



REPORT



Comparative Assessment (CA) Report – Infield Pipelines

Prepared for: BP Exploration (Alpha) Limited

Prepared by: Genesis Energies
 26 Albyn Place, Aberdeen, AB10 1YL, UK
 Tel: +44 (0)1224 615100
 Fax: +44 (0)1224 615111
www.genesisenergies.com

Project Title: Miller Pipelines Decommissioning Programme Support

Document/Rev No: 204504C-000-RT-0200/6

BP Document No: DC109-EN-REP-000-5008

Date: January, 2026

Rev	Date	Description	Issued by	Checked by	Approved by	Client Approval
A	30/06/22	Previously issued under J75112B-A-RT-00007. Issued for client comment	JW	TH	TH	
0	29/07/22	Issued for Use	TH	JW	TH	
1	17/11/22	Updated with ODU comments and to Remove PL720 Pipeline. Issued for Use	JW	TH	TH	
2	14/12/22	Updated Environmental Input. Issued for Use.	JW	TH	TH	
3	16/06/23	Updated with ODU comments. Issued for Use	JW	TH	TH	
4	03/11/23	Updated with ODU comments. Issued for Use	JW	TH	TH	
5	19/05/25	Updated with ODU comments on DP, Issued for Use	GL	TH	TH	
6	06/01/26	Updated with ODU comments. Issued for Consultation	TH	GL	TH	JL

DocuSigned by:
Joe Leask
 71D19906A01443F...



Contents

ABBREVIATIONS	5
1.0 EXECUTIVE SUMMARY	7
2.0 PROJECT OVERVIEW	9
2.1 Field Description	9
2.2 Environmental and Social Overview.....	12
2.2.1 Conservation Interests	12
2.2.2 Seabed	12
2.2.3 Fish, Marine Mammals and Seabirds	12
2.2.4 Other Users of the Sea	12
2.3 Inclusions, Exclusions and Boundaries for CA	14
2.3.1 Inclusions	14
2.3.2 Exclusions.....	14
2.3.3 Boundaries.....	15
2.3.4 Crossings.....	15
3.0 DECOMMISSIONING OPTIONS.....	18
3.1 Decommissioning Options Considered	18
3.1.1 General Considerations.....	18
3.1.2 Option 1a) Total Removal by Reverse Reeling.....	18
3.1.3 Option 1b) Total Removal by Reverse S-Lay	19
3.1.4 Option 1c) Total Removal by Cut and Lift.....	19
3.1.5 Option 2a) Remediate in Situ – Exposed Sections Rock Covered.....	20
3.1.6 Option 2b) Remediate in Situ – Exposed Section Trenched and Buried	21
3.1.7 Option 2c) Remediate in Situ -Exposed Sections Cut and Removed.....	22
3.1.8 Option 3) Leave In-situ and Monitor	22
4.0 OVERVIEW OF THE CA PROCESS.....	23
4.1 Scoping	23
4.1.1 Facilities and Boundaries	23
4.1.2 Evaluation Method	24
4.1.3 Assessment Criteria	24
4.1.4 Groupings of Components for CA	24
4.1.5 Pipeline status summary	24
4.2 Screening	28



4.3	Preparation	28
4.3.1	HIRA	28
4.3.2	ENVID	29
4.4	Establish	30
4.4.1	Stakeholder Engagement.....	30
4.4.2	Agreed Criteria, Sub-Criteria and Weightings.....	30
4.4.3	Review and Agree pre-screening outcome.....	30
4.5	Evaluate	30
4.6	Report.....	31
5.0	CA WORKSHOP CONSIDERATIONS	32
5.1	From historical data and technical support studies.....	32
5.1.1	PL722 - 18" dia. Rigid Pipeline (Concrete coated, surface laid).....	32
5.1.2	PL1971 - 16" dia. Rigid Pipeline (Trenched and Buried).....	32
5.2	Results of Options Pre-screening	32
5.2.1	PL722 - 18" dia. Rigid Pipeline (Concrete coated, surface laid).....	33
5.2.2	PL1971 -16" dia. Rigid Pipeline (Trenched and Buried).....	33
5.3	Evaluation Workshop Tools	36
5.3.1	Qualitative Assessment - Rating Guide Table	36
5.3.2	Evaluation / Rating Workbook	36
5.3.3	Decommissioning Fact Sheets	36
5.4	Mechanics of Rating the Options	36
5.4.1	Sensitivity Analysis.....	37
6.0	COMPARATIVE ASSESSMENT EVALUATION.....	38
6.1	Results, Conclusions and Recommendations	38
6.1.1	PL722 - 18" dia. Rigid Pipeline (Concrete coated and surface laid).....	39
6.1.2	PL1971: 16" dia. Rigid Pipeline (Trenched and Buried).....	43
7.0	REFERENCES.....	47
	APPENDIX A – HIRA SUMMARY TABLES	48
	APPENDIX B – ENVIRONMENTAL & SOCIETAL FACT SHEETS.....	50
	APPENDIX C – TECHNICAL FACT SHEETS	51
	APPENDIX D – CA RATINGS GUIDE TABLE	52
	APPENDIX E – CA EVALUATION WORKSHOP RESULTS WORKBOOK.....	53



Figures & Tables

Figures

Figure 2-1: Miller Field Location	10
Figure 2-2: Miller Field Layout.....	11
Figure 2-3: Location of protected areas in the vicinity	13
Figure 3-1: Mass Flow Excavation	18
Figure 3-2: Typical Reel Lay Vessel.....	19
Figure 3-3: Pipelay Barge	19
Figure 3-4: Pipeline Cut into Section for Recovery	20
Figure 3-5: Hydraulic Shears.....	20
Figure 3-6: Rock Placement Vessel	21
Figure 3-7: Plough	21
Figure 3-8: Mechanical Trencher in 'V' cutting mode.....	22
Figure 3-9: Jetting Trenching Unit	22
Figure 4-1: OEUK CA Process.....	23
Figure 4-2: Terminology associated with the status of a trenched and buried pipeline	25
Figure 4-3: PL722 18" dia. Oil Export Pipeline – Schematic	25
Figure 4-4: PL1971 16" dia. Gas Import Pipeline – Schematic	26
Figure 4-5: PL1971 16" dia. Gas Import Pipeline – DOC Survey Records.....	26

Tables

Table 2-1: Miller Field Pipelines and Umbilicals - Materials Summary and Full Pipeline/PWA Boundaries.....	17
Table 4-1: Evaluation Method A – Comparative Impact.....	24
Table 4-2: Pipelines details and exposure lengths for CA	27
Table 4-3: CA Workshop Participants	31
Table 5-1: Pipeline Recommendations.....	35
Table 6-1: PL722 CA Workshop Ranking and Recommendations.....	39
Table 6-2: PL722 Average Ratings by Main Criteria.....	40
Table 6-3: PL722 Sensitivity Analysis 1	42
Table 6-4: PL1971 CA Workshop Ranking and Recommendations.....	43
Table 6-5: PL1971 Average Ratings by Main Criteria.....	44
Table 6-6: PL1971 Sensitivity Analysis 1.....	46



ABBREVIATIONS

BPEAL	BP Exploration (Alpha) Limited
CA	Comparative Assessment
CCS	Carbon Capture and Storage
CSV	Construction Support Vessel
Doc.	Document
DOB	Depth of Burial
DOC	Depth of Cover
DOL	Depth of Lowering
DP	Decommissioning Programme
DPN	Disused Pipeline Notification
DSV	Dive Support Vessel
ENVID	Environmental Impact Identification
ESAS	European Seabirds at Sea
EUNIS	European Nature Information Service
HAZID	Hazard Identification
HC	Hydrocarbon
HIRA	Hazard Identification and Risk Assessment
ICES	International Council for the Exploration of the Sea
kGBP	Thousand Pounds
km	Kilometre
KP	Kilometre Point
m	metre
MAH	Major Accident Hazard
MPA	Marine Protected Area
M.S. Excel	Microsoft Excel
MRF	Miller Reception Facilities
MSBL	Mean Seabed Level
MSFD	Marine Strategy Framework Directive
N/A	Not Applicable
OEUK	Offshore Energies UK (Previously Oil & Gas UK)
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
PL	Pipeline
PLU	Umbilical
pMPA	Proposed Marine Protected Area
RAG	Red / Amber/ Green



ROV	Remotely Operated Vehicle
ROVSV	Remotely Operated Vehicle Service Vessel
SAC	Special Area of Conservation
SFF	Scottish Fishermen's Federation
SIMOPS	Simultaneous Operations
SOSI	Seabird Oil Sensitivity Index
SPA	Special Protection Area
SSIV	Subsea Isolation Valve
te	tonne
TOP	Top of Pipeline
TTD	Target Trench Depth
UKCS	United Kingdom Continental Shelf



1.0 EXECUTIVE SUMMARY

This Comparative Assessment (CA) has been carried out to support the Decommissioning Programme (DP) for the Miller Infield Pipeline systems.

The CA workshop evaluation was based on the regulatory requirements, stakeholder expectations and technology available at the time to execute the decommissioning options evaluated.

The strategy for the pipeline structures (SSIV and spool crossing frame), jumpers and any exposed stabilisation features (mattresses) is that they will be removed and returned onshore for recycling or disposal. Also, the short (~169m) redundant surface laid umbilical jumper (PLU1972) which served the Brae B SSIV, although included in the Miller Infield Pipelines DP [7], it has been agreed this will be recovered as part of the decommissioning of the Brae B field by the Brae owners when decommissioning Brae B platform and has therefore not been subjected to CA.

The main export pipeline (PL720) from Miller Platform to St Fergus Terminal Miller Reception Facilities (MRF) 230km away does not form part of this CA as it is subject to possible reuse considerations for carbon capture and storage (CCS) by third parties.

A separate CA will be prepared for PL720 at a later date when a conclusion is reached on reuse options. Therefore, this CA Report, considers the decommissioning options for the two infield subsea pipelines only:

- The existing 18" Concrete Coated Oil Export Line (PL722);
- The existing 16" rigid Gas Import Line (PL1971).

Robust evidence has been gathered in terms of determining the status of the pipelines associated with the field, by review of separate survey reports carried out over the operational life of the field. A review of this evidence has determined the on-seabed status of each pipeline and where relevant, their burial depth.

- The last Depth of Burial (DOB) Survey was carried out on PL1971 in 2024;
- The last visual survey for exposures and spans was carried out on PL722 and PL1971 in 2024

The pipelines status review has concluded that:

- Where the pipeline is currently surface laid (PL722), it is not predicted to self-bury; and
- Where the pipeline is currently trenched and rock covered (PL1971), it is predicted to remain so.

The decommissioning options considered for the pipelines were:

- Total Removal, with all removed materials returned onshore for recycling and disposal:
 - By Reverse Reeling;
 - By Reverse S-Lay;
 - By Cut and Lift;
- Remediate In-situ, by leaving the surface laid or trenched and buried sections of the lines in-situ, whilst remediating the exposed sections by one of the following sub options:
 - Rock Cover in-situ;



- Trench and Bury in-situ;
- Cut and Remove with all removed materials returned onshore for recycle and disposal.
- Leave In-situ and Monitor
 - Monitoring frequency and duration to be agreed with the regulator

Each of the decommissioning options is described in more detail in Section 3.1.

A recognised CA process and evaluation method has been adopted and together with the supporting studies that informed the CA are described in Section 4.0.

All decommissioning options and their sub options listed above, including at least one Total Removal Option for each pipeline has been carried through to a conclusion in the CA process.

Since only two pipelines are included in this CA, each pipeline has been evaluated separately during the CA process and are listed, together with the recommended/ preferred decommissioning option for each pipeline in Section 6.1.

To summarise the conclusions of the CA:

- The existing 18" Concrete Coated Oil Export Line (PL722):

Will be remediated in-situ by being trenched and buried to a depth greater than or equal to 0.6m along its full length.

- The existing 16" rigid Gas Import Line (PL1971):

Will be remediated in-situ with exposed end cut and removed.



2.0 PROJECT OVERVIEW

2.1 Field Description

The Miller Infield pipelines are in Blocks 16/7 and 16/8.

The Miller platform was located c. 9 km from the UK/Norway median line. See Figure 2-1.

The Miller Pipeline System incorporated crude oil and natural gas transportation facilities between various offshore installations as well as gas exporting facilities to shore at St Fergus. Production from the pipeline ceased in 2007 and the DPs for the Miller topsides and jacket (including the subsea infrastructure within the 500m zone) was approved in 2013. The offshore work for the removal of the Miller topsides and jacket was completed in 2018.

The two infield pipelines in this CA which supports the new DP are:

- 18" oil export pipeline (PL722) from Miller platform to the Brae Alpha platform 7.5km away; and
- 16" Brae-Miller Linkline (PL1971) between the Brae Bravo and Miller platform.

See Figure 2-2 for infield layout.

These pipelines were depressurized, cleaned and flushed in 2009 and finally severed at circa EL. -80m as part of the Miller jacket removal scope in 2018. The pipeline end of PL722 at the Brae A platform has been positively isolated and the pipeline end of PL1971 at Brae B has been severed at circa EL. -61m as part of the topsides and upper jacket removal scope 2021/2022.

The pipelines are currently maintained under an approved Disused Pipeline Notification (DPN).

PLU1972 is a 169m long SSIV umbilical jumper which is surface laid and protected by mattresses located within the 500m exclusion zone at Brae B, this umbilical is to be fully removed (except for an 8m length at a rock covered crossing) and has therefore not been subjected to CA.

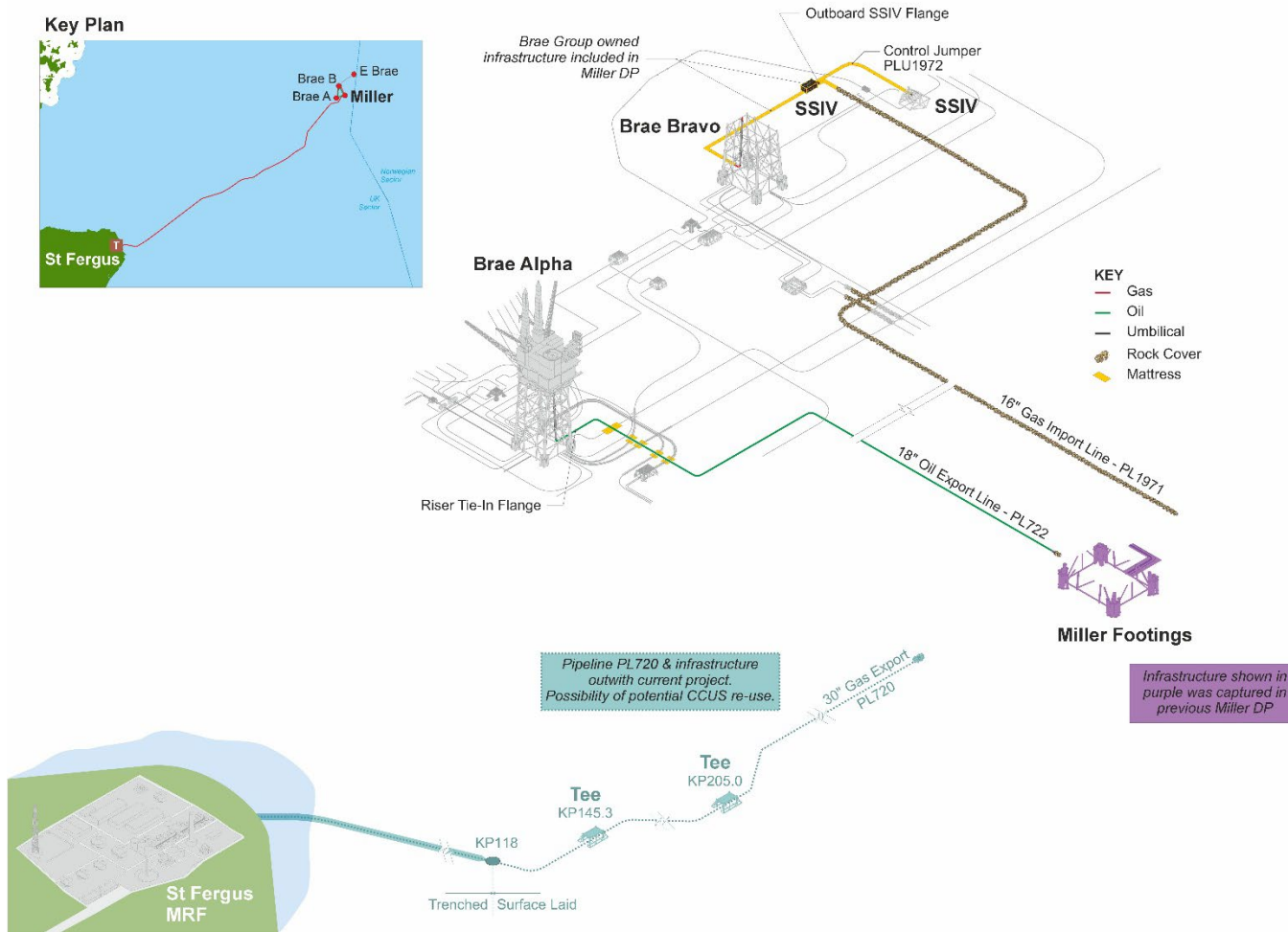
The main export pipeline (PL720) from Miller Platform to St Fergus Terminal Miller Reception Facilities (MRF) 230km away does not form part of this CA as it is subject to possible reuse considerations for carbon capture and storage (CCS) by third parties.

A separate CA will be prepared for PL720 at a later date when a conclusion is reached on reuse options.

Figure 2-1: Miller Field Location



Figure 2-2: Miller Field Layout





2.2 Environmental and Social Overview

2.2.1 Conservation Interests

There are four protected areas within 70km of the Miller Field, see Figure 2-3.

- Scanner Pockmark Special Area of Conservation (SAC) is 44.4 km distant;
- Braemar Pockmarks (SAC) is 15.7 km distant;
- Norwegian Boundary Sediment Plain (MPA) is 55.6 km distant;
- Central Fladden (MPA) is 68.9 km distant.

At these distances, the decommissioning activities are not expected to impact on any of these designated areas.

2.2.2 Seabed

The sediment across the Miller area is relatively uniform and typically comprises the Marine Strategy Framework Directive (MSFD) Broad Benthic Habitat Type 'Offshore circalittoral sand' and the European Nature Information Service (EUNIS) biotope complex 'Deep circalittoral sand' (A5.27) (EMODnet, 2023).

Quaternary sediments in the area vary in thickness from a few metres close to shore, to in excess of 250 m thick in the Witch Ground Basin. The Witch Ground Basin is characterised by numerous pockmarks on the seabed, although they do not intersect with the Project area.

2.2.3 Fish, Marine Mammals and Seabirds

The Miller pipelines are situated within an area which is: a spawning ground for saithe; a nursery ground for anglerfish, blue whiting, European hake, ling, sandeel, spurdog, haddock, and whiting; and a spawning and nursery ground for Norway pout, *Nephrops*, mackerel, cod, and spotted ray.

The Atlas of Cetacean Distribution in Northwest European Waters has indicated that moderate to low densities of harbour porpoise and Atlantic white-sided dolphin, and low to high densities of white-beaked dolphin and minke whale, have been sighted in the immediate vicinity of the Miller field. Additionally, beaked whales are known to be present in the area, but densities estimates are unavailable.

Distribution and abundance of bird species vary seasonally and annually. Seabird densities such as Atlantic puffin are generally higher in the breeding season (April – July), whereas other species such as the Northern fulmar have higher densities in the winter season (August - February). Of the species expected to occur in the area, guillemot (*Uria aalge*) and the European storm petrel (*Hydrobates pelagicus*) are afforded protection by the European Commission (EC) Birds Directive (Annex I).

2.2.4 Other Users of the Sea

2.2.4.1 Commercial Fisheries and Vessel Density

The Miller platform occurs within ICES rectangle 46F1. Data provided by the Scottish Government demonstrates that trawls and seine nets were used throughout this rectangle in



the years 2019 to 2023 (Marine Directorate of Scottish Government, (MDSG) 2024). Species targeted in the area include cod, monk fish, *Nephrops* and haddock.

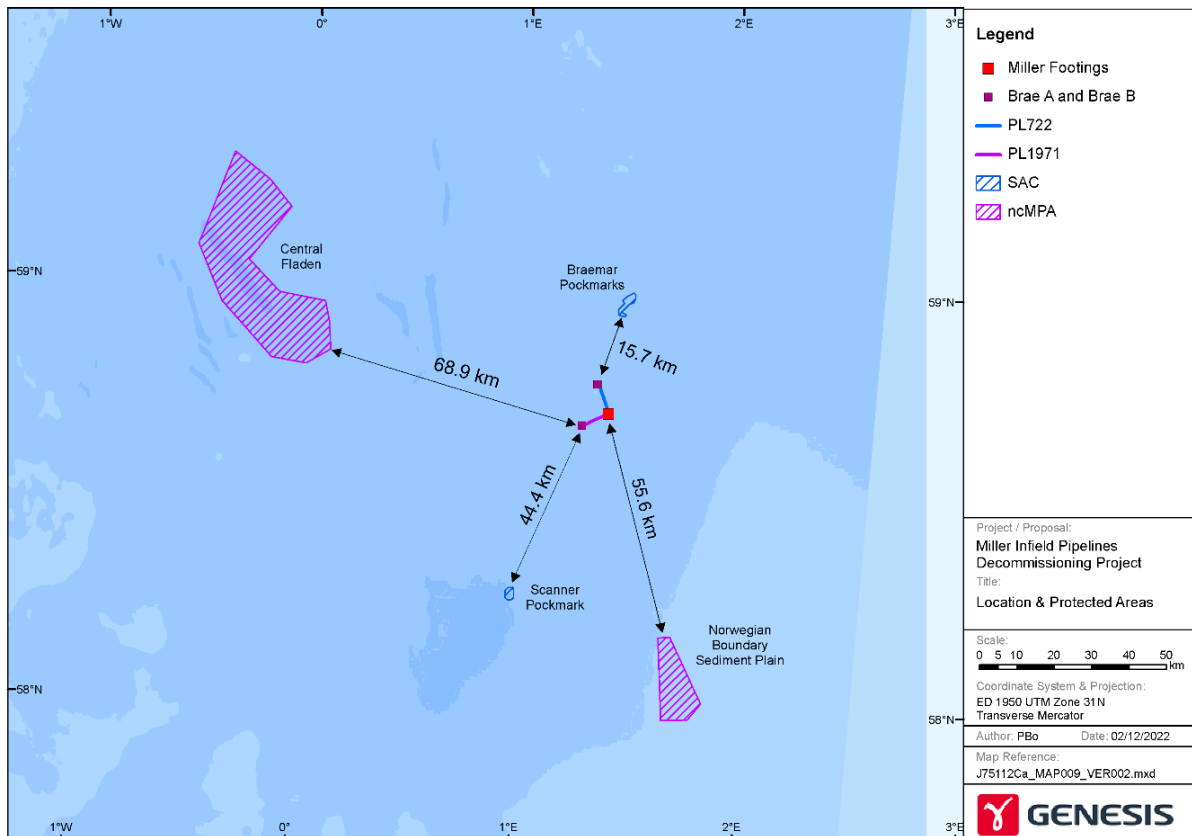
The data suggests that this ICES rectangle encompasses an area that is of relatively low importance to the UK fishing industry such that fishing activity in the area can be considered low to moderate. Bottom trawl gear is used therefore, the importance of ensuring a safe seabed as part of the proposed decommissioning project is emphasised.

The vessel density in the area ranges from 0 to > 50 hours per km² per month.

2.2.4.2 Onshore Communities

Waste generated during the proposed activities will be transported to shore in an auditable manner through licensed waste contractors. The waste management hierarchy of 'reduce, re-use, recycle' will be followed. BPEAL intends to engage approved waste management contractors to handle, store and dispose of all waste generated by the proposed decommissioning activities.

Figure 2-3: Location of protected areas in the vicinity





2.3 Inclusions, Exclusions and Boundaries for CA

2.3.1 Inclusions

Pipelines and umbilicals

The pipelines and their respective pipeline number, dimensions and specific boundaries, to be considered in this CA are presented in Table 2-1.

2.3.2 Exclusions

A breakdown, itemised description and weights of the components excluded from this CA are provided in the Miller Subsea Materials Inventory and Status Report [2] and are only summarised below. These exclusions were not considered in the CA evaluation.

2.3.2.1 Pipelines

The main export pipeline (PL720) from Miller Platform to St Fergus Terminal Miller Reception Facilities (MRF) 230km away does not form part of this CA as it is subject to possible reuse considerations for carbon capture and storage (CCS) by third parties.

A separate CA will be prepared for this pipeline at a later date when a conclusion is reached on reuse options.

2.3.2.2 Risers

It has been agreed that the riser section of PL722 (within the jacket of Brae A) will be decommissioned by the Brae Group owners at the time of decommissioning platform. The riser upper section of PL1971 (within the jacket of Brae B) has already been removed as part of the removal of the Brae B upper jacket in 2022.

2.3.2.3 Structures

There are two pipeline structures associated with the Miller subsea system. A SSIV was installed at Brae B on PL1971 and a spool crossing frame installed at Brae A allows the PL722 pipeline tie in spools to cross the Heimdal pipeline spools.

The gravity based SSIV weighs 108Te and is 13.6m (L) x 7.7m (W) x 3.5m (H) and is owned and operated by the Brae Group owners.

The spool crossing frame weighs 75Te and is 15.5m (L) x 6m (W) x 2.5m (H) and is piled to the seabed with 4 driven piles.

In compliance with OPRED Guidance Notes [1] the SSIV and the spool crossing frame will be fully removed and returned onshore for reuse/recycling.

2.3.2.4 Stabilisation / Protection Features

Mattresses

There are 77¹ prefabricated concrete mattresses spread across different locations, associated with the Miller infield subsea systems:

- 12 associated with PL722 Brae A spool pieces crossing over Heimdal Pipeline;

¹ All prefabricated mattresses are located within the 500m exclusion zones of the Brae platforms. It has been agreed that these will be decommissioned by the Brae Group owners at the time of decommissioning the Brae platforms.



- 33 associated with PL1971 Brae B spool pieces (outboard of SSIV) and SSIV umbilical stabilisation
- 12 associated with PL1971 Pipeline Stabilisation/crossing.
- 20 associated with PL1971 Spool pieces (inboard of SSIV)

There are no grout bags associated with the Miller infield subsea systems reported.

It is proposed that all mattresses that are already rock covered/buried will remain so and any mattresses that are not rock covered/buried, that are currently exposed or become exposed during the decommissioning phase will be recovered and returned onshore for recycle or disposal.

If, during execution of the project, full recovery of all not rock covered and exposed mattresses is not achievable, BPEAL will engage with OPRED to agree alternative options.

Rock Cover

There is 47,310te of rock cover associated with providing protection to PL1971 which is trenched, and rock covered for its entire length.

There is no rock cover associated with the other infield pipeline (PL722).

In compliance with OPRED Guidance Notes [1] it is proposed that the rock cover will remain undisturbed.

2.3.2.5 Spools/ Short Umbilicals

There are nine short spools² that provide tie-ins at Brae A (4) and Brae B (5) and the SSIV umbilical (PLU1972) although associated with PL1971, it is only a 169m long (1.3te) and currently installed below exposed mattresses.

These spools and the SSIV umbilical and associated mattresses are within the 500m exclusion zones of the Brae platforms, and it has been agreed these will be removed by the Brae Group owners at the time of decommissioning the Brae subsea infrastructure.

2.3.3 Boundaries

In summary the boundaries of the CA are as follows:

- PL722 – 18” dia. Oil export pipeline: Pipeline Flange (Miller)³ to Pig Receiver⁴ (Brae ‘A’);
- PL1971 – 16” dia. Gas import pipeline: Riser cut location (-61m) to Pipeline Cut Location (Miller).

2.3.4 Crossings

There are 12 pipeline crossings associated with the infield lines.

Whilst acknowledging these crossings, the CA process has not specifically evaluated the impact on timing of decommissioning of the pipeline at the location of each crossing.

² It is clarified that the 9 short spools are part of PL1971 and PL722 pipeline and therefore are covered in the DP battery limits already, although as they are to be removed, they do not form part of the CA therefore they are in the exclusions section

³ Note - Does not include the spools which were covered by the original Miller Platform DP and recovered during the 2023 works in the Miller 500m zone.

⁴ Brae A riser upper section will be removed as part of the Brae A Upper Jacket DP. The fate of the lower section of the line will be defined within a future Brae Alpha Jacket DP. The outcome of which will be shared by BPEAL with OPRED.



It has been assumed that:

- Where a 3rd party crossing crosses above the BPEAL pipeline, the 3rd party will be responsible for developing the decommissioning proposals associated with the protection and stabilisation features at that crossing;
- Where the BPEAL pipeline crosses above a 3rd party crossing, BPEAL will be responsible for developing the decommissioning proposals associated with the protection and stabilisation features at that crossing;
- Leading up to the execution phase for decommissioning the Miller pipelines, BPEAL will engage with the operators of each 3rd party crossing to agree a strategy and timescale for managing the decommissioning of each crossing;
 - When developing these strategies, BPEAL will take account of the recommended decommissioning strategy for the specific pipelines evaluated by this CA.

The crossings at each pipeline are quantified below:

PL722 – 18” dia. Oil Export Pipeline:

- There are two 3rd party pipelines, which cross over PL722:
- There is one 3rd party pipeline which crosses under PL722, the 8” dia. Heimdal pipeline at the Brae ‘A’ platform. Protection to this crossing is made up of 12 concrete mattresses and a spool crossing frame which is piled to the seabed (4 piles).

PL1971 – 16” dia. Gas Import Pipeline:

- Installed in 2001, PL1971 crosses over nine pipelines. The pipeline is trenched, and rock covered over its entire length. The pipeline is trenched between crossings and then additional blanket rock has been applied over the full length to provide additional cover.

PLU1972 - SSIV Umbilical:

- There is one 3rd party crossing of PLU1972 close to Brae Bravo, where the Brae Group pipeline PL4164 crosses over the umbilical. The umbilical is surface laid and the crossing is rock covered.



Project Title: Miller Infield Pipelines Decommissioning Programme Support
 Document/Rev No: 204504C-000-RT-0200/6
 BP Document No: DC109-EN-REP-000-5008
 Date: January, 2026

Table 2-1: Miller Field Pipelines and Umbilicals - Materials Summary and Full Pipeline/PWA Boundaries

PIPELINE NUMBER	DESCRIPTION	LENGTH (km)	DIAMETER (mm)	FROM	TO
PL722	Oil Export Pipeline	7.460 ¹	457	Pipeline Flange (Miller)	Pig Receiver (Brae 'A') ²
PL1971	Gas Import Pipeline	8.684 ³	406.4	Riser cut location (-61m) ⁴	Pipeline Cut Location (Miller)
PLU1972 ⁵	SSIV Umbilical	0.169	61.6	East Brae 18" Gas Transfer SSIV	Brae B 16" SSIV

¹ Length quoted includes pipeline length, tie-in spool and riser at Brae A

² The riser section of pipeline PL722 is contained within the jacket of Brae A Platform, based on an agreement between BPEAL and the Brae A Group owners the riser section will be decommissioned as part of the decommissioning of the Brae A platform and is therefore excluded from the CA. (See Section 2.3.2.1)

³ Length quoted includes riser on lower Brae B jacket (40m), tie-in spool length (220m) at Brae B and pipeline (8414m).

⁴ The SSIV and spools inboard of the SSIV for PL1971 are owned and operated by the Brae Group owners, although covered by the Miller DP, the SSIV and all spools inboard of the SSIV will be decommissioned as part of the decommissioning of the Brae B platform and is therefore excluded from the CA. (See Section 2.3.2.1).

⁵ The SSIV umbilical (PLU1972) is a short jumper which is surface laid and protected by mattresses located within the 500m exclusion zone at Brae B, although covered by the Miller DP based on an agreement between BPEAL and the Brae B owners this will be decommissioned as part of the decommissioning of the Brae B platform field in line with OPRED Guidance Notes [1] and is therefore excluded from the CA.(See Section 2.3.2.5).

3.0 DECOMMISSIONING OPTIONS

3.1 Decommissioning Options Considered

An overview of each of the pipeline decommissioning options is presented below.

3.1.1 General Considerations

- The term “exposed section” is where the existing Depth of Cover (DoC) is less than the 0.6m to Top of Pipeline (ToP), which takes account of OPRED Guidance Notes [1] that state “it is expected that burial to a minimum depth of 0.6m above the top of the pipeline will be necessary in most cases” also “there is no fixed standard in terms of acceptable burial depth. However, operators will be expected to demonstrate why it is considered safe to leave deposits in place if the burial depth is less than 0.6 metres below the surface of the seabed.”
- Where total removal options are considered, remediation of the open trench or seabed after deburial and removal of the pipeline has not been considered as a requirement however discussion with stakeholders may be required if a total removal option is recommended in the CA.

3.1.2 Option 1a) Total Removal by Reverse Reeling

In this option, the pipeline would be fully recovered from the seabed by reverse reeling and returned to shore for recycling or disposal. Where the pipeline is already trenched and rock covered i.e. PL1971, it would require deburial by mass flow excavation (Figure 3-1) before recovery operations could commence.

The capacity of currently available reel lay vessels (Figure 3-2) range from 2000te to 5600te. Multiple trips to shore may be required depending on the quantity of pipeline to be recovered.

Where a pipeline being recovered crosses under a 3rd party pipeline the pipeline would have to be cut at a pre-determined distance away from the crossing and potentially the remainder of the pipeline recovered later i.e. after the 3rd party pipeline has been decommissioned.

Figure 3-1: Mass Flow Excavation

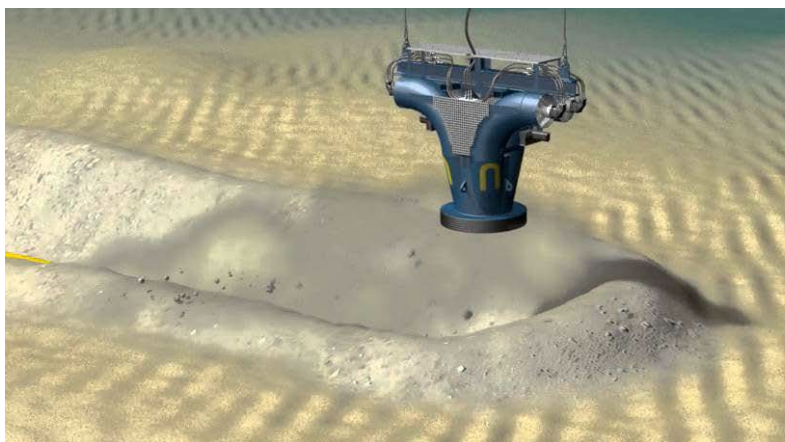


Figure 3-2: Typical Reel Lay Vessel



3.1.3 Option 1b) Total Removal by Reverse S-Lay

In this option, the pipeline(s) would be fully recovered from the seabed by reverse S-lay and returned to shore for recycling or disposal. A pipelay barge (Figure 3-3) would likely be used for the recovery of rigid export pipelines.

Figure 3-3: Pipelay Barge



Where a pipeline being recovered crosses under a 3rd party pipeline the pipeline would have to be cut at a pre-determined distance away from the crossing and potentially the remainder of the pipeline recovered later i.e. after the 3rd party pipeline has been decommissioned.

3.1.4 Option 1c) Total Removal by Cut and Lift

In this option, the pipeline(s) would be fully recovered from the seabed in relatively short pipe lengths and returned to shore for recycling or disposal. Typically an ROV would be adopted to

assist with the deployment of cutting tools (typically hydraulic shears) to cut the pipeline into 24m sections.

Depending on the quantity of material to be recovered it may be more cost efficient to transfer cut sections to a cargo barge which would make multiple trips to and from shore.

Figure 3-4: Pipeline Cut into Section for Recovery



This method has been used extensively in the UKCS and in decommissioning.

Figure 3-5: Hydraulic Shears



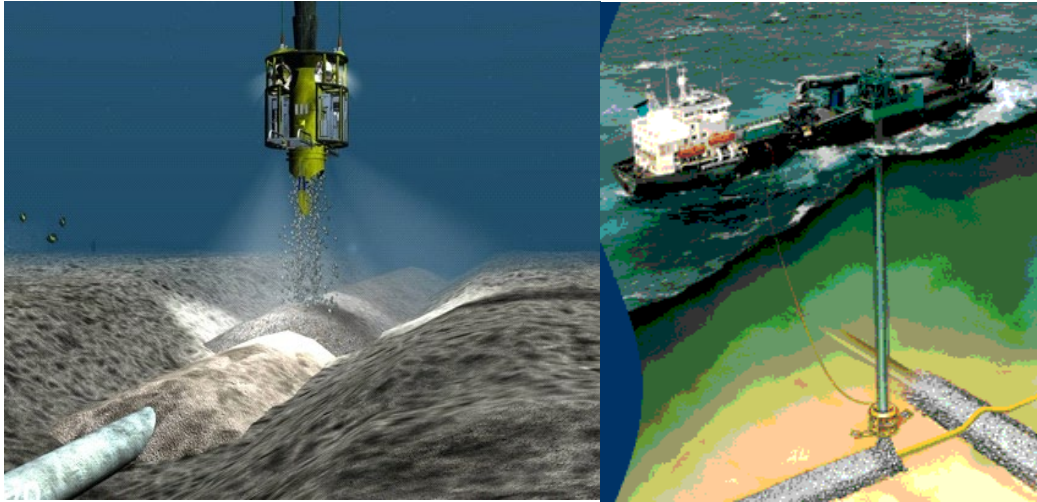
Where a pipeline being recovered crosses under a 3rd party pipeline the pipeline would have to be cut at a pre-determined distance away from the crossing and potentially the remainder of the pipeline recovered later i.e. after the 3rd party pipeline has been decommissioned.

3.1.5 Option 2a) Remediate in Situ – Exposed Sections Rock Covered

In this option, the exposed pipelines would be left in place on the seabed and rock covered to achieve a burial depth of at least 0.6m over TOP. Where the pipeline is already trenched and rock covered, the pipeline ends, trench transitions and exposed sections of pipeline identified in the pipeline survey would be covered with rock deployed from a rock placement vessel. The amount of rock cover and rock berm profile would be in line with industry practise and would be agreed with all consultees during the works authorisation process.

Future inspections of the pipelines left in-situ would be required to confirm that the rock berm remains stable and that no further exposures develop.

Figure 3-6: Rock Placement Vessel



Where the pipelines cross other pipelines the application of rock cover would be delayed over an area at pre-determined distance away from the crossing and decommissioned later i.e. after the 3rd party pipeline has been decommissioned.

3.1.6 Option 2b) Remediate in Situ – Exposed Section Trenched and Buried

In this option, the exposed pipelines would remain in place on the seabed and would be trenched and buried to achieve a burial depth of at least 0.6m above TOP, using a plough, mechanical trenching or jet trenching unit deployed from an ROVSV crane. Where the pipeline is already trenched and rock covered, the pipeline ends, trench transitions and exposed sections of the pipeline identified in the pipeline survey would be trenched and buried. The trenching strategy would be in line with industry practise and would be agreed with all consultees during the works authorisation process.

Future inspections of the pipelines left in-situ would be required to confirm that no further exposures develop.

Figure 3-7: Plough



Figure 3-8: Mechanical Trencher in 'V' cutting mode

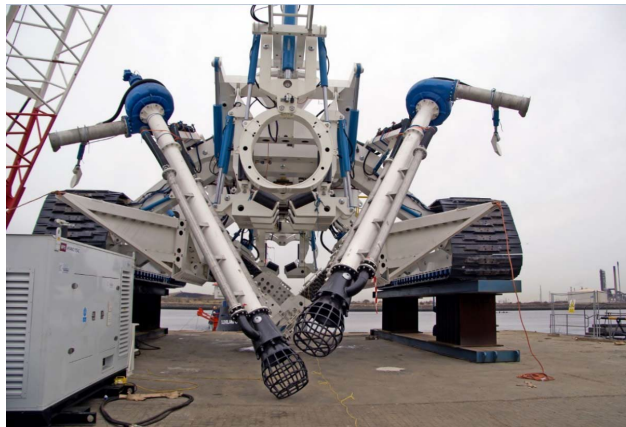


Figure 3-9: Jetting Trenching Unit



3.1.7 Option 2c) Remediate in Situ -Exposed Sections Cut and Removed

In this option, the trenched and rock covered sections of pipeline would remain in place. The pipeline ends, trench transitions and exposed sections of pipeline identified in the pipeline survey would be cut and removed to full trench depth. The remaining section of pipeline at full trench depth would be covered by existing seabed or rock cover to eliminate potential future snagging hazards.

Future inspection/ monitoring surveys of the pipelines left in-situ would be required to confirm that no further exposures develop.

3.1.8 Option 3) Leave In-situ and Monitor

In this option, the pipeline including any exposed sections would remain on the seabed with no further remedial action performed.

Future inspections/ monitoring surveys of the pipelines left in-situ would be required to confirm that no further exposures or spans develop, and that any future pipeline deterioration was not detrimental to other users of the sea. Any future remedial action resulting would be agreed between the operator/ liability owner and the regulator.

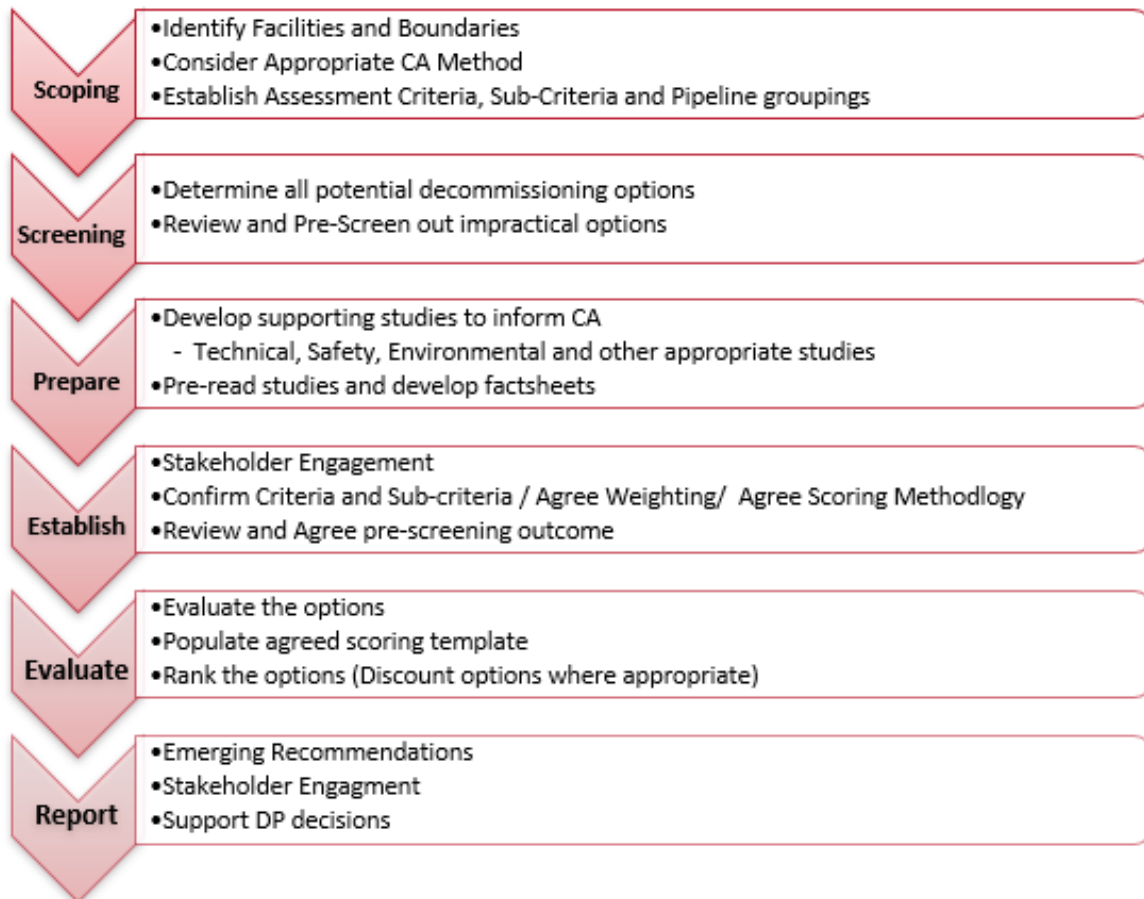
The frequency of future monitoring surveys would be agreed with the regulator during the approval phase of the DP and would be assessed following each future monitoring survey and be amended depending on the results of each subsequent survey.



4.0 OVERVIEW OF THE CA PROCESS

The Miller Field CA has followed the recommended process to be adopted for Comparative Assessment as laid out in 2015 Offshore Energies UK (OEUK) Guidelines for CA in Decommissioning Programmes – 2015 [3]. Figure 4-1 describes the process that was followed.

Figure 4-1: OEUK CA Process



4.1 Scoping

4.1.1 Facilities and Boundaries

To ensure robust evidence was available to support and inform the CA, significant preparation by data gathering, reviewing drawings, inspection reports, survey reports and operating history has been completed and technical studies have been completed to accurately determine the quantity, specification, physical layout, status and predicted behaviour of the pipelines to be decommissioned.



Three documents were produced that are relevant to and support and inform the CA, they are:

- the Miller Subsea Materials Inventory and Status Report [2];
- Miller Subsea Decommissioning Options and Pre-screening Report [4].
- Miller Pipelines Burial Feasibility Study [9]

Results from these studies is summarised in the tables and narrative provided throughout this CA report. However, these documents are available upon request if further detail is required.

4.1.2 Evaluation Method

Evaluation Method A, as described in the OEUK Guidelines [3] was adopted i.e. Qualitative Assessment using Red/Amber/Green (RAG) to rate the performance of each decommissioning option against a pre-determined set of sub-criteria.

Under Evaluation Method A, colour coding represents the relative preference of the options with respect to the criteria and sub-criteria, see Table 4-1

Table 4-1: Evaluation Method A – Comparative Impact

Performance	Comparative Impact
Most Preferred	Lower Impact
	Moderate Impact
Least Preferred	Higher Impact
No Preference	No significant impact across options ⁵

4.1.3 Assessment Criteria

The main criteria adopted for the evaluation fully aligns with OPRED Guidance Notes [1] and the sub-criteria adopted generally aligns with OPREDs “matters to be considered” as listed in the Guidance Notes - Annex A Comparative Assessment Framework.

4.1.4 Groupings of Components for CA

Since there are only two pipelines to be evaluated in this CA it was not necessary to refer to pipeline groups as it was decided to evaluate each pipeline separately. This report therefore references specific pipeline numbers only i.e.:

- PL722 – 18” dia. Oil Export Line x 7.1km long approximately;
- PL1971 – 16” dia. Gas Import Line x 8.5km long approximately.

Table 2-1 provides a materials summary and boundary details of each pipeline.

4.1.5 Pipeline status summary

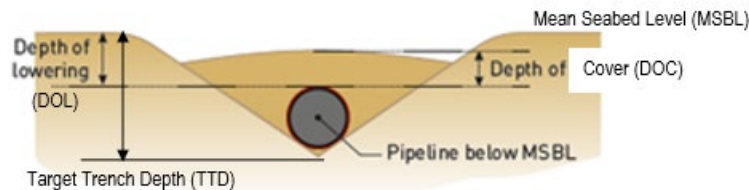
Terminology used in describing the status of each pipeline described in this section and potential constraints of each pipeline decommissioning option described in Section 5.1 is shown in Figure 4-2:

⁵ OPRED Guidance Notes [1] Annex A identifies that “The preferred option should be selected by focusing on the matters (sub-criteria) where the impacts of the options are *significantly different*”; therefore, where there is no significant difference between the options that sub-criterion across the options may be colour coded grey.



- Depth of Lowering (DoL) is distance from Mean Seabed Level (MSBL) to Top of Pipe (ToP);
- Depth of Cover (DoC) is distance from ToP to top of material above, sometimes described as Depth of Burial (DoB), and is not normally flush with MSBL;
- Target Trench Depth (TTD) is the target distance from MSBL to bottom of the trench, set to achieve the specified DoL.

Figure 4-2: Terminology associated with the status of a trenched and buried pipeline



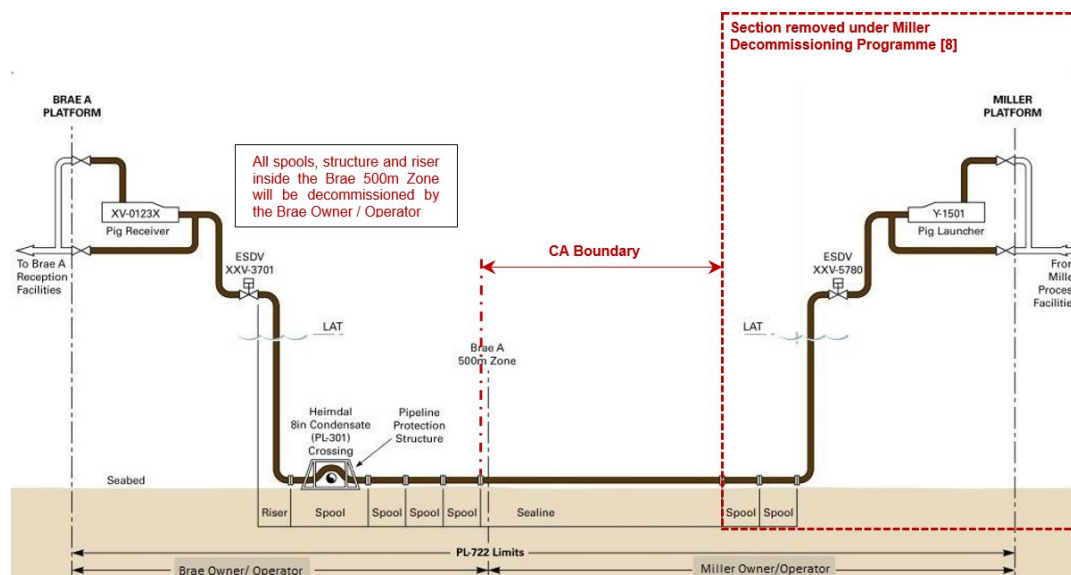
4.1.5.1 PL722 - 18" dia. rigid pipeline (concrete coated and surface laid)

PL722 is an 18" dia. concrete coated oil export pipeline which runs 7.460km (including spools) from the Miller Platform to the Brae 'A' Platform.

Figure 4-3 shows the original PL722 pipeline layout. The removal of the infrastructure around the Miller platform (within the platform 500m) was approved under the Miller Decommissioning Programme [8]. When the spools were removed at the Miller platform, the pipeline end was protected by spot rock cover.

Eighty two (82) span anomalies were recorded in the 2024 survey with a total combined span length of 0.462km. Details of individual spans are provided in the Miller Subsea Materials Inventory and Status Report [2]; Ultimately the recommendations of this CA to trench and bury the line (Section 6.1.1) will remedy any current spans.

Figure 4-3: PL722 18" dia. Oil Export Pipeline – Schematic



Since PL722 is surface laid and reported as fully exposed, no graphic representation of exposures from previous surveys is provided.



4.1.5.2 PL1971 - 16" dia. Rigid Pipeline (Trenched and Buried)

PL1971 is a 16" dia. gas import pipeline which runs 8.634km (including spools) from Brae 'B' to Miller platform.

Figure 4-4 shows the original PL1971 pipeline layout. The removal of the infrastructure around the Miller platform (within the platform 500m) was approved under the Miller Decommissioning Programme [13]. When the spools were removed at the Miller platform, the pipeline end was protected by spot rock cover.

The pipeline is trenched, and rock covered over its entire length. Five separate surveys were over the full length of the pipeline, 2009, 2015, 2018, 2021 and 2024 have been reviewed. At the time of the review/ CA (2020) the 2015 survey results were the most recent survey⁶ where depth of burial was recorded, and they show that the pipeline is well buried with only minor exposures noted in the anomalies. The average depth of burial is 0.85m

No exposures were detailed in the 2024 visual survey.

See Figure 4-5 which shows a graphic of previous DOC surveys.

Figure 4-4: PL1971 16" dia. Gas Import Pipeline – Schematic

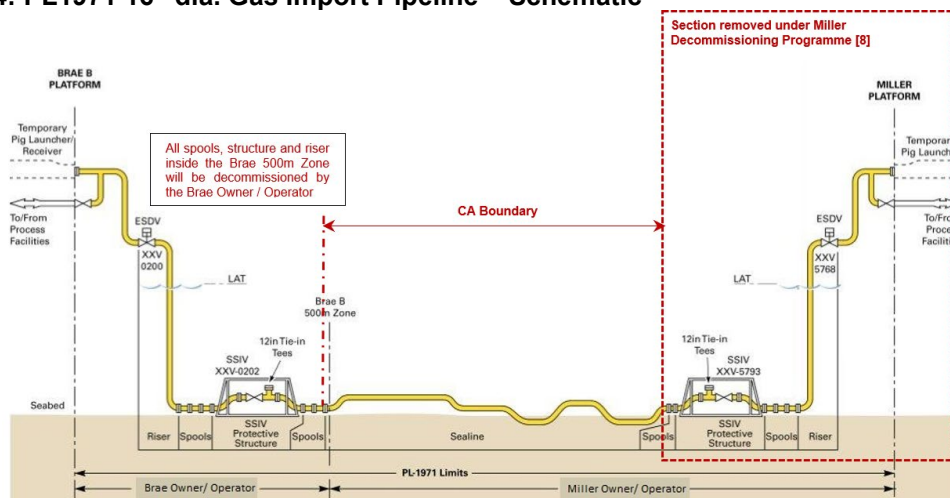
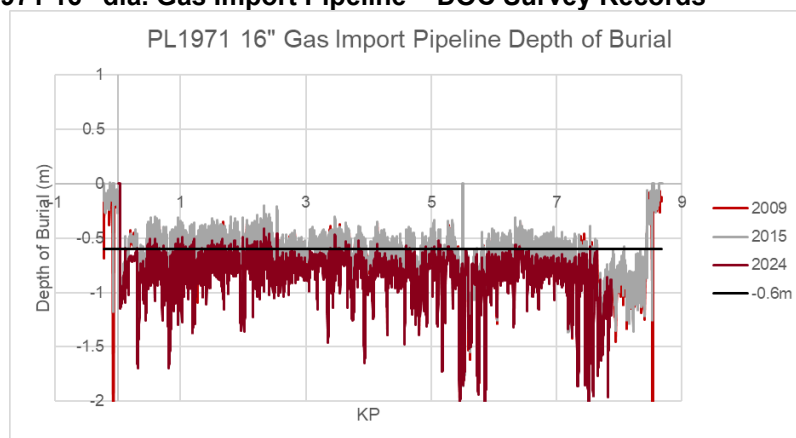


Figure 4-5: PL1971 16" dia. Gas Import Pipeline – DOC Survey Records



⁶ BPEAL carried out a Depth of Burial (DOB) survey of PL1971 in 2024 to provide a more up to date burial status than available from the last 2015 DOB survey. The depth of burial has increased between 2015 and 2024 therefore there is no impact on the CA conclusions.



Table 4-2: Pipelines details and exposure lengths for CA

PIPELINE NO.	COMPONENT TYPE / AS-LAID CONDITION	DESCRIPTION	BOUNDARY	LENGTH	WEIGHT	BURIAL STATUS	EXPOSED LENGTH
PL722	<ul style="list-style-type: none"> Rigid Pipeline Concrete Coated Surface Laid 	18" dia. Oil Export	KP0.0 – 7.11	7.110 km	3,141te	Surface Laid	7.11km
PL1971	<ul style="list-style-type: none"> Rigid Pipeline Trenched and Buried 	16" dia. Gas Import	KP0.0 – 8.414	8.414km	2,398te	Rock covered to an average DOC of 0.85m with additional rock cover along length and at crossings	0.009km ¹

Notes:

¹ 9m section of pipeline which could be exposed at the end flange at Brae B.



4.2 Screening

Where decommissioning of a pipeline in-situ is being considered, a CA of the options is required. A two-stage process with an early option screening process to narrow options is permissible.

Stage 1: Option Screening

- Identify a comprehensive list of potential decommissioning options;
- Identify the criteria against which each option will be considered;
- Complete an evidence-based evaluation to reduce the number of reasonable/technically feasible options to a short-list;
- Carry out an expert review of evaluation results to assure the outcome and choice of options to be carried forward to a more detailed comparative assessment.

Stage 2: Detailed Comparative Assessment process

- Adopting shortlisted options from Stage 1, undertake a detailed CA of each option;
- Assessments must be evidenced based, using existing data where possible or gathering additional or new information as appropriate;
- Decisions must be transparent, and regulators and stakeholders must understand the rationale underpinning the assessment and decision-making process.

To fulfil the requirements of Stage 1 Option Screening, the options summarised in Sections 3.1 were taken offline and were studied in detail to define the methods, equipment and vessels needed to support each option.

Similar assessment criteria as described in Section 4.1.3 were applied during the option screening study [4]. The OEUK Guidelines [3] Evaluation Type A approach as described in Section 4.1.2 was also adopted, where each of the pipeline decommissioning options were qualitatively assessed using the Red/Amber/Green (RAG) evaluation method.

The results of this pre-screening study are summarised in Section 5.1 and reported in detail in the Miller Subsea Decommissioning Options and Pre-screening Report [4].

4.3 Preparation

In addition to the Technical Studies described in Section 4.1.1, safety and environmental desktop studies were carried out in preparation for and in support of the CA:

- Miller Decom Hazard Identification and Risk Assessment (HIRA) Report [5]
- Miller Desktop Environmental Impact Identification (ENVID) Report [6]

4.3.1 HIRA

The objectives of the HIRA desktop study were to:

- Identify initiating events that have the potential to give rise to safety, health, societal and environmental consequences;
- Evaluate the safeguards, controls and mitigating measures;
- Risk assess the hazards identified across the options; and



- Develop background and understanding for the population of the CA summary tables for use in the CA workshop.

The activities associated with each decommissioning option under consideration were assessed separately which enabled the specific safety related risks of each option to be identified.

The HIRA processes involved a structured approach, as per general industry practice and was undertaken in accordance with Genesis and BPEAL procedures for HAZID Study. The main elements of the HAZID process were:

- For the process, system or facility under study, identify relevant hazards and their potential safety consequences, including Major Accident Hazards (MAHs);
- Document any proposed safeguards; and
- Enable development of the CA Safety Summary Tables.

Risk evaluation (likelihood/ severity) associated with hazard scenarios was conducted, again in line with the BPEAL Risk Matrix.

To enable a comparative evaluation of the risks across each decommissioning option under consideration, the BPEAL Risk Matrix was adopted and used to rate each decommissioning option against an agreed set of guide words.

The ratings were then summated to derive the relative safety performance of each decommissioning option against:

- Project Risk to Offshore Personnel;
- Project Risk to Other Users of the Sea;
- Project Risk to those on land;
- Risk of High consequence event / MAH Event.

These risk criteria align with the safety sub-criteria considered in the CA evaluation.

Summary tables were prepared following the HIRA to inform the CA Evaluation Workshop. The summary tables are provided in Appendix A.

4.3.2 ENVID

The objectives of the desktop ENVID study were to:

- Assess the various decommissioning options for each pipeline to be considered in the CA Workshop and identify any potential showstoppers; and
- Identify sub criteria to be considered for 'Environmental and Societal' in the CA screening;

The desktop review was undertaken using the BPEAL Environment Impact Identification methodology. To determine the impact significance of each decommissioning option to be evaluated by CA, the ENVID has considered the severity of each impact and the duration/frequency of the impact/activity. These were then combined to give an impact significance rating.

There were no showstoppers identified for the decommissioning options considered for either pipeline covered by this CA; however, it is expected that in some instances where the ENVID



will have resulted in a similar level of significance between options, the CA may rate them differently.

The ENVID was expanded to include the assessment of Societal Impacts of each decommissioning option. The ratings were then summated to derive the relative Environmental and Societal performance of each decommissioning option.

Summary fact sheets were prepared following the ENVID to inform the CA Evaluation Workshop, and are provided in Appendix B.

4.4 Establish

4.4.1 Stakeholder Engagement

Consulting with stakeholders is an important part of the decommissioning impact assessment process as it allows any concerns or issues which stakeholders may have, to be communicated and addressed.

A scoping letter has been published to inform the regulator and consultees of the proposed decommissioning activities, which has allowed them the opportunity to identify any additional areas they may wish to be considered within the EA. Feedback received from stakeholders has been included in the EA.

A stakeholder engagement meeting was convened to present the findings of the CA and EA and to clarify the recommended decommissioning option for each pipeline. See recommendations Section 6.1.

4.4.2 Agreed Criteria, Sub-Criteria and Weightings

The main and sub-criteria as described in Section 4.1.3 was presented and described in the CA workshop and was agreed to be used in the evaluation.

4.4.3 Review and Agree pre-screening outcome

The Subsea Decommissioning Options and Pre-screening Report [4] was carried out and published to the wider project team for review ahead of the CA Evaluation Workshop.

The updates from the review cycle of this study [4] was presented as the introduction at the CA Evaluation Workshop. Technical fact sheets were prepared to summarise the results of both the Options screening study [4], the Miller Subsea Materials Inventory and Status Report [2]. The technical fact sheets are provided in Appendix C.

4.5 Evaluate

Details of participants at the CA Evaluation Workshop is provided in Table 4-3.



Table 4-3: CA Workshop Participants

BPEAL	
Garry Stevenson	Project Manager (Andrew DP Study)
Moses Alawode	Project Manager (Miller DP Study)
Graham Ling	Subsea Engineer
Genesis	
Stuart Odell	Project Manager
John Wilson	Senior Consultant Decommissioning (Chair)
Martha O'Sullivan	Consultant Environmental Engineer
Louis Findlay	Technical Safety & Risk Engineer
Gemma Lang	Senior Subsea Consultant

Workshop considerations are explained in Section 5.0, outcome of the workshop is reported in Section 6.0.

4.6 Report

This document reports the results, conclusions and emerging recommendations of the CA Workshop and these are summarised in Sections 6.1 of this report. More detailed worksheets providing further clarification of the individual criterion and sub-criterion evaluation is provided in Appendix E.

The outcome and recommendations of the CA are reflected in the draft DP [7] which has been issued as a 3rd pre-draft.



5.0 CA WORKSHOP CONSIDERATIONS

5.1 From historical data and technical support studies

5.1.1 PL722 - 18" dia. Rigid Pipeline (Concrete coated, surface laid)

PL722 was designed and installed to be surface laid.

The Miller Pipelines Burial Feasibility Study [9] observations highlight that ground conditions for this pipeline have been reviewed during the study [9] and are considered suitable for trenching and burial, however;

- Damage anomalies along the section of the pipeline that runs from the Miller platform to the Tiffany crossing location (~ KP3.83) may make the use of trenching operations that require pipeline handling (i.e. Plough or Mechanical Trenching) less efficient and prone to potential failure of the already damaged sections of pipeline;
- Crossing stabilisation features (rock cover) at ~ KP 3.88 will hinder trenching operations at this location;
- The generalised soil description is similar across the full route of the pipeline and is a sand layer with stiff to very stiff clay below.

On this basis, where trench and burying is the option being considered, the proposed base scope of work for the un-trenched 18" Gas Export pipeline would be to trench and bury using a Jet Trencher. However, since the Miller Pipelines Burial Feasibility Study [9] has also observed that there remains some uncertainty in being able to achieve the TTD using Jet Trenching techniques alone to ensure a greater than or equal to 0.6m depth of cover along the full pipeline route. To ensure the required TTD will be achieved a combination of jet trenching and mechanical plough and backfill techniques will be considered where required.

5.1.2 PL1971 - 16" dia. Rigid Pipeline (Trenched and Buried)

PL1971 is different from PL722 in that it is already trenched, and rock covered to a DOC greater than 0.6m along its entire length, it was therefore not subject of study under Miller Pipelines Burial Feasibility Study [9].

There is no evidence that problems were encountered during trenching operations when the pipeline was initially installed. Therefore, on this basis, where trench and burying is the option being considered for exposed ends of pipeline, there is no reason to indicate there would be technical problems when trenching and burying these exposures.

5.2 Results of Options Pre-screening

The Pre-screening Report [4] describes the pre-screening process and provides the basis for the short-listed options to be taken forward in the CA workshop.

Table 5-1 below, identifies for each pipeline:

- the options considered initially;
- the options pre-screened out by the pre-screening study [4]; and
- the options that were carried forward to the CA workshop.

Detailed descriptions of all methods evaluated and the reasoning for decommissioning options being discounted at pre-screening stage are described in the Pre-screening Report [4] and



are only summarised here. Presentation slides provided an overview of each decommissioning option at the CA workshop.

5.2.1 PL722 - 18" dia. Rigid Pipeline (Concrete coated, surface laid)

Option 1a) - Total Removal by Reverse Reeling, described in Section 3.1.2, has been pre-screened out for this pipeline as:

- Concrete coated pipe installed by S-Lay has not been designed to be reeled on to a vessel, the pipe integrity would fail during reeling operations and is a technical and safety risk;
- There is also no track record in the industry of this method of recovery for this type of pipeline.

Option 1b) - Total Removal by Reverse S-Lay, described in Section 3.1.3, has also been pre-screened out for this pipeline as:

- There is no industry track record of reverse S-lay of concrete coated pipe;
- There is concern that the deterioration of the concrete coating over time would hinder initial pick up of the pipe and may result in large sections of concrete coating falling off during recovery and is a technical and safety risk.

Option 1c) - Total Removal by Cut and Lift, described in Section 3.1.4, has been recommended to be carried forward for further evaluation by CA. Although this method will have a much longer offshore campaign than the other Total Removal Options considered:

- It is the most technically feasible option for Total Removal;
- It has a significant track record.

Two Remediate In-situ options have been carried forward for further evaluation by CA i.e.:

- Option 2a): By the application of Rock Cover to all exposed sections, as described in Section 3.1.5; and
- Option 2b): By trenching and burying all exposed sections, as described in Section 3.1.6.

Option 2c) Remediate in-situ option to cut and remove all exposed sections, as described in Section 3.1.7, has been pre-screened out, since most of the pipeline length does not meet expectations on the burial depth / DOC, it is considered that Option 2c) is the same as Option 1c) - Total Removal by Cut and Lift, which has been evaluated by CA.

Option 3: Leave In-Situ and Monitor is applicable to this large diameter concrete coated trunk line and is therefore evaluated as an option in the CA workshop.

5.2.2 PL1971 -16" dia. Rigid Pipeline (Trenched and Buried)

PL1971 is different in construction from PL722 in that it is a slightly smaller diameter line and does not have concrete coating. The other main difference for PL1971 compared to PL722 is that this pipeline is already trenched, and rock covered to an average DOC greater than 0.6m. Therefore, although total removal is considered unlikely for this rock covered pipeline, it is necessary to evaluate at least one Total Removal Option by CA.

Reverse Reeling (Option 1a) and Reverse S-Lay (Option 1b) have been rated similarly in the Pre-screening Report [4] therefore it was concluded that the outcome of a subsequent CA was



likely to be similar for both options, as a result carrying only one of these options forward has not affected the CA process. Therefore, the Pre-screening Report [4] recommends that Option 1a) - Total Removal by Reverse Reeling, as described in Section 3.1.2, be carried forward to CA.

Option 1c) - Total Removal by Cut and Lift, would require a significantly longer duration of offshore work, than the other Total Removal options considered and would result in a longer decommissioning offshore campaign. This increases the chance of schedule slippages; therefore, it was recommended not be carried forward for evaluation by CA.

The three Remediate In-situ options, 2a), 2b) and 2c) as described in Section 3.1 were all recommended to be carried forward for evaluation by CA.

Option 3: Leave In-Situ and Monitor would only apply to the short-exposed ends of this pipeline as the Remediate In-situ options cover the option to leave the trenched and buried and rock covered section of the lines in-situ. The Pre-screening Report [4] concluded that Option 3) was not an applicable option, as the short-exposed ends are not considered to fall into the category of a large diameter surface laid trunkline as described in OPRED Guidelines for such an option.



Table 5-1: Pipeline Recommendations

Pipeline No.	Component Type/ As-laid Condition	1. Total Removal by:			2. Remediate In-Situ with exposed sections:			3. Leave In-Situ and Monitor
		a) Reverse Reeling	b) Reverse S-Lay	c) Cut and lift	a) Rock Covered	b) Trenched and Buried	c) Cut and Lift	
PL722	<ul style="list-style-type: none"> Rigid pipeline Concrete Coated Surface Laid 	<p>✗ (Not Technically Feasible)</p>	<p>✗ (Pre-screened out)</p>	<p>✓</p>	<p>✓</p>	<p>✓</p>	<p>✗ (N/A)¹</p>	<p>✓</p>
PL1971	<ul style="list-style-type: none"> Rigid pipeline Trenched and buried 	<p>✓</p>	<p>✗ (Pre-screened out)</p>	<p>✗ (Pre-screened out)</p>	<p>✓</p>	<p>✓</p>	<p>✓</p>	<p>✗ (Pre-screened out)</p>

✓ denotes this decommissioning option is to be carried through to the CA workshop for evaluation

✗ denotes this decommissioning option will not be evaluated in the CA workshop

¹ Since PL722 consists of a surface laid pipeline, with the full length of the line exposed, Option 1c) is the same activity as Option 2c) for this pipeline and has only been evaluated as one option.



5.3 Evaluation Workshop Tools

5.3.1 Qualitative Assessment - Rating Guide Table

A project specific guide table for each sub-criterion to be comparatively assessed qualitatively was prepared and published to ensure workshop participants were aligned in the application of Red/Amber/Green (RAG) rating against each sub-criterion. This guide table is provided in Appendix D.

5.3.2 Evaluation / Rating Workbook

A project specific evaluation/ rating workbook was prepared in M.S Excel format which reflects the criteria and sub-criteria to be assessed against the specific decommissioning options for the project and for each pipeline being evaluated.

This workbook was populated at the workshop with the agreed ratings and relevant narrative explaining the reasoning behind the rating of each sub-criterion against each decommissioning option.

The evaluation/ rating workbook is provided in Appendix E, this elaborates on the basis to the recommended decommissioning options recorded in Section 6.1

5.3.3 Decommissioning Fact Sheets

Decommissioning fact sheets have been prepared and are included in Appendices B and C. These present a summary of the results of the supporting studies and were used to inform the workshop participants throughout the workshop.

Note: that the authors of the factsheets also participated in the evaluation workshop and were, when required, able to expand and clarify the facts.

5.4 Mechanics of Rating the Options

The evaluation / rating workbook described in Section 5.3.2 was live on screen and was populated during the workshop.

Each pipeline was assessed in turn, by:

- a) Taking each sub-criterion in turn and assessing and rating across each decommissioning option. This ensured a true comparison of the options for each sub-criterion, which would not be the case if each decommissioning option had been assessed in isolation and for all criteria first;
- b) When appropriate, comments have been added in the cell being rated to record the reasoning for the rating. These comments have been used to develop the summary narrative in Section 6.1;
- c) Steps a) and b) were repeated for each sub-criterion in turn until all sub-criteria had been assessed for all decommissioning options;
- d) Summating the ratings was not completed until each criterion has been assessed and rated individually. This avoided the possibility of summation results influencing ratings across subsequent criteria;
- e) Once all criteria had been completed, a summary page was collated and viewed to determine the overall ranking for each decommissioning option:



- i. The decommissioning option with the most number of sub criteria rated as Higher Impact (Red), was agreed to be the least preferred option;
- ii. The decommissioning option with the least number of sub criteria rated as Higher Impact (Red) and the most number of sub criteria rated (Lower Impact (Green), was agreed to be the most preferred option;
- iii. Other options were then ranked in order, based on relative numbers of Higher Impact (Red) and Lower Impact (Green) ratings that the sub-criteria have attracted.

The results by individual sub-criteria were then viewed and an overall rating and ranking for each pipeline was agreed. See the Visual Summary page for each pipeline in the workbook provided in Appendix E.

5.4.1 Sensitivity Analysis

Sensitivity analyses were conducted to review potential impact on the recommended / preferred decommissioning options for each pipeline, the sensitivity analysis fell into two categories:

1. Sensitivity Analysis 1 – by specific sub-criteria:

During the workshop, as participants carried out the original RAG evaluation described in Section 4.5, if participants considered a decision on a specific rating to be marginal between one rating and another, this would be noted in the individual worksheets and a decision was taken to carry out a sensitivity analysis offline, by applying the agreed alternative rating for that specific sub-criteria and decommissioning option. The reasoning behind the requirement for the sensitivity analysis was also noted in the worksheets.

2. Sensitivity Analysis 2 – where economic criteria was not considered:

Taking account of BEIS Guidance [1], where it states, “it is unlikely that costs alone will be accepted as the deciding factor in arriving at the most preferred option unless all other matters show no significant difference”. Sensitivity Analysis 2 has removed the Economic Criteria and evaluated the outcome on the remaining sub-criteria.

To demonstrate that the rating results from the evaluation of the cost of the decommissioning options has not had an undue influence on the ranking of the decommissioning options, the economic risk sub-criteria is discounted under this sensitivity analysis for each pipeline. i.e.:

- Cost for Decommissioning/ Removal Activities: and
- Cost for Long Term Monitoring / Remediation Activities.

The details, results and conclusions from these sensitivity analyses are described in detail in Section 6.1.



6.0 COMPARATIVE ASSESSMENT EVALUATION

6.1 Results, Conclusions and Recommendations

This section provides a summary of the ranking reached for each decommissioning option under consideration and for each pipeline at the workshop. Options ranked 1 being the most preferred option and options ranked 2 or greater being poorer performing options compared to the preferred option.

During the CA Workshop, the allocated ratings were recorded on a pre-prepared MS Excel evaluation workbook and narrative was added to explain and justify each rating. A full set of the evaluation workbooks for each pipeline is provided in Appendix E.

The overall ratings and rankings for each pipeline were determined from a summation of the ratings of the individual sub-criteria.

Each sub-section below provides conclusions and recommendations as to the preferred decommissioning options for each pipeline and provides a summary of the influencing factors which caused this ranking. Each sub-section also provides conclusions on the impact of the sensitivity analyses carried out.



6.1.1 PL722 - 18” dia. Rigid Pipeline (Concrete coated and surface laid)

Table 6-1: PL722 CA Workshop Ranking and Recommendations

Decommissioning Options	1. Total Removal by:			2. Remediate In-situ:			3. Leave In-situ
Sub-Option	a) Reverse Reeling	b) Reverse S-Lay	c) Cut & Lift	a) Rock Covered	b) Trenched & Buried	c) Cut & Removed	Monitor
Ranking			4	3	1		2
Rating Count	N/A	N/A	Higher Impact = 1	Higher Impact = 0	Higher Impact = 0	Option Pre-screened out as equivalent of Option 1C) for this pipeline	Higher Impact = 1
			Moderate Impact = 5	Moderate Impact = 7	Moderate Impact = 1		Moderate Impact = 2
			Lower Impact = 5	Lower Impact = 4	Lower Impact = 10		Lower Impact = 8
			Not Significantly Different = 4	Not Significantly Different = 4	Not Significantly Different = 4		Not Significantly Different = 4
Recommendation	Option Pre-screened out	Option Pre-screened out	Discount Option in DP	Discount Option in DP	Carry Forward as Recommendation in DP (See Notes)		Discount Option in DP
<p>Notes:</p> <p>Option 2b) – Remediate in-situ with the whole length of pipeline trenched and buried to a depth of cover greater than or equal to 0.6m below seabed is the most preferred option, having only one Moderate Impact (Amber) and the remainder all Lower Impact (Green) or Not Significantly Different ratings .Option 3) - Leave In-Situ and Monitor is ranked 2nd best option, although it has been evaluated as Higher Impact for one sub-criteria it has much less Moderate Impact (Amber) ratings and much more Lower Impact (Green) ratings than Options 1c) and 2a). The Higher Impact (Red) rating attracted to Option 3 is associated with residual risk to fishermen should the exposed pipeline start to deteriorate causing snagging hazards and should be discounted from further evaluation.</p> <p>Options 1c) and 2a) are ranked 4th and 3rd respectively and should also be discounted from further evaluation.</p>							



6.1.1.1 Key influencing factors in ranking of PL722:

Table 6-2 provides a summary of the average ratings by main criteria and by decommissioning options evaluated in the workshop.

Table 6-2: PL722 Average Ratings by Main Criteria

Decommissioning Options	1. Total Removal by:	2. Remediate In-situ with exposed sections:		3. Leave In-situ and Monitor
	c)	a)	b)	
ASSESSMENT CRITERIA	Cut and Lift	Rock Covered	Trenched and Buried	
TECHNICAL FEASIBILITY	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
SAFETY	Moderate Impact	Moderate Impact	Lower Impact	Lower Impact
ENVIRONMENTAL	Lower Impact	Moderate Impact	Lower Impact	Lower Impact
SOCIETAL	Lower Impact	Moderate Impact	Lower Impact	Moderate Impact
ECONOMIC RISK	Higher Impact	Moderate Impact	Lower Impact	Lower Impact

Refer to the CA Evaluation Workshop Results Workbook - in Appendix E for detailed narrative on the ratings basis across all sub-criteria and all options. This section below provides a high-level summary of the key differentiators between the options only.

Technical Feasibility Criteria

It was concluded that all decommissioning options evaluated were not significantly different from a Risk of Major Project Failure perspective.

However, Option 1c) – Total Removal by Cut and Lift was considered to have a marginally weaker rating than the other options from a Technical Complexity and Track Record perspective, as cutting through concrete coating on the seabed may potentially be an issue that could impact schedule. Spalling and concrete debris may fall from the pipeline during cutting and subsequent lifting from the seabed, which could also prolong the schedule due to an extended clean up duration.

Safety Criteria

Overall Option 1c) – Total Removal by Cut and Lift was considered to have a marginally weaker rating than the other options and overall rated as Moderate Impact (Amber) due to:

- A higher level of vessel SIMOPs and over a longer period than the other options;
- Additional materials handling of pipeline spools both by deck crew on the vessel, compared to the other options where nothing is returned onshore;
- Also, hydrocarbon residues may remain in the pipeline shipped onshore and the concrete coating will require to be removed to enable recycle of steel pipeline;



- There are also a small number of tug and barge transits to and from shore to back load recovered materials.

All other Safety sub-criteria for all other options was rated as Lower Impact (Green) except for Option 2a) Remediate In-situ with Exposed Sections Rock Covered which was considered to have a marginally worse rating, Moderate Impact (Amber) than other options due to:

- Project Risk to Other Users of the Sea, in the potential high interaction with other vessels due additional vessel transits to deliver rock to site;
- Residual Risk to Other Users of the Sea, in the potential for the rock berm to become unstable over time and present a moderate risk of snagging to trawling equipment.

Environmental Criteria

Overall Option 2a) – Remediate In-situ with exposed sections rock covered was considered to have a marginally weaker rating, than all the other options evaluated, this was due to the significant quantity of rock cover to be applied, with the sub-criteria Short-term Seabed Disturbance and Long-term Change of Habitat have both been evaluated as Moderate Impact (Amber), with all other options rated as Lower Impact (Green)

Option 1c) – Total Removal by Cut and Lift was rated Moderate Impact (Amber) specifically for Waste Processing, due to the quantity of waste returned onshore for processing with a large percentage being concrete which could potentially go to landfill unless alternative use for concrete is found

The Impact of Decommissioning Operations Offshore is not significantly different across all decommissioning options for this pipeline.

Societal Criteria

Overall Option 2a) – Remediate In-situ with exposed sections rock covered and Option 3) – Leave In-situ were both rated marginally weaker than the other options for Impact on Commercial Fisheries due to the fact they both leave obstructions on the seabed that could become problematic to fishermen overtime if the rock berms become unstable (Option 2a) or if the exposed pipeline deteriorates (Option 3).

No significant positive or negative impact is anticipated to onshore communities or amenities from any of the options.

Economic Risk Criteria

Overall, Option 2b) – Remediate In-situ with exposed sections trenched and buried to a depth of cover greater than or equal to 0.6m has been estimated to be the lowest cost remediation option and identified as the benchmark to assess other options for the sub-criterion Cost for Decommissioning/ Removal activities and is rated as Lower Impact (Green). Option 3) – Leave In-situ is also rated as Lower Impact (Green) for this sub-criterion as it involves only survey costs

Option 2a) – Remediate In-situ with exposed sections rock covered and was considered to have a slightly weaker rating than Option 2b) – Remediate In-situ with exposed sections trenched and buried and Option 3) – Leave In-situ as the Cost for Decommissioning/ Removal activities was estimated to be 200% of the cost of the Lowest Cost Decommissioning Option. Option 1c) – Total Removal by Cut and Lift was considered to have the worse rating overall, as the Cost for Decommissioning/ Removal activities was estimated to be 425% of the cost of the Lowest Cost Decommissioning Option.



Both Option 1c) – Total Removal by Cut and Lift and Option 2b) – Remediate In-situ with exposed sections trenched and buried were rated as Lower Impact (Green) from the perspective of Long-Term Monitoring and Potential Future Remediation cost as both options leave a clear seabed.

Option 2a) – Remediate In-situ with exposed sections rock covered was rated as Moderate Impact (Amber) from the perspective of Long-Term Monitoring and Potential Future Remediation cost as there will be future monitoring surveys and potential for remedial action to the rock berms if they become unstable.

Option 3) – Leave In-situ was rated as Higher Impact (Red) from the perspective of Long-Term Monitoring and Potential Future Remediation cost as there will be future monitoring surveys and potential for remedial action when the pipeline deteriorated leading to regular snagging of trawling equipment.

Sensitivity Analysis Results

Sensitivity Analysis 1:

There were only two proposed changes under this sensitivity analysis, see Table 6-3.

Table 6-3: PL722 Sensitivity Analysis 1

Option / Sub-Criteria	Original Rating	Revised Rating	Reason for sensitivity analysis
Option 1c) – Total Removal by Cut and Lift / Safety Risk to Those on Land	Not significantly different	Moderate Impact (Amber)	To test the sensitivity of the quantity of materials being returned onshore (>104,000Te) under this option compared to the other options (<3,400Te).
Option 1c) – Total Removal by Cut and Lift / Environmental Waste Processing	Moderate Impact (Amber)	Not significantly different	To test the sensitivity of the results in the case where a re-use could be found for the concrete coating instead of going to landfill.
Overall Impact: These changes have had no effect on the original ranking resulting from the original evaluation, as they counteract each other.			

Sensitivity Analysis 2: Where Economic Risk is not considered.

This analysis has also not changed the rankings resulting from the original evaluation.



6.1.2 PL1971: 16” dia. Rigid Pipeline (Trenched and Buried)

The CA Evaluation Workshop ranking and recommendation for each decommissioning option was as follows:

Table 6-4: PL1971 CA Workshop Ranking and Recommendations

Decommissioning Options	1. Total Removal by:			2. Remediate In-situ with exposed sections:			3. Leave In-situ
	a) Reverse Reeling	b) Reverse S-Lay	c) Cut & Lift	a) Rock Covered	b) Trenched & Buried	c) Cut & Removed	Monitor
Ranking	4			3	1=	1=	
Rating Count	Higher Impact = 0	N/A	N/A	Higher Impact = 0	Higher Impact = 0	Higher Impact = 0	N/A
	Moderate Impact = 6			Moderate Impact = 2	Moderate Impact = 0	Moderate Impact = 0	
	Lower Impact = 2			Lower Impact = 6	Lower Impact = 8	Lower Impact = 8	
	Not Significantly Different = 7			Not Significantly Different = 7	Not Significantly Different = 7	Not Significantly Different = 7	
Recommendation	Discount Option in DP	Option Pre-screened out	Option Pre-screened out	Carry Forward for C&P Evaluation (See Notes)	Carry Forward for C&P Evaluation (See Notes)	Carry Forward as Recommendation in DP (See Notes)	Option Pre-screened out
Notes: 1. None of the options were considered to have a Higher Impact (Red) rating. 2. Option 2c) and Option 2b) – Remediate In-situ with exposed sections cut and removed and Trenched and buried are equal as they were both rated as Lower Impact (Green) or Not Significantly Different for all sub-criteria. However the the Most Preferred Option cut and removed has been selected as the exposure is only a short 9m section. They were only marginally better than 2a) and they can all be considered further during the contract and procurement (C&P) phase leading to execution phase of the project. 3. Option 1a) – Total Removal by reverse reeling is the worst performing option and should be discounted at this stage.							



6.1.2.1 Key influencing factors in ranking of PL1971:

Table 6-5 provides a summary of the average ratings by main criteria and by decommissioning options evaluated in the workshop.

Table 6-5: PL1971 Average Ratings by Main Criteria

Decommissioning Options	1. Total Removal by:	2. Remediate In-situ with exposed sections:		
	a)	a)	b)	c)
ASSESSMENT CRITERIA	Reverse Reeling	Rock Covered	Trenched and Buried	Cut & Removed
TECHNICAL FEASIBILITY	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
SAFETY	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
ENVIRONMENTAL	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
SOCIETAL	Not Significantly Different	Not Significantly Different	Not Significantly Different	Not Significantly Different
ECONOMIC RISK	Moderate Impact	Lower Impact	Lower Impact	Lower Impact

Refer to the CA Evaluation Workshop Results Workbook - in Appendix E for detailed narrative on the ratings basis across all sub-criteria and all options. This section below provides a high-level summary of the key differentiators between the options only.

Technical Feasibility Criteria

It was concluded that all decommissioning options evaluated were not significantly different from a Risk of Major Project Failure perspective.

Option 1a) – Total Removal by Reverse Reeling was rated as marginally weaker than the other decommissioning options from the perspective of Technical Complexity and Track Record as it was highlighted that the 16” dia. rigid pipeline was on the upper end of previous experience in reverse reeling techniques and had not, to date been, used as a recovery technique for this pipeline size in the North Sea.

Safety Criteria

For three of the five Safety sub-criteria the evaluation considered all the decommissioning options to be Not Significantly Different. The exceptions were:

- For the sub-criteria Risk to Project Personnel:
 - Option 1a) – Total Removal by Reverse Reeling was rated as marginally worse than the other options due to the amount of materials handling anticipated by the vessel deck crew, when recovering the pipeline sections.
- For Residual (Long Term) Risk to Other users of the Sea:
 - Option 2a) – Remediate In-situ with exposed sections Rock Covered is considered to have a marginally weaker rating than other options, due to the



potential for the rock berm becoming unstable over time, leading to a snagging hazard for trawler equipment.

Environmental Criteria

The Impact of Decommissioning Operations Offshore is not significantly different across all decommissioning options for this pipeline.

Overall Option 1a) – Total Removal by Reverse Reeling was considered to have a marginally weaker rating than all the other options evaluated, this was due to requirement to:

- De-bury the fully trenched and buried pipeline causing Short-term Seabed Disturbance and Long-term Change of Habitat as the trench would be left open and the existing rock cover being dispersed over a wider corridor which may impact the ecosystem long term;
- Manage and process the large quantity of waste returned onshore.

Societal Criteria

The Impact on Commercial Fisheries and the Socio- Economic Impact on Communities and Amenities is not significantly different across all decommissioning options for this pipeline.

Economic Risk Criteria

Overall, Option 2b) – Remediate In-situ with exposed sections Trenched and Buried to a depth of cover greater than or equal to 0.6m has been estimated to be the lowest cost remediation option and identified as the benchmark to assess other options for the sub-criterion Cost for Decommissioning/ Removal activities and is rated as Lower Impact (Green). All other Remediate In-situ Options are estimated to be within 20% of this lowest cost option and are therefore all also rated as Lower Impact (Green).

Overall Option 1a) – Total Removal by Reverse Reeling was considered to have a marginally weaker rating than all the other options evaluated against this sub-criterion as it was estimated to be 167% of the cost of the lowest cost Option.

Option 2a) – Remediate In-situ with exposed sections Rock Covered was rated as Moderate Impact (Amber) from the perspective of Long-Term Monitoring and Potential Future Remediation cost as there will be future monitoring surveys and potential for remedial action to the rock berms if they become unstable. All other options were rated Lower Impact (Green) for this sub-criterion as they leave a clear seabed.

Sensitivity Analysis Results

Sensitivity Analysis 1:

There were only two proposed changes under this sensitivity analysis, see Table 6-6.



Table 6-6: PL1971 Sensitivity Analysis 1

Option / Sub-Criteria	Original Rating	Revised Rating	Reason for sensitivity analysis
Option 1a) – Total Removal by Reverse Reeling / Risk of Major Project Failure	Not significantly different	Moderate Impact (Amber)	To reflect the situation where the 16" dia. pipeline was at the technical limit for reverse reeling technique and the line also being rock covered within the trench.
Option 1a) – Total Removal by Reverse Reeling / Safety Risk to Those on Land	Not significantly different	Moderate Impact (Amber)	To test the sensitivity of quantity of materials being returned onshore (>2,400Te) under this option compared to the other options (<64Te).
These changes have had no effect on the original ranking resulting from the original evaluation.			

Sensitivity Analysis 2: Where Economic Risk is not considered.

This analysis has also not changed the rankings resulting from the original evaluation.



7.0 REFERENCES

REF NO.	DESCRIPTION
1	OPRED Guidance Notes – Decommissioning of Offshore Oil and Gas Installations and Pipelines under the Petroleum Act 1998, Department of Energy and Climate Change (November 2018)
2	BPEAL Doc. No. DC109-UZ-REP-000-5012: Miller Subsea Materials Inventory and Status Report. Genesis Doc. No 204504C-000-RT-5402-0001 Rev D4
3	Oil and Gas UK Guidelines for CA in Decommissioning Programmes, October 2015
4	BPEAL Doc. No. DC109-UZ-REP-000-5013: Miller Subsea Decommissioning Options and Pre-screening Report. Genesis Doc. No. J75112B-U-RT-20001 Rev D1
5	BPEAL Doc. No. DC109-HS-REP-000-5010: Miller Project Risk Assessment (HIRA) Report. Genesis Doc. No. J75112B-F-RT-05000 Rev D1
6	BPEAL Doc. No. DC109-EN-REP-000-5017: Miller Desktop ENVID Report. Genesis Doc. No. Genesis Doc. No. J75112B-Y-RT-24003 Rev D1
7	BPEAL Doc. No. DC109-EN-REP-000-5009: Miller Infield Pipelines Decommissioning Programme- 3 rd Pre-Draft. Genesis Doc. No. J75112B-A-RT-00008 Rev B7
8	Miller Decommissioning Programme MLR-A-D0-PM-PRO-00217
9	Miller Pipeline Burial Feasibility Study, DeepOcean Doc. No. J20-039-ENG-REP-001
10	Marine Scotland (2022). 2021 Scottish Sea Fisheries Statistics - Fishing Effort and Quantity and Value of Landings by ICES Rectangles. DOI: 10.7489/12338-1. [Online] Available at: https://data.marine.gov.scot/dataset/2021-scottish-sea-fisheries-statistics-fishing-effort-and-quantity-and-value-landings-ices
11	EMODnet (2023). Broad-scale seabed habitat map including confidence & EUNIS & MSFD classifications. Available from: https://www.emodnet-seabedhabitats.eu/access-data/download-data/



APPENDIX A – HIRA SUMMARY TABLES

HIRA summary tables of the results of the HIRA were prepared to inform the workshop participants. These summary tables are provided herein.

PL722 18” dia. Rigid Pipeline (Concrete coated and surface laid)

Basis of Score	Decommissioning Option						
	Total Removal by:			Remediation in-situ with:			Leave In-situ
	1A) Reverse Reeling	1B) Reverse S-Lay	1C) Cut and Lift	2A) Exposed Sections Rock Covered	2B) Exposed Sections Trenched and Buried	2C) Exposed Sections Cut and Lifted	2C) and Monitor
Risk to Project Personnel							
Duration of Campaign/ number of vessels (i.e. total vessel days).	Option pre-screened out during Pre-Screening Study [4].	Option pre-screened out during Pre-Screening Study [4].	CSV/ DSV/ Barge/ tugs involved in activity over long duration at sea.	Single vessel associated with activity over full length of exposed line.	Single vessel associated with activity over full length of exposed line.	Option pre-screened out during Pre-Screening Study [4].	Survey Vessel periodically inspecting line (circa 2-3 yr. cycle assumed)
Duration of Diving Campaign/ Divers/ Diving Bells (i.e. diver days).			No Diving.	No Diving.	No Diving.		No Diving.
Handling complexity on deck/ toxic or hazardous materials.			Multiple complex operations on deck/ barge over relatively long duration. Also dropped concrete risks during recovery to deck.	Automated process on vessel/ minimal interaction during activity.	Launch and recovery activity only on vessel. Minimal interaction during activity.		Launch and recovery activity only on vessel. Minimal interaction during activity.
Risk to Other Users of the Sea							
Interference likelihood based on estimate of project vessel transits.	Option pre-screened out during Pre-Screening Study [4].	Option pre-screened out during Pre-Screening Study [4].	CSV/ DSV/ Barge/ tugs involved in activity over relatively long duration at sea. Multiple transits to shore.	Single vessel associated with activity over full length of exposed line, relatively high number of transits required.	Single vessel associated with activity over full length of exposed line.	Option pre-screened out during Pre-Screening Study [4].	Survey Vessel periodically inspecting line (circa 2-3 yr. cycle assumed)
Ability to apply risk mitigation at site.			No differential across options. Relatively simple to stop activity and move off station to avoid other users of the sea.	No differential across options. Relatively simple to stop activity and move off station to avoid other users of the sea.	No differential across options. Relatively simple to stop activity and move off station to avoid other users of the sea.		No differential across options. Relatively simple to stop activity and move off station to avoid other users of the sea.
Fishing type and frequency in the area.			No differential across options seen regardless of levels of fishing activity.	No differential across options seen regardless of levels of fishing activity.	No differential across options seen regardless of levels of fishing activity.		No differential across options seen regardless of levels of fishing activity.
Risk to those on Land							
Quantity of materials returned to shore (te).	Option pre-screened out during Pre-Screening Study [4].	Option pre-screened out during Pre-Screening Study [4].	Relatively low amount returned to shore. (circa 3000te)	Nothing returned onshore.	Nothing returned onshore.	Option pre-screened out during Pre-Screening Study [4].	Nothing returned onshore.
Handling complexity in yard, toxic or hazardous materials.			Reflects volume of material returned to shore, assuming all is potentially contaminated with HCs.	Nothing returned onshore.	Nothing returned onshore.		Nothing returned onshore.
High Consequence events e.g. damage to major oil and gas trunk lines, helicopter events, diving accidents (above) or snagging potential for fishing vessels							
Duration of campaign/ number of vessels (i.e. number of flights/ crew changes).	Option pre-screened out during Pre-Screening Study [4].	Option pre-screened out during Pre-Screening Study [4].	Campaign duration captured under risk to project personnel and no crew changes expected at sea/ by helicopter.	Campaign duration captured under risk to project personnel and no crew changes expected at sea/ by helicopter.	Campaign duration captured under risk to project personnel and no crew changes expected at sea/ by helicopter.	Option pre-screened out during Pre-Screening Study [4].	Campaign duration captured under risk to project personnel and no crew changes expected at sea/ by helicopter.
Proximity to major operational trunk lines and subsea infrastructure.			Some pipeline crossings encountered.	Some pipeline crossings encountered.	Some pipeline crossings encountered.		No interaction anticipated.
Residual Risk to Other Users of the Sea							
Residual risk based on footprint left exposed on seabed (% of original scope/ likelihood of impact/ snagging etc).	Option pre-screened out during Pre-Screening Study [4].	Option pre-screened out during Pre-Screening Study [4].	No residual footprint left on seabed.	Rock covered and survey to check suitability and safety for other users of the sea	Trenched and survey to check suitability and safety for other users of the sea	Option pre-screened out during Pre-Screening Study [4].	Degradation over time presents snagging risk to fishing activities along with remediation works to make safe. survey scheduled to maintain checks on suitability
Seabed stability - likelihood of future exposure of buried / remaining infrastructure.			Clear Seabed.	Some exposure, survey scheduled to maintain checks on suitability.	Clear Seabed.		Degradation over time presents snagging risk to fishing activities along with remediation works to make safe. survey scheduled to maintain checks on suitability



PL1971 16" dia. Rigid Pipeline (Trenched and Buried)

Basis of Score	Decommissioning Option						
	Total Removal by:			Remediation in-situ with:			Leave In-situ
	1A) Reverse Reeling	1B) Reverse S-Lay	1C) Cut and Lift	2A) Exposed Sections Rock Covered	2B) Exposed Sections Trenched and Buried	2C) Exposed Sections Cut and Lifted	2C) and Monitor
Risk to Project Personnel							
Duration of Campaign/ number of vessels (i.e. total vessel days).	Assumed 1-2 vessels involved in reeling and structure lifts. Longer duration assumed than Remediation options.	Option pre-screened out during Pre-Screening Study [4].	Option pre-screened out during Pre-Screening Study [4].	Single vessel associated with activity over full length of exposed line.	Single vessel associated with activity over full length of exposed line.	CSV/ DSV over relatively short duration.	Option pre-screened out during Pre-Screening Study [4].
Duration of Diving Campaign/ Divers/ Diving Bells (i.e. diver days).	No Diving			No Diving.	No Diving.	No Diving.	
Handling complexity on deck/ toxic or hazardous materials.	Significant materials returned to deck but contained on reel.			Automated process on vessel/ minimal interaction during activity.	Launch and recovery activity only on vessel. Minimal interaction during activity.	Small quantity of materials returned to deck. Substantially less than any total removal options.	
Risk to Other Users of the Sea							
Interference likelihood based on estimate of project vessel transits.	Assumed 1-2 vessels involved in reeling and structure lifts. Longer duration assumed than Remediation options.	Option pre-screened out during Pre-Screening Study [4].	Option pre-screened out during Pre-Screening Study [4].	Single vessel associated with activity over full length of exposed line, relatively high number of transits required.	Single vessel associated with activity over full length of exposed line.	CSV/ DSV over relatively short duration.	Option pre-screened out during Pre-Screening Study [4].
Ability to apply risk mitigation at site.	No differential across options. Relatively simple to stop activity and move off station to avoid other users of the sea.			No differential across options. Relatively simple to stop activity and move off station to avoid other users of the sea.	No differential across options. Relatively simple to stop activity and move off station to avoid other users of the sea.	No differential across options. Relatively simple to stop activity and move off station to avoid other users of the sea.	
Fishing type and frequency in the area.	No differential across options seen regardless of levels of fishing activity.			No differential across options seen regardless of levels of fishing activity.	No differential across options seen regardless of levels of fishing activity.	No differential across options seen regardless of levels of fishing activity.	
Risk to those on Land							
Quantity of materials returned to shore (te).	Some materials returned to shore for processing. To be unloaded from reel onshore.	Option pre-screened out during Pre-Screening Study [4].	Option pre-screened out during Pre-Screening Study [4].	Nothing returned onshore.	Nothing returned onshore.	Relatively small quantity of materials returned to shore for processing.	Option pre-screened out during Pre-Screening Study [4].
Handling complexity in yard, toxic or hazardous materials.	Reflects volume of material returned to shore, assuming all is potentially contaminated with HCs.			Nothing returned onshore.	Nothing returned onshore.	Reflects volume of material returned to shore, assuming all is potentially contaminated with HCs.	
High Consequence events e.g. damage to major oil and gas trunk lines, helicopter events, diving accidents (above) or snagging potential for fishing vessels							
Duration of campaign/ number of vessels (i.e. number of flights/ crew changes).	Campaign duration captured under risk to project personnel and no crew changes expected at sea/ by helicopter.	Option pre-screened out during Pre-Screening Study [4].	Option pre-screened out during Pre-Screening Study [4].	Campaign duration captured under risk to project personnel and no crew changes expected at sea/ by helicopter.	Campaign duration captured under risk to project personnel and no crew changes expected at sea/ by helicopter.	Campaign duration captured under risk to project personnel and no crew changes expected at sea/ by helicopter.	Option pre-screened out during Pre-Screening Study [4].
Proximity to major operational trunk lines and subsea infrastructure.	Few pipeline crossings.			Few pipeline crossings.	No interaction anticipated.	No interaction anticipated.	
Residual Risk to Other Users of the Sea							
Residual risk based on footprint left exposed on seabed (% of original scope/ likelihood of impact/ snagging etc).	No residual footprint left on seabed.	Option pre-screened out during Pre-Screening Study [4].	Option pre-screened out during Pre-Screening Study [4].	Rock covered and survey to check suitability and safety for other users of the sea	Trenched and survey to check suitability and safety for other users of the sea	Survey to check suitability and safety for other users of the sea	Option pre-screened out during Pre-Screening Study [4].
Seabed stability - likelihood of future exposure of buried / remaining infrastructure.	Clear Seabed.			Some exposure, survey scheduled to maintain checks on suitability.	Clear Seabed.	Clear Seabed.	



APPENDIX B – ENVIRONMENTAL & SOCIETAL FACT SHEETS

ENVID summary tables of the results of the ENVID were prepared to inform the workshop participants. These summary tables are provided herein.

PL722 18” dia. Rigid Pipeline (Concrete coated and surface laid)

CA Sub criteria	ENVID Nodes within each Sub criteria	Decommissioning Option			
		1. Total Removal by:	2. Remediate in-situ with (trenched and buried sections left in-situ)		3. Leave in-situ
		C) Cut and Lift	A) Exposed Sections Rock Covered	B) Exposed Sections Trenched and Buried	and Monitor
Environmental Sub criteria					
Impact of Decommissioning Operations Offshore	Energy use and emissions	Impact significance: Moderate The ENVID determined that the impact significance of energy use and the resultant atmospheric from vessels is minor across all options except the cut and lift option which was considered moderate due to the length of the offshore campaign.	Impact significance: Minor	Impact significance: Minor	Impact significance: Minor
	Underwater noise	Impact significance: Minor The ENVID determined that the greatest noise source was vessel noise and found the impact significance of noise from vessels to be minor across all options, such that they can be ranked all the same in the CA.	Impact significance: Minor	Impact significance: Minor	Impact significance: Minor
	Discharges to sea from vessels and flowlines	Impact significance: Minor The ENVID determined that the impact significance of discharges to sea is minor across all options, such that they can be ranked all the same in the CA.	Impact significance: Minor	Impact significance: Minor	Impact significance: Minor
Seabed Disturbance - Short Term	Disturbance to the seabed	Impact significance: Minor Though the environmental significance of two of the options were moderate in the ENVID, consideration needs to be given to them potentially ranking differently in the CA.	Impact significance: Moderate	Impact significance: Moderate	N/A
Change of Habitat - Long Term	Impact of physical presence of materials left on the seabed only on benthic species - not fishing.	N/A The impact significance varied across the different options.	Impact significance: High	Impact significance: Negligible	Impact significance: Negligible
Waste Processing <i>i.e. processing of returned materials and use of landfill</i>	Generation of waste/use of landfill	Impact significance: Moderate Note this does not refer to routine vessel waste, rather waste associated with the infrastructure to be decommissioned.	N/A	N/A	N/A
Societal Sub criteria					
Socio-economic: legacy impacts	Impact of materials left on the seabed on other users	N/A	Impact significance: Moderate	Impact significance: Negligible	Impact significance: Minor
Socio-economic impact on communities and amenities	Yard activities	Impact significance: Moderate Note - the BPEAL risk matrix caused the impact significance to be moderate for Options 1A and 1C as it includes 'duration'. In the CA cognisance needs to be taken of this during the discussions.	N/A	N/A	N/A

PL1971 16” dia. Rigid Pipeline (Trenched and Buried)

CA Sub criteria	ENVID Nodes within each Sub criteria	Decommissioning Option			
		1.Total Removal by:	2. Remediate in-situ with: (trenched and buried sections left in-situ)		
		A) Reverse Reeling	A) Exposed Sections Rock Covered	B) Exposed Sections Trenched and Buried	C) Exposed Sections Cut and Remove
Environmental Sub criteria					
Impact of Decommissioning Operations Offshore	Energy use and emissions	Impact significance: Negligible The ENVID determined that the impact significance of energy use and the resultant atmospheric from vessels would be negligible or minor across all options.	Impact significance: Negligible	Impact significance: Negligible	Impact significance: Negligible
	Underwater noise	Impact significance: Negligible The ENVID determined that the impact significance of noise from vessels would be negligible or minor across all options.	Impact significance: Negligible	Impact significance: Negligible	Impact significance: Negligible
	Discharges to sea from vessels and flowlines	Impact significance: Minor The ENVID determined that the impact significance of discharges to sea would be minor across all options, such that they can be ranked all the same in the CA.	Impact significance: Minor	Impact significance: Minor	Impact significance: Minor
Seabed Disturbance - Short Term	Disturbance to the seabed	Impact significance: Moderate The environmental significance of all options was considered to be moderate in the ENVID, thus consideration needs to be given to them in the CA.	Impact significance: Moderate	Impact significance: Minor	Impact significance: Minor
Change of Habitat - Long Term	Impact of physical presence of materials left on the seabed only on benthic species - not fishing.	N/A Addition of rock to the area could cause loss of existing habitat.	Impact significance: Moderate	Impact significance: Negligible	Impact significance: Negligible
Waste Processing <i>i.e. processing of returned materials and use of landfill</i>	Generation of waste/use of landfill	Impact significance: Minor Though the environmental significance of the applicable options were minor in the ENVID, consideration needs to be given to them potentially ranking differently in the CA to reflect volumes of material returned. Note this does not refer to routine vessel waste, rather waste associated with the infrastructure to be decommissioned.	N/A	N/A	Impact significance: Minor
Societal Sub criteria					
Socio-economic: legacy impacts	Impact of materials left on the seabed on other users	N/A	Impact significance: Moderate	Impact significance: Negligible	Impact significance: Negligible
Socio-economic impact on communities and amenities	Yard activities	Impact significance: Minor	N/A	N/A	Impact significance: Minor



APPENDIX C – TECHNICAL FACT SHEETS

Technical factsheets were prepared by the subsea engineer on completion of the engineering/ supporting study listed in Section 4.1.1.

Although certain options were pre-screened out as described in Section 5.2 the metrics that were prepared during the pre-screening are included in the technical fact sheets herein.

PL722 18” dia. Rigid Pipeline (Concrete coated and surface laid)

Basis of Score	Decommissioning Option						
	Total Removal by:			Remediate in-situ with: (trenched and buried sections left in-situ)			Leave In-situ
	1A) Reverse Reeling	1B) Reverse S-Lay	1C) By Cut-and-Lift	2A) Exposed Sections Rock-Covered	2B) Exposed Sections Trenched and Buried	2C) Exposed Sections Cut and Removed	3. and Monitor
Total vessel days		46 (329%)	167 (1,193%)	51 (364%)	20 (143%)		14 (100%)
Vessel SIMOPS days		2	57	0	0		0
Mob and demob days		33	27	17	14		11
Number vessel transit days		4.7 (671%)	6 (857%)	2 (286%)	1.3 (186%)		0.7 (100%)
Quantity of materials returned to shore (te)		3,201	3,201	0	0		0
Quantity of materials for land fill (te)		1,357	1,357	0	0		0
Quantity of materials left on or in seabed (te)		0	0	3,201	3,201		3,201
Quantity of rock cover applied (te)		0	0	89,706	0		0
Cost estimate (kGBP)		4,764 (525%)	7,488 (826%)	3,532 (389%)	1,763 (194%)		907 (100%)

PL1971 16” dia. Rigid Pipeline (Trenched and Buried)

Basis of Score	Decommissioning Option						
	Total Removal by:			Remediate in-situ with: (trenched and buried sections left in-situ)			Leave In-situ
	1A) Reverse Reeling	1B) Reverse S-Lay	1C) By Cut-and-Lift	2A) Exposed Sections Rock-Covered	2B) Exposed Sections Trenched and Buried	2C) Exposed Sections Cut and Removed	3. and Monitor
Total vessel days	21 (105%)	25 (125%)	188 (940%)	22 (110%)	20 (100%)	22 (110%)	
Vessel SIMOPS days	1	2	68	0	0	0	
Mob and demob days	14	17	23	17	14	14	
Number vessel transit days	2 (154%)	2 (154%)	5 (40%)	1.3 (100%)	1.3 (100%)	1.3 (100%)	
Quantity of materials returned to shore (te)	2,406	2,479	2,479	0	0	3	
Quantity of materials for land fill (te)	24.1	24.8	24.8	0	0	0.03	
Quantity of materials left on or in seabed (te)	0	0	0	2,406	2,406	2,403	
Quantity of rock cover applied (te)	0	0	0	100	0	10	
Cost estimate (kGBP)	2,195 (167%)	4,286 (326%)	8,567 (651%)	1,468 (112%)	1,316 (100%)	1,454 (110%)	



APPENDIX D – CA RATINGS GUIDE TABLE

Assessment Criteria	SUB-CRITERIA/ RATING	Lower Impact	Moderate Impact	Higher Impact	
TECHNICAL FEASIBILITY	Risk of Major Project Failure	Normal operational procedures proposed. Scope is straightforward and understood. Offshore Execution Phase Schedule unlikely to slip beyond planned schedule plus contingencies applied.	Some specialist operational procedures required, some minor scope uncertainties to be resolved before execution. Potential for some schedule slippage activity resulting project delay but not leading to revisit to execution methods.	Unique operational procedures proposed, Major scope uncertainties will remain at execution. Potential for unplanned and unforeseen activity resulting in significant project delay or potential revisit to execution methods.	
	Technical Complexity & Track Record	Uses established technology and/or working methods designed for this field of operation. Large experienced contractor pool available.	Uses proven technology and/or working method but in a diverse field of operation. Some experienced contractors available.	Uses novel technology untested in this field of operation or untried methods to be introduced. Likely to be new to contractors.	
SAFETY	Risk During Project Execution	To Project Personnel	No vessel SIMOPS. No diving. Minimal materials handling or interaction with deck crew.	Low vessel SIMOPS (2 vessels). Some diving involved, but short duration. Some materials handling on deck (No toxic or high-risk materials, no heavy loads)	High level vessel SIMOPs (>2 vessels). Significant diving activity anticipated. Significant materials handling on deck (involving either toxic or high-risk materials, or heavy loads)
		To other Users of the Sea	No increased risk to other vessels than currently under normal operations.	Some additional risk to other vessels due to some additional construction vessel activity and additional vessel transits but over short durations. Activities involved at seabed means construction vessels need short time before they can initiate evasive action from collision.	Increased risk to other vessels due to multiple construction vessels activity and additional vessel and barge transits over prolonged durations. Activities involved at seabed means it is difficult for construction vessel to initiate evasive action from collision.
		To those on Land	Minimal materials returned onshore.	Relatively small volumes of decommissioned materials returned onshore for disposal. No contaminated materials anticipated.	Significant volume of materials returned onshore for dismantling and disposal. Contaminated materials to be managed.
		High consequence event	Short duration project, no helicopter crew changes involved, crew mob and demob with the vessel(s). No diving. No working, lifting or transiting suspended loads over live pipelines.	Longer duration project (>3 months< 6 months), weekly helicopter crew changes anticipated to vessel(s). Some diving involved, but short duration. Some short duration working adjacent to live pipelines, no major lifts above live pipelines.	Longer duration project (>6 months), multiple helicopter crew changes anticipated to vessel(s). Significant diving activity anticipated. Significant working and lifting over live pipelines.
	Residual (Long Term) Risk To Other Users of the Sea	No increased risk to fishing trawlers introduced than currently present out with the current field exclusion zones.	Some additional risk to fishing vessels introduced due to infrastructure being decommissioned in-situ and remain above the seabed. However snagging risk mitigated by infrastructure expected to remain over trawable.	Increased risk from installations / exposed sections of pipeline or protection / stabilisation features decommissioned in-situ, with no mitigation introduced to prevent snagging from over trawling.	
ENVIRONMENTAL	Impact of Decommissioning Operations Offshore <i>(includes energy use, emissions to air, underwater noise and discharges to sea)</i>	Undetectable impact from emissions to air. No/minor permitted discharges to sea. Underwater noise generated is not expected to exceed existing background noise.	Effects of emissions to air are detectable. Potential for unplanned discharges of hydrocarbons / chemicals not resulting in noticeable environmental impact. Noise generated could exceed existing background levels resulting in noticeable displacement of cetaceans.	Noticeable impact of change in air quality on local populations. Potential for unplanned discharges of hydrocarbons / chemicals resulting in noticeable environmental impact. Underwater noise generated resulting in physical injury to cetacean species could be possible.	
	Seabed Disturbance-Short Term	Localised disturbance to the seabed. Possible addition of small volumes of rock cover.	Localised changes to the seabed are possible e.g. addition of rock to sandy seabed area.	Widespread mid-to long term (2 + years) degradation of the seabed.	
	Loss of Habitat - Long Term	No additional material added (e.g. rock cover) to support decommissioning activities. Benthic species in area are widespread. Any potential impact to the sediment and associated ecology is expected to be barely detectable.	Some additional material added (e.g. rock cover) to support decommissioning activities. Benthic species in area are widespread. Detectable impact to the sediment and associated ecology. (e.g. from plastics or wax at exposed sections).	Significant impact on a designated species. Detectable impacts to sediments and water column and associated ecologies (e.g. from plastics or wax at exposed sections).	
	Waste Processing <i>(i.e. Generation of waste and use of landfill)</i>	Short sections of pipelines returned onshore for re-use/ recycle/ disposal	Long lengths of pipelines returned onshore for re-use/ recycle/ disposal	Large volumes of non- hazardous materials returned that cannot be recycled or large volumes of hazardous materials	
SOCIETAL	Impact on Commercial Fisheries	Option results in area becoming or continuing to be accessible to fishing gear.	Stabilisation features e.g. rock cover means that though seabed is accessible to fishing gear, this could change over time (e.g. potential for the rock berms to become dislodged following multiple trawl passes).	Exclusion zones in place following decommissioning activities.	
	Socio-economic Impact on Communities and Amenities <i>(from yard activities)</i>	Additional employment created and minimal disruption to local communities.	Maintaining local jobs and minimal disruption to local communities.	Significant impact on local communities e.g. noise, traffic, odour. No additional employment.	
ECONOMIC RISK	Cost for Decommissioning/ Removal activities	Lowest cost option or within 30% of lowest cost	Between 130% and 250% of lowest cost option	Greater than 250% of lowest cost option	
	Cost for long term monitoring / Remediation activities	Lowest cost option or within 30% of lowest cost	Between 130% and 250% of lowest cost option	Greater than 250% of lowest cost option	



APPENDIX E – CA EVALUATION WORKSHOP RESULTS WORKBOOK

This Appendix contains a large volume of information and has been provided with its own index for easy reference.

	Page
PL722 - 18" dia. Rigid Pipeline (Concrete coated and surface laid)	
Technical Feasibility and Safety Criteria - CA Workshop Output Sheet	54
Environmental Criterion - CA Workshop Output Sheet	55
Societal and Economic Risk Criteria - CA Workshop Output Sheet	56
Visual Rating Summary - CA Workshop Output Sheet	57
Narrative Summary - CA Workshop Output Sheet	58
Sensitivity 1: Visual Rating Summary	59
Sensitivity 2: Visual Rating Summary - No Economic Risk	60
PL1971 -16" dia. Rigid Pipeline (Trenched and Buried)	
Technical Feasibility and Safety Criteria - CA Workshop Output Sheet	61
Environmental Criterion - CA Workshop Output Sheet	62
Societal and Economic Risk Criteria - CA Workshop Output Sheet	63
Visual Rating Summary - CA Workshop Output Sheet	64
Narrative Summary - CA Workshop Output Sheet	65
Sensitivity 1: Visual Rating Summary	66
Sensitivity 2: Scoring Summary - No Economic Risk	67



204504C-000-RT-0200_5-Appendix E - Rating Workbook - Miller PL722 (2025).xlsx

Rigid Pipeline/ Concrete Coated/ Surface Laid

TECHNICAL & SAFETY

PL722 -18" Oil Export Pipeline x 7.11km long

Assessment Criteria	Decommissioning Options	1. TOTAL REMOVAL BY:	2. REMEDIATE IN-SITU WITH:		3. LEAVE IN-SITU		
	Sub Criteria/ Sub Options	c)	a)	b)	AND MONITOR		
TECHNICAL FEASIBILITY	Risk of Major Project Failure	Normal operational procedures proposed. Scope is straightforward and understood. Offshore Execution Phase Schedule unlikely to slip beyond planned schedule. Cutting through concrete coating on the seabed may potentially need additional planning allowance but not considered insurmountable.	Whole pipeline is surface laid, this option therefore involves applying rock cover to entire length of pipeline. Normal operational procedures are proposed and the scope is straightforward and schedule is unlikely to slip. Uses established technology and working methods designed for this field of operation with a large experienced contractor pool available.	Whole pipeline is surface laid, this option therefore involves trenching and burying entire length of pipeline. Normal operational procedures are proposed and the scope is straightforward and schedule is unlikely to slip. Uses established technology and working methods designed for this field of operation with a large experienced contractor pool available. There is a minor uncertainty on the ability to achieve a trench depth along full route of the pipeline to achieve required depth of cover using jet trenching techniques alone, but alternative trenching techniques be planned accordingly to achieve 0.6m burial in sections where jet trenching has not achieved this depth.	Periodic surveys of pipeline, by single vessel using ROVs, very common activity in Central North Sea.		
	RATING	Not significantly different	Not significantly different	Not significantly different	Not significantly different		
	Technical Complexity & Track Record	Uses proven technology and working methods but in a diverse field of operation. Some experienced contractors available. Although this option is not known to have been carried out in Central North Sea, spalling and concrete debris may fall from the pipeline during cutting and subsequent lifting from the seabed, which could also prolong the schedule in clean up.	Uses established technology and working methods designed for this field of operation. Large experienced contractor pool available. Common to all options considered, crossings (only 3 crossings on this pipeline) will not be decommissioned until the last pipeline crossing associated with this pipeline is to be decommissioned.	Evaluation is similar to Option 2a).	Evaluation is similar to Option 2a).		
	RATING	Moderate Impact	Lower Impact	Lower Impact	Lower Impact		
	TECHNICAL: OVERALL RATING BASED ON AVERAGE	Moderate Impact	Lower Impact	Lower Impact	Lower Impact		
	SAFETY	Risk During Project Execution	To Project Personnel	Moderate level of vessel SIMOPs, 2 vessels for 57days and 4 vessels for 2 days. No diving involved. Moderate quantity of materials handling approximately 300 individual pipeline spools x 24m long on deck over this period (3,140Te of materials backloaded).	Relatively short, single vessel campaign (51 vessel days in total). No diving involved. Automated process in application of rock cover. Minimal interaction with deck crew.	Relatively short, single vessel campaign (20 vessel days in total). No diving involved. Launch and recovery of trenching equipment only with crew trained in these activities. Minimal interaction with deck crew.	Short and periodic survey activity only, single vessel. Launch and recovery of survey equipment only with crew trained in these activities. Minimal interaction with deck crew.
			RATING	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
			To Other Users of the Sea	The work vessels are not connected to the seabed during recovery of the pipelines, so vessel can take evasive action if required, but may be 65 days on station. There is a small number of tug and barge transits to and from shore to backload materials, 6 transit days.	Evaluation is similar to Option 1c). Vessel on station 29 days and additional 2 transits to deliver rock to site.	No increased risk to other vessels than currently under normal operations.	No increased risk to other vessels than currently under normal operations.
			RATING	Moderate Impact	Moderate Impact	Lower Impact	Lower Impact
			To Those on Land	Relatively small quantity of materials handling approximately 300 individual pipeline spools x 24m long backloaded to shore. HC residues may be remain in the pipeline and concrete coating to be removed to enable recycle of steel pipeline. Evaluated as not significantly different from other options. <i>(Consider Sensitivity 1 - Option 1c) increasing impact to Moderate Impact (Amber) to test the sensitivity of the quantity of materials being returned onshore (3,201Te under this option compared to zero for the other options.)</i>	Nothing returned onshore to be managed. Supply of rock cover materials from quarry not seen as project specific risk as rock cover suppliers activities will be ongoing irrespective of this project.	Nothing returned onshore to be managed	Nothing returned onshore to be managed
RATING			Not significantly different	Not significantly different	Not significantly different	Not significantly different	
High Consequence Event			Campaign duration risks evaluated under "Risk to Project Personnel" above. No crew changes will be completed at sea or by helicopter, crew change will occur when vessel is in port. No Diving involved. There is a small number of tug and barge transits to and from shore to backload materials, 6 transit days.	Short duration project, no helicopter crew changes involved, crew mob and demob with the vessel(s). No diving. No working, lifting or transiting suspended loads over live pipelines	Short duration project, no helicopter crew changes involved, crew mob and demob with the vessel(s). No diving. No working, lifting or transiting suspended loads over live pipelines	Short and periodic survey activity only, single vessel. No crew changes, diving or lifting over live pipelines.	
RATING	Moderate Impact	Lower Impact	Lower Impact	Lower Impact			
Residual (Long Term) Risk To Other Users of the Sea	Option results in clear seabed, therefore no residual risk.	The rock berm will be specified and installed to be over trawlable however, over time the berm could potentially become unstable and present a moderate risk of snagging to trawlers.	Evaluation is similar to Option 1c), except pipeline is buried leaving no potential snagging hazard. Seabed is stable and likelihood of buried pipeline becoming exposed is low. Monitoring surveys are planned to ensure this stability continues.	This pipeline is surface laid and fully exposed, however it was designed to be and currently remains over trawlable. The pipeline is concrete coated which may delay deterioration, however once deterioration occurs many snagging hazards to trawlers could occur.			
RATING	Lower Impact	Moderate Impact	Lower Impact	Higher Impact			
SAFETY: OVERALL RATING BASED ON AVERAGE	Moderate Impact	Moderate Impact	Lower Impact	Moderate Impact			
SAFETY: OVERALL RATING BASED ON DISCUSSION	Moderate Impact	Moderate Impact	Lower Impact	Lower Impact			
COMMENTS	Overall rating of Option 3) is downrated to Low Impact (Green) following discussion, as it was considered that original rating of residual risk to fishing industry may be over stated. To be discussed during stakeholder engagement with the fishing industry.						



204504C-000-RT-0200_5-Appendix E - Rating Workbook - Miller PL722 (2025).xlsx

January 2026

Rigid Pipeline/ Concrete Coated/ Surface Laid

PL722 - 18" Oil Export Pipeline x 7.11km long

ENVIRONMENTAL

Assessment Criteria	Decommissioning Options	1. TOTAL REMOVAL BY:	2. REMEDIATE IN-SITU WITH:		3. LEAVE IN-SITU
	Sub Criteria/ / Sub Options	c)	a)	b)	AND MONITOR
		CUT AND LIFT	WHOLE PIPELINE ROCK COVERED	WHOLE PIPELINE TRENCHED AND BURIED	
ENVIRONMENTAL	Impact of Decommissioning Operations Offshore <i>(includes emissions to air, discharges to sea and underwater noise)</i>	Campaign 167 vessel days The ENVID determined that the impact significance of energy use and the resultant atmospherics, of noise from vessels and of discharges to sea, relative to current and ongoing vessel operations in the general area (other fields) is low across all options, such that the environmental impact of decommissioning operations offshore is not considered to be a significant differentiator.	Campaign 51 vessel days	Campaign 20 vessel days	Campaign 14 vessel days
	RATING	Not significantly different	Not significantly different	Not significantly different	Not significantly different
	Seabed Disturbance- Short Term	Localised and short term disturbance to the seabed only to remove pipeline from the trench.	Activity associated with the application of rock cover is recognised to result in short term disturbance during rock placement. The footprint of this short term disturbance is likely to be significantly greater than current footprint. circa 89,706Te of rock to be introduced.	Jet Trenching is to be adopted due to condition of the pipeline condition is creating areas and such technique is likely to result in significant short term seabed disturbance as the trencher mobilises the sediment to allow the trenching of the pipeline and the sediment plume re-settles. Ploughing will also be considered where jet trenching does not achieve the 0.6m burial depth.	No seabed disturbance anticipated.
	RATING	Lower Impact	Moderate Impact	Moderate Impact	Lower Impact
	Change of Habitat - Long Term	Benthic species in area are widespread. No additional material added (e.g. rock cover) to support decommissioning activities. Option leaves a clear seabed and the ecosystem recovery commences as soon as operations are completed.	Benthic species in area are widespread. However, the introduction to the seabed of circa 89,706Te of new materials, over a 7.11km pipeline length means the introduction of a reasonably sized and different habitat type to the area. This may impact existing ecosystem, by allowing other species to settle in the area.	Evaluation is similar to Option 1c).	Existing habitat is retained.
	RATING	Lower Impact	Moderate Impact	Lower Impact	Lower Impact
	Waste Processing <i>(i.e. processing of returned materials and use of landfill)</i>	7.11km (circa 3,140Te) of pipeline returned onshore to be managed with almost 69Te of which is likely to go to landfill. <i>(Consider Sensitivity 1 - Option 1c) as Lower Impact (Green), if a re-use could be found for the concrete coating).</i>	Nothing returned onshore.	Nothing returned onshore.	Nothing returned onshore.
	RATING	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
ENVIRONMENTAL: OVERALL RATING BASED ON AVERAGE	Lower Impact	Moderate Impact	Lower Impact	Lower Impact	



204504C-000-RT-0200_5-Appendix E - Rating Workbook - Miller PL722 (2025).xlsx

Rigid Pipeline/ Concrete Coated/ Surface Laid

SOCIETAL & ECONOMIC RISK

PL722 - 18" Oil Export Pipeline x 7.11km long

Assessment Criteria	Decommissioning Options	1. TOTAL REMOVAL BY:	2. REMEDIATE IN-SITU WITH:		3. LEAVE IN-SITU
	Sub Criteria/ / Sub Options	c)	a)	b)	
		CUT AND LIFT	WHOLE PIPELINE ROCK COVERED	WHOLE PIPELINE TRENCHED AND BURIED	AND MONITOR
SOCIETAL	Impact on Commercial Fisheries	This option results in a clear seabed.	Pipeline is surface laid and a large rock berm will be created, to ensure it is over trawlable. However the rock berm could become unstable overtime, leading to snagging hazards and ultimately the fishing industry introducing self imposed exclusions zones where the berm has destabilised. Recommend seeking views of the Fishing Industry during stakeholder engagement to determine if this is a constraint to them.	This option results in a clear seabed.	This trunk line is surface laid and fully exposed, however it was designed to be and currently remains over trawlable. The pipeline is concrete coated which may delay deterioration, however once deterioration occurs many snagging hazards to trawlers could occur, ultimately leading to the fishing industry introducing self imposed exclusions zones. CA workshop participants recommend seeking views of the Fishing Industry during stakeholder engagement to determine if this is a constraint to them.
	RATING	Lower Impact	Moderate Impact	Lower Impact	Moderate Impact
	Socio-economic Impact on Communities and Amenities	Only circa 3,140Te of pipeline is returned onshore for dismantling and removal of concrete coating, this is not sufficient quantity to be regarded as having Socio-economic impact and considered to be "Not Significantly Different" from the other options.	No materials returned so no positive or negative impact.	No materials returned so no positive or negative impact.	No materials returned so no positive or negative impact.
RATING	Not significantly different	Not significantly different	Not significantly different	Not significantly different	
SOCIETAL: OVERALL RATING - BASED ON AVERAGE	Lower Impact	Moderate Impact	Lower Impact	Higher Impact	
ECONOMIC RISK	Cost for Decommissioning/ Removal activities	425% of Lowest Cost Remediation Option	200% of Lowest Cost Remediation Option	Lowest Cost Remediation Option	Survey cost only 51% of Lowest Cost Remediation Option
	RATING	Higher Impact	Moderate Impact	Lower Impact	Lower Impact
	Cost for long term monitoring / Remediation activities	Clean seabed, post decomm survey only.	Anticipate greater than 2 monitoring surveys and potentially requirement to re-profile the rock berms if they become unstable.	Anticipate 2 monitoring surveys only, seabed is stable and unlikely to require future remedial action after exposed sections are buried.	This pipeline is surface laid and was designed to be and currently remains over trawlable. However potential remedial work may be required if pipeline deteriorates causing future snagging hazard.
	RATING	Lower Impact	Moderate Impact	Lower Impact	Moderate Impact
ECONOMIC RISK: OVERALL RATING BASED ON AVERAGE	Higher Impact	Moderate Impact	Lower Impact	Moderate Impact	



204504C-000-RT-0200_5-Appendix E - Rating Workbook - Miller PL722 (2025).xlsx

January 2026

Rigid Pipeline/ Concrete Coated/ Surface Laid

VISUAL RATING SUMMARY

PL722 - 18" Oil Export Pipeline x 7.11km long

Assessment Criteria	Decommissioning Options		1. TOTAL REMOVAL BY:	2. REMEDIATE IN-SITU WITH:		3. LEAVE IN-SITU
	Sub Criteria/ / Sub Options		c)	a)	b)	AND MONITOR
			CUT AND LIFT	WHOLE PIPELINE ROCK COVERED	WHOLE PIPELINE TRENCHED AND BURIED	
TECHNICAL FEASIBILITY	Risk of Major Project Failure		Not significantly different	Not significantly different	Not significantly different	Not significantly different
	Technical Complexity & Track Record		Moderate Impact	Lower Impact	Lower Impact	Lower Impact
SAFETY	Risk During Project Execution	To Project Personnel	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
		To Other Users of the Sea	Moderate Impact	Moderate Impact	Lower Impact	Lower Impact
		To Those on Land	Not significantly different	Not significantly different	Not significantly different	Not significantly different
		High Consequence Event	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
	Residual (Long Term) Risk To Other Users of the Sea		Lower Impact	Moderate Impact	Lower Impact	Higher Impact
ENVIRONMENTAL	Impact of Decommissioning Operations Offshore		Not significantly different	Not significantly different	Not significantly different	Not significantly different
	Seabed Disturbance- Short Term		Lower Impact	Moderate Impact	Moderate Impact	Lower Impact
	Change of Habitat - Long Term		Lower Impact	Moderate Impact	Lower Impact	Lower Impact
	Waste Processing		Moderate Impact	Lower Impact	Lower Impact	Lower Impact
SOCIETAL	Impact on Commercial Fisheries		Lower Impact	Moderate Impact	Lower Impact	Moderate Impact
	Socio-economic Impact on Communities and Amenities		Not significantly different	Not significantly different	Not significantly different	Not significantly different
ECONOMIC RISK	Cost for Decommissioning/ Removal activities		Higher Impact	Moderate Impact	Lower Impact	Lower Impact
	Cost for long term monitoring / Remediation activities		Lower Impact	Moderate Impact	Lower Impact	Moderate Impact
OVERALL RATING			Higher Impact	Higher Impact	Lower Impact	Lower Impact
OVERALL RANKING			4	3	1	2
RATING COUNT			Red = 1	Red = 0	Red = 0	Red = 1
			Amber = 5	Amber = 7	Amber = 1	Amber = 2
			Green = 5	Green = 4	Green = 10	Green = 8
			Not significantly different = 4	Not significantly different = 4	Not significantly different = 4	Not significantly different = 4
COMMENTS			Option 2b) - Remediate In-situ with Whole pipeline Trenched and Buried to a depth greater than or equal to 0.6m below seabed is the most preferred option, having only one Moderate Impact (Amber) for one sub-criteria and the remainder all Lower Impact (Green) or Not Significantly Different ratings . Option 3) - Leave In-Situ and Monitor is ranked 2nd best option, although it has been evaluated as Higher Impact (Red) for one sub-criteria, it has much less Moderate Impact (Amber) ratings and much more Lower Impact (Green) ratings than Options 1c) and 2a). The Higher Impact (Red) rating attracted to Option 3 is associated with residual risk to fishermen should the exposed pipeline start to deteriorate causing snagging hazards. Options 1c) and 2a) are ranked 4th and 3rd respectively and should be discounted from further evaluation.			



204504C-000-RT-0200_5-Appendix E - Rating Workbook - Miller PL722 (2025).xlsx

Rigid Pipeline/ Concrete Coated/ Surface Laid

PL722 - 18" Oil Export Pipeline x 7.11km long

NARRATIVE SUMMARY

Red text below highlights the main areas of influence in a rating evaluation poorer than Low Impact (Green).

Decommissioning Options	1. TOTAL REMOVAL BY:		2. REMEDIATE IN-SITU WITH:		3. LEAVE IN-SITU
	c)	a)	b)		
Sub Criteria/ / Sub Options	CUT AND LIFT	WHOLE PIPELINE ROCK COVERED	WHOLE PIPELINE TRENCHED AND BURIED		AND MONITOR
TECHNICAL FEASIBILITY	Normal operational procedures are proposed and the scope is straightforward and schedule is unlikely to slip. Some experienced contractors available, using proven technology and working methods. Evaluated as Moderate Impact (Amber) as this option is not known to have been carried out in Central North Sea. Spalling and concrete debris may fall from the pipeline during cutting and subsequent lifting from the seabed, which could also prolong the schedule in clean up.	Normal operational procedures are proposed and the scope is straightforward and schedule is unlikely to slip. Uses established technology and working methods designed for this field of operation with a large experienced contractor pool available.	Normal operational procedures are proposed and the scope is straightforward and schedule is unlikely to slip. Uses established technology and working methods designed for this field of operation with a large experienced contractor pool available. There is a minor uncertainty on the ability to achieve a trench depth along full route of the pipeline to achieve required depth of cover using jet trenching techniques alone, but alternative trenching techniques be planned accordingly to achieve 0.6m burial in sections where jet trenching has not achieved this depth .		Periodic surveys of pipeline, by single vessel using ROVs, very common activity in Central North Sea.
AVERAGE RATING THIS CRITERIA	Moderate Impact	Lower Impact	Lower Impact		Lower Impact
SAFETY	No diving involved. However, there is a high level vessel SIMOPs over a prolonged period (years) with significant materials handling of pipeline spools both by deck crew on vessel and at quayside and dismantling yard onshore. HC residues may be remain in the pipeline and concrete coating to be removed to enable recycle of steel pipeline. The work vessels are not connected to the seabed during recovery of the pipelines so can take evasive action if required to avoid other vessels. There is a moderate number of tug and barge transits to and from shore to backload materials over a prolonged period. Residual, long term risk from this option is low as results in clear seabed.	No diving involved. Relatively short, single vessel campaign (51 vessel days in total). Automated process in application of rock cover results in minimal interaction with deck crew on the vessel. Low risk to those on land as no materials returned onshore. Moderate Project Risk to Other Users of the Sea, due to the potential high interaction with other vessels due additional vessel transits to deliver rock to site; Moderate residual risk to Other Users of the Sea, as although the rock berm will be specified and installed to be over trawlable, over time the berm could potentially become unstable and present a moderate risk of snagging to trawlers.	No diving involved. Relatively short campaign duration, single vessel. Minimal vessel deck crew interaction with launch and recovery of trenching equipment only by trained crew. No increased risk to other vessels than currently under normal operations. Nothing returned onshore to be managed. No working, lifting or transiting suspended loads over live pipelines. Residual risk is low as pipeline is buried leaving no snagging hazard.		Single vessel periodic and short duration survey vessels activity. Survey equipment managed from the vessel, no diving involved,
AVERAGE RATING THIS CRITERIA	Moderate Impact	Moderate Impact	Lower Impact		Lower Impact
ENVIRONMENTAL	The ENVID determined that the impact significance of energy use and the resultant atmospheric, of noise from vessels and of discharges to sea, relative to current and ongoing vessel operations in the general area (other fields) is low across all options, such that the environmental impact of decommissioning operations offshore is not considered to be a significant differentiator.				
	Localised and short term disturbance to the seabed only with this option leaving a clear seabed and the ecosystem recovery commences as soon as operations are completed. Waste Processing sub-criterion rated as Moderate Impact (Amber) as 3,140te of pipeline returned onshore to be managed with almost 69Te of which is likely to go to landfill.	Localised and short term disturbance to the seabed only . However, the introduction to the seabed of circa 89,706Te of new materials, over a 7.11km pipeline length may introduce a large and different habitat type to the area. This may moderately impact the existing ecosystem, by allowing other species to settle in the area. Low impact of waste processing as nothing returned onshore.	Localised and short term disturbance to the seabed only with this option leaving a clear seabed and the ecosystem recovery commences as soon as operations are completed. Low impact of waste processing as nothing returned onshore.		No seabed disturbance or long term change of habitat and nothing returned onshore.
AVERAGE RATING THIS CRITERIA	Lower Impact	Moderate Impact	Lower Impact		Lower Impact
SOCIETAL	No impact on commercial fisheries as this option results in a clear seabed. Only 3,140Te of pipeline is returned onshore for dismantling and removal of concrete coating, this is not sufficient quantity to be regarded as having Socio-economic impact	Pipeline is surface laid and a large rock berm will be created, to ensure it is over trawlable. However the rock berm could become unstable overtime leading to inaccessibility for the fishing industry. No materials returned onshore means that no positive Socio-economic impact .	No impact on commercial fisheries as this option results in a clear seabed. No materials returned onshore means that no positive Socio-economic impact .		Higher Impact on commercial fisheries as pipeline is surface laid and could deteriorate over time causing a self imposed exclusions zone. Should be discussed with Fishing Industry during stakeholder engagement to determine if this is a constraint to them. No materials returned onshore means that no positive Socio-economic impact .
AVERAGE RATING THIS CRITERIA	Lower Impact	Moderate Impact	Lower Impact		Higher Impact
ECONOMIC RISK	425% of Lowest Execution Cost Remediation Option. Considered lowest cost of all options for long term monitoring and potential future remediation activities since results in a clean seabed, with one post decomm survey only anticipated.	200% of Lowest Execution Cost Remediation Option. Considered higher cost than other options for long term monitoring and potential future remediation activities since anticipate greater than 2 monitoring surveys and potentially requirement to re-profile the rock berms if they become unstable.	Lowest Execution Cost Remediation Option. Also considered 2nd lowest cost of all options for long term monitoring and potential future remediation activities since results in a clean seabed, with 2 periodic monitoring surveys to confirm the pipeline remains buried.		Survey cost only 51% of Lowest Execution Cost Remediation Option. Potentially a high cost option for long term monitoring and potential future remediation activities. Although crown of pipeline remains exposed but below mean seabed level. Potential remedial work may be required if pipeline deteriorates causing future snagging hazard.
AVERAGE RATING THIS CRITERIA	Higher Impact	Moderate Impact	Lower Impact		Moderate Impact
OVERALL RATING	Higher Impact	Higher Impact	Lower Impact		Lower Impact
OVERALL RANKING	4	3	1		2
COMMENTS	Option 2b) - Whole pipeline Trenched and Buried to a depth greater than or equal to 0.6m below seabed is the most preferred option, having only one Moderate Impact (Amber) for one sub-criteria and the remainder all Lower Impact (Green) or Not Significantly Different ratings . Option 3) - Leave In-Situ and Monitor is ranked 2nd best option, although it has been evaluated as Higher Impact (Red) for two sub-criteria it has much less Moderate Impact (Amber) ratings and much more Lower Impact (Green) ratings than Options 1c) and 2a). The Higher Impact (Red) rating attracted to Option 3 is associated with residual risk to fishermen and long term cost liability should the exposed pipeline start to deteriorate causing snagging hazards that would then need remedied Options 1c) and 2a) are ranked 4th and 3rd and should be discounted from further evaluation.				



204504C-000-RT-0200_5-Appendix E - Rating Workbook - Miller PL722 (2025).xlsx

Rigid Pipeline/ Concrete Coated/ Surface Laid

VISUAL RATING SUMMARY

PL722 - 18" Oil Export Pipeline x 7.11km long

Assessment Criteria	Decommissioning Options	1. TOTAL REMOVAL BY:	2. REMEDIATE IN-SITU WITH:		3. LEAVE IN-SITU
	Sub Criteria/ / Sub Options	c) CUT AND LIFT	a) WHOLE PIPELINE ROCK COVERED	b) WHOLE PIPELINE TRENCHED AND BURIED	AND MONITOR
TECHNICAL FEASIBILITY	Risk of Major Project Failure	Not significantly different	Not significantly different	Not significantly different	Not significantly different
	Technical Complexity & Track Record	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
SAFETY	Risk During Project Execution	To Project Personnel	Moderate Impact	Lower Impact	Lower Impact
		To Other Users of the Sea	Moderate Impact	Moderate Impact	Lower Impact
		To Those on Land	Moderate Impact	Lower Impact	Lower Impact
		High Consequence Event	Moderate Impact	Lower Impact	Lower Impact
	Residual (Long Term) Risk To Other Users of the Sea	Lower Impact	Moderate Impact	Lower Impact	Higher Impact
ENVIRONMENTAL	Impact of Decommissioning Operations Offshore	Not significantly different	Not significantly different	Not significantly different	Not significantly different
	Seabed Disturbance- Short Term	Lower Impact	Moderate Impact	Moderate Impact	Lower Impact
	Change of Habitat - Long Term	Lower Impact	Moderate Impact	Lower Impact	Lower Impact
	Waste Processing	Not significantly different	Not significantly different	Not significantly different	Not significantly different
SOCIETAL	Impact on Commercial Fisheries	Lower Impact	Moderate Impact	Lower Impact	Moderate Impact
	Socio-economic Impact on Communities and Amenities	Not significantly different	Not significantly different	Not significantly different	Not significantly different
ECONOMIC RISK	Cost for Decommissioning/ Removal activities	Higher Impact	Moderate Impact	Lower Impact	Lower Impact
	Cost for long term monitoring / Remediation activities	Lower Impact	Moderate Impact	Lower Impact	Moderate Impact
OVERALL RATING		Higher Impact	Higher Impact	Lower Impact	Lower Impact
OVERALL RANKING		4	3	1	2
RATING COUNT		Red = 1	Red = 0	Red = 0	Red = 1
		Amber = 5	Amber = 7	Amber = 0	Amber = 2
		Green = 5	Green = 4	Green = 11	Green = 8
		Not significantly different = 4	Not significantly different = 4	Not significantly different = 4	Not significantly different = 4
COMMENTS		When Sensitivity 1 is considered , all rankings remain the same as the original evaluation with: Option 2b) - Whole pipeline Trenched and Buried remaining the most preferred option. Option 3) - Leave In-Situ and Monitor remaining ranked 2nd best option. Options 1c) and 2a) are ranked 4th and 3rd respectively and should be discounted from further evaluation.			

Rating changed from Not significantly different across all options to test the sensitivity of the quantity of materials being returned onshore (3,140Te) under this option compared to zero for the other options .

Rating changed from Moderate Impact to test the sensitivity of the results in the case where a re-use could be found for the concrete coating instead of going to landfill.



204504C-000-RT-0200_5-Appendix E - Rating Workbook - Miller PL722 (2025).xlsx

January 2026

Rigid Pipeline/ Concrete Coated/ Surface Laid

VISUAL RATING SUMMARY - Sensitivity 2:
Economic Risk not considered

PL722 - 18" Oil Export Pipeline x 7.11km long

Assessment Criteria	Decommissioning Options		1. TOTAL REMOVAL BY:	2. REMEDIATE IN-SITU WITH:		3. LEAVE IN-SITU
	Sub Criteria/ / Sub Options		c)	a)	b)	
			CUT AND LIFT	WHOLE PIPELINE ROCK COVERED	WHOLE PIPELINE TRENCHED AND BURIED	AND MONITOR
TECHNICAL FEASIBILITY	Risk of Major Project Failure		Not significantly different	Not significantly different	Not significantly different	Not significantly different
	Technical Complexity & Track Record		Moderate Impact	Lower Impact	Lower Impact	Lower Impact
SAFETY	Risk During Project Execution	To Project Personnel	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
		To Other Users of the Sea	Moderate Impact	Moderate Impact	Lower Impact	Lower Impact
		To Those on Land	Not significantly different	Not significantly different	Not significantly different	Not significantly different
		High Consequence Event	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
	Residual (Long Term) Risk To Other Users of the Sea		Lower Impact	Moderate Impact	Lower Impact	Higher Impact
ENVIRONMENTAL	Impact of Decommissioning Operations Offshore		Not significantly different	Not significantly different	Not significantly different	Not significantly different
	Seabed Disturbance- Short Term		Lower Impact	Moderate Impact	Moderate Impact	Lower Impact
	Change of Habitat - Long Term		Lower Impact	Moderate Impact	Lower Impact	Lower Impact
	Waste Processing		Moderate Impact	Lower Impact	Lower Impact	Lower Impact
SOCIETAL	Impact on Commercial Fisheries		Lower Impact	Moderate Impact	Lower Impact	Moderate Impact
	Socio-economic Impact on Communities and Amenities		Not significantly different	Not significantly different	Not significantly different	Not significantly different
Economic Risk removed on this Sensitivity Analysis		OVERALL RATING	Higher Impact	Higher Impact	Lower Impact	Lower Impact
		OVERALL RANKING	3=	3=	1	2
		RATING COUNT	Red = 0	Red = 0	Red = 0	Red = 1
			Amber = 5	Amber = 5	Amber = 0	Amber = 1
			Green = 4	Green = 4	Green = 9	Green = 7
			Not significantly different = 4	Not significantly different = 4	Not significantly different = 4	Not significantly different = 4
		COMMENTS	Workshop participants agreed to carry out a sensitivity analysis, where Economic Risk was not a consideration in the overall evaluation. This sensitivity is evaluated against the original outcome Visual Rating Summary and not the Sensitivity 1 outcome. When Sensitivity 2 - Economic Risk is not considered: Option 2b) - Whole pipeline Trenched and Buried remaining the most preferred option. Option 3) - Leave In-Situ and Monitor remaining ranked 2nd best option. Options 1c) and 2a) are ranked 3rd= and should be discounted from further evaluation.			



204504C-000-RT-0200_5-Appendix E - Rating Workbook - Miller PL1971 (2025).xlsx

Rigid Pipeline/ Trenched and Buried

TECHNICAL & SAFETY

PL1971 - 16" Gas Import x 8.414Km long

Assessment Criteria	Decommissioning Options	1. TOTAL REMOVAL BY:	2. REMEDIATE IN-SITU WITH:			
	Sub Criteria/ Sub Options	a)	a)	b)	c)	
		REVERSE REELING	EXPOSED SECTIONS ROCK COVERED	EXPOSED SECTIONS TRENCHED AND BURIED	EXPOSED SECTIONS CUT AND REMOVED	
TECHNICAL FEASIBILITY	Risk of Major Project Failure	Normal operational procedures proposed. Scope is straightforward and understood. Offshore Execution Phase Schedule unlikely to slip beyond planned schedule. Noted that 16" dia rigid pipeline is at the upper end of experience in reeling. <i>(Consider Sensitivity 1 - increasing the rating to Moderate Impact (Amber) given the pipelines being at the limit of reeling experience and the line also being rock covered within the trench)</i>	Normal operational procedures proposed. Scope is straightforward and understood. Offshore Execution Phase Schedule unlikely to slip beyond planned schedule.	Evaluation Similar to 2a). Noted that trenching will only occur after removal of associated tie-ins and tie-in structures. This can be planned accordingly.	Evaluation Similar to 2a).	
	RATING	Not significantly different	Not significantly different	Not significantly different	Not significantly different	
	Technical Complexity & Track Record	There is no track record of recovery of pipelines of this diameter by reverse reeling in the North Sea. However, 6" dia. pipelines have previously been reverse reeled in the GOM. Noted that crossings will not be decommissioned until last pipeline crossing this pipeline is to be decommissioned.	Uses established technology and working methods designed for this field of operation. Large experienced contractor pool available.	Evaluation Similar to 2a).	Evaluation Similar to 2a).	
	RATING	Moderate Impact	Lower Impact	Lower Impact	Lower Impact	
	TECHNICAL: OVERALL RATING BASED ON AVERAGE	Moderate Impact	Lower Impact	Lower Impact	Lower Impact	
SAFETY	Risk During Project Execution	To Project Personnel	Single vessel onstation or in transit for 7 days maximum, plus 14 days mob/demob. SIMOPS 2nd vessel onstation for 1 day. No diving involved. Some materials handling on deck, with potential HC residues in the pipeline.	No vessel SIMOPS, single vessel onstation or in transit for 5 days maximum, plus 17 days mob/demob. No diving involved. Automated process in application of rock cover. Minimal interaction with deck crew.	No vessel SIMOPS, single vessel onstation or in transit for 6 days maximum, plus 14 days mob/demob. No diving involved. Launch and recovery of trenching equipment only with crew trained in these activities. Minimal interaction with deck crew.	No vessel SIMOPS, single vessel onstation or in transit for 8 days maximum, plus 14 days mob/demob. No diving involved. Some materials handling on deck, with potential HC residues in the pipeline.
		RATING	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
		To Other Users of the Sea	Reeling activity expected to be 1 to 2 days only. during this period the vessel is connected to the seabed during reeling activity. However, it is anticipated mitigation measures (set up communication with other vessels in the area and emergency methods to disconnect and laydown the pipeline) will be introduced, resulting in the risk to other users of the sea being not significantly different from the remediate in-situ options.	No increased risk to other vessels than currently under normal operations.	Evaluation similar to Option 2a).	Evaluation similar to Option 2a).
		RATING	Not significantly different	Not significantly different	Not significantly different	Not significantly different
		To Those on Land	Relatively small volumes of decommissioned materials returned for disposal (~2,400Te). Pipeline to be unreeled and cut up onshore with potential for HC residues in pipeline to be managed. <i>(Consider Sensitivity 1 - 1A) as Moderate Impact (Amber).</i>	Nothing returned onshore to be managed. Supply of rock cover materials from quarry not seen as project specific risk as rock cover suppliers activities will be ongoing irrespective of this project.	Nothing returned onshore to be managed.	Minimal quantities of materials returned onshore to be managed (<5Te)
		RATING	Not significantly different	Not significantly different	Not significantly different	Not significantly different
		High Consequence Event	Campaign duration risks are evaluated under "Risk to Project Personnel" above. Campaigns across the options are of a relatively short duration with limited number of vessel transits to and from shore. No diving involved and no crew changes will be completed at sea or by helicopter. Risk of High Consequence Event is therefore low.	Evaluation similar to Option 1a).	Evaluation similar to Option 1a).	Evaluation similar to Option 1a).
	RATING	Not significantly different	Not significantly different	Not significantly different	Not significantly different	
	Residual (Long Term) Risk To Other Users of the Sea	This option once executed, results in a clean seabed, therefore no residual risk to other users of the sea.	This option, once executed, leaves two small additional rock berms on seabed, which over time could potentially become unstable and present a moderate risk of snagging to trawlers.	Evaluation similar to Option 1a).	Evaluation similar to Option 1a).	
	RATING	Lower Impact	Moderate Impact	Lower Impact	Lower Impact	
SAFETY: OVERALL RATING BASED ON AVERAGE	Moderate Impact	Lower Impact	Lower Impact	Lower Impact		



204504C-000-RT-0200_5-Appendix E - Rating Workbook - Miller PL1971 (2025).xlsx

January 2026

Rigid Pipeline/ Trenched and Naturally Back Filling

ENVIRONMENTAL

PL1971 - 16" Gas Import x 8.414Km long

Assessment Criteria	Decommissioning Options	1. TOTAL REMOVAL BY:		2. REMEDIATE IN-SITU WITH:	
	Sub Criteria/ / Sub Options	a)	a)	b)	c)
		REVERSE REELING	EXPOSED SECTIONS ROCK COVERED	EXPOSED SECTIONS TRENCHED AND BURIED	EXPOSED SECTIONS CUT AND REMOVED
ENVIRONMENTAL	Impact of Decommissioning Operations Offshore <i>(includes emissions to air, discharges to sea and underwater noise)</i>	Campaign 21 vessel days	Campaign 22 vessel days	Campaign 20 vessel days	Campaign 20 vessel days
		The ENVID determined that the impact significance of energy use and the resultant atmospheric, of noise from vessels and of discharges to sea, relative to current and ongoing vessel operations in the general area (other fields) is low across all options, such that the environmental impact associated with these aspects not considered a significant differentiator.			
	RATING	Not significantly different	Not significantly different	Not significantly different	Not significantly different
	Seabed Disturbance- Short Term	The pipeline is buried to 0.67m depth of cover, however it has a layer of rock cover along its entire length within the trench, applied to make up required burial depth. Deburial of approximately 8,414km of pipeline will result in greater disturbance than other remediate in-situ options where only current exposed sections of pipeline (approximately 9m) are disturbed.	Localised disturbance to the seabed only, the activities associated with the application of rock cover is recognised to result in short term disturbance during rock placement. The footprint of this short term disturbance is likely to be greater than current footprint. However, short term impact and anticipated to be less impact than Option 1a).	Localised disturbance to the seabed only, where new trench created, disturbance is therefore considered minor.	Minimal seabed disturbance anticipated.
	RATING	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
	Change of Habitat - Long Term	After deburial and extraction of the pipeline the trench will be left open and the existing rock cover will be dispersed over a wide corridor which may impact the existing ecosystem over long term.	Benthic species in area are widespread. Additional rock cover means the introduction of a different habitat type to the area. This will impact existing ecosystem, by allowing other species to settle in the area. However, only a relatively small volume of additional rock cover introduced (c.100Te)	Benthic species in area are widespread. No additional material added (e.g. rock cover) to support decommissioning activities. Ecosystem recovery commences as soon as operations are completed.	Benthic species in area are widespread. Potential additional material added (e.g. spot rock) to support decommissioning activities. Ecosystem recovery commences as soon as operations are completed.
	RATING	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
	Waste Processing <i>(i.e. processing of returned materials and use of landfill)</i>	2,400te of pipeline transferred onshore. Although steel will be recycled, significantly more handling involved in separation of coatings and management of residues wastes inside pipeline. More waste to be managed with c. 25te going to landfill compared to Options 2a), 2b) where no materials are returned and Option 2c) where less than 1te is returned and <0.1te going to landfill.	Nothing returned onshore.	Nothing returned onshore.	Less than 3Te of pipeline returned onshore, with less than 0.03Te going to landfill.
	RATING	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
ENVIRONMENTAL: OVERALL RATING BASED ON AVERAGE	Moderate Impact	Lower Impact	Lower Impact	Lower Impact	



204504C-000-RT-0200_5-Appendix E - Rating Workbook - Miller PL1971 (2025).xlsx

Rigid Pipeline/ Trenched and Naturally Back Filling

SOCIETAL & ECONOMIC RISK

PL1971 - 16" Gas Import x 8.414Km long

Assessment Criteria	Decommissioning Options	1. TOTAL REMOVAL BY:	2. REMEDIATE IN-SITU WITH:		
	Sub Criteria/ / Sub Options	A	A	B	C
		REVERSE REELING	EXPOSED SECTIONS ROCK COVERED	EXPOSED SECTIONS TRENCHED AND BURIED	EXPOSED SECTIONS CUT AND REMOVED
SOCIETAL	Impact on Commercial Fisheries	This option results in a clear seabed, but open trench and with rock berm debris spread over a larger area.	Existing pipeline has rock cover over its entire length within the existing trench and above at crossings which will remain. This option adds relatively small additional rock berms (2 off) at exposed ends which will be installed to be over trawlable. Evaluated as not significantly different from other options due to small length of exposed line (circa. 90m) to be rock covered.	Existing pipeline has rock cover over its entire length within the existing trench and above at crossings which will remain. This option results in a clear seabed at the short exposed section locations.	Evaluation similar to 2b).
	RATING	Not significantly different	Not significantly different	Not significantly different	Not significantly different
	Socio-economic Impact on Communities and Amenities	Quantity of materials to be managed onshore is relatively small, no positive or negative Socio-economic impact anticipated.	No materials to be managed onshore, no positive or negative Socio- economic impact anticipated.	Evaluation similar to 2a).	Evaluation similar to 1a).
	RATING	Not significantly different	Not significantly different	Not significantly different	Not significantly different
	SOCIETAL: OVERALL RATING - BASED ON AVERAGE	Not Significantly Different	Not Significantly Different	Not Significantly Different	Not Significantly Different
ECONOMIC RISK	Cost for Decommissioning/ Removal activities	167% of lowest cost option.	112% of Lowest cost option.	Lowest cost option.	110% of lowest cost option.
	RATING	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
	Cost for long term monitoring / Remediation activities	Clean seabed, post decomm survey only. Possible one future visit to monitor behaviour of the open trench.	Anticipate more than 2 monitoring surveys and potentially requirement to re-profile the new rock berms if they become unstable. Noted that existing rock cover inside trench is less likely to become unstable.	Anticipate 2 monitoring surveys only, seabed is stable and unlikely to require future remedial action after exposed sections are buried.	Anticipate 2 monitoring surveys only, exposed sections recovered and clean seabed results. Unlikely to need further remedial action post project.
	RATING	Lower Impact	Moderate Impact	Lower Impact	Lower Impact
	ECONOMIC RISK: OVERALL RATING BASED ON AVERAGE	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
ECONOMIC RISK: OVERALL RATING BASED ON DISCUSSION	Moderate Impact	Moderate Impact	Lower Impact	Lower Impact	



204504C-000-RT-0200_5-Appendix E - Rating Workbook - Miller PL1971 (2025).xlsx

January 2026

Rigid Pipeline/ Trenched and Naturally Back Filling

VISUAL RATING SUMMARY

PL1971 - 16" Gas Import x 8.414Km long

Assessment Criteria	Decommissioning Options	1. TOTAL REMOVAL BY:	2. REMEDIATE IN-SITU WITH:		
	Sub Criteria/ / Sub Options	a)	a)	b)	c)
		REVERSE REELING	EXPOSED SECTIONS ROCK COVERED	EXPOSED SECTIONS TRENCHED AND BURIED	EXPOSED SECTIONS CUT AND REMOVED
TECHNICAL FEASIBILITY	Risk of Major Project Failure	Not significantly different	Not significantly different	Not significantly different	Not significantly different
	Technical Complexity & Track Record	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
SAFETY	Risk During Project Execution	To Project Personnel	Moderate Impact	Lower Impact	Lower Impact
		To Other Users of the Sea	Not significantly different	Not significantly different	Not significantly different
		To Those on Land	Not significantly different	Not significantly different	Not significantly different
		High Consequence Event	Not significantly different	Not significantly different	Not significantly different
	Residual (Long Term) Risk To Other Users of the Sea	Lower Impact	Moderate Impact	Lower Impact	Lower Impact
ENVIRONMENTAL	Impact of Decommissioning Operations Offshore	Not significantly different	Not significantly different	Not significantly different	Not significantly different
	Seabed Disturbance- Short Term	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
	Change of Habitat - Long Term	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
	Waste Processing	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
SOCIETAL	Impact on Commercial Fisheries	Not significantly different	Not significantly different	Not significantly different	Not significantly different
	Socio-economic Impact on Communities and Amenities	Not significantly different	Not significantly different	Not significantly different	Not significantly different
ECONOMIC RISK	Cost for Decommissioning/ Removal activities	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
	Cost for long term monitoring / Remediation activities	Lower Impact	Moderate Impact	Lower Impact	Lower Impact
OVERALL RATING		Moderate Impact	Lower Impact	Lower Impact	Lower Impact
OVERALL RANKING		4	3	1st=	1st=
RATING COUNT		Red =0	Red = 0	Red = 0	Red = 0
		Amber =6	Amber = 2	Amber = 0	Amber = 0
		Green =2	Green = 6	Green = 8	Green = 8
		Not significantly different = 7	Not significantly different = 7	Not significantly different = 7	Not significantly different = 7
COMMENTS		<p>Almost half (7) of all sub-criteria are rated as not significantly different.</p> <p>Option 2b): Remediate In-situ with Exposed Sections Trenched and Buried and Option 2c) Cut and Lift Exposed Section were 1st equal. However, it was concluded that Option 2c) Cut and Lift Exposed Section is the Most Preferred Decommissioning Option reflecting experience on the other end of the line, and potential challenges of trenching towards a rock berm. Any differences between all three remediation options were marginal, so it was concluded that all could be considered further during the contract and procurement phase leading to execution phase of the project.</p> <p>The Total Removal Option 1a) is the worst performing options and should be discounted at this stage.</p>			



204504C-000-RT-0200_5-Appendix E - Rating Workbook - Miller PL1971 (2025).xlsx

Rigid Pipeline/ Trenched and Naturally Back Filling

PL1971 - 16" Gas Import x 8.414Km long

NARRATIVE SUMMARY

Red text below highlights the main areas of influence in a rating evaluation poorer than Low Impact (Green).

Decommissioning Options	1. TOTAL REMOVAL BY:		2. REMEDIATE IN-SITU WITH:	
	a)	a)	b)	c)
Sub Criteria / Sub Options	REVERSE REELING	EXPOSED SECTIONS ROCK COVERED	EXPOSED SECTIONS TRENCHED AND BURIED	EXPOSED SECTIONS CUT AND REMOVED
TECHNICAL FEASIBILITY	Each decommissioning option has a relatively similar campaign duration. Some uncertainty over integrity and fatigue performance of the pipelines to be reverse reeled. Noted that 16" dia rigid pipeline is at the upper end of experience in reeling. This recovery method has not been adopted in the North Sea . Method is used in GOM for 6" dia. pipelines	Normal operational procedures proposed. Scope is straightforward and understood. Offshore Execution Phase Schedule unlikely to slip. Uses established technology and working methods designed for this field of operation. Large experienced contractor pool available.	Evaluation similar to Option 2a)	Evaluation similar to Option 2a)
AVERAGE RATING THIS CRITERIA	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
SAFETY	Risk to project personnel evaluated as moderate due to quantities of materials to be handled on deck and potential for HC residues. Risk to those on land, other users of the sea and likelihood of a high consequence event evaluated as low and not significantly different across all decommissioning options considered. Residual risk to users of the sea evaluated as low, since option leaves a clean seabed post project.	Risk to project personnel and those on land evaluated as low as minimal interaction with deck crew and at quayside as no materials returned onshore Risk to other users of the sea and likelihood of a high consequence event evaluated as low and not significantly different across all decommissioning options considered. Residual risk to users of the sea evaluated as moderate, since option once executed leaves 2 small rock berms on seabed, which over time could potentially become unstable and present a moderate risk of snagging to trawlers.	Evaluated similar to Option 2a) except: Residual risk to users of the sea evaluated as low, since option leaves a clean seabed post project.	Risk to project personnel evaluated as low even as only minimal quantities of materials to be handled on deck. Risk to those onshore evaluated as low due to significantly less quantity of materials being returned onshore than Option 1a). Risk to other users of the sea and likelihood of a high consequence event evaluated as low and not significantly different across all decommissioning options considered. Residual risk to users of the sea evaluated as low, since option leaves a clean seabed post project.
AVERAGE RATING THIS CRITERIA	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
ENVIRONMENTAL	The impact significance of energy use and the resultant atmospheric, of noise from vessels and of discharges to sea is not considered a significant differentiator across all options. Deburial of approximately 8.491km of pipeline will result in greater disturbance than other remediate in-situ options where only current exposed sections of pipeline (approximately 300m) are disturbed. After deburial and extraction of the pipeline the trench will be left open and the existing rock cover will be dispersed over a wide corridor which may impact the ecosystem over long term. 2,400Te of pipeline transferred onshore and increase in materials going to landfill (25Te). Although steel will be recycled, significantly more is handling involved in separation of coatings and management of residues wastes inside pipeline.	The impact significance of energy use and the resultant atmospheric, of noise from vessels and of discharges to sea is not considered a significant differentiator across all options. The activities associated with the application of rock cover is recognised to result in short term disturbance during rock placement. The footprint of this short term disturbance is likely to be greater than current footprint. However, short term impact and anticipated to be less impact than Option 1a). No waste returned onshore.	The impact significance of energy use and the resultant atmospheric, of noise from vessels and of discharges to sea is not considered a significant differentiator across all options. Localised disturbance to the seabed. Only. No additional material added to support decommissioning activities. Ecosystem recovery commences as soon as operations are completed. No waste returned onshore.	Evaluated similar to Option 2b) except: Less than 5Te of pipeline returned onshore, with less than 0.1Te going to landfill.
AVERAGE RATING THIS CRITERIA	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
SOCIETAL	No impact on commercial fisheries as this option results in a clear seabed, open trench. Quantity of materials to be managed onshore is relatively small and will therefore have no significant impact (positive or negative) on communities or amenities.	Minimal impact on commercial fisheries as 2 relatively small additional rock berms at exposed ends will be installed to be over trawable. Current pipeline is covered by rock within the trench and above at existing crossings No materials returned onshore and therefore no impact (positive or negative) on communities or amenities.	Minimal impact on commercial fisheries current pipeline is covered by rock within the trench and above at existing crossings, this option results in a clear seabed bed at pipeline ends. No materials returned onshore and therefore no impact (positive or negative) on communities or amenities.	Minimal impact on commercial fisheries current pipeline is covered by rock within the trench and above at existing crossings, this option results in a clear seabed bed at pipeline ends. Quantity of materials to be managed onshore is relatively small and will therefore have no significant (positive or negative) impact on communities or amenities.
AVERAGE RATING THIS CRITERIA	Not Significantly Different	Not Significantly Different	Not Significantly Different	Not Significantly Different
ECONOMIC RISK	Project execution cost is 167% of lowest cost option. However balanced by the fact that cost for long term monitoring or potential remediation activities will be lower than the other options as project execution results in a clear seabed.	Project execution cost is 112% of lowest cost option. However, like ongoing liability post project execution with more than 2 monitoring surveys and potentially requirement to re-profile the new rock berms if they become unstable.	Lowest project execution cost option. However, like ongoing liability post project execution with greater than 2 monitoring surveys only, seabed is stable and unlikely to require future remedial action after exposed sections are buried.	Project Execution cost is 110% of lowest cost option. However, like ongoing liability post project execution with more than 2 monitoring surveys only, exposed sections recovered and clean seabed results. Unlikely to need further remedial action post project.
AVERAGE RATING THIS CRITERIA	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
OVERALL RATING	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
OVERALL RANKING	4	3	1st =	1st =
COMMENTS	Option 2b): Remediate In-situ with Exposed Sections Trenched and Buried and Option 2c) Cut and Lift Exposed Section were 1st equal. However, it was concluded that Option 2c) Cut and Lift Exposed Section is the Most Preferred Decommissioning Option reflecting experience on the other end of the line, and potential challenges of trenching towards a rock berm. Any differences between all three remediation options were marginal, so it was concluded that all could be considered further during the contract and procurement phase leading to execution phase of the project. The Total Removal Option 1a) is the worst performing options and should be discounted at this stage.			

SUMMARY



204504C-000-RT-0200_5-Appendix E - Rating Workbook - Miller PL1971 (2025).xlsx

January 2026

Rigid Pipeline/ Trenched and Naturally Back Filling

VISUAL RATING SUMMARY - Sensitivity 1

PL1971 - 16" Gas Import x 8.414Km long

Assessment Criteria	Decommissioning Options		1. TOTAL REMOVAL BY:	2. REMEDIATE IN-SITU WITH:		
	Sub Criteria/ / Sub Options		A	A	B	C
			REVERSE REELING	EXPOSED SECTIONS ROCK COVERED	EXPOSED SECTIONS TRENCHED AND BURIED	EXPOSED SECTIONS CUT AND REMOVED
TECHNICAL FEASIBILITY	Risk of Major Project Failure		Moderate Impact	Lower Impact	Lower Impact	Lower Impact
	Technical Complexity & Track Record		Moderate Impact	Lower Impact	Lower Impact	Lower Impact
SAFETY	Risk During Project Execution	To Project Personnel	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
		To Other Users of the Sea	Not significantly different	Not significantly different	Not significantly different	Not significantly different
		To Those on Land	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
		High Consequence Event	Not significantly different	Not significantly different	Not significantly different	Not significantly different
	Residual (Long Term) Risk To Other Users of the Sea		Lower Impact	Moderate Impact	Lower Impact	Lower Impact
ENVIRONMENTAL	Impact of Decommissioning Operations Offshore		Not significantly different	Not significantly different	Not significantly different	Not significantly different
	Seabed Disturbance- Short Term		Moderate Impact	Lower Impact	Lower Impact	Lower Impact
	Change of Habitat - Long Term		Moderate Impact	Lower Impact	Lower Impact	Lower Impact
	Waste Processing		Moderate Impact	Lower Impact	Lower Impact	Lower Impact
SOCIETAL	Impact on Commercial Fisheries		Not significantly different	Not significantly different	Not significantly different	Not significantly different
	Socio-economic Impact on Communities and Amenities		Not significantly different	Not significantly different	Not significantly different	Not significantly different
ECONOMIC RISK	Cost for Decommissioning/ Removal activities		Moderate Impact	Lower Impact	Lower Impact	Lower Impact
	Cost for long term monitoring / Remediation activities		Lower Impact	Moderate Impact	Lower Impact	Lower Impact
OVERALL RATING			Moderate Impact	Lower Impact	Lower Impact	Lower Impact
OVERALL RANKING			4	3	1st=	1st=
RATING COUNT			Red =0	Red = 0	Red = 0	Red = 0
			Amber =8	Amber = 2	Amber = 0	Amber = 0
			Green =2	Green = 8	Green = 10	Green = 10
			Not significantly different = 5	Not significantly different = 5	Not significantly different = 5	Not significantly different = 5
COMMENTS			When Sensitivity 1 is applied, all rankings remain the same as the original evaluation with: Option 2b): Remediate In-situ with Exposed Sections Trenched and Buried and Option 2c) Cut and Lift Exposed Section were 1st equal. However, it was concluded that Option 2c) Cut and Lift Exposed Section is the Most Preferred Decommissioning Option reflecting experience on the other end of the line, and potential challenges of trenching towards a rock berm. Any differences between all three remediation options were marginal, so it was concluded that all could be considered further during the contract and procurement phase leading to execution phase of the project. The Total Removal Option 1a) is the worst performing options and should be discounted at this stage.			

Rating changed from Not significantly different across all options to reflect the situation where the 16" dia. pipeline was at the technical limit for reverse reeling technique and the line also being rock covered within the trench.

Rating changed from Not significantly different to test the sensitivity of quantity of materials being returned onshore (>2,400Te) under this option compared to the other options (<5Te).



204504C-000-RT-0200_5-Appendix E - Rating Workbook - Miller PL1971 (2025).xlsx

Rigid Pipeline/ Trenched and Naturally Back Filling

VISUAL RATING SUMMARY - Sensitivity 2: Economic Risk not considered

PL1971 - 16" Gas Import x 8.414Km long

Assessment Criteria	Decommissioning Options		1. TOTAL REMOVAL BY:		2. REMEDIATE IN-SITU WITH:	
	Sub Criteria/ / Sub Options		A	A	B	C
		REVERSE REELING	EXPOSED SECTIONS ROCK COVERED	EXPOSED SECTIONS TRENCHED AND BURIED	EXPOSED SECTIONS CUT AND REMOVED	
TECHNICAL FEASIBILITY	Risk of Major Project Failure		Not significantly different	Not significantly different	Not significantly different	Not significantly different
	Technical Complexity & Track Record		Moderate Impact	Lower Impact	Lower Impact	Lower Impact
SAFETY	Risk During Project Execution	To Project Personnel	Moderate Impact	Lower Impact	Lower Impact	Lower Impact
		To Other Users of the Sea	Not significantly different	Not significantly different	Not significantly different	Not significantly different
		To Those on Land	Not significantly different	Not significantly different	Not significantly different	Not significantly different
		High Consequence Event	Not significantly different	Not significantly different	Not significantly different	Not significantly different
	Residual (Long Term) Risk To Other Users of the Sea		Lower Impact	Moderate Impact	Lower Impact	Lower Impact
ENVIRONMENTAL	Impact of Decommissioning Operations Offshore		Not significantly different	Not significantly different	Not significantly different	Not significantly different
	Seabed Disturbance- Short Term		Moderate Impact	Lower Impact	Lower Impact	Lower Impact
	Change of Habitat - Long Term		Moderate Impact	Lower Impact	Lower Impact	Lower Impact
	Waste Processing		Moderate Impact	Lower Impact	Lower Impact	Lower Impact
SOCIETAL	Impact on Commercial Fisheries		Not significantly different	Not significantly different	Not significantly different	Not significantly different
	Socio-economic Impact on Communities and Amenities		Not significantly different	Not significantly different	Not significantly different	Not significantly different
OVERALL RATING		Moderate Impact	Lower Impact	Lower Impact	Lower Impact	
OVERALL RANKING		4	3	1st=	1st=	
RATING COUNT		Red =0	Red = 0	Red = 0	Red = 0	
		Amber =5	Amber = 1	Amber = 0	Amber = 0	
		Green =1	Green = 5	Green = 6	Green = 6	
		Not significantly different = 7	Not significantly different = 7	Not significantly different = 7	Not significantly different = 7	
COMMENTS		Workshop participants agreed to carry out a sensitivity analysis, where Economic Risk was not a consideration in the overall evaluation. When Sensitivity 2 is considered, i.e. Economic Risk is not considered, all rankings remain the same as the original evaluation .				

Economic Risk removed on this Sensitivity Analysis