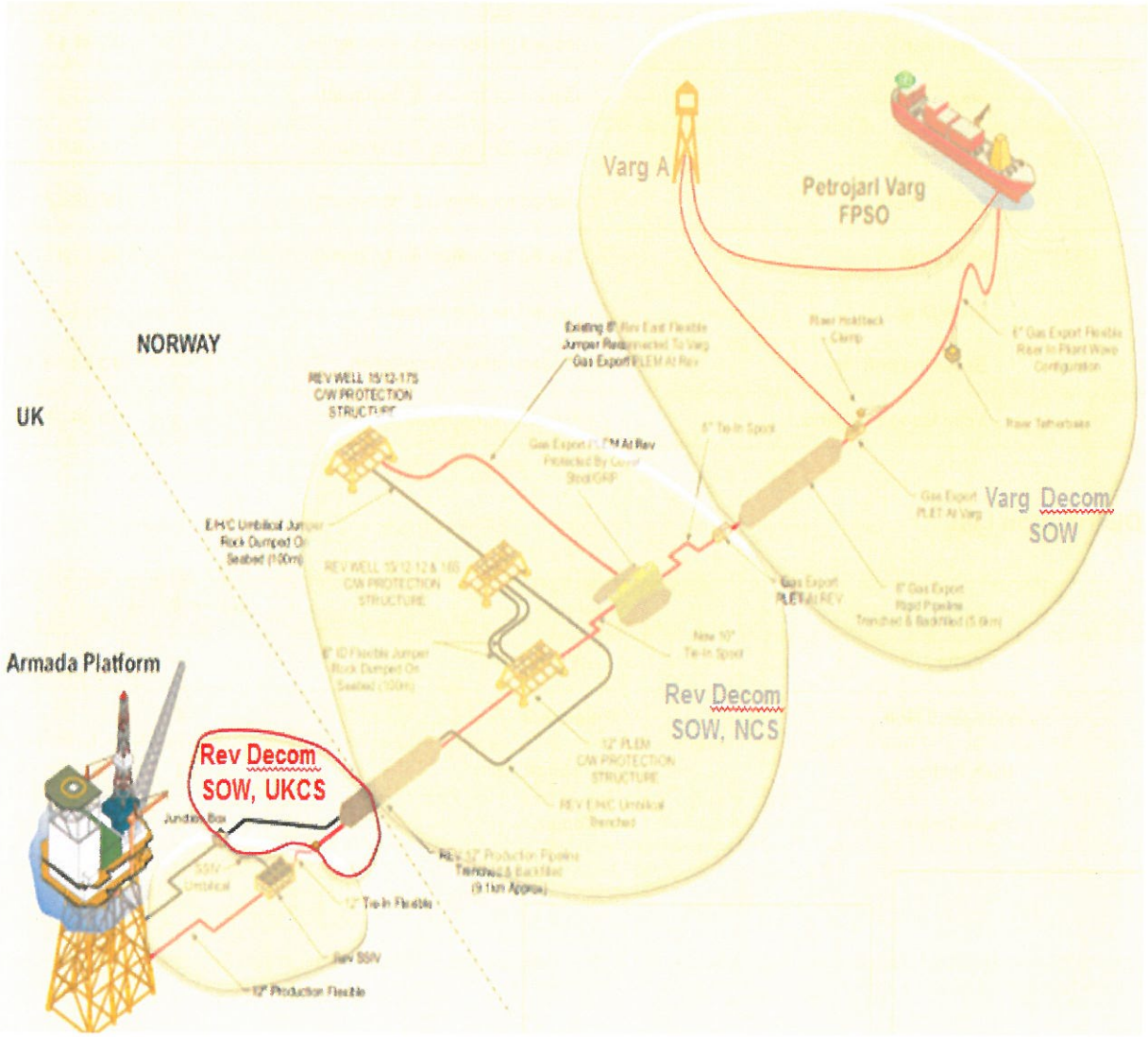
REV Pipelines Decommissioning Programme



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Terms and Abbreviations

ABBREVIATION	EXPLANATION
BEIS	Department of Business, Energy and Industrial Strategy
CA	Comparative Assessment
EIA	Environmental Impact Assessment
EPRD	Engineering, Preparation, Removal and Disposal
EU	European Union
FPSO	Floating Production Storage and Offloading
HSE	Health and Safety Executive
ICES	International Council for the Exploration of the Sea
KP	Kilometer Posted
LSA	Low Specific Activity
MARPOL	International Convention for the Prevention of Pollution from Ships (73/78)
MCDA	Multi Criteria Decision Analysis
NCMPA	Nature Conservation Marine Protection Area
NCS	Norwegian Continental Shelf
NORM	Naturally Occurring Radioactive Material
ODU	Offshore Decommissioning Unit
P&A	Plug and Abandonment
Repsol	Repsol Norge AS
ROV	Remotely Operated Vehicle
SAC	Special Area of Conservation
SFF	Scottish Fishermen's Federation
SOW	Scope of Work
SSIV	Rev Subsea Isolation Valve
TOP	Top of Pipe
UKCS	United Kingdom Continental Shelf

Figures and Tables

TABLE OF APPENDICES

1 Executive summary

1.1 Decommissioning Programme

This document contains one decommissioning programme for the Rev export pipeline and umbilical, for the infrastructure located on UKCS only (see Section 1.3).

1.2 Requirement for Decommissioning Programme

Pipelines:

In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Rev export pipeline and umbilical (see Table 1.2) are applying to the Department for Business, Energy and Industrial Strategy (BEIS) to obtain approval for decommissioning the pipelines detailed in Section 2.3 of this programme. (See also Section 8 – Partner Letter of Support).

In conjunction with public, stakeholder and regulatory consultation, the decommissioning programme is submitted in compliance with national and international regulations and BEIS's guidelines. The schedule outlined in this document is for a three (3) year decommissioning project plan due to begin in 2020, but could commence earlier.

1.3 Introduction

The Rev Field, located in Production Licence 038C, Block 15/12 on the NCS, comprises four seabed installations split into two separate areas, Rev West and Rev East. Whilst the Rev Field is in the Norwegian sector of the North Sea, the export pipeline and umbilical cross over into the UKCS and connect to Chrysaor's Armada installation (Block 22/05, Central North Sea). The UKCS components, which are the subject of this decommissioning programme, comprise:

- Approximately 4.8 km of 12-inch gas condensate pipeline from the UK median line to the flange at the Rev Subsea Isolation Valve (SSIV) close to the Chrysaor operated Armada platform (but excluding the SSIV itself); and
- Approximately 4.9 km of the Rev electrical and hydraulic control cable (umbilical) from the UK median line to the point at which it joins the junction box close to Armada (but excluding the box itself).

The Rev Field started production in 2009 but production has decreased to the extent that the field now only produces intermittently (at times of appropriate reservoir pressure). Based on the periodic nature of production of the Rev Field, the rights holders (Repsol Norge AS and Petoro AS) are planning to cease production of the field, the latest date is 31st March 2020, but could be earlier.

Following public, stakeholder and regulatory consultation, the decommissioning programme is submitted without derogation and in full compliance with BEIS guidelines. The decommissioning programme explains the principles of the removal activities which is supported by an Environmental Impact Assessment and Comparative Assessment.

Please note that transboundary pipelines have been included in the decommissioning programme and for clarity have been annotated UKCS/NCS on Table 2.1.

1.4 Overview of Installations/Pipelines Being Decommissioned

1.4.1 Installations

No installations form part of this decommissioning programme; the tables provided in the BEIS template for this section are therefore considered ***not applicable***.

1.4.2 Pipelines

Table 1.1 Pipelines Being Decommissioned		
Number of Pipelines	1 Pipeline 1 Umbilical	See Table 2.1

Table 1.2 Pipelines Section 29 Notice Holders Details		
Section 29 Notice Holders'	**Registration Number**	**Equity Interest (%)**
Repsol Norge AS (Talisman Energy Norge AS)	993787787	70
Petoro AS	983382355	30

1.5 Summary of Proposed Decommissioning Programme

Table 1.3 Summary of Decommissioning Programme		
Selected Option	**Reason for Selection**	**Proposed Decommissioning Solution**
1. Topsides		
N/A	N/A	N/A
2. Jacket(s)/Floating Facility (FPSO etc.)		
N/A	N/A	N/A
3. Subsea Installation(s)		
N/A	N/A	N/A
4. Pipelines, Flowlines & Umbilicals		
12-inch export pipeline (PL2468) will be flushed and decommissioned *in situ*.	The pipeline is sufficiently buried and stable, posing no hazard to marine users. Minimal seabed disturbance, lower energy usage, reduced risk to personnel engaged in the activity.	PL2468 will be decommissioned *in situ* apart from the exposed section within the Armada 500 m zone (approximately 150 m) which will be cut and recovered to shore, with the trench exit point being made safe for overtrawling.
Umbilical (PLU2472) will be fully removed by reverse reeling.	The umbilical is in a trench and has been left to naturally backfill, however the burial depth achieved is not sufficient to be confident regarding the potential long term risk to other users that the umbilical might have should it be over trawled. Therefore removal will leave a clear seabed and remove a potential obstruction to fishing operations.	PLU2472 will be fully removed (4,9km in the UKCS) by reverse reeling.
5. Wells		
N/A	N/A	N/A
6. Drill Cuttings		
N/A	N/A	N/A
7. Interdependencies		
Mattresses will be removed as part of the partial pipeline and umbilical removal activities.		

1.6 Field Location Including Field Layout and Adjacent Facilities

Please see Figures 1.1 and 1.2 both next page.

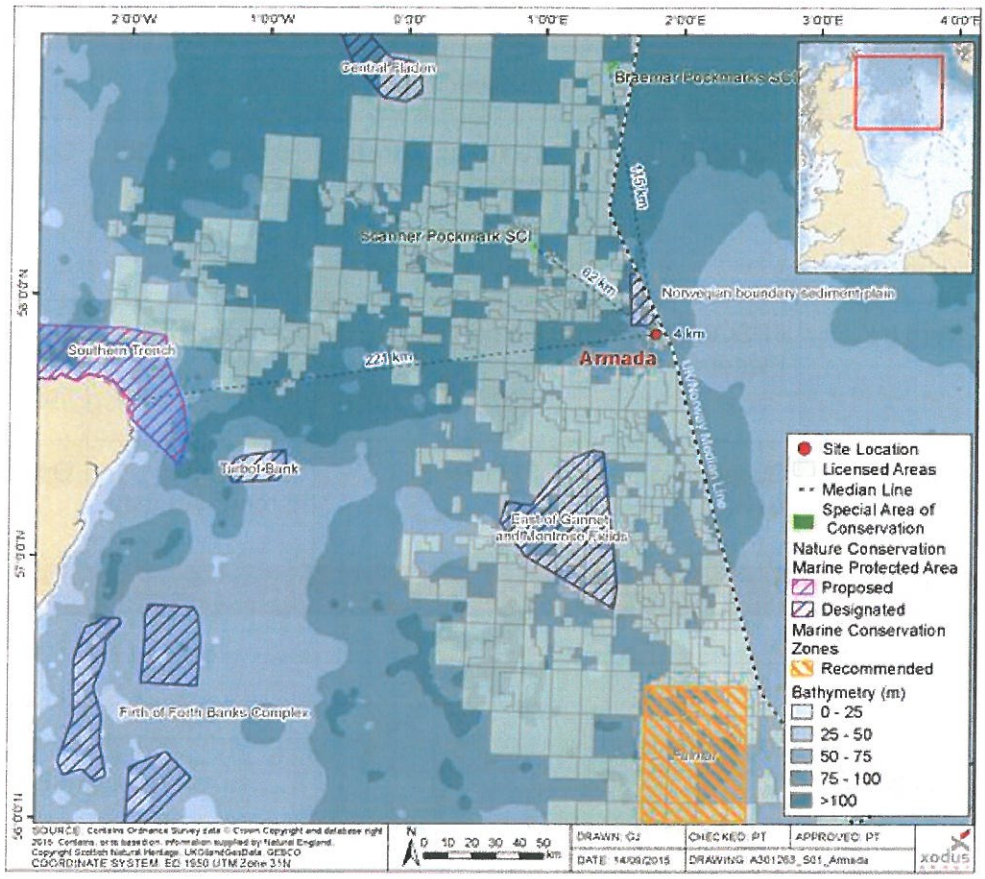


Figure 1.1 Field Location

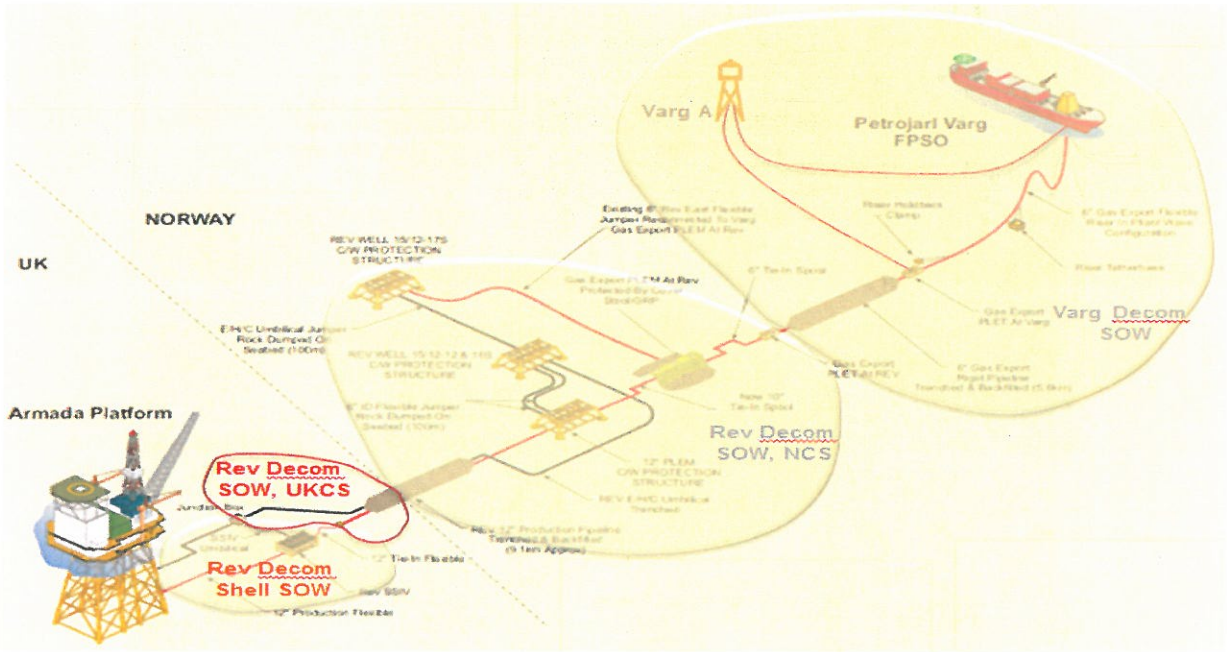


Figure 1.2 Rev Field Layout

Table 1.4 Adjacent Facilities					
Owner	**Name**	**Type**	**Distance/Direction**	**Information**	**Status**
Chrysaor	Armada	Platform	Directly adjacent to the west.	Armada host for Rev/Gaupe	Operational
Repsol	Varg (NCS)	FPSO/Wellhead Platform	6 km northeast	Connected to the Rev infrastructure in NCS	Out of Use – Decommissioning ongoing
Shell	Gaupe (NCS)	Subsea Tie back	1.7 km south	Produces through Armada	Operational
Impacts of Decommissioning Proposals					
No impact is expected					

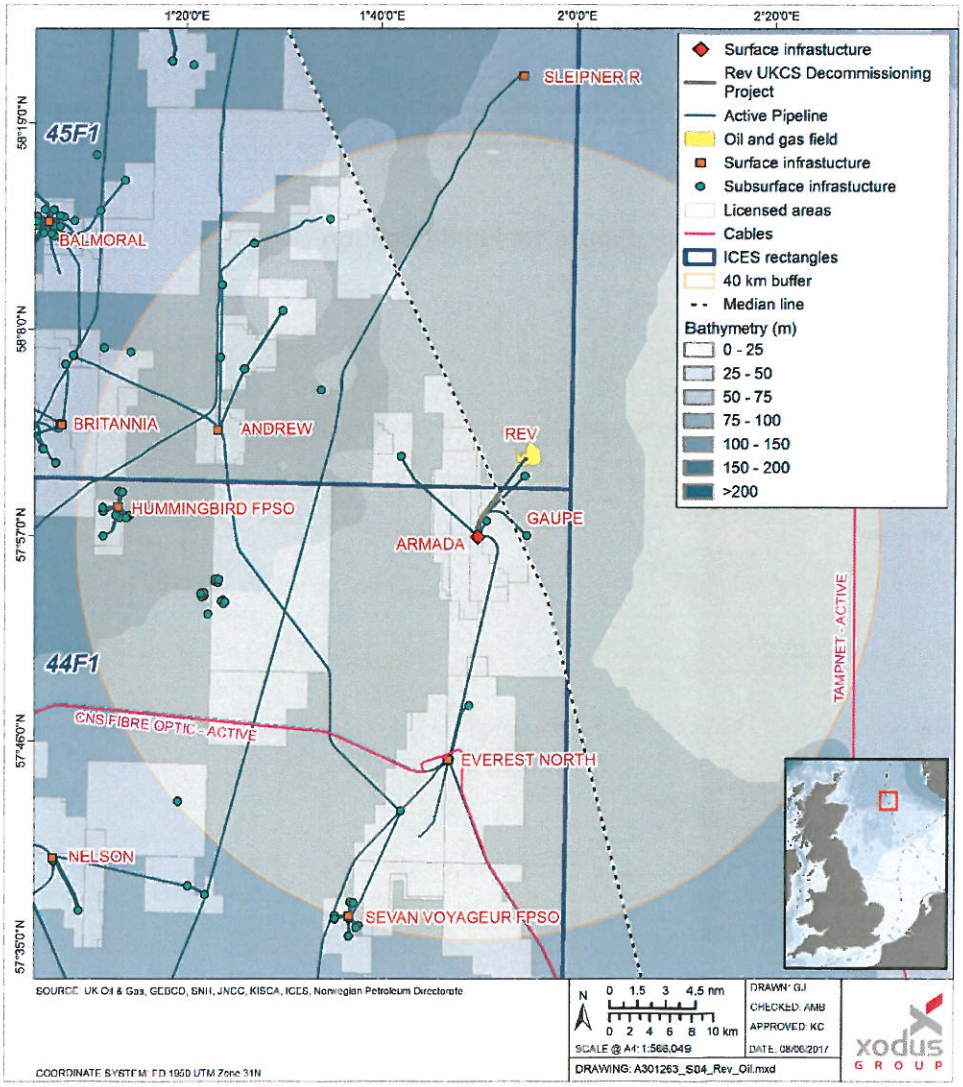


Figure 1.3 Adjacent Facilities

1.7 Industrial Implications

The purpose of this section is to communicate, to the stakeholders the various elements of the project overall contracting strategy for the Rev Decommissioning Project on the UKCS.

The objectives for the overall contracting strategy are to:

- Select contractors with relevant competence who can deliver the required HSE, quality and capacity
- The contractors should have their core competence within the area that represents the main part of each scope of work
- Integrate lessons learnt from previous and ongoing projects executed for the NCS and UKCS to ensure correct technical specifications and timelines are maintained

The contracting strategy for the Facilities removal and disposal services is to tender for EPRD services (Engineering, Preparation, Removal and Disposal) for the Rev Subsea structures. Further, the contracting model is to have one EPRD contractor to minimize the contractual interfaces for the removal of the Rev Subsea structures on both NCS and UKCS scopes of work. It is foreseen that the EPRD contract will have the UKCS scope of work as an option so allowing this to be included or not depending if synergies with the Armada decommissioning work are identified. In addition, the EPRD contractor will have the responsibility for the Disposal contract and decide which site or sites will be used. If any waste is sent across border the relevant documentation will be prepared by the Contractor. Repsol will have its 'see to duty' to ensure the EPRD Contractor follows both UK and Norwegian regulations for the complete scope of work including disposal and waste handling.

Repsol holds a number of frame contracts for subsea services which will be utilised for tendering for the EPRD contract. The Frame Contractors have experience of working on UKCS and NCS.

In addition to the above consideration will be given to the following possible synergies to combine scope of works to give better execution and savings:

- Combined with Armada decommissioning scope of work
- Combined with Gaupe subsea removal
- Possible combination with Repsol-Sinopec scope of work

The conclusion of the any possible combined scope of work will be very dependent on timing in relation to final completion within the agreed timeframe as given by both UK and Norwegian authorities.

2 DESCRIPTION OF ITEMS TO BE DECOMMISSIONED

2.1 Installations: Surface Facilities (Topsides/Jackets/FPSO etc.)

No installations form part of this decommissioning programme; the tables provided in the BEIS template for this section are therefore considered ***not applicable***.

2.2 Installations: Subsea including Stabilisation Features

No installations form part of this decommissioning programme; the tables provided in the BEIS template for this section are therefore considered ***not applicable***.

2.3 Pipelines Including Stabilisation Features

Table 2.1 Pipeline/Flowline/Umbilical Information									
Description	**Pipeline Number (as per PWA)**	**Diameter (in)**	**Length (km)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points**	**Burial Status**	**Pipeline Status**	**Current Content**
Steel pipeline	PL2468 (UKCS)	12	4.771	SML 450I SUPD (X65)	Gas/ Condensate	UK/Norwegian Boundary – Armada Pipeline Target box	Trenched and Buried	Operational	Hydrocarbons
	PL2468 (NCS)	12	4.304	SML 450I SUPD (X65)	Gas/ Condensate	Rev PLEM - UK/Norwegian Boundary	Trenched and Buried	Operational	Hydrocarbons

Table 2.1 Pipeline/Flowline/Umbilical Information									
Description	**Pipeline Number (as per PWA)**	**Diameter (in)**	**Length (km)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points**	**Burial Status**	**Pipeline Status**	**Current Content**
Umbilical	PLU2472 (UKCS)	6	4.935	Umbilical	Scale Inhibitor/ Corrosion Inhibitor/ Methanol/ Hydraulic Control Fluid Signal/Power	SSIV Breakout – UK/Norwegian Boundary	Trenched and natural back fill	Operational	Chemicals
	PLU2472 (NCS)	6	4.660	Umbilical	Scale Inhibitor/ Corrosion Inhibitor/ Methanol/ Hydraulic Control Fluid Signal/Power	UK/Norwegian Boundary – Rev Production Well 15/12-12	Trenched and natural back fill	Operational	Chemicals

Table 2.2 **Subsea Pipeline Stabilisation Features**				
Stabilisation Feature	**Total Number**	**Weight (Te)**	**Location(s)**	**Exposed/Buried/Condition**
Concrete Mattresses - 12in production pipeline	28	4.7 Te each	PL2468	Exposed
Concrete Mattresses - Umbilical	42	4.7 Te each	PLU2472	Exposed
Grout Bags	N/A			
Formwork	N/A			
Frond Mats	N/A			
Other (please specify)	N/A			

2.4 Wells

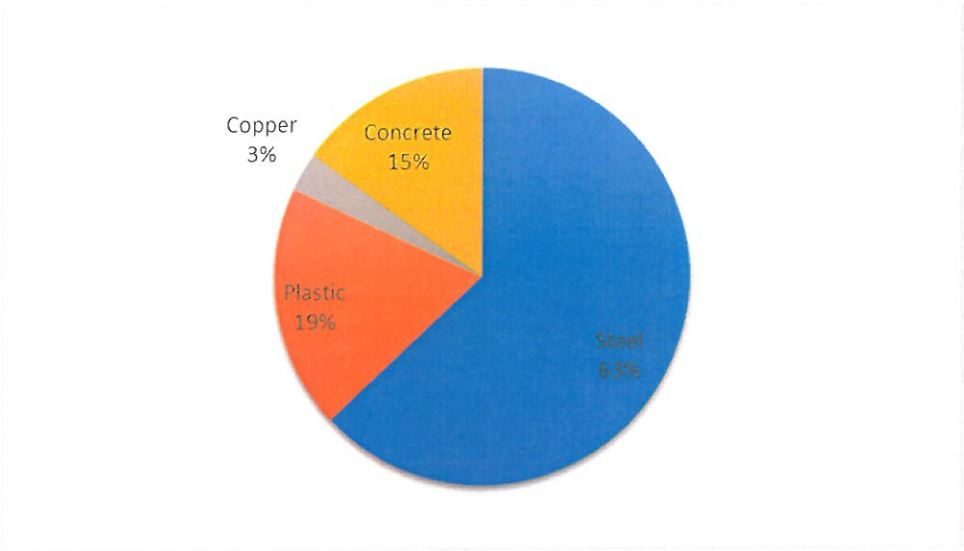
No wells form part of this decommissioning programme; the tables provided in the BEIS template for this section are therefore considered ***not applicable***.

2.5 Drill Cuttings

No drill cuttings form part of this decommissioning programme; the tables provided in the BEIS template for this section are therefore considered ***not applicable***.

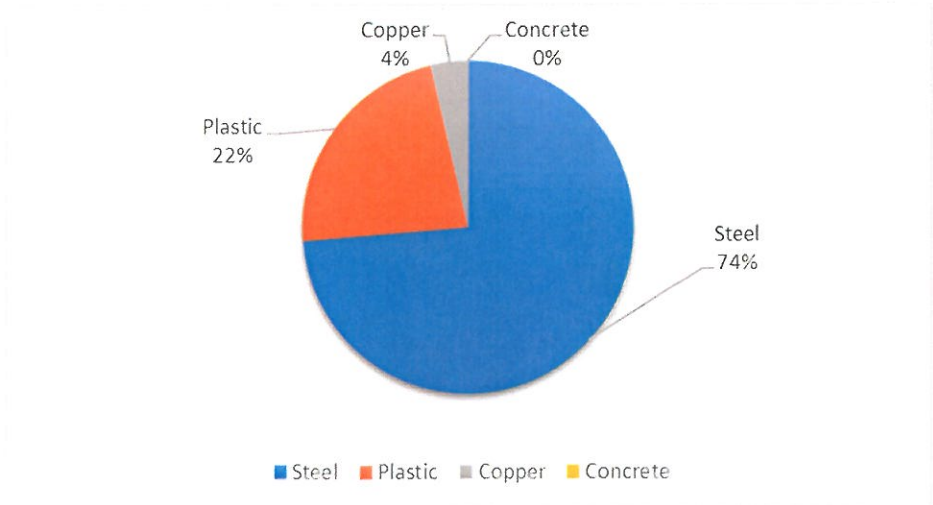
2.6 Inventory Estimates

No installations form part of this decommissioning programme; this figure is therefore considered **not applicable**. Refer to section 3.4 of the Rev UKCS Decommissioning Project EIA Report for further information.



Total Tonnage = 1311 Te

Figure 2.1 Pie Chart of Estimated Inventory (Pipelines) - UKCS



Total Tonnage = 1009Te

Figure 2.2 Pie Chart of Estimated Inventory (Pipelines) - NCS

3 Removal and Disposal Methods

Repsol has a Waste Management Procedure (Repsol, 2016) included within its environmental improvement programme. Each Repsol facility must establish waste instructions that clarify the facility's routines for source separation. The waste hierarchy pyramid illustrates the priorities in the Norwegian waste policy and the EU's Waste Framework Directive Repsol adheres to these principles, as they ensure the most environmentally friendly and cost-effective results for the waste handling.

Waste reduction (to prevent the generation of waste) is the highest level in the waste hierarchy, while reuse is the second highest level. Waste reduction is an integral part of the plan for treatment of waste for Repsol.

- As part of the waste management plan Repsol maintains a continuous emphasis on:
- Reducing the amount of waste generated
- Reusing rather than discarding
- Reducing the amount of health hazardous and environmentally harmful substances in the waste.

3.1 Topsides

No topsides form part of this decommissioning programme; this section is therefore considered ***not applicable***.

3.2 Jackets

No topsides form part of this decommissioning programme; this section is therefore considered ***not applicable***.

3.3 Subsea Installations and Stabilisation Features

No subsea installations (and their stabilisation features) form part of this decommissioning programme; this section is therefore considered ***not applicable***.

3.4 Pipelines

3.4.1 Decommissioning Options

Table 3.1 summarises the pipeline and umbilical that fall within the decommissioning programme as per Table 2.1

*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 (describe briefly)	9) Remedial rock-dump

Table 3.1 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
12-inch export pipeline (PL2468)	Trenched and backfilled	Part	1 and 6
Umbilical (PLU2472)	Trenched and backfilled	Part	1,6 and 7

3.4.2 Comparative Assessment (CA) Method

Repsol selected a Multi Criteria Decision Analysis (MCDA) methodology for the evaluation phase of the CA. This methodology uses a pairwise comparison system. This allows the relative importance of each differentiating criteria to be judged against each other in a qualitative way, supported by quantification where appropriate. As a starting point, the criteria considered for the CA were taken from the BEIS Guidelines for Decommissioning of Offshore Oil and Gas Installations and Pipelines which are as follows:

- Safety
- Environmental
- Technical
- Societal
- Economic

Additional sub-criteria and definitions were added for clarity. The next step in the CA process was to describe and discuss the attributes of each option with respect to each of the differentiating criteria. A pair-wise comparison was then performed for each of the differentiating criteria where the proposed options were compared against each other. The methodology automatically generated a visual output indicating the highest scoring option i.e. the option which represents the most 'successful' solution in terms of its overall contribution to the set of differentiating criteria.

3.4.3 Outcome of Comparative Assessment

Table 3.2 details the outcome of the CA for both the pipeline and umbilical.

Table 3.2 Outcomes of Comparative Assessment

Pipeline or Group	Recommended Option*	Justification
12-inch export pipeline (PL2468)	6 (partial removal)	The pipeline is buried to a depth of at least 1 m (in many cases between 1 m and 2 m) along the entire length. In terms of short term impact and cost, de-burying and removing the pipeline is predicted to be a factor of 10 times the activity required to make the pipeline safe and leave it in place. Additionally, the potential long-term impacts are minimal due to the depth of burial which has been demonstrated to be broadly constant since installation in 2008. The exposed section of the pipeline up to the 12-inch flexible from the SSIV will be fully removed (150 m).
Umbilical (PLU2472)	1 (removal via reverse reeling)	The umbilical has been left to naturally backfill, and although backfill has occurred the depth of burial and the trench profile combined pose a risk in the long term that significant remedial work may be required to ensure the umbilical is safe. Removal by reverse reeling is achievable, safe and economical in the long term.

3.5 Pipeline Stabilisation Features

The 12-inch export pipeline has in place 22 concrete mattresses and the umbilical has in place 48 concrete mattresses. These will all be removed as part of the Rev UKCS Decommissioning Project.

Table 3.3 Pipeline Stabilisation Feature(s)			
Stabilisation feature(s)	**Number**	**Option**	**Disposal Route (if applicable)**
Concrete Mattresses	70	To be recovered	Return to shore for reuse or recycling
Grout Bags	N/A		
Formwork	N/A		
Frond Mats	N/A		
Rock Dump	N/A		
Other (please specify)	N/A		

3.6 Wells

No wells form part of this decommissioning programme; this section is therefore considered ***not applicable***.

3.7 Drill Cuttings

No drill cuttings form part of this decommissioning programme; this section is therefore considered ***not applicable***.

3.8 Waste Streams

Table 3.4 details the main waste streams arising from the proposed programme and Table 3.5 details the planned inventories from the Rev UK Decommissioning Project.

Table 3.4 Waste Stream Management Methods	
Waste Stream	**Removal and Disposal Method**
Bulk Liquids	Food waste is typically macerated to increase the rate of dispersion and biodegradation at sea and waste water will be treated appropriately before being discharged to sea, in accordance with the requirements of the MARPOL convention. Each vessel will have a relevant waste management plan in place.
Marine Growth	No significant marine growth is expected on the infrastructure brought ashore, any marine growth that does exist will be disposed of at landfill or composted.
Naturally Occurring Radioactive Material (NORM)/ Low Specific Activity (LSA) Scale	Any hazardous wastes remaining in the recovered infrastructure e.g. NORM will be disposed of under an appropriate permit and as per Repsol's detailed hazardous waste strategy set out in the Waste Management Procedure (Repsol, 2016), which includes details on handling, storage and transport.
Asbestos	N/A
Other Hazardous Wastes	Any hazardous wastes remaining in the recovered infrastructure e.g. NORM will be disposed of under an appropriate permit and as per Repsol's detailed hazardous waste strategy set out in the Waste Management Procedure (Repsol, 2016), which includes details on handling, storage and transport.
Onshore Dismantling Sites	An appropriately licensed disposal yard has not yet been selected. However, the selection process will ensure that the chosen facility is able to demonstrate a proven disposal track record and waste stream management throughout the deconstruction process, as well as the ability to deliver innovative reuse/recycling options.

Table 3.5 Inventory Disposition			
	Total Inventory Tonnage	**Planned Tonnage to Shore**	**Planned Left *In Situ***
Installations	N/A	N/A	N/A
Pipelines	931	29	902
Umbilicals	224	224	0
Mattresses	329	329	0

The percentage of waste sent for re-use, recycling or disposal is unknown at this stage. Under Repsol's Waste Management Procedure, the waste hierarchy prioritises re-use, recycling and finally disposal. Realistically the steel from the recovered sections of the pipeline will be recycled whilst it is likely that the umbilical and concrete mattresses will need to be disposed of via other routes. Repsol will work with the selected contractors and waste processing facilities to prioritise opportunities for re-use and recycling.

4 Environmental Impact Assessment

4.1 Environmental Sensitivities (Summary)

Table 4.1 describes the important/sensitive features of the receiving environment in which the decommissioning activities will take place. Reference details in the Rev UKCS Decommissioning Project EIA Report, which should be cited as a supporting document.

Table 4.1 Environmental Sensitivities

Environmental Receptor	Main Features
Conservation Interests	The closest Special Area of Conservation (SAC) to the Rev UKCS Decommissioning Project is the Scanner Pockmarks SAC located approximately 61 km away and is designated to conserve the biodiversity associated with submarine structures made by leaking gases. The Norwegian Boundary Sediment Plain Nature Conservation Marine Protection Area (NCMPA) located approximately 4.5 km northwest. The site was designated for the conservation of aggregations of the ocean quahog and the sand and gravel habitat that supports them. Further information on the conservation interests in the vicinity can be found in Section 5.6 of the Rev UKCS Decommissioning Project EIA Report.
Seabed	In 2007 a geophysical survey was carried out along the proposed Rev pipeline route from the Rev wells to the Armada platform (incorporating the area now occupied by the Rev UKCS Decommissioning Project. The seabed in the area was described as relatively flat and smooth with only occasional undulations. Sediments were reported to comprise of fine to medium silty sand, with the sand being present as a veneer over firm gravelly, sandy clay. Where the veneer is shallow clay patches are exposed. Further information on the seabed in the vicinity can be found in Section 5.4.5 of the Rev UKCS Decommissioning Project EIA Report.
Fish	The Project area supports spawning and nursery habitats for a number of commercially species. Species which use the area for spawning include cod, sand eel and Norway pout. Nursery grounds for the following species have been identified in the area: cod, spurdog, herring, European hake, ling, mackerel, anglerfish, plaice, sand eel, spotted ray, blue whiting, whiting, haddock and Norway pout). Further information on fish in the vicinity can be found in Section 5.5.3 of the Rev UKCS Decommissioning Project EIA Report.
Fisheries	The Project area is located in ICES rectangle 44F1. According to Scottish Government statistics for 2011 to 2015, ICES rectangle 44F1 is targeted for demersal, pelagic and to a lesser extent shellfish species. Haddock and Nephrops are the most valuable species landed. Overall, fishing effort in the Project area is considered low compared with other areas of the North Sea. Further information on the fisheries in the vicinity can be found in Section 5.7.1 of the Rev UKCS Decommissioning Project EIA Report.
Marine Mammals	The species most likely to be encountered in the Rev area are harbour porpoise, white-beaked dolphin and minke whale. Harbour seals generally forage 40 – 50 km from their haul-out sites and are therefore unlikely to be encountered in the vicinity of the Project. Grey seals have been known to make occasional journeys of hundreds of kilometres away from haul-out sites, so although it is possible they may be encountered in the vicinity of

Table 4.1 Environmental Sensitivities	
Environmental Receptor	**Main Features**
	the Project it is unlikely that this will occur with any regularity. Further information on the fisheries in the vicinity can be found in Section 5.5.5 of the Rev UKCS Decommissioning Project EIA Report.
Birds	The most numerous species likely to be present in the Rev area are northern fulmar black-legged kittiwake and common guillemot (BEIS, 2016). The highest seabird vulnerability occurs later in the year, when birds (some of which will be flightless whilst they change plumage) have moved offshore following breeding. Further information on the seabirds in the vicinity can be found in Section 5.5.4 of the Rev UKCS Decommissioning Project EIA Report.
Onshore Communities	The Rev UKCS Decommissioning Project is located too far offshore to have any impact on onshore communities.
Other Users of the Sea	The main other users of the sea in the vicinity of the Project are considered to be fishermen. Fishing effort in the area is not considered to be as great as other areas of the North Sea. In addition, the seabed will be left in a favourable condition for fishing activities and the status of the seabed will be regularly monitored to ensure that this remains the case. An other users of the sea impact assessment is presented in Section 9 of the Rev UKCS Decommissioning Project EIA Report.
Atmosphere	Increased energy use and subsequent atmospheric emissions will occur as a result of vessel activity associated with the Project. However, the total CO_2 emissions from the decommissioning activities are estimated to be approximately 2,565.38 tonnes, which will contribute approximately 0.00012% of the atmospheric emissions associated with UK offshore shipping and oil and gas activities. An energy and atmospherics impact assessment is presented in Section 7 of the Rev UKCS Decommissioning Project EIA Report.

4.2 Potential Environmental Impacts and their Management

4.2.1 Environmental Impact Assessment Summary

The EIA undertaken in regard of the Rev UKCS Decommissioning Project assessed the potential impacts as a result of the Project and presented the proposed mitigation and management to deal with these impacts. The following impact assessments were conducted:

- Atmospheric emissions (Vessel use, material use, material recycling, material replacement, transport of materials).
- Discharges to Sea (Discharge of residual hydrocarbon during decommissioning of the pipeline and through degradation of the pipeline left in situ.
- Discharge of residual chemical from decommissioning of the umbilical).
- Other Sea Users (Use of space, both short and long-term, including potential for snagging of fishing gear).
- Underwater noise (Vessel and cutting noise on marine mammals and fish)
- Physical presence (Interaction with the seabed through direct impacts and indirect impacts as a result of infrastructure removal, placing of new material and post decommissioning over trawl surveys).
- Accidental events (Collision risk between vessels, accidental release of inventory offshore or onshore)

Each of the above impact assessments included a cumulative and transboundary assessment as well as consideration of the potential impact on protected sites and species in the vicinity of the Rev UKCS Decommissioning Project.

Table 4.2 details the main potential impacts associated with the Rev UKCS Decommissioning Project along with the proposed mitigation and management techniques.

Table 4.2 Environmental Impact Management		
Activity	**Main Impacts**	**Management**
Topsides Removal	N/a	N/a
Jacket / Floating Facility Removal	N/a	N/a
Subsea Installation Removal	N/a	N/a
Pipeline and umbilical flushing and cleaning	N/a (flushed contents will be treated in line with existing waste management practices as part of normal operations)	Cleaning of subsea pipes and control cables involves propelling a volume of gel plug through the pipe followed by flushing with seawater equal to three times the volume to remove any debris or build up from inside the pipe. Flushing and cleaning aims to reduce the oil content of the fluids in the export pipeline to a target cleanness at which no environmental harm will result during decommissioning, when containment is broken, or after decommissioning, when the pipe wall deteriorates.
Decommissioning Pipeline and umbilical	Increase atmospheric emissions as a result of increased vessel activity.	• Use of low sulphur diesel; • Operations will be carefully planned to reduce vessel numbers and the duration of operations; • All vessels will comply with the Merchant Shipping (Prevention of Air Pollution from Ships) (Amendment) Regulations 2014; • All combustion equipment will be subject to regular monitoring and inspections to ensure an effective maintenance regime is in place, ensuring all combustion equipment runs as efficiently as possible; • All vessels will have the appropriate UK Air Pollution Prevention or International Air Pollution Prevention certificates in place as required; • Onshore facilities will have appropriate management procedures in place to ensure that atmospheric emissions, including those from movement of materials, are below levels that could affect local air quality.
	Discharge to sea from degradation of the 12-inch export pipeline.	The relevant permits and consents will be in place for the discharge of residual hydrocarbons in the UKCS from the decommissioning of the export pipeline. • The cleanliness of the flushed oil-containing pipelines represents the lowest reasonably

Table 4.2 Environmental Impact Management		
Activity	**Main Impacts**	**Management**
		practicable level that can be achieved and the maximum potential quantity of hydrocarbons discharged during degradation will be extremely small. In addition, the volume of chemicals anticipated to be released as a result are expected to be extremely low.
	The presence of Project vessels has the potential to interfere with other sea users that may be present in the area.	• During decommissioning the number of vessels and length of time required on site will be reduced as far as practicable through careful planning of the decommissioning activities and information on the location of vessel operations will be communicated to other sea users through the standard communication channels including Kingfisher, Notice to Mariners and Radio Navigation Warnings (as appropriate); • The subsea infrastructure is currently shown on Admiralty Charts and the Fishsafe system. Once decommissioning activities are complete, updated information on the Rev UKCS subsea area (i.e. which infrastructure remains in situ and which has been removed) will be made available to allow the Admiralty Charts and the Fishsafe system to be updated; • The limited infrastructure decommissioned in situ will be buried to a sufficient depth and any exposed areas and cut ends will also be buried; • Any objects dropped during decommissioning activities will be removed from the seabed as appropriate; • A post-decommissioning survey will identify any debris on the seabed within 100 m of any infrastructure left in situ. An ROV support vessel may be deployed to recover large items of oilfield debris whilst chain mats are likely to be deployed to clear smaller items of oilfield debris; • The post-decommissioning survey will confirm the depth to which the in situ decommissioned infrastructure is buried below the seabed as appropriate. Environmental samples will be acquired to characterise the condition of the sediment chemistry and macrobenthos when decommissioning is complete; • An appropriate vessel will be engaged to carry out over trawls to verify that the seabed has been left in a condition that does not present a hazard to commercial fishing. Final decommissioning activities will be considered to be complete subject to certification of seabed clearance by the SFF (or a similarly qualified body) and acceptance of the Decommissioning Close-out Report by BEIS. • Repsol recognises its commitment to monitor

Table 4.2 Environmental Impact Management		
Activity	**Main Impacts**	**Management**
		any structures decommissioned in situ and therefore intends to set up arrangements to undertake post-decommissioning monitoring on behalf of the Licence Owners. The frequency of the monitoring that will be required will be agreed with BEIS and future monitoring will be determined through a risk-based approach based on the findings from each subsequent survey. During the period over which monitoring is required, the status of the infrastructure decommissioned in situ would be reviewed and any necessary remedial action undertaken to ensure it does not pose a risk to other sea users.
	A number of decommissioning activities will emit noise into the marine environment and have the potential to disturb or injure marine species including marine mammals and fish.	The primary measure of reducing potential impact will be to limit the duration of the noise emitting activities; for example, vessels will only be deployed where necessary and the number of cuts will be limited as far as is practicable.
	The decommissioning operations will cause some direct and indirect disturbance to the seabed as a result of removal of infrastructure and post decommissioning surveys.	Repsol will select appropriate subsea contractors in line with its commitments to manage environmental impacts. As part of this, Repsol will require the contractor(s) to ensure that seabed interaction occurs in a controlled manner.
	The following accidental events are possible during decommissioning activities; • Dropped object causing pipeline rupture; • Accidental release at onshore decommissioning facilities; and • Accidental release from a vessel.	The following provides an overview of proposed measures that either reduce the probability of an accidental release, or reduce the consequences: • Review of spill prevention and response procedures; • Procedural controls; • Bunkering and storage arrangements; • Vessel condition certificates; • Vessel maintenance records; • Evidence of crew competency; and • Certification of equipment.
Decommissioning	The concrete	The concrete mattresses will be removed as part of

Table 4.2 Environmental Impact Management		
Activity	**Main Impacts**	**Management**
Stabilisation Features	mattresses will be removed as part of the same campaign as the decommissioning of the respective pipeline and umbilical. The potential impacts are therefore considered to be included in the impacts described above.	the same campaign as the decommissioning of the respective pipeline and umbilical. The mitigation and management proposed is therefore considered to be included in the impacts described above.
Decommissioning Drill Cuttings	N/a	N/a

5 Interested Party Consultations

From the outset of the Rev UKCS Decommissioning Project it has been recognised that involving stakeholders as partners in the decommissioning journey would be valuable because of their respective areas of specialist knowledge and interest. The approach also acknowledges that engagement is only meaningful if it is based upon a genuine exchange of views and with the objective of influencing decisions and outcomes. Stakeholders have therefore been provided with information to enable discussion and comment in order to be certain that the basis on which decisions are taken is well-founded and properly informed.

Table 5.1 provides summary of stakeholder comments on this decommissioning programme.

Table 5.1 Summary of Stakeholder Comments		
Who	**Action**	**Comment**
Informal Consultations		
Scoping Letter – issued to Joint Nature Conservation Committee, Scottish Environment Protection Agency, Marine Scotland, Scottish Fishermen's Federation and Oil & Gas Authority.		
Comparative Assessment Workshop – attended by Department for Business, Energy and Industrial Strategy Offshore Decommissioning Unit, Joint Nature Conservation Committee, Scottish Fishermen's Federation and Petoro.		
Statutory Consultations		
Public	Public Notice, see Appendix C for a copy, was published in the Press & Journal and The Telegraph on 12th January, 2018.	No Comments Received

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 installation. Standard procedures for operational control and hazard identification and management will be used. Where possible the work will be coordinated with other decommissioning operations such as Armada or the other Repsol Norge decommissioning project on the Varg asset. 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 below shows the high-level project schedule, with key dates.

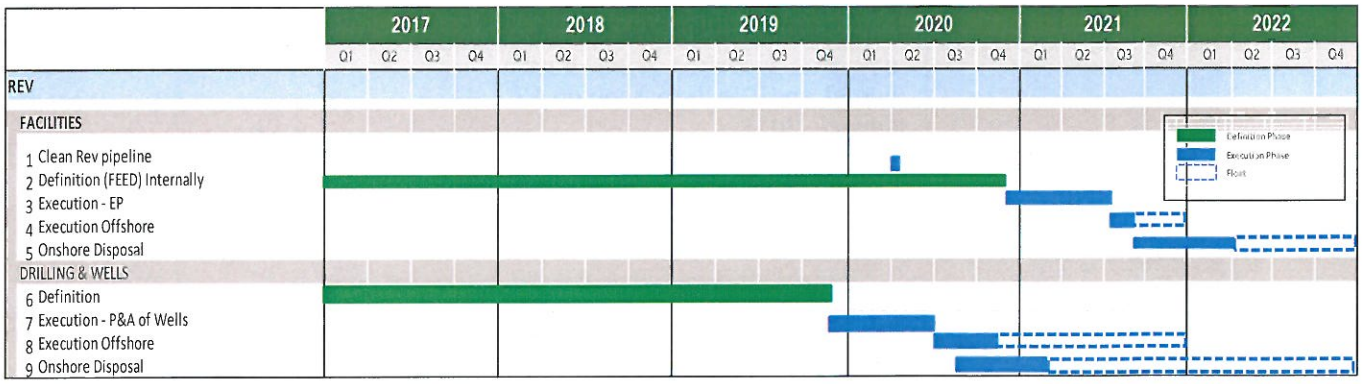


Figure 6.1 High-Level Schedule for Rev Decommissioning Project

The filled blue bars are latest dates the work is currently planned, however the work could commence earlier if opportunities arise. The dotted bars indicate potential activity schedule windows and that all activities will be completed by end of Q4 2022.

The activities (2 & 6) shown in green are the relevant planning activities for facilities and drilling & wells and cover all the preparation works such as studies, tendering for the execution scope, preparation for execution documentation, preparation for application for consent for the drilling rig, preparation for permits, etc.

All the activities shown in blue are the actual execution scope covering both engineering as well as the work offshore and onshore recycling/disposal.

Activity 1 – Clean Rev Pipeline: this activity covers the planned flushing of the pipeline and umbilical.

Activity 2 – covers the detail engineering required for the offshore removal scope of the pipelines/umbilicals and subsea structures, while activity 3 is the actual offshore execution of the removal scope.

Activity 7 – covers the detail design work for Wells P&A and covers the preparation of the basis of design which describes in detail the P&A work for each well, while activity 8 is the actual offshore execution of the P&A scope.

Activities 5 and 8 cover the onshore disposal/recycling of all offshore materials/equipment brought from offshore.

6.4 Costs

Table 6.1 Provisional Decommissioning Programme costs	
Item	**Estimated Cost (£M)**
Platform(s) /Jacket(s) - Preparation / Removal and Disposal	N/A
Pipelines Decommissioning	Provided to BEIS
Subsea Installation(s) and Stabilisation Feature(s)	Provided to BEIS
Well Abandonment	N/A
Continuing Liability – Future Pipeline and Environmental Survey Requirements	Provided to BEIS
TOTAL	Provided 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 Programme (normally within 4 months of the completion of the onshore disposal) including debris removal and independent verification of seabed clearance and plus finalising of the onshore work related to recycling and disposal of all materials removed the seabed.

6.6 Post-Decommissioning Monitoring and Evaluation

The plan is to carry out two post decommissioning surveys after completion of the final seabed clearance once the final offshore scope of work is completed. These surveys will be of the pipeline left in situ plus environmental. The environmental data will be collected and analysed and the results compared to the environmental baseline data. The results will be reported to BEIS and if there are any negative trends these will be discussed and an action plan agreed.

6.7 Management of Residual Liability

In the close out report described in Section 6.5, the person responsible for the subsequent management of on-going residual liabilities including management and reporting the results of the agreed post decommissioning monitoring (described in Section 6.6), evaluation and remedial, programme will be nominated.

7 Supporting Documents

The documents detailed in Table 7.1 have been used to inform this Decommissioning Programme.

Table 7.1 Supporting Documents		
Document Number	**Title**	**Link**
1	Rev UKCS Decommissioning Project Environmental Impact Assessment (EIA) Report (REV01-27338-S-RA-0002)	
2	Rev UKCS Comparative Assessment Report (REV01-27338-Z-RA-0002)	
3	Impact Assessment (covering whole field, submitted to Norwegian Authorities) (REV01-24981-Z-RA-0001)	
4	Disposal Plan (covering whole field, submitted to Norwegian Authorities) (REV01-TEN-Z-RA-0003)	

8 Partner Letter of Support

A copy of the letter of support from current equity holder in the field is shown below:

petoro

Offshore Petroleum Regulator for Environment & Decommissioning

Department for Business, Energy & Industrial Strategy
3rd Floor, Wing C
AB1 Building
Crimon Place
Aberdeen
AB10 1BJ

Date: 11 April 2018

Dear Sir or Madam

REV PIPELINE DECOMMISSIONING PROGRAMMES PETROLEUM ACT 1998

We acknowledge receipt of your letter dated 26 March 2018.

We, Petoro AS confirm that we authorise Repsol Norge AS to submit on our behalf abandonment programmes relating to the Rev facilities as directed by the Secretary of State on 5th May 2009.

We confirm that we support the proposals detailed in the Repsol Norge AS Decommissioning Programmes dated 10 April 2018, which is to be submitted by Repsol Norge AS in so far as they relate to those facilities in respect of which we are required to submit an abandonment programme under section 29 of the Petroleum Act 1998.

Yours faithfully

Ragnar Sandvik
Senior Advisor, Asset Management
For and on behalf of Petoro AS

Appendix A Umbilical Trenching/Burial Profile Graphs

The data shown in Figures A.1 to A.7 is based on a survey completed March 2017. The information shown in A1 shows the burial profile of the umbilical from the Rev field to Armada platform, where the transition between Norway and UK for the umbilical is at approx. KP 4.810, where the KP values goes from 0 at Rev to 9 at Armada. While the figures A.2 to A.7 show the position of the top of the umbilical against the adjacent seabed as well as the mean seabed for various position along the umbilical from the KP4 to KP10, Armada end.

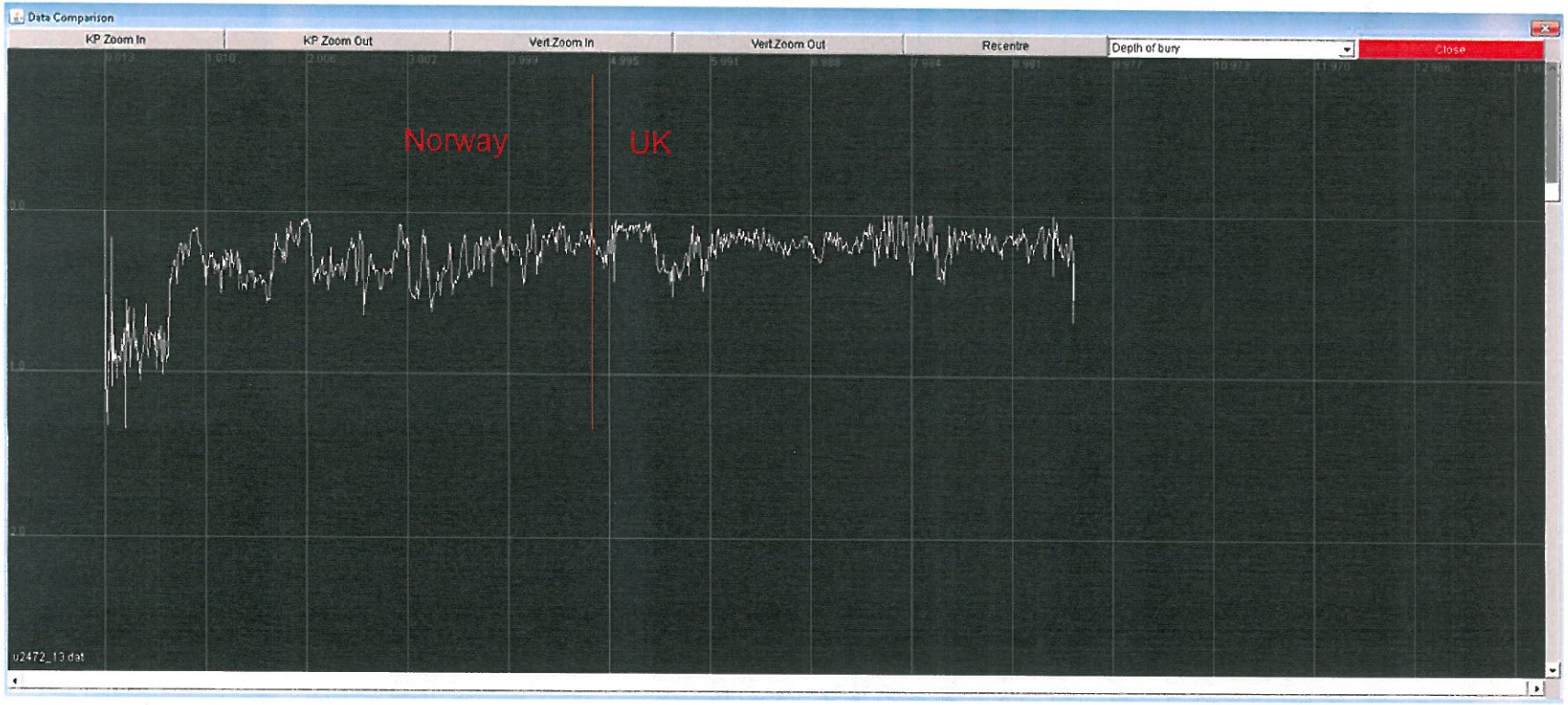


Figure A.1 Umbilical KP value vs. depth of burial

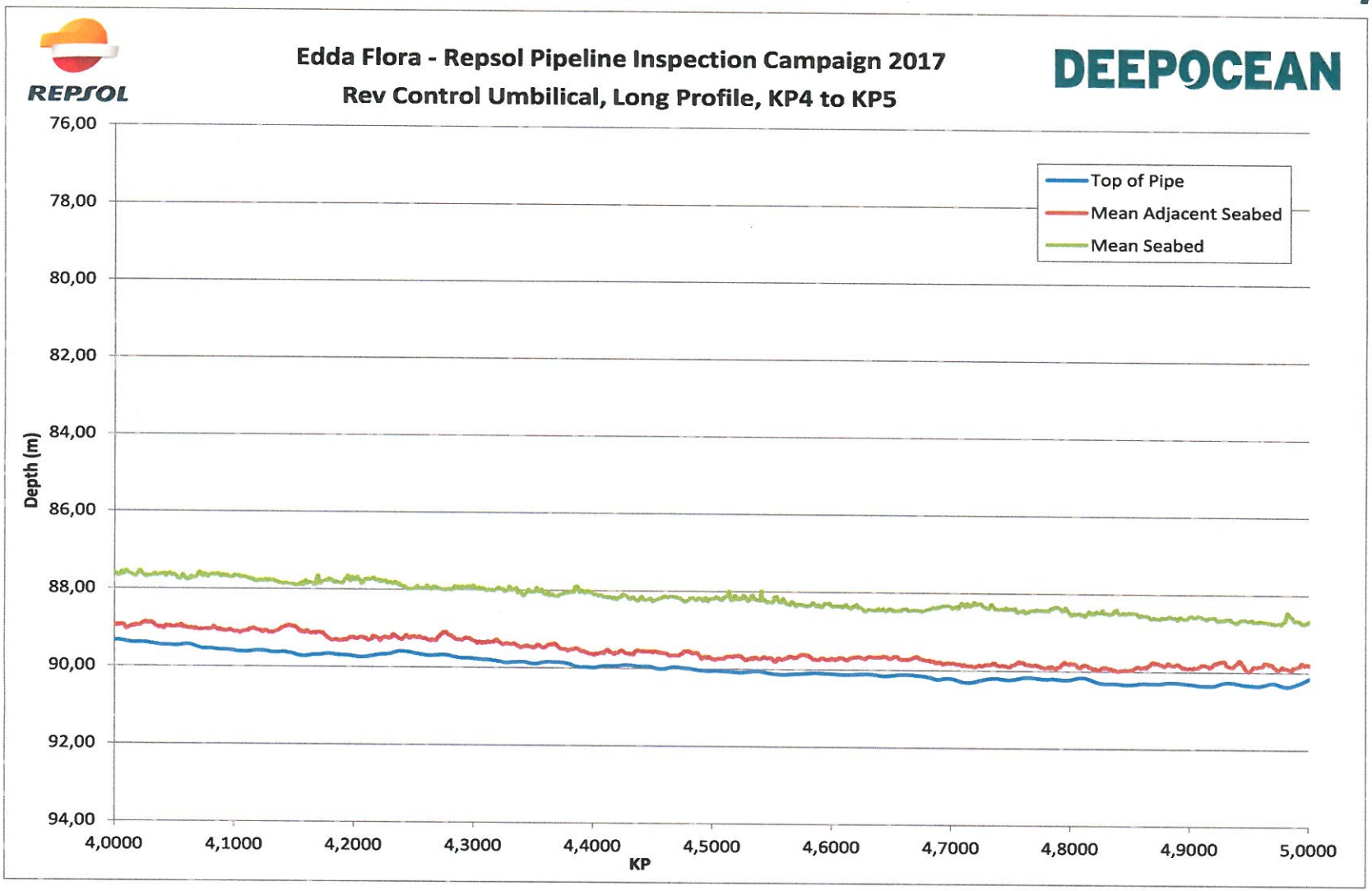


Figure A.2 TOP vs Mean Adjacent Seabed and Mean seabed burial profile for Umbilical – KP4 to KP5

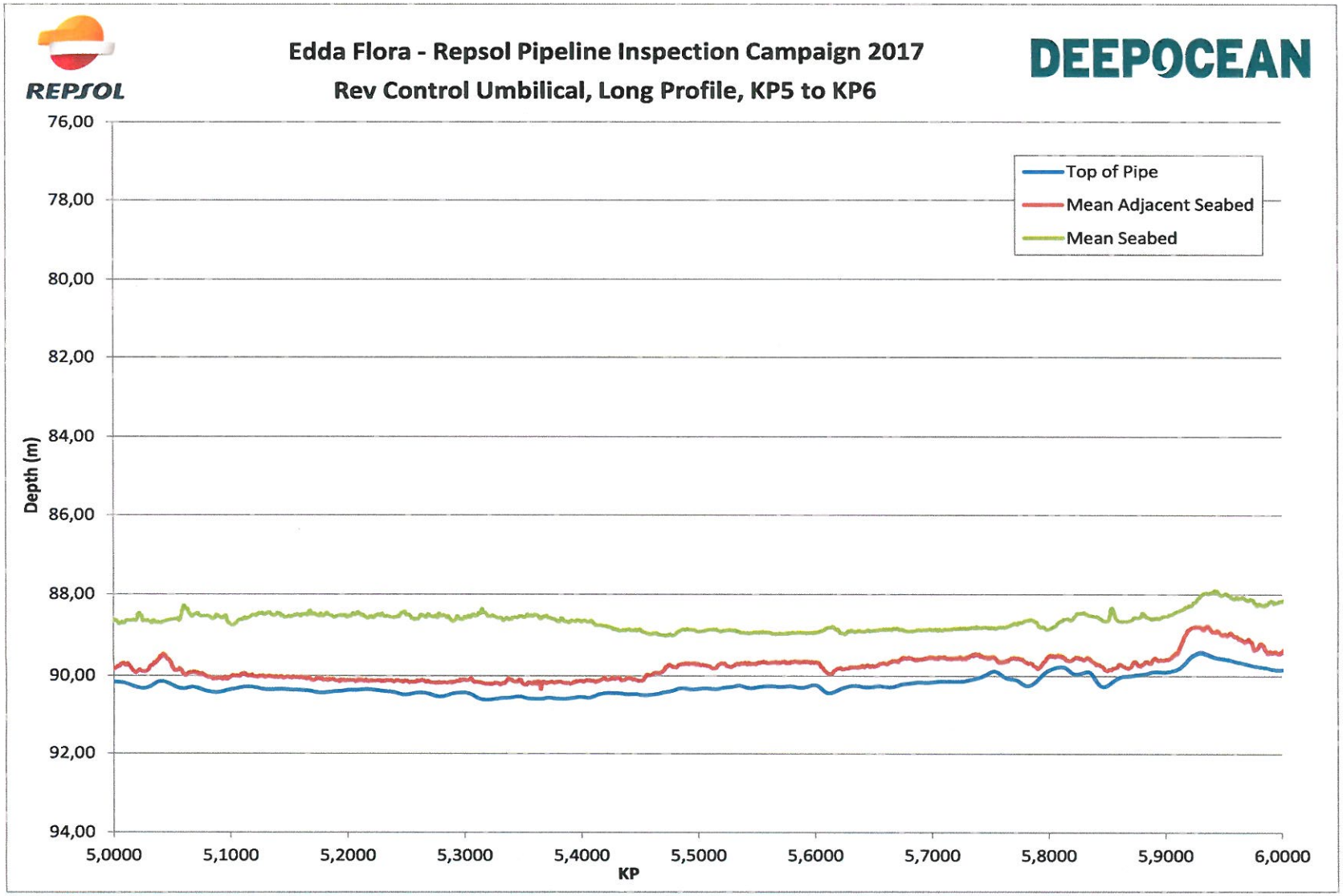


Figure A.3 TOP vs Mean Adjacent Seabed and Mean seabed burial profile for Umbilical – KP5 to KP6

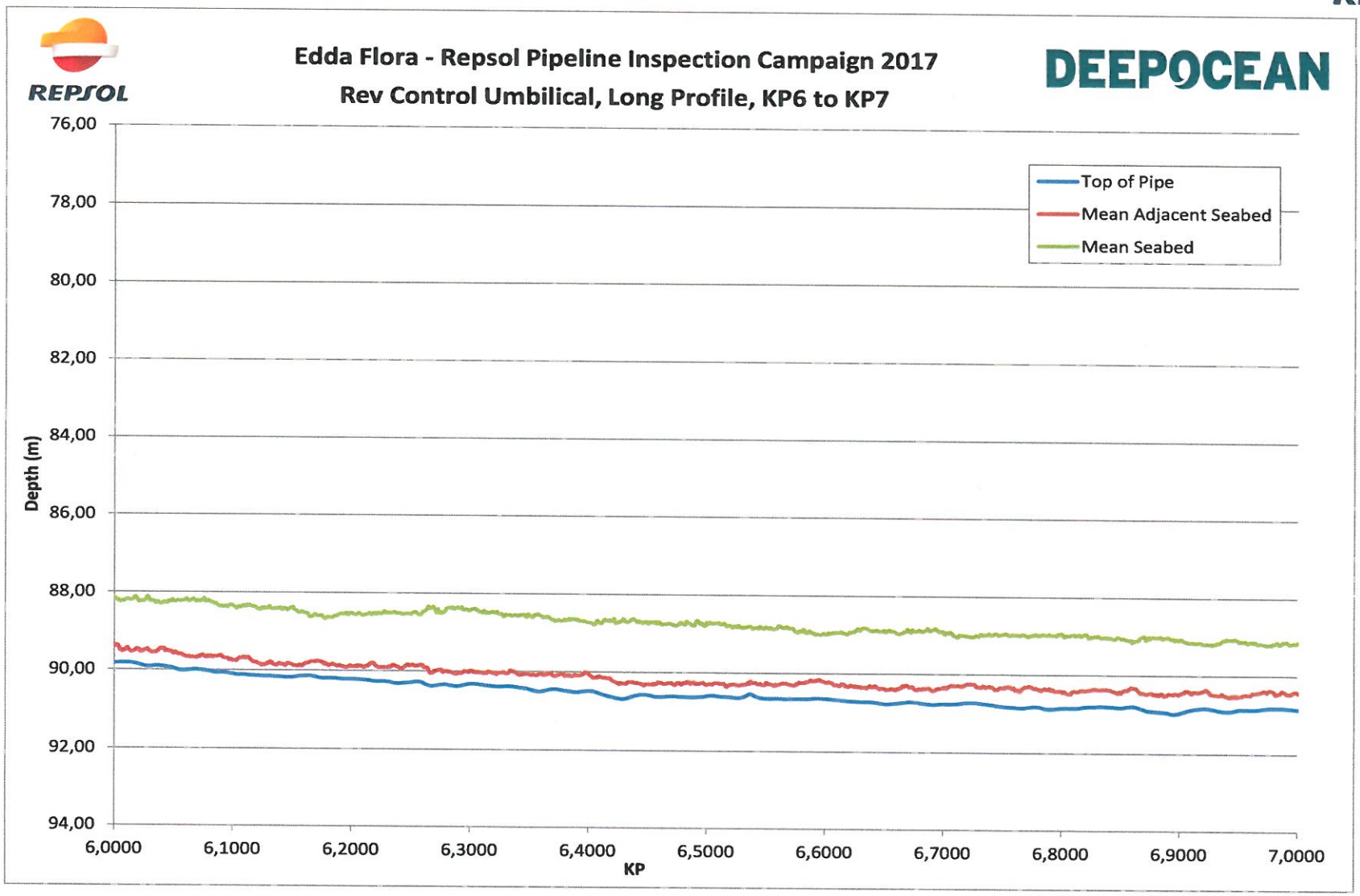


Figure A.4 TOP vs Mean Adjacent Seabed and Mean seabed burial profile for Umbilical – KP6 to KP7

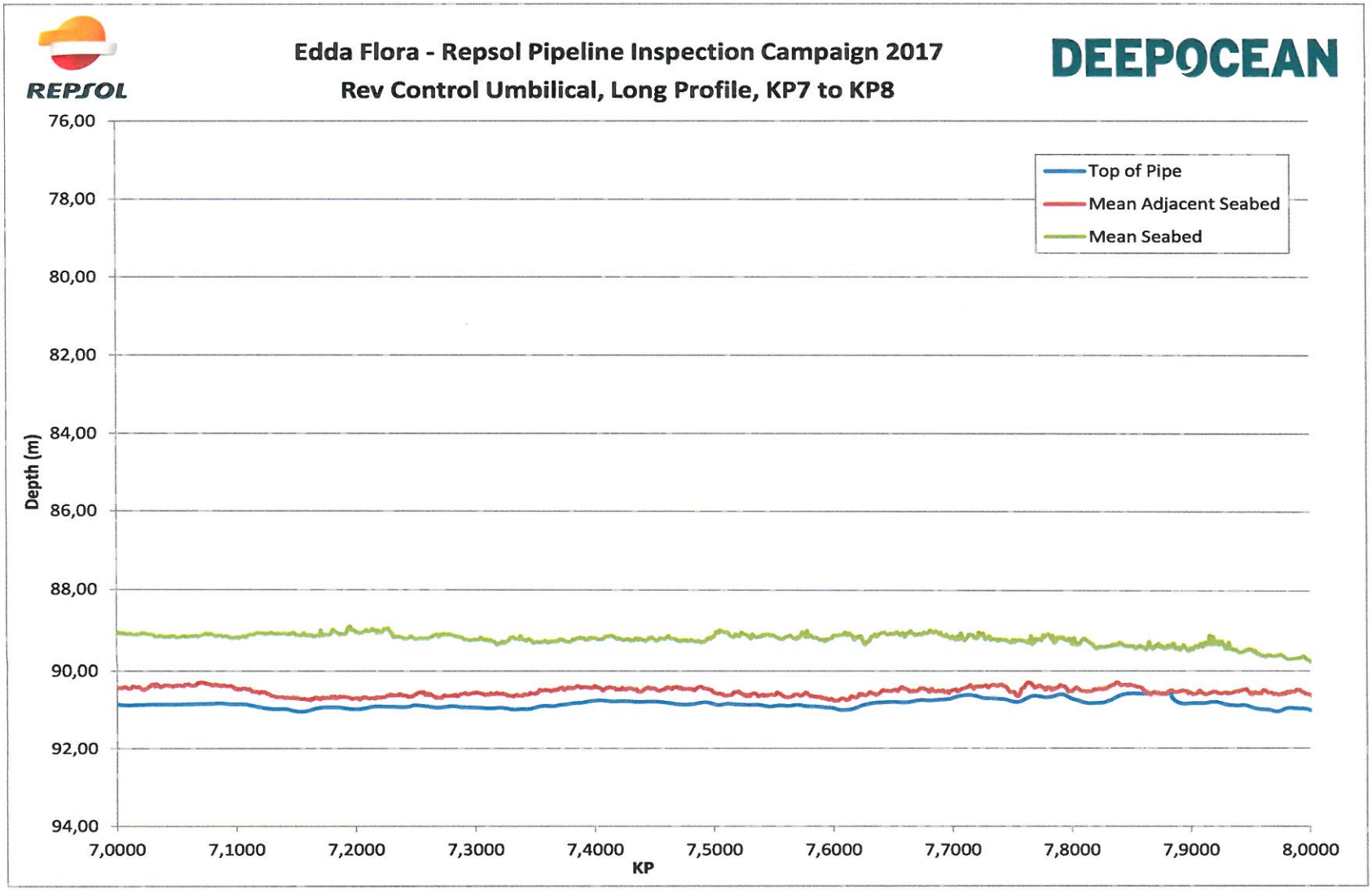


Figure A.5 TOP vs Mean Adjacent Seabed and Mean seabed burial profile for Umbilical – KP7 to KP8

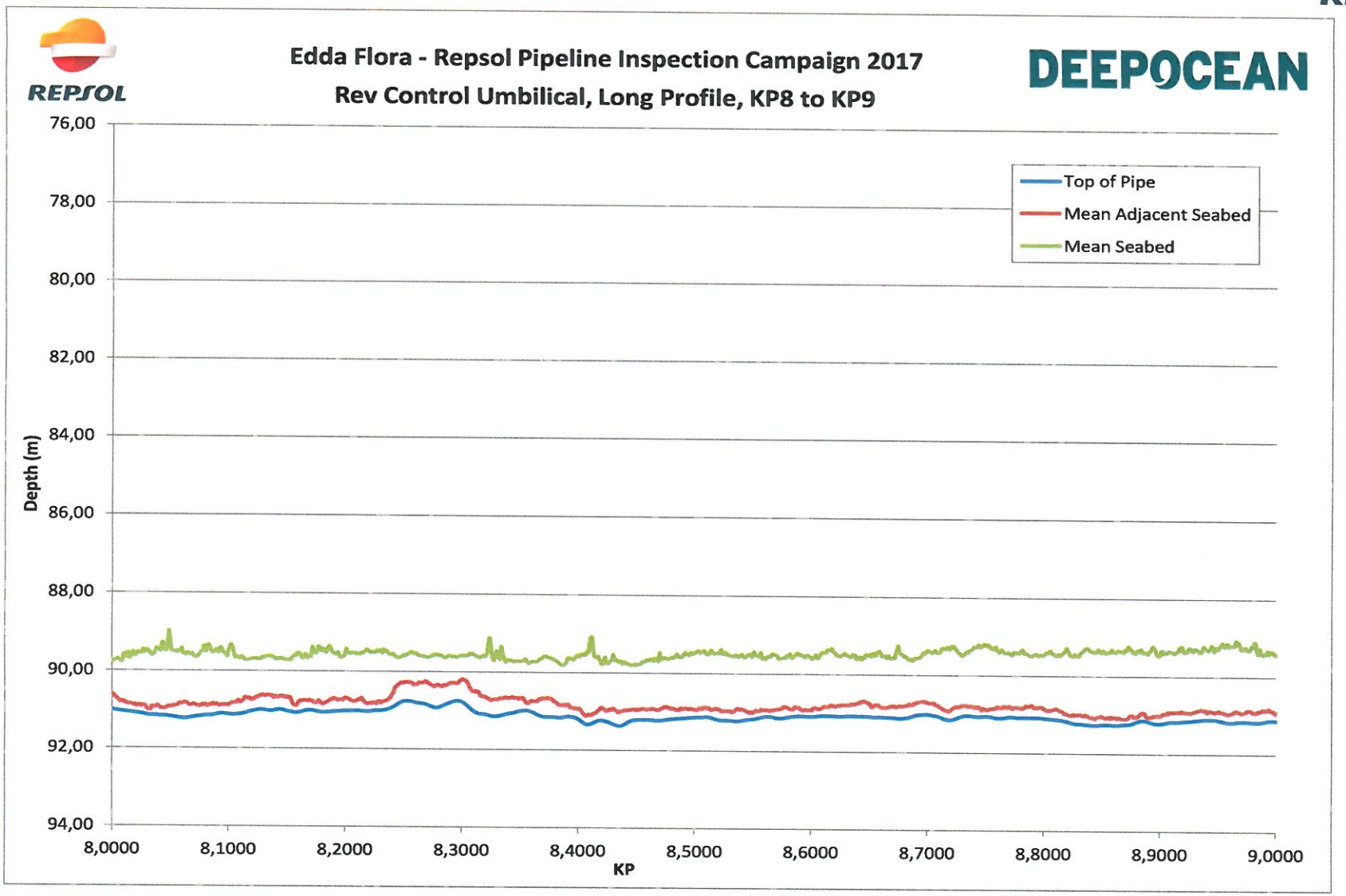


Figure A.6 TOP vs Mean Adjacent Seabed and Mean seabed burial profile for Umbilical – KP8 to KP9

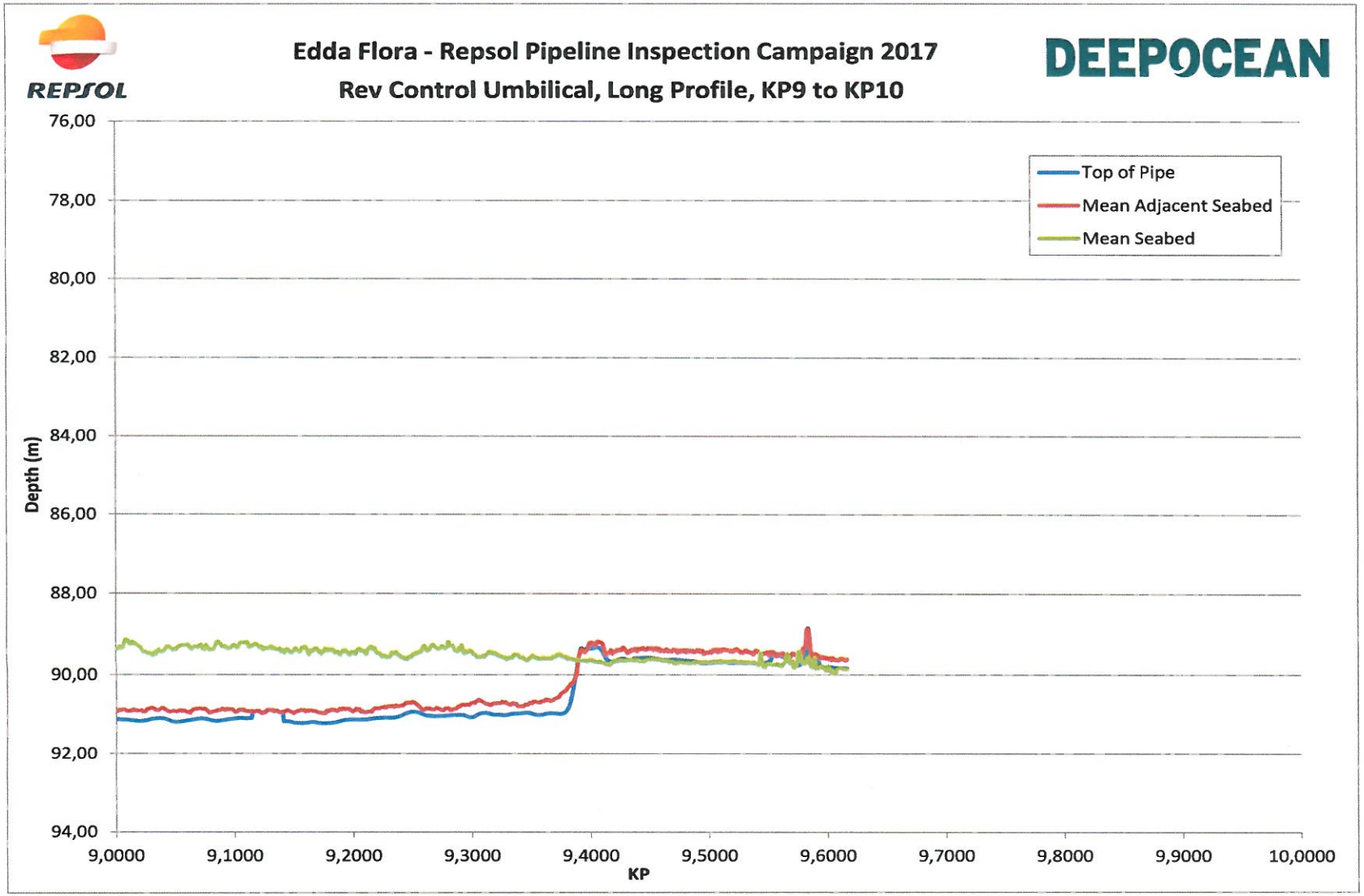


Figure A.7 TOP vs Mean Adjacent Seabed and Mean seabed burial profile for Umbilical – KP9 to KP10

Appendix B Pipeline Trenching/Burial Profile Graphs

The data shown in Figures B.1 and B.2 is based on a survey completed March 2017. The information shown in B1 shows the burial profile of the pipeline from the Rev field to Armada platform, where the transition between Norway and UK for the umbilical is at approx. KP 4.370, where the KP values goes from 0 at Rev to 9 at Armada. The pipeline has its lowest value at KP 5.1 with a burial depth of approx. 1m. For the rest of the length the pipeline is buried between 1 and 2 meter, with an average of below 1.5m. In the figure below the zero reading indicats the pipeline is buried too deep for a reading.

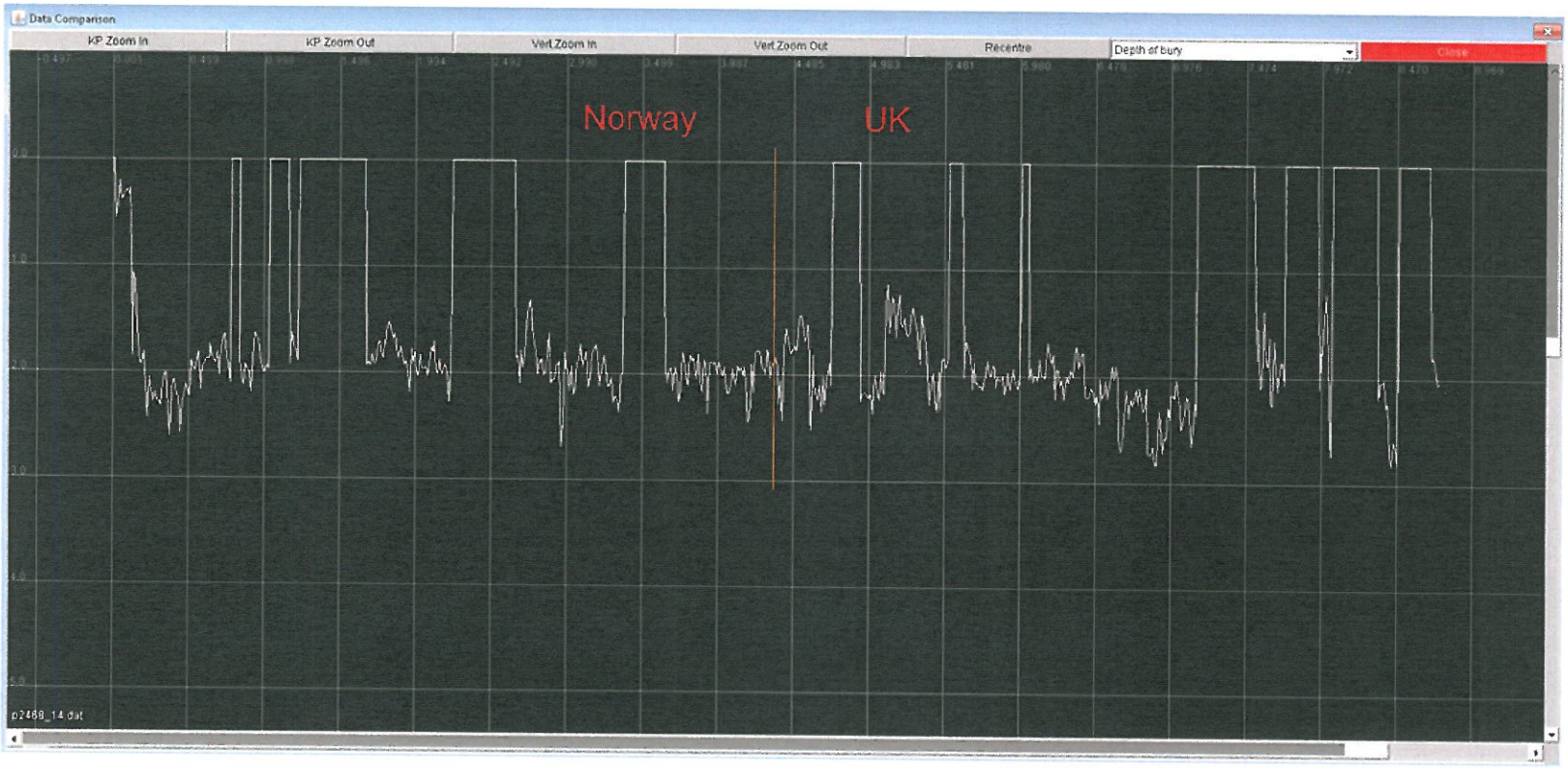


Figure B.1 Pipeline KP value vs. depth of burial

While figure B.2 shows some cross profiles of the pipeline and its burial depth against the seabed.

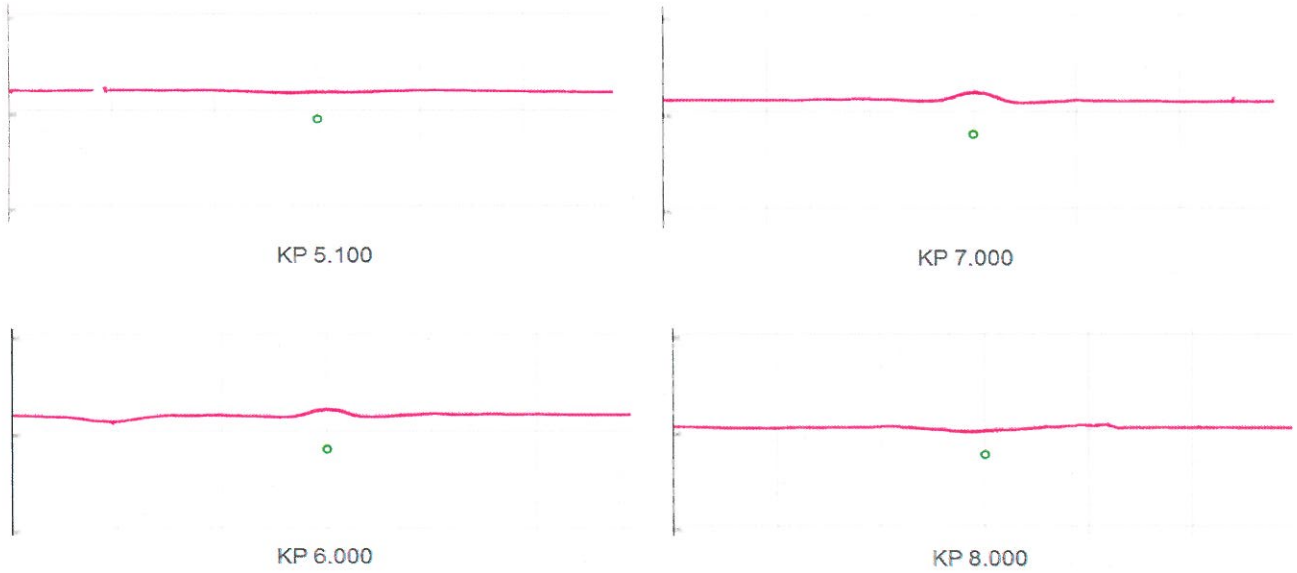


Figure B.2 Pipeline typical cross profiles at various KP values

Appendix C Public Notice & Consultee Correspondence

Appendix C.1 Public Notice

A copy of the public notice that was published in the Press & Journal and The Telegraph on January 12th 2018 is shown below. In relation to this there were no comments received from the Public.

PETROLEUM ACT 1998

Decommissioning of the Rev Field

Repsol Norge AS has submitted, for the consideration of the Secretary of State for the Department for Business, Energy and Industrial Strategy, a draft decommissioning programme for the decommissioning of the Rev Field in accordance with the provisions of the Petroleum Act 1998 (The Act). It is a requirement of the Act that interested parties be consulted on such proposals.

The Rev Field, Block 15/12, is based on the Norwegian Continental Shelf (NCS) and via a 9 km export pipeline the production goes to the Chrysaor Armada Platform, which is 221 km East of Aberdeen in the Central North Sea, for processing. The items covered by the Rev Field draft decommissioning programme are the 4.8 km pipeline and the 4.9 km umbilical that go from a point 200m east of the Armada platform to the border between the United Kingdom Continental Shelf and the NCS.

Repsol Norge AS hereby gives notice that the Rev's draft decommissioning programme is available from the following location during office hours or can be requested by phone or email as indicated:

Repsol Norge AS

P.O.Box 630 Sentrum

N-4003 Stavanger

Norway

Contact: Mike Bishop, Rev Team Lead: +47 52001488

mbishop@repsol.com

Representations regarding the draft decommissioning programme should be submitted in writing to Mike Bishop at the above address where they should be received by the consultation closing date, Saturday 10th February, and should state the grounds upon which any representations are being made.

Appendix C.2 Consultee Correspondence

There were no comments received from the Consultees during the consultation period.