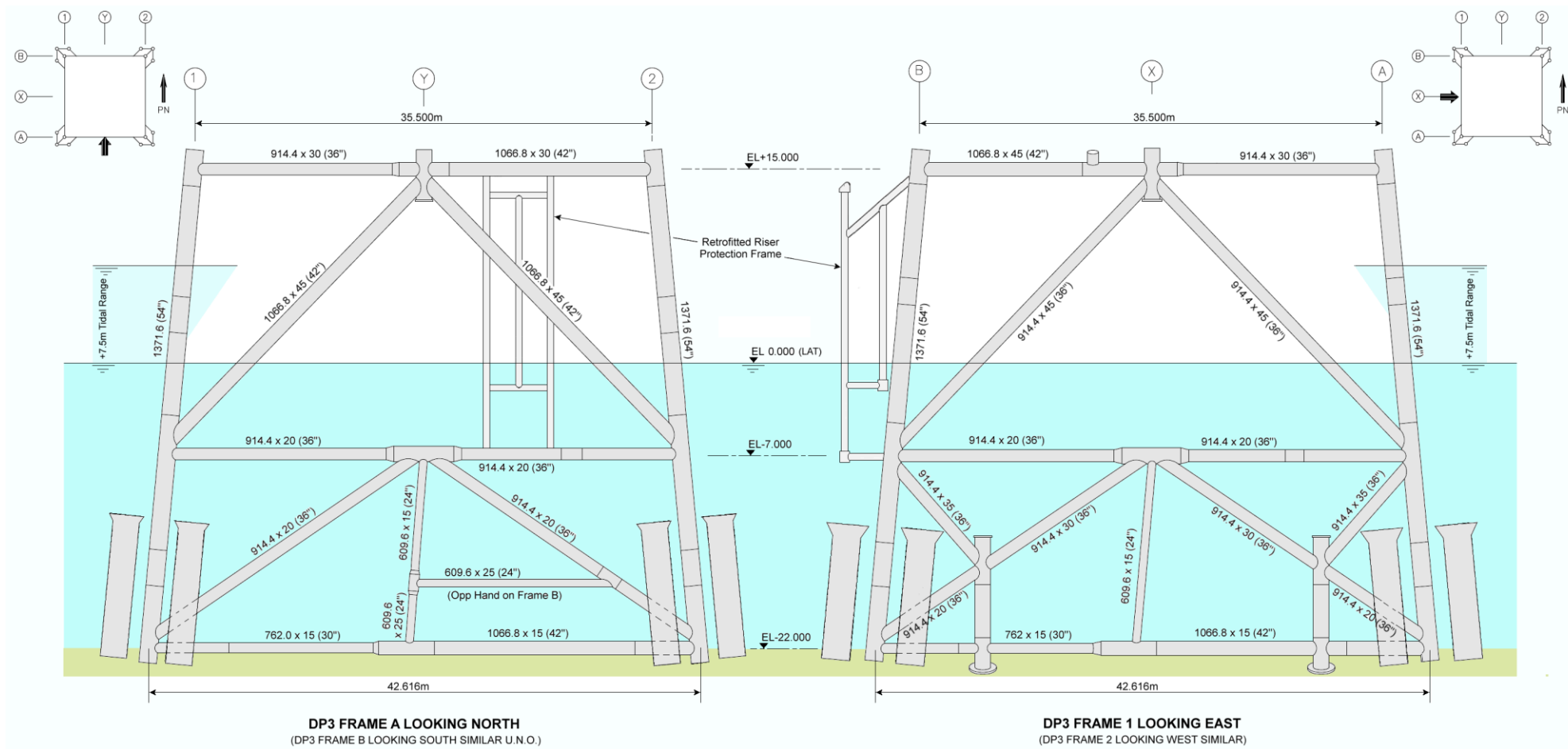


Figure 3.2.1: DP3 jacket elevations

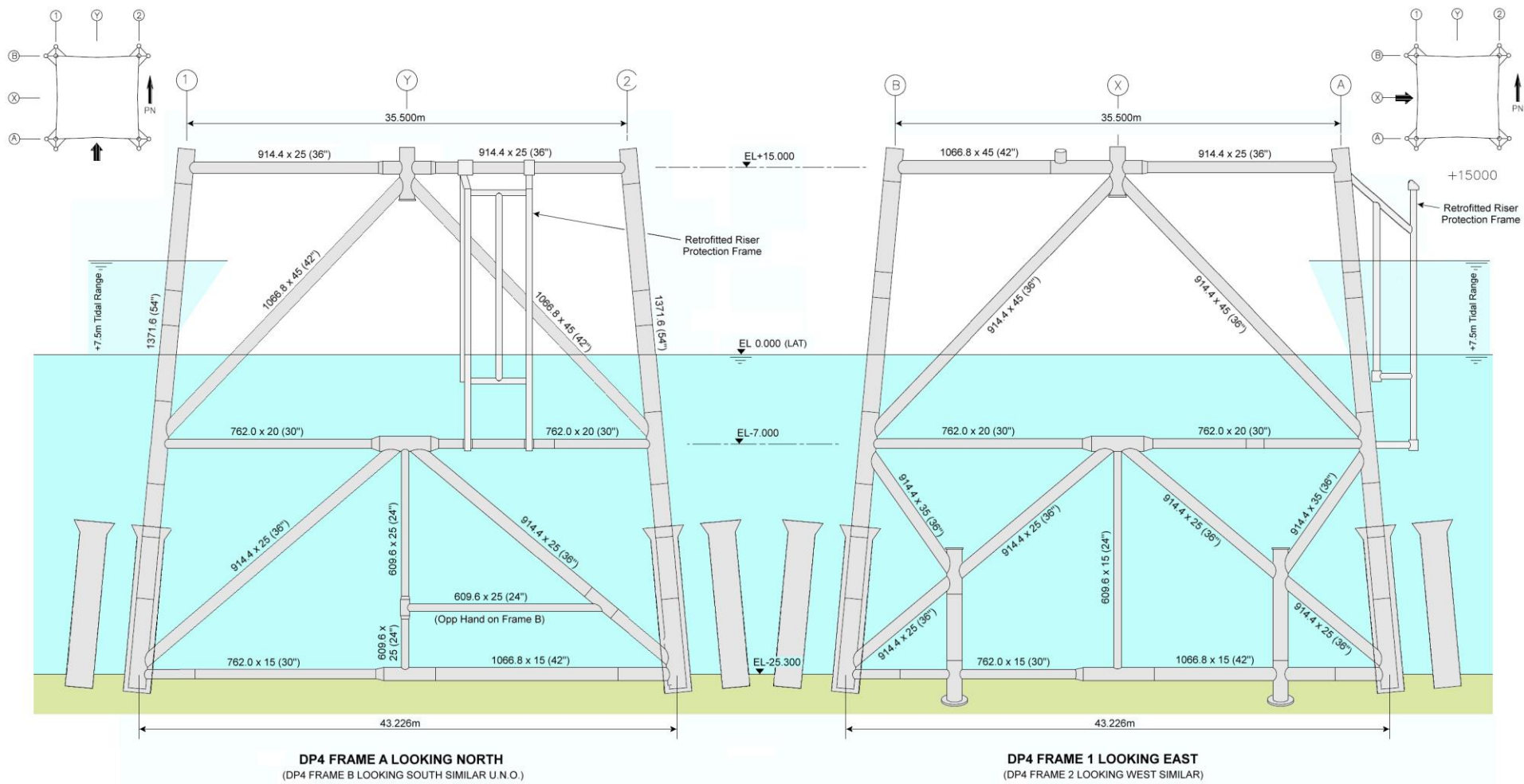


Figure 3.2.2: DP4 jacket elevations

Table 3.2.1: Jacket Decommissioning Methods	
1) Semi-Submersible Crane Vessel <input checked="" type="checkbox"/> ; 2) Monohull Crane Vessel <input checked="" type="checkbox"/> ; 3) Shear Leg Vessel <input checked="" type="checkbox"/> ; 4) Jack up Work barge <input checked="" type="checkbox"/> ; 5) Complete with topsides <input checked="" type="checkbox"/>	
Method	Description
Single lift removal by SSCV / MCV / SLV	Removal of topsides and jacket as a complete unit followed by transportation to shore for re-use, recycling, and disposal as appropriate.
Single lift removal with jacket by SSCV / MCV / SLV	Removal of jacket as a single unit followed by transportation to shore for re-use, recycling, disposal as appropriate
<b>Proposed removal method and disposal route</b>	<b>Removal of jacket as a single unit followed by transportation to shore for re-use, recycling, and final disposal to landfill as appropriate. A final decision on the decommissioning method will be made following a commercial tendering process.</b>

### 3.3 Pipelines and Cables

#### 3.3.1 Decommissioning Options:

All pipelines, power cable and fibre-optic cable transitions at the DP3 and DP4 installations will be completely removed.

The following options considered (and identified in terms of applicability to the pipelines and cables listed in Table 3.3.1) are:

- 1) Complete removal;
- 2) Leave *in situ*, making pipeline and cable ends safe by removal.

Table 3.3.1: Proposals for pipeline & cables		
Pipeline	Condition and Current Status	Decommissioning Options considered
<b>PL194 &amp; PL195</b> (24" FBE & concrete weight coated pipelines, operational)	Trenched and buried.	1 & 2
<b>PL204 &amp; PL205</b> (2") 3LPP coated pipeline, operational)	Trenched and buried.	1 & 2
Power cables <b>IF-07E13, IF-07E31, IF-07E41, &amp; IF-07E84</b>	Trenched and buried.	1 & 2
Fibre-optic cable <b>PL2718</b>	Trenched and buried.	1 & 2

#### 3.3.2 Comparative Assessment Method and Outcome

A comparative assessment of the decommissioning options was performed in accordance with the Spirit Energy Guidance for Comparative Assessments for Decommissioning. Each decommissioning option was qualitatively assessed against Safety, Environment, Technical and Societal and Cost. Refer [2] for details. The outcome of the Comparative Assessment is described in Table 3.3.2.

**Table 3.3.2: Outcomes of Comparative Assessment**

Pipeline or Group	Recommended Option	Justification
<b>PL194 &amp; PL195</b> (24")	<p>Remove exposed ends and associated stabilisation and protection features; leave the pipeline(s) <i>in situ</i>.</p> <p>Cut <b>PL194</b> at base of DP4 pipeline riser, remove expansion spools and short surface length to where the pipeline enters the deposited rock. Total length removed ~65m.</p> <p>Cut <b>PL194</b> at base of CPP1 pipeline riser, remove expansion spools and short surface length to where the pipeline enters the deposited rock. Total removed ~65m.</p> <p>Cut <b>PL195</b> at base of DP3 pipeline riser, remove expansion spools and short surface length to where the pipeline enters the deposited rock. Total length removed ~60m.</p> <p>Cut <b>PL195</b> at base of CPP1 pipeline riser, remove expansion spools and short surface length to where the pipeline enters the deposited rock. Total length removed ~55m.</p> <p>If necessary reprofile the existing rock or, as a contingency measure, deposit small quantities of additional rock to ensure any exposed cut pipeline ends are buried.</p> <p>Monitoring to confirm the pipelines remain buried will be completed to a schedule agreed with OPRED.</p>	<p>Outside the 500m safety zones the pipelines and cables will already have been exposed to fishing activity for over 35 years.</p> <p>There is much to differentiate the completely remove and leave <i>in situ</i> decommissioning proposals from a technical, safety and cost perspective.</p> <p>Both pipelines are buried and stable - with latest survey data indicating that no spans are present, posing no hazard to marine users. Minimal seabed disturbance, lower energy usage, reduced risk to personnel engaged in the activity.</p>
<b>PL204 &amp; PL205</b> (2")	<p>Remove exposed ends and associated stabilisation and protection features; leave the pipeline(s) <i>in situ</i>.</p> <p>Cut <b>PL204</b> at base of DP4 J-tube, remove section of pipeline on support ramp together with short surface length down to transition depth. Total length removed ~80m.</p> <p>Cut <b>PL204</b> at base of CPP1 J-tube, remove section of pipeline on support ramp together with short surface length down to transition depth. Total length removed ~150m.</p> <p>Cut <b>PL205</b> at base of DP3 pipeline riser, remove sections of pipeline on support ramp together with short surface length down to transition depth. Total length removed ~65m.</p> <p>Cut <b>PL205</b> at base of CPP1 pipeline riser, remove section of pipeline on support ramp together with short surface length down to transition depth. Total length removed ~65m.</p> <p>Monitoring to confirm the pipelines remain buried will be completed to a schedule agreed with OPRED.</p>	<p>Outside the 500m safety zones the pipelines and cables will already have been exposed to fishing activity for over 35 years.</p> <p>Apart from cost there is little to differentiate the completely remove and leave <i>in situ</i> decommissioning proposals.</p> <p>Both pipelines are buried and stable - with latest survey data indicating that no spans are present, posing no hazard to marine users. Minimal seabed disturbance, lower energy usage, reduced risk to personnel engaged in the activity.</p>
<b>Power cable IF-07E13</b>	<p>Remove exposed ends and associated stabilisation and protection features; leave the cable <i>in situ</i>.</p> <p>Cut <b>IF-07E13</b> at base of DP3 J-Tube, remove cables from support ramp and on seabed down to transition depth. Total length removed ~55m.</p> <p>Cut <b>IF-07E13</b> at base of CPP1 J-Tube, remove cables from support ramp and on seabed down to transition depth. Total length removed ~55m.</p> <p>Monitoring to confirm the cable remains buried will be completed to a schedule agreed with OPRED.</p>	<p>Outside the 500m safety zones the cable(s) will already have been exposed to fishing activity for over 35 years.</p> <p>Apart from cost there is little to differentiate the completely remove and leave <i>in situ</i> decommissioning proposals. Maximises</p>

**Table 3.3.2: Outcomes of Comparative Assessment**

Pipeline or Group	Recommended Option	Justification
		<p>recycling of materials and removes legacy related threats to other users of the sea.</p> <p>The cable(s) is or are otherwise buried and stable - with latest survey data indicating that no spans are present, posing no hazard to marine users. Minimal seabed disturbance, lower energy usage, reduced risk to personnel engaged in the activity.</p>
Power cable <b>IF-07E31</b>	<p>Remove exposed ends and associated stabilisation and protection features; leave the cable(s) <i>in situ</i>.</p> <p><b>IF-07E31</b> has already been severed at DP3 and CPP1.</p> <p>Monitoring to confirm the pipelines remain buried will be completed to a schedule agreed with OPRED.</p>	Refer justification for power cable <b>IF-07E13</b> .
Power cable <b>IF-07E41</b>	<p>Remove exposed ends and associated stabilisation and protection features; leave the cable(s) <i>in situ</i>.</p> <p>Cut <b>IF-07E41</b> at base of DP4 J-Tube, remove cable from support ramp and on seabed down to transition depth. Total length removed ~55m.</p> <p>Cut <b>IF-07E41</b> at base of CPP1 J-Tube, remove cable from support ramp and on seabed down to transition depth. Total length removed ~150m.</p> <p>Monitoring to confirm the pipelines remain buried will be completed to a schedule agreed with OPRED.</p>	Please refer justification for power cable <b>IF-07E13</b> .
Power & fibre-optic cable <b>IF-07E84</b>	<p>Remove exposed ends and associated stabilisation and protection features; leave the cable(s) <i>in situ</i>.</p> <p>Cut <b>IF-07E84</b> at base of DP4 J-Tube, remove cable from support tube and on seabed down to transition depth. Total length removed ~55m.</p> <p>Cut <b>IF-07E84</b> at base of DP8 J-Tube, remove cable from support ramp and on seabed down to transition depth. Total length removed ~110m.</p> <p>Monitoring to confirm the pipelines remain buried will be completed to a schedule agreed with OPRED.</p>	Please refer justification for power cable <b>IF-07E13</b> .
<b>PL2718</b> Power & fibre-optic cable	<p>Remove exposed ends and associated stabilisation and protection features; leave the cable <i>in situ</i>.</p> <p>Cut <b>PL2718</b> at base of DP3 J-Tube, remove cable from support ramp and on seabed down to transition depth. Total length removed ~210m.</p> <p>Cut <b>PL2718</b> at base of CPP1 J-Tube, remove cable from support ramp and on seabed down to transition depth. Total length removed ~105m.</p> <p>Monitoring to confirm the pipelines remain buried will be completed to a schedule agreed with OPRED.</p>	Please refer justification for power cable <b>IF-07E13</b> , although exposure to fishing activity will have been over 10 years.



### 3.4 Pipeline & Cable Decommissioning Summarised

The pipeline and cable decommissioning proposals are summarised in the following schematics.

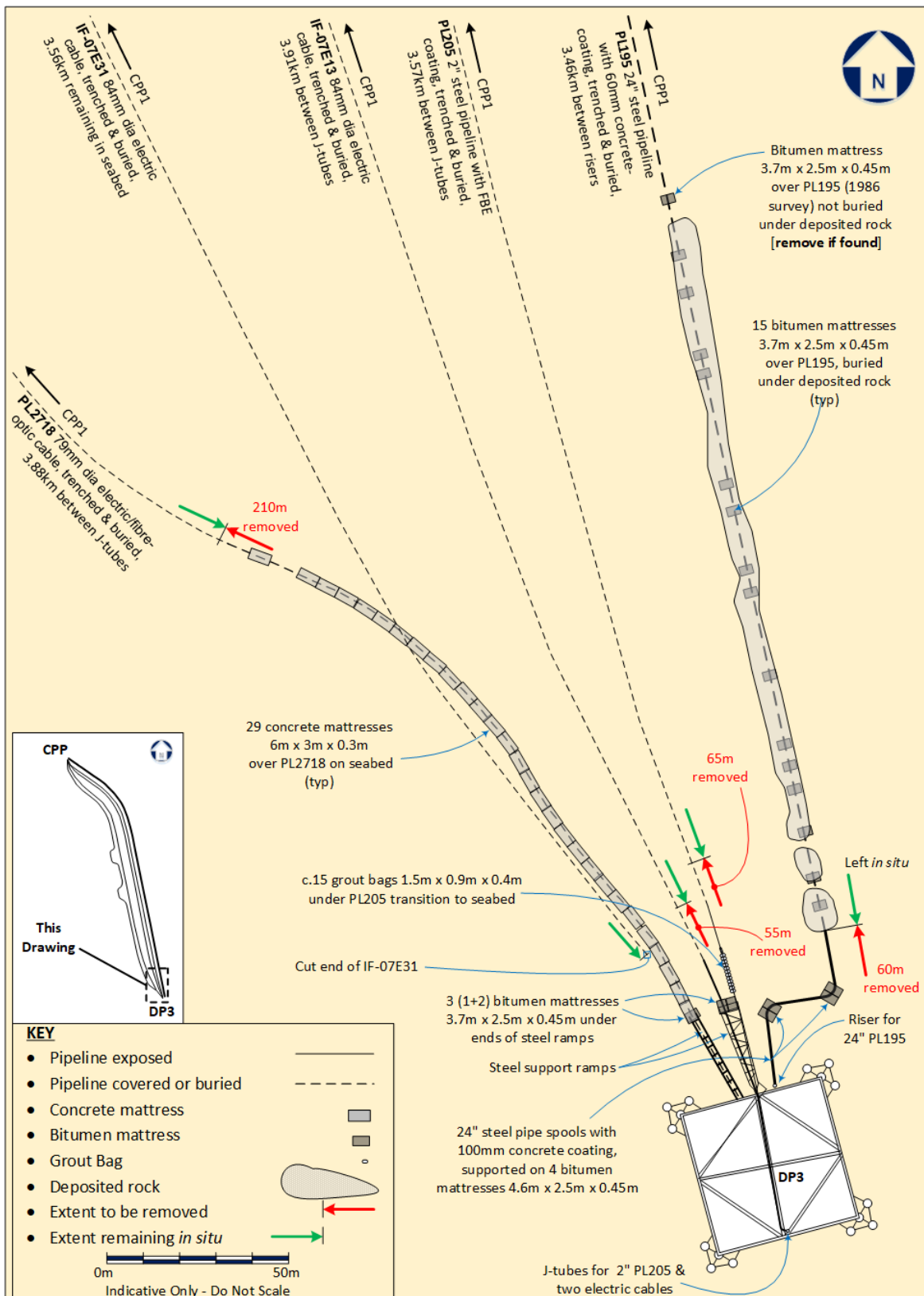


Figure 3.4.1: Decommissioning of pipelines and cables at DP3

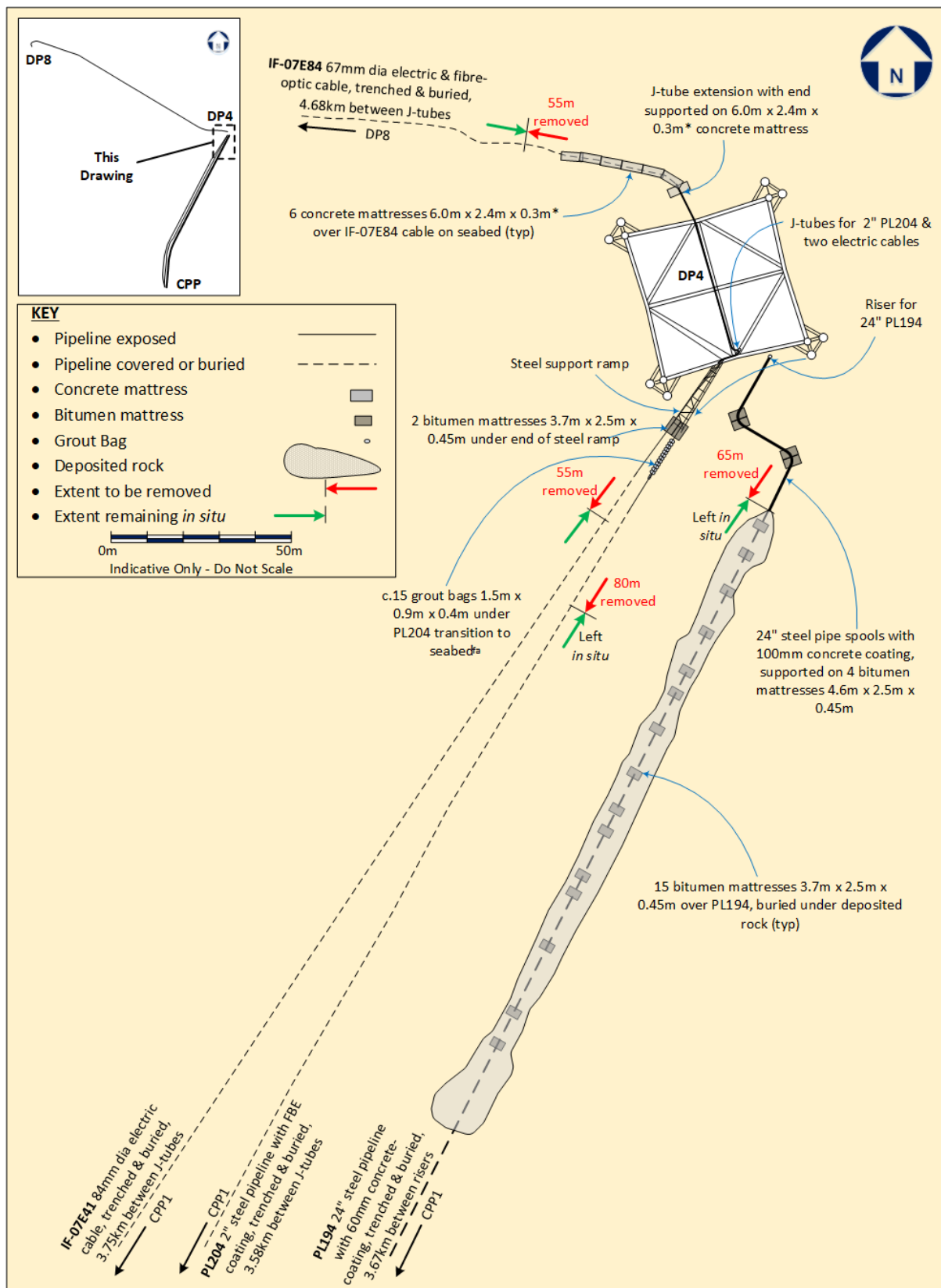


Figure 3.4.2: Decommissioning of pipelines and cables at DP4

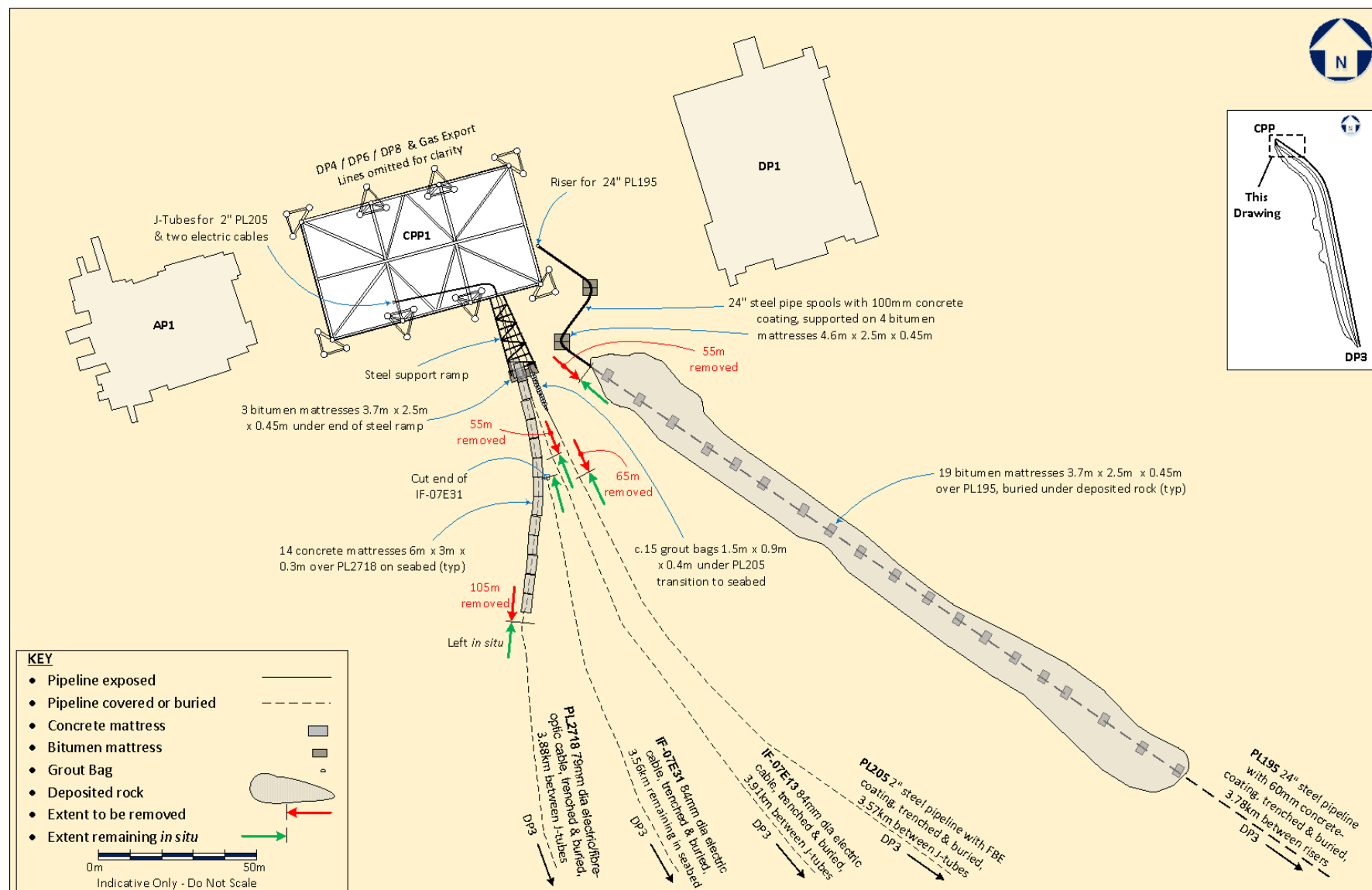


Figure 3.4.3 Decommissioning of DP3 pipelines & cables at CPP1

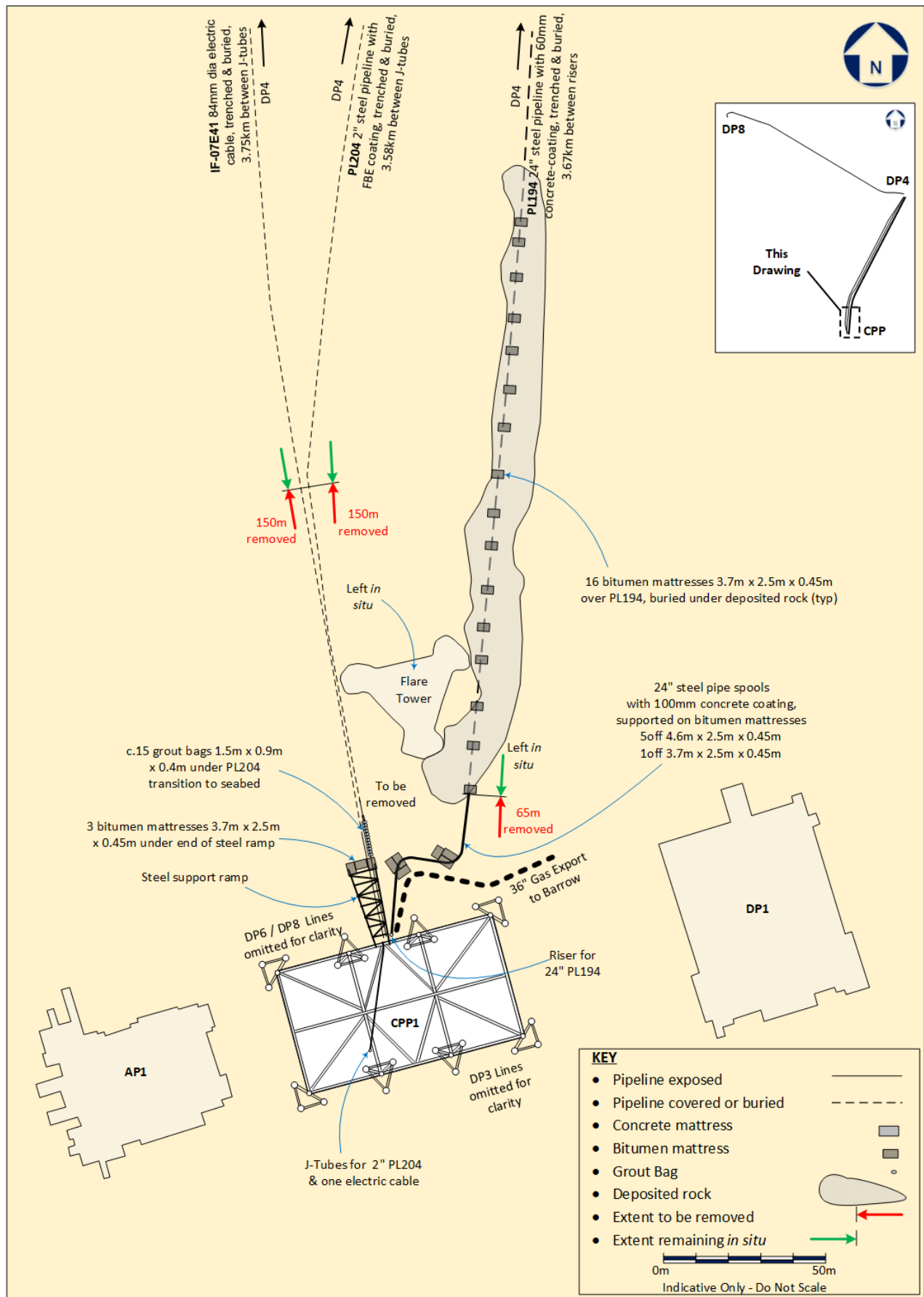


Figure 3.4.4: Decommissioning of DP4 pipelines & cables at CPP1

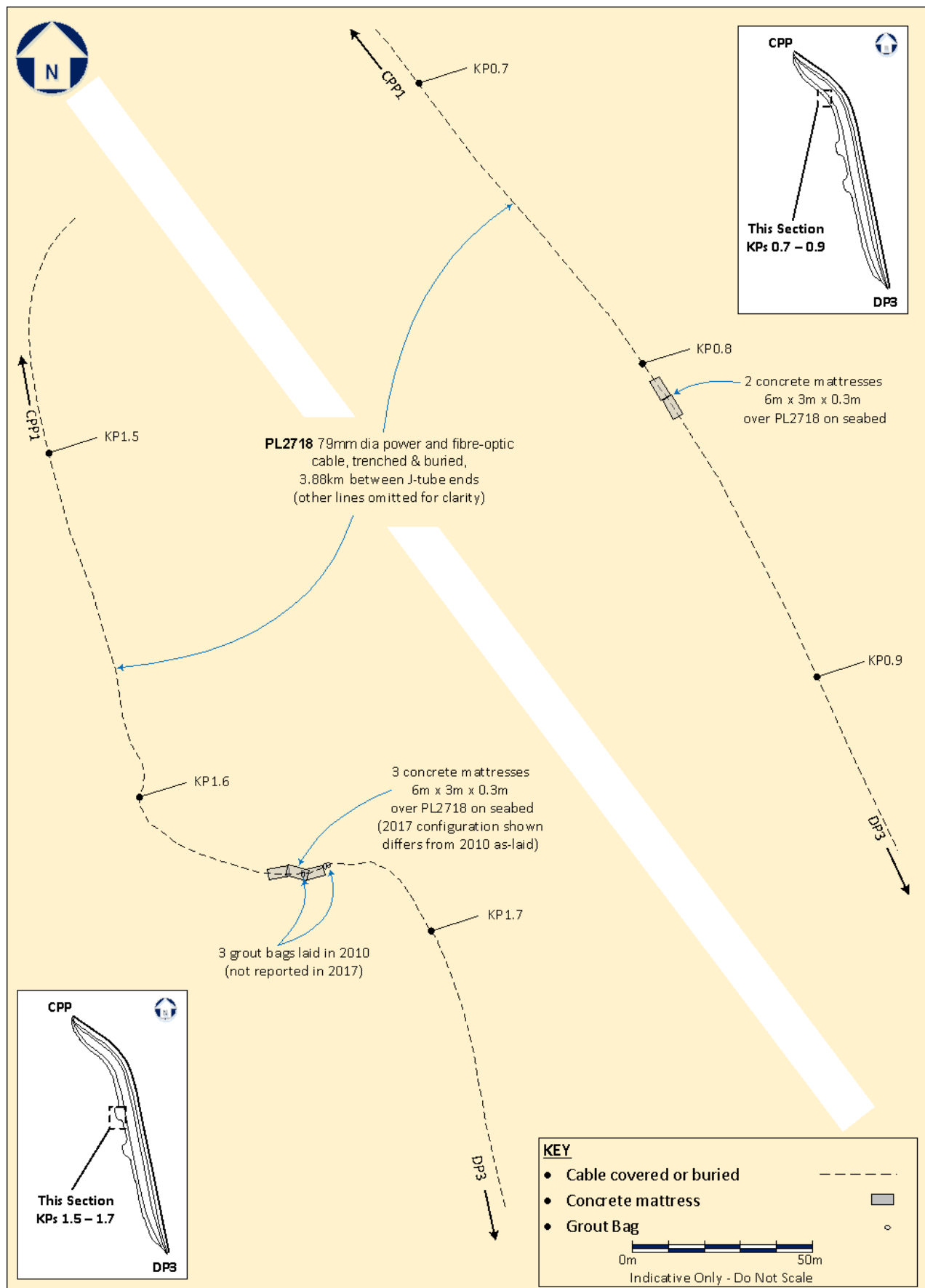


Figure 3.4.5: PL2718 midline mattresses

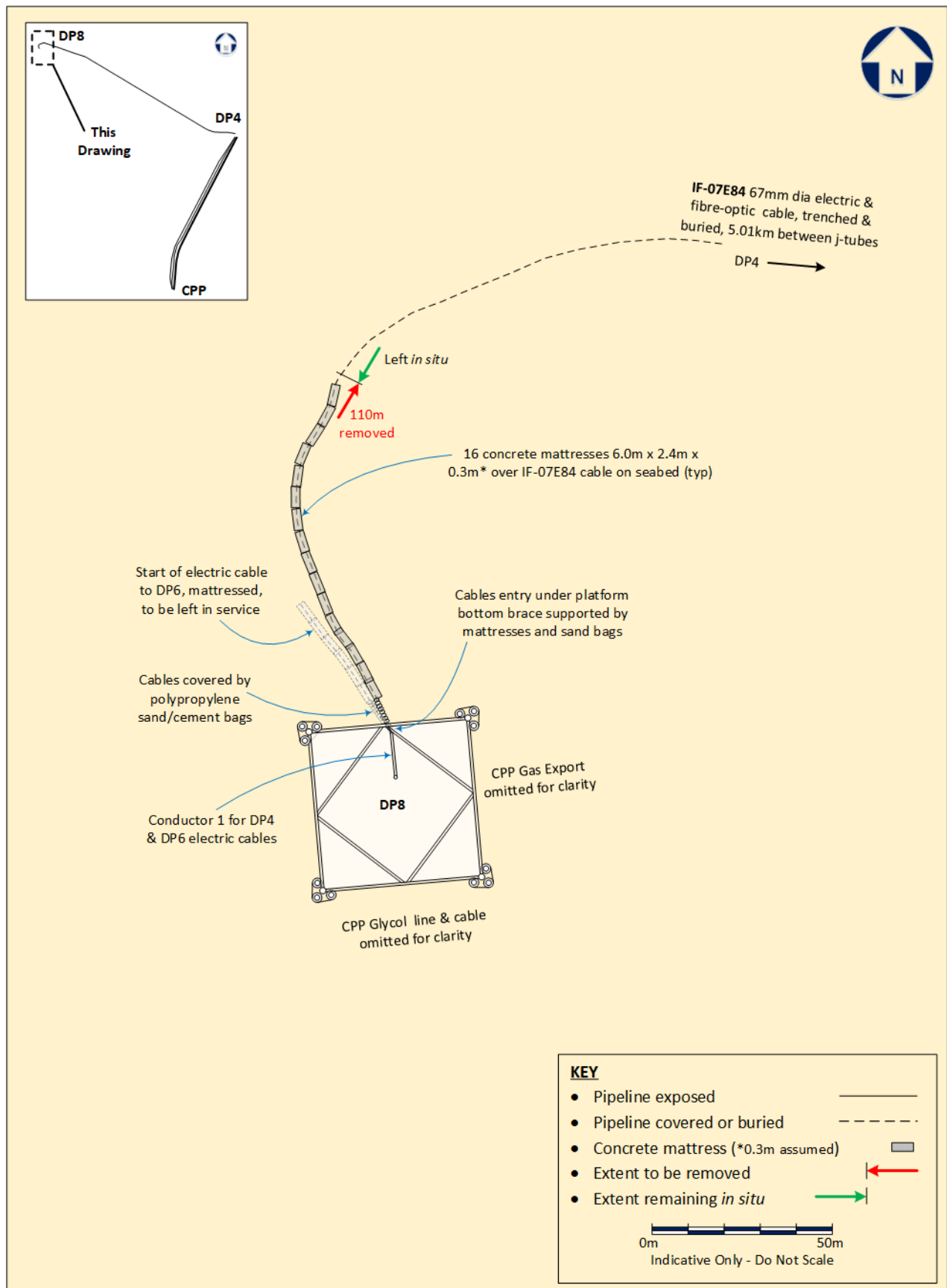


Figure.3.4.6: Decommissioning of DP4 cable at DP8

### 3.5 Pipeline and Cable Stabilisation Features

All exposed concrete and bitumen mattresses will be recovered to shore unless noted otherwise. Deposited rock and underlying bitumen mattresses will be left *in situ*.

Table 3.5.1: Pipeline and Cable Stabilisation Features			
Stabilisation features	Number	Description	Disposal Route (if applicable)
Bitumen mattresses	19	<b>PL195</b> on approach to DP3: 4x Type 1 bitumen mattresses under pipeline expansion spool, exposed; 15x Type 2 bitumen mattresses, buried under deposited rock 200m long. On approach to the main body of rock, one of these mattresses may be mostly exposed.	Recover exposed bitumen mattresses under the pipeline expansion spool to shore for reuse, recycling or disposal. Leave the bitumen mattresses under deposited rock <i>in situ</i> . If necessary reprofile the existing rock or, as a contingency measure, deposit small quantities of additional rock to ensure any exposed mattress edges are buried.
	3	<b>PL205 &amp; PL2718</b> on approach to DP3: 3x Type 2 bitumen mattresses underneath end of steel support ramp, exposed.	Recover the exposed bitumen mattresses underneath the end of the support ramp to shore for reuse, recycling or disposal.
	23	<b>PL195</b> on approach to CPP1: 4x Type 1 bitumen mattresses under pipeline expansion spool, exposed; 19x Type 2 bitumen mattresses, buried under deposited rock 200m long.	Recover the exposed bitumen mattresses under the pipeline expansion spool to shore for reuse, recycling or disposal. Leave the bitumen mattresses under deposited rock <i>in situ</i> .
	3	<b>PL205, IF-07E13 &amp; PL2718</b> on approach to CPP1: 3x Type 2 bitumen mattresses underneath end of steel support ramp.	Recover the exposed bitumen mattresses underneath the end of the support ramp to shore for reuse, recycling or disposal.
	20	<b>PL194</b> on approach to DP4: 4x Type 1 and 1x Type 2 bitumen mattresses under pipeline expansion spool, exposed; 15x Type 2 bitumen mattresses, buried under deposited rock 200m long.	Recover exposed bitumen mattresses under the pipeline expansion spool to shore for reuse, recycling or disposal. Leave the bitumen mattresses under deposited rock <i>in situ</i> . If necessary reprofile the existing rock or, as a contingency measure, deposit small quantities of additional rock to ensure any exposed mattress edges are buried.
	2	<b>PL204</b> on approach to DP4: 2x Type 2 bitumen mattresses underneath end of steel support frame, exposed.	Recover the exposed bitumen mattresses underneath the end of the support ramp to shore for reuse, recycling or disposal.
	22	<b>PL194</b> on approach to CPP1: 5x Type 1 & 1x Type 2 bitumen mattresses under pipeline expansion	Recover the exposed bitumen mattresses under the pipeline expansion spool to shore for



**Table 3.5.1: Pipeline and Cable Stabilisation Features**

Stabilisation features	Number	Description	Disposal Route (if applicable)
		spool, exposed 16x Type 2 bitumen mattresses, buried under deposited rock 200m long.	reuse, recycling or disposal. Leave the bitumen mattresses under deposited rock <i>in situ</i> .
	3	<b>PL204 &amp; IF-E041</b> on approach to CPP1: 3x Type 2 bitumen mattresses underneath end of steel support ramp.	Recover the exposed bitumen mattresses underneath the end of the support ramp to shore for reuse, recycling or disposal.
Concrete mattresses	29	<b>PL2718</b> on approach to DP3: 29x Type 1 concrete mattresses, on top of fibre-optic cable.	Recover the concrete mattresses to shore for re-use, recycling or disposal.
	5	<b>PL2718</b> 'mid-line' mattresses: 2x Type 1 concrete mattresses at ~KP0.80; 3x Type 1 concrete mattresses at ~KP1.65.	If exposed, the 'mid-line' mattresses will be recovered to shore for re-use, recycling or disposal. Following this, should it be foreseen that the cable would present a snagging hazard prior to the verification overtrawl, as a contingency measure the cable may either need to be retrenched and buried or small quantity of deposited rock - up to 15Te, may be required to protect the cable.
	14	<b>PL2718</b> on approach to CPP1: 14x Type 1 concrete mattresses, on top of fibre-optic cable.	Recover the concrete mattresses to shore for re-use, recycling or disposal.
	7	<b>IF-07E84</b> on approach to DP4: 1x Type 2 concrete mattress under J-tube support; 6x Type 2 concrete mattresses over cable.	Recover the concrete mattresses to shore for re-use, recycling or disposal.
	16	<b>IF-07E84</b> on approach to DP8: 16x Type 2 concrete mattress over cable.	Recover the concrete mattresses to shore for re-use, recycling or disposal.
Grout bags (1.5 x 0.9 x 0.4 UNO)	15	<b>PL205</b> on approach to DP3.	Assuming exposed, recover to shore for re-use, recycling or disposal unless buried in which case they will be left <i>in situ</i> .
	15	<b>PL204</b> on approach to DP4.	
	15	<b>PL205</b> on approach to CPP1.	
	15	<b>PL204</b> on approach to CPP1.	
	13	25kg bags on support ramp as protection for <b>PL205</b> at DP3.	Completely recover to shore for reuse, recycling or disposal.
	13	25kg bags on support ramp as protection for <b>PL204</b> at DP4.	
	26	25kg bags on support ramp as protection for <b>PL204</b> (13 No.) and <b>PL205</b> (13 No.) at CPP1.	

Table 3.5.1: Pipeline and Cable Stabilisation Features			
Stabilisation features	Number	Description	Disposal Route (if applicable)
	50	<b>IF-07E84</b> on approach to DP8. 25kg Grout bags.	
Deposited rock	2x200m 2x200m	<b>PL195</b> on approach to DP3 and CPP1; <b>PL194</b> on approach to DP4 and CPP1.	Leave undisturbed <i>in situ</i> .

### 3.6 Wells

Table 3.6.1: Well Decommissioning
Both installations host six production wells ( <b>DP3</b> : 110/8a-C1-V, C2-S, C3-S, C4-S, C5-S & C6-S), <b>DP4</b> : 110/3a-D1-V, D2-S, D3-S, D4-S, D5-S & D6-V). The wells will be decommissioned in accordance with latest version of the Oil & Gas UK Well Decommissioning Guidelines (Issue 6, June 2018). A Master Application Template (MAT) and the supporting Supplementary Application Template (SAT) will be submitted in support of works carried out. A PON5 will also be submitted to OPRED for application to decommission the wells. Well decommissioning is scheduled to commence in 2019.

### 3.7 Waste Streams

Table 3.7.1: Waste Stream Management Methods	
Waste Stream	Removal and Disposal method
Bulk liquids	Residual hydrocarbons will be removed from topsides and any associated bulk seawater from topsides will be cleaned and disposed overboard under permit. The 24" pipelines from DP3 and DP4 will be pigged, flushed and left filled with seawater. The incoming 2" MEG lines will be flushed and filled with seawater prior to the start of the decommissioning activities. Any residual fluids from within these pipelines will be released to marine environment under permit prior to removal to shore. Further cleaning and decontamination will take place onshore prior to recycling / re-use.
Marine growth	Where necessary and practicable to allow access, some marine growth will be removed offshore. The remainder will be brought to shore and disposed of according to guidelines and company policies.
NORM/LSA Scale	NORM is not expected based on production to date. However, tests for NORM will be undertaken offshore and any NORM encountered will be dealt with and disposed of in accordance with guidelines and company policies.
Asbestos	Limited quantities of asbestos are expected on the installations. Any such material found will be dealt with and disposed of in accordance with guidelines and company policies.
Other hazardous wastes	Will be recovered to shore and disposed of according to guidelines and company policies.
Onshore Dismantling sites	Appropriate licensed sites will be selected. Dismantling site must demonstrate proven disposal track record and waste stream management throughout the deconstruction process and demonstrate their ability to deliver innovative reuse and recycling options.

Table 3.7.2: Inventory Disposition			
Inventory	Total Inventory Tonnage	Planned tonnage to shore	Planned tonnage decommissioned <i>in situ</i>
DP3 Installation	11,924	10,112.1	1,811.9
DP3 Pipelines & cables	4,644.8	512.8	4,132.0
DP4 Installation	11,344	9,955.7	1,388.3
DP4 Pipelines & cables	4,406.3	581.9	3,824.4

All recovered material will be transported onshore for reuse, recycling or disposal. It is not possible to predict the market for reusable materials with any confidence so the figures in Table 3.7.3 are disposal aspirations.

Table 3.7.3: Reuse, Recycle & Disposal Aspirations for Recovered Material			
Inventory	Re-use	Recycle	Disposal
Overall	<5%	>95%	<5%

Please refer to the Environmental Appraisal [1] in Section 7 for further details.

## **4. ENVIRONMENTAL APPRAISAL**

### **4.1 Environmental Sensitivities**

Environmental sensitivities are discussed in the Environmental Appraisal [1] and so shall not be repeated here.

### **4.2 Potential Environmental Impacts and their Management**

There will be some planned and unplanned environmental impacts arising from decommissioning of DP3 and DP4. Long-term environmental impacts from the decommissioning operations are expected to be low. Incremental cumulative impacts and trans-boundary effects associated with the planned decommissioning operations are also expected to be low. There will be a requirement for a new Environmental Appraisal to be produced and submitted to OPRED should the Decommissioning Programmes change.

For further details please refer Environmental Appraisal [1].

## 5. INTERESTED PARTY CONSULTATIONS

### 5.1 Informal Consultations

Table 5.1.1: Summary of Stakeholder Comments		
Who	Comment	Response
<b>INFORMAL CONSULTATIONS</b>		
ANIFPO		
NFFO	The decommissioning proposals herein were presented to NFFO on 22 Oct 2018.	The NFFO had no adverse comment to make concerning the decommissioning proposals.
NIFPO		
SFF	The decommissioning proposals herein were sent to SFF on 29 Oct 2018.	The SFF had no adverse comment to make concerning the decommissioning proposals and were happy to use guidance from NFFO.
<b>STATUTORY CONSULTATIONS</b>		
NFFO		
NIFPO		
SFF		
GMG		
Public		

## 6. PROGRAMME MANAGEMENT

### 6.1 Project Management and Verification

A Spirit Energy project management team will be appointed to manage the operations of competent contractors selected for all decommissioning activities. The team will ensure the decommissioning is executed safely, in accordance with legislation and Spirit Energy Health and Safety principles. Changes to the Decommissioning Programmes will be discussed with OPRED with any necessary approvals sought.

### 6.2 Post-Decommissioning Debris Clearance and Verification

The DP3 and DP4 installation sites, the 500m safety zones and areas of decommissioning activity along the pipelines will be subject to debris and trawlability surveys when the platform removal activities have concluded. Any operational oil and gas related debris on the seabed will be recovered for onshore disposal or recycling in line with existing disposal methods. Independent verification of seabed state will be supported by a Seabed Clearance Certificate. This will be included in the OPRED Close Out Report and sent to the Seabed Data Centre (Offshore Installations) at the Hydrographic Office.

### 6.3 Schedule

A proposed schedule is provided in Figure 6.3.1. The activities are subject to the acceptance of the Decommissioning Programmes presented in this document and any unavoidable constraints (e.g. vessel availability) that may be encountered while executing the decommissioning activities. Therefore, activity schedule windows have been included to account for this uncertainty.

The commencement of offshore decommissioning activities will depend on commercial agreements and commitments.

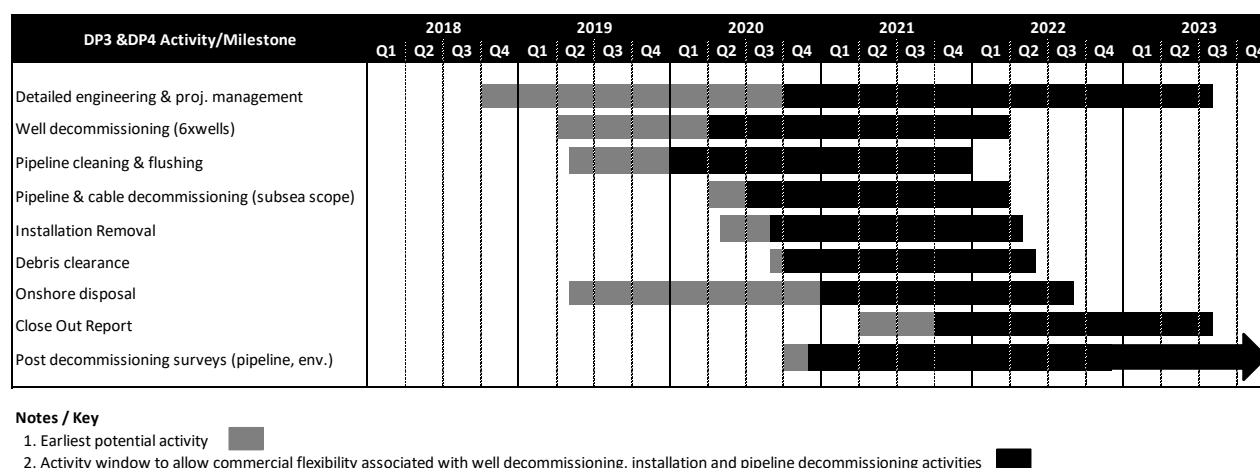


Figure 6.3.1: Gantt Chart of project plan

### 6.4 Costs

Decommissioning costs will be provided separately to OPRED and OGA.

### 6.5 Close Out

After decommissioning has been completed, pipeline end and stabilisation material status surveys and environmental surveys will be completed with the findings being sent to OPRED in the Close Out Report as required in the OPRED Guidance Notes. This report will be submitted within a

timescale to be agreed with OPRED. The report will explain any variance from the Decommissioning Programmes.

## 6.6 Post-Decommissioning Monitoring and Evaluation

After decommissioning has been completed, pipeline status surveys and environmental surveys will be completed with the findings being sent to OPRED in the Close Out report. The frequency of future pipeline and cable surveys after removal of the DP3 and DP4 installations will be agreed with OPRED and supported with risk assessments. Residual liability will remain with the Section 29 holders identified in Table 1.4.4 and Table 1.4.5. Unless agreed otherwise in advance with OPRED, Spirit Energy will remain the focal point for such matters, such as any change in ownership, for example.

The requirement for legacy and liability management will be described in more detail in the Close Out report.

## 7. SUPPORTING DOCUMENTS

### 7.1 Reference Documents

Table 7.1.1: Supporting Documents		
	Document Number	Title
[1]	CEU-PRJ-EIS0041-REP-0010	DP3–DP4 Decommissioning Environmental Appraisal
[2]	SPT-PRJ-EIS0041-REP-0014	DP3-DP4 Comparative Assessment for pipelines and cables



## **APPENDIX A PUBLIC NOTICE & CONSULTEE CORRESPONDENCE**

### **Appendix A.1 Public Notices**