BRAE AREA DEVENICK SUBSEA FACILITIES DECOMMISSIONING PROGRAMMES



August 2022 – Revision 04 Consultation Draft

TB-DEVDEC01-X-AD-0001-000



DOCUMENT CONTROL

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Revision Control

Revision No	Reference	Changes/Comments	Issue Date
1	First Draft		January 2022
2	-	Revised to reflect OPRED comments	March 2022
3	-	Revised to reflect OPRED comments on CA and EA	May 2022
4	Consultation Draft	Revised to incorporate final OPRED Comments	August 2022

Distribution List

Name	Company
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ABBREVIATIONS

Abbreviation	Explanation
BEIS	Department for Business, Energy, and Industrial Strategy
CA	Comparative Assessment
DSV	Dive Support Vessel
E & A	Exploration and Appraisal
EA	Environmental Appraisal
FPAL	First Point Assessment Limited
FPSO	Floating Production Storage and Offtake (installation)
HSE	Health and Safety Executive
ICES	International Council for the Exploration of the Sea
MEG	Mono Ethylene Glycol
MM	Million
MODU	Mobile Offshore Drilling Unit
N/A	Not Applicable
NORM	Naturally Occurring Radioactive Material
NSTA	North Sea Transition Authority
OGA	Oil and Gas Authority
OGUK	Oil and Gas UK
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
OSPAR	Oslo Paris Convention
P&A	Plug and Abandon
PIP	Pipe In Pipe
PL	Pipeline (as in pipeline number)
PLU	Umbilical (as in umbilical number)
SAC	Special Area of Conservation
SONAR	Sound Navigation and Ranging
SSIV	Subsea Isolation Valve
TAQA	TAQA Bratani Limited
UHB	Upheaval Buckling
UK	United Kingdom
UKCS	United Kingdom Continental Shelf
WHPS	Wellhead Protection Structure



1 Executive Summary

1.1 Decommissioning Programme

As required by the Petroleum Act 1998, amended by the Energy Act 2008, this document contains two Decommissioning Programmes, one for each set of notices under Section 29 of the Petroleum Act 1998:

- The Devenick installation (Wellheads and Xmas trees, WHPS, Manifold, SSIV Structure and Cooling Spool Protection Structures), and;
- The associated pipelines and umbilicals.

The Devenick Field straddles Blocks 9/24b, 9/24c and 9/29a. Outside the fields themselves, Devenick facilities are installed in Blocks 9/28c, 16/3a and 16/3e. Decommissioning the Devenick facilities is planned as part of the wider Brae Area overall decommissioning project. TAQA Bratani Limited (TAQA) will continue to explore resource and cost saving synergies with the wider project and other operators.

1.2 Requirement for Decommissioning Programmes

Installation:

In accordance with the Petroleum Act 1998, as amended, TAQA, as operator of the Devenick subsea field, and on behalf of the Section 29 Notice Holders (see Table 1.2), is applying to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) to obtain approval for decommissioning the Devenick subsea facilities as detailed in Section 2.1 of this document. (See also Section 8 – Section 29 Holders' Letters of Support).

Pipelines:

In accordance with the Petroleum Act 1998, as amended, TAQA, as operator of the Devenick subsea pipelines, and on behalf of the Section 29 Notice Holders (see Table 1.4), is applying to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) to obtain approval for decommissioning the Devenick subsea facilities as detailed in Section 2.1 of this document. (See also Section 8 – Section 29 Holders' Letters of Support).

In conjunction with public, stakeholder and regulatory consultation the Decommissioning Programmes are submitted in compliance with national and international regulations, and OPRED guidance [1].

The estimated schedule outlined for the decommissioning project spans a six year period, commencing in 2024.



1.3 Introduction

The Devenick field lies in UKCS Blocks 9/24b, 9/24c and 9/29a in a water depth that varies between approximately 115 m and 130 m around 310 km north-east of Aberdeen.

The facilities comprise;

- The 9/24b-4 (S1) well and associated standalone wellhead protection structure. The 9/29a-2Z (S2) well. This was plugged and abandoned in 2015, and the Xmas tree and integrated protection structure, and wellhead were recovered to shore for recycling in 2017
 [2]. (An Exploration and Appraisal well, 9/29a-1, was plugged, abandoned, and removed in 2015).
- The Devenick manifold.
- Production flowlines and umbilicals connecting the S1 and S2 well locations to the manifold. These are trenched and backfilled over most of their length with spot rock placement where required.
- Surface laid cooling spools forming part of the production flowlines at the S1 and S2 well locations and the associated rock covered protection structures.
- The production pipeline, methanol pipeline and umbilical connecting the Devenick manifold and the East Brae platform. These are trenched and backfilled over most of their length with spot rock placement where required. These pipelines and umbilical run via Blocks 9/28c and 16/03e.
- The SSIV structure at the East Brae platform end of the production flowline.
- The SSIV control umbilical running from the East Brae platform to the SSIV structure.

The Devenick field started production in 2012 from well S1. The S1 Well was originally drilled as an appraisal well, however; the Well was later recompleted as a development production well by BP, the field operator at the time. The S2 well was not commissioned due to higher than anticipated levels of H_2S in the reservoir fluids and there has been no production from this well. Consequently, the pipelines and umbilical between S2 and the Devenick manifold have not been used.

Devenick cannot produce after East Brae Cessation of Production, as Devenick depends on East Brae as its control point and export route. The OGA has accepted a proposed CoP date for East Brae of no earlier than the beginning of 2022, and the same CoP date for Devenick. East Brae CoP will be driven by the performance of the installation and the reservoir and market conditions. Notwithstanding, the current planned date for Devenick CoP is 2024. TAQA will formally notify the NSTA one month in advance of the proposed date for permanent cessation of Devenick production.

The decommissioning activities were prioritised in three phases according to risk, opportunity, and support of ongoing production. Activities commenced with disconnection and permanent P&A of the S2 Well, 9/29a-2Z, (Phase 1), followed by the E&A (Exploration and Appraisal) Well, 9/29a-1, (Phase 2). The P&A and removal of S2 well and the associated WHPS were agreed with OPRED prior to execution. The E&A well falls outwith the Petroleum Act's scope and is therefore not discussed further in the decommissioning programme.

Phases 1 and 2 are complete [2]. The final Phase 3 of the Devenick decommissioning work covers P&A of the S1 Well, 9/24b-4, and decommissioning and dismantling of the balance of the Devenick subsea infrastructure. Phase 3 includes removal of the cooling spool protection structures and



cooling spools at the S2 well location, and the associated survey, debris removal and seabed remediation in this location.

The Phase 3 Devenick decommissioning activities may be integrated with the overall wider Brae Area scope of multiple decommissioning projects to maximise synergies, optimise the use of resources, and minimise disturbance of the environment.

The decommissioning activities will include:

- Subsea flowline and control umbilical disconnection at the S1 well and Devenick Manifold
- Preparation for removal of subsea infrastructure and stabilisation materials
- Permanent abandonment of S1 Well
- Recovery and transport to shore of subsea structures, stabilisation materials (i.e., mattresses and grout bags), tie-in spools and equipment. Where practical difficulties in removing stabilisation features are encountered, TAQA will consult with OPRED to agree an alternative approach.
- Make-safe as-left materials (buried pipelines & rock cover) and remediate seabed
- Full field seabed clearance verification survey

This decommissioning sequence assumes that there is access through the S1 WHPS for well P&A and Xmas Tree recovery.

1.3.1 Scope of Decommissioning Programmes

The decommissioning programmes contained in this document cover the Devenick subsea facilities, from the S1 and S2 well locations to the end of the Devenick pipelines and umbilicals on the East Brae platform. At East Brae, if derogation to leave the platform footings in place is granted, the facilities will be removed to a point on the pipelines and umbilicals in close proximity (within approximately 75 m) of the base of the East Brae jacket/sub-structure, as this represents a reasonable balance between the level of risk associated with removing the facilities, the degree of disturbance of the seabed, and the loss of amenity for other sea users. The break points are likely to be crossings with the Braemar pipelines and umbilicals which are some 30 m to 50 m from the platform footings. Notwithstanding, final decommissioning solutions for the pipelines and umbilical at East Brae will be discussed and agreed with OPRED to align with decommissioning arrangements for the platform and associated infrastructure.

The pipelines and umbilical from the Devenick manifold to the East Brae platform cross three third-party telecommunication cables. On either side of these crossings the Devenick lines are trenched and buried. At the crossings, the Devenick lines run over the top of the telecommunication lines. The crossings are protected by overtrawlable rock cover. The Devenick lines are crossed by a fourth third party telecommunication cable and a third-party pipeline. These crossings are in the trenched and buried portions of the Devenick lines. These crossings are also rock covered. At all five third-party crossings the Devenick lines will be left in situ. In addition to the thirds-party crossings, the Devenick lines cross the TAQA operated Braemar pipeline and umbilicals in close proximity to the base of the East Brae platform. These crossings are protected by mattresses. If derogation is granted to leave the East Brae platform footings in place, these crossings will be left in situ. If derogation is not granted the crossings will be dismantled and returned to shore for reuse, recycling, or disposal.



1.3.2 Decommissioning Programmes Outline

All the subsea facilities will be removed to leave a clear seabed, with the exceptions of;

- Trenched and backfilled pipelines and umbilicals, which will remain in situ, provided they are buried to a depth greater than 600 mm. This option was selected following the Comparative Assessment (CA) process taking account of the risks, environmental disturbance and technical challenges associated with excavating and removing the trenched and backfilled pipelines. Pipelines and umbilicals that are buried at a depth of less than 600 mm will be reviewed and the requirement for mitigation measures will be assessed. All necessary mitigation measures will be discussed and agreed with OPRED before implementation.
- Pipelines and umbilicals in close proximity to the base of the East Brae jacket footings (as detailed above).
- The stabilisation rock cover on the S1 and S2 cooling spool protection structures. This rock will be moved aside to facilitate recovery of the structures and spools. The rock itself will be left in situ on the seabed.

Where practical difficulties are experienced in removing pipeline protection and stabilisation features, i.e., mattresses and grout bags, TAQA will consult with OPRED to agree an alternative approach.

1.3.3 Completed Devenick Well Decommissioning Activities

The S2 well was plugged, abandoned, and removed between 2015 and 2017 following consultation with OPRED and agreement of the work programme. This is described in the S2 close out report [2]. The main activities were;

- April 2015. Disconnection and tie in spool removal of PL2750, PL2751, and PLU2755 at the S2 Xmas tree and the Devenick Manifold. This work was performed by a Dive Support Vessel (DSV). Mattresses were displaced during this activity. At the end of the work the mattresses were either replaced in their original positions, or, in the case of four mattresses, left stacked immediately adjacent to the Devenick Manifold.
- August 2015. Plugging and abandonment of the S2 well. This work was carried out by the John Shaw mobile drilling unit. This involved removal of hydrocarbons and plugging the well, recovery of the Xmas tree and integrated protection structure, and setting permanent cement plugs. At the end of this phase of the work, in light of a deteriorating weather forecast, recovery of the wellhead system was deferred to a future DSV campaign.
- August 2016. Severance of the well conductor and attempted wellhead recovery by DSV. Three severance explosive charges were run and detonated to cut the well conductor. The DSV was unable to recover the wellhead system.
- July 2017. Recovery of the wellhead and guide base by DSV.

The equipment recovered from the S2 wellsite was treated as follows;

• The Xmas tree and integrated protection structure removed during the P&A programme in August 2015 were sent for recycling. The weight of the Xmas tree and integrated protection structure was approximately 38 te, primarily made up of steel.



• The wellhead, which was removed in August 2017, was recycled in August/September 2017. The weight of the wellhead system was approximately 20 te, primarily made up of steel.

The equipment associated with S2 which is still in place at the Well site and the manifold will be removed as part of the remaining Devenick decommissioning work scope. This includes pipelines, umbilicals, cooling spool protection structures and pipeline stabilisation features; grout bags and mattresses. The equipment will be removed to shore for reuse, recycling, or appropriate disposal. The stabilisation features will also be removed to shore except for the rock cover from the colling spool protection structures, which will remain in situ, and any mattresses, etc. that are used to remediate holes in the seabed arising from removal of equipment.

Following removal of the S2 wellhead in 2017, concrete debris remained on the seabed immediately adjacent to the S2 well location, at the end of the cooling spool protection structure. This concrete and any other debris will be removed or remediated as part of the remaining Devenick decommissioning work scope.

At the end of the Devenick decommissioning activities, the entire area, including the S2 well location, will be surveyed to confirm that it is left in an acceptable condition.

The Devenick stand-alone exploration and appraisal well, 9/29a-1, was plugged and abandoned in 2015. All equipment associated with this well was removed in 2015. The E&A well falls outwith the Petroleum Act decommissioning scope and is therefore not discussed further in the decommissioning programme.



1.4 Overview of Facilities Being Decommissioned

1.4.1 Installations

Table 1.1: Installations Being Decommissioned

Field(s)	Devenick	Production Type	Gas/Condensate
Water Depth	≈ 115 - 130 m	UKCS Block	9/24b, 9/29a, 9/24c, 9/28c, 16/3a and 16/3e,
Distance to Median	≈ 4 km	Distance to UK Coastline	≈ 185 km
Subsea Inst	allations		
Number	Туре		Total Weight (tonnes)
1	Manifold		242.0
1	SSIV Structu	ire	72.5
1	S1 WHPS		120.0
4	S1 Cooling Spool Prote	ction Frames	135.5
4	S2 Cooling Spool Prote	ction Frames	135.5
Subsea Wel	ls		
Number	Туре		Weight (tonnes)
1	Gas Producing	(S1)	76.0

Table 1.2: Devenick Installation Section 29 Notice Holders						
Company	Registration Number	Equity Interest (%) Unit Area	Equity Interest (%) Block 9/29a	Equity Interest (%) Block 9/24b	Equity Interest (%) Block 9/24c	
TAQA Bratani Limited	05975475	88.7	81	100	100	
INEOS UK SNS Limited	01021338	11.3	19	0	0	
BP Exploration Operating Company Limited	00305943	0	0	0	0	
Britoil Limited	SC077750	0	0	0	0	



1.4.2 Pipelines

Table 1.3: Devenick Pipelines Being Decommissioned				
Number of Pipelines (Inc. Umbilicals)	10	See Table 2.3		

Table 1.4: Devenick Pipeline Section 29 Notice Holders						
Company	Registration Number	Equity Interest (%) Unit Area	Equity Interest (%) Block 9/29a	Equity Interest (%) Block 9/24b	Equity Interest (%) Block 9/24c	
TAQA Bratani Limited	05975475	88.7	81	100	100	
INEOS UK SNS Limited	01021338	11.3	19	0	0	
BP Exploration Operating Company Limited	00305943	0	0	0	0	
Britoil Limited	SC077750	0	0	0	0	



1.5 Summary of Proposed Decommissioning Programmes

The selected decommissioning option for the Devenick infrastructure is shown in Table 1.5 below.

Table 1.5: Summary of Decommissioning Programme								
Proposed Decommissioning Solution	Reason For Selection							
Subsea Installations								
All materials, structures and equipment will be removed at end of field life to meet TAQA standards and comply with OSPAR requirements. All recovered materials will be transported to shore for re-use, recycling, or disposal.	To remove all seabed structures and leave a clear seabed							
Pipelines, Flowlines and Umbilicals								
All pipelines and umbilicals will be flushed and cleaned to an appropriate standard. This is one of the first decommissioning activities and may be carried out at the end of East Brae platform operations. Surface laid portions of pipelines and umbilicals that are not in close proximity to the East Brae jacket footings will be removed together with protection structures. The recovered items will be, transported to shore for re-use, recycling, or disposal. Limited sections of surface laid pipelines and umbilicals in close proximity to the East Brae jacket/sub-structure footings may be left in place, subject to derogation to leave the footings in place, and agreement with OPRED. "Close proximity" is considered within approximately 75 m of the platform footings. Logical break points between portions left in situ and portions removed will be selected, e.g., pipeline crossings, etc. This is the lowest risk, least seabed disturbance option. If derogation to leave the jacket/sub-structure footings in place is not granted, all surface laid pipelines and umbilicals will be recovered and taken to shore for appropriate re-use, recycling, or disposal.	To leave a safe, clear seabed and in compliance with regulatory requirements.							
Buried pipelines and umbilicals will be flushed and cleaned to an appropriate standard and then surveyed to verify their burial status. Any pipelines and umbilicals with a burial depth of less than 600 mm or spans will be remediated as necessary and the buried pipelines will be left in situ. The latest pipeline survey was completed in 2019, and the next is planned for Q3 2022. Exposures and spans are listed in the EA [3]. The total length of exposures and spans is approximately 85 m over a total pipeline length of around 80 km.	This option results in minimal seabed disturbance, lower energy usage, and reduced risk to personnel engaged in decommissioning activity. Data from successive surveys indicate that the burial depths of Devenick pipelines and umbilicals are generally increasing over time [3]. Degradation will occur over a long period within seabed sediment, with no anticipated hazard to other users of the sea.							



Table 1.5: Summary of Decommissioning Programme							
Proposed Decommissioning Solution	Reason For Selection						
Pipeline cooling spool protection structures will be recovered to shore. (The stabilising rock cover in place on the mud mats at the base of each structure will be relocated to facilitate this operation). The cooling spool protection structures will be recovered to shore for re-use, recycling, or disposal.	To leave a safe clear seabed and in compliance with regulatory requirements.						
Wells							
Devenick well S1 will be Plugged and Abandoned (P&A'd) using a MODU or well servicing vessel. in compliance with the TAQA 'Well Barrier Standard TUK-11-B-009', OGUK Guidelines for Suspension and Abandonment and other governing standards at the time of abandonment. If compliance with standards cannot be achieved, TAQA will adopt a risk-based approach in consultation with the relevant authorities. All seabed equipment and the top section of the well conductor will be removed to shore for appropriate reuse, recycling, or disposal. Following removal of the S1 well, the seabed will be surveyed for debris and depressions, etc., and any necessary remediation will be performed. Devenick well S2 and wellhead were removed in 2015 and 2017, respectively. There are a number of concrete "boulders" at the site of the S2 well. These will be used to remediate the void left by the removal of the wellhead or removed to shore for recycling or disposal as appropriate.	Meets TAQA standards and NSTA and HSE regulatory requirements.						
Drill Cuttings							

There are no drill cuttings in the scope of this decommissioning programme.

Interdependencies

The S1 and S2 cooling spool protection structure rock cover will be relocated to allow recovery of the cooling spool protection structures and the spools. Leaving the rock covered cooling spool protection structures in place is not appropriate due to their size and the consequent risk that they pose to other sea users.

The Devenick pipelines and umbilicals terminate on the East Brae platform. Decommissioning of the Devenick risers and the portions of the umbilicals attached to the East Brae jacket, and the pipelines and umbilicals on the seabed in proximity to the East Brae platform will be managed in conjunction with East Brae decommissioning. This will minimise risk, impacts on the environment and use of resources.



1.6 Field Locations Including Field Layouts and Adjacent Facilities

The location of the Devenick field within the UKCS and the adjacent facilities are shown in Figure 1.1. The facilities adjacent to Devenick are listed in Table 1.6.

Figure 1.2 shows the Devenick facilities layout in more detail. Devenick production is exported to East Brae in Block 16/03a in 116 m of water approximately 280 km north-east of Aberdeen.



Figure 1.1: Devenick Field Location within the UKCS







Table 1.6: Adj	acent Facilities	;			
Operator	Name	Туре	Distance/ Direction from Devenick	Information	Status
TAQA	Harding	Platform	13 km North Northwest	Oil and Gas Development	Operational
TAQA	East Brae	Platform	33 km South	Oil and Gas Development	Operational
TAQA	Braemar	Field	22km South Southwest	Oil & Gas Development	Operational
TAQA	Brae Alpha	Platform	24.9 km Southwest	Gas / Condensate Development	Operational
TAQA	Braemar Production Pipeline	Pipeline PL1969	Devenick Pipelines / Umbilicals cross this pipeline inside the East Brae platform 500 m zone.	Production Pipeline	Operational
TAQA	Braemar Umbilical	Umbilical PLU1970	Devenick Pipelines / Umbilicals cross this umbilical inside the East Brae platform 500 m zone.	Chemical & Control Umbilical	Operational



Table 1.6: Adjacent Facilities							
Operator	Name	Туре	Distance/ Direction from Devenick	Information	Status		
TAQA	Braemar SSIV Umbilical	Umbilical PLU1977	33 km South	SSIV umbilical	Operational		
Total	Tullich	Field	16 km North Northwest	Oil & Gas Development	Operational		
Total	Gryphon	FPSO	21km North	Oil & Gas Development	Operational		
Total	Maclure	Field	21km North	Oil & Gas Development	Operational		
Aker BP	Ivar Aasen	Platform	38.1 km East	Oil & Gas Development (Norwegian Sector)	Operational		
Equinor	Gudrun	Platform	12.9 km Southeast	Oil & Gas Development (Norwegian Sector)	Operational		
GASSCO	Utsira High	Pipeline PL3164	Crosses Devenick Pipelines / Umbilical ≈ 4 km south of Devenick Manifold	Gas Pipeline (Originates in Norwegian Sector)	Operational		
Century Link	AC1	Telecoms. Cable	Devenick Pipelines / Umbilical cross over this cable ≈ 17.5 km south of Devenick Manifold	Transatlantic cable.	Operational		
Aqua Comms	Havfrue / AEC-2	Telecoms. Cable	Crosses Devenick / Umbilical Pipelines ≈ 4.5 km south of Devenick Manifold	Transatlantic cable	Operational		
Deutsche Telekom AG	TAT10	Telecoms. Cable	Devenick Pipelines / Umbilical cross over this cable ≈ 22 km south of Devenick Manifold	Transatlantic cable	Disused		



Table 1.6: Adjacent Facilities								
Operator	Name	Туре	Distance/ Direction from Devenick	Information	Status			
Telia Carrier	TAT14	Telecoms. Cable	Devenick Pipelines / Umbilical cross over this cable ≈ 11.5 km south of Devenick Manifold	Transatlantic cable	Disused			

Impacts of Decommissioning Proposals

TAQA has been, and will continue to be, in contact with operators and owners of adjacent facilities. The are no known interactions between the adjacent facilities and the proposed Devenick decommissioning programmes, other than the East Brae platform and associated Braemar tie-back. Decommissioning of Devenick and East Brae are inextricably linked as East Brae provides the only export route for Devenick production.

The proposed "leave in place" solution for the buried pipelines and umbilical between the East Brae platform and the Devenick Manifold will not result in any disturbance to the AC1, TAT10 and TAT14 telecommunication cables crossed by the Devenick lines nor the Havfrue / AEC-2, and Utsira gas pipeline that cross the Devenick lines. Should survey identify any remediation works required around the telecommunication cables or Utsira gas pipeline, TAQA will contact the relevant owners or operators.

1.7 Industrial Implications

TAQA is developing the Devenick decommissioning contract and procurement strategy, on behalf of the Section 29 Notice Holders. TAQA envisages that this strategy may include using incumbent drilling contractors for well plug and abandonment activities.

Notwithstanding, TAQA has, and will continue to

- Publish Devenick decommissioning project information, including the project schedule, on the TAQA decommissioning <u>website</u>.
- Publish project information and contact details on the OGA Pathfinder website.
- Engage with the OGA and the decommissioning supply chain on issues relating to the Devenick decommissioning programme and schedule.
- Use the FPAL database as the primary source for establishing tender lists for contracts and purchases with a value of £250,000 or more.



2 Description of Items to be Decommissioned

2.1 Installations: Subsea Including Stabilisation Features

Key information regarding the Devenick subsea facilities is presented in Table 2.1.

Table 2.1: Subsea Installations							
ltem	Number	Size (m) [LxWxH]	Weight (tonne)	Lo	ocation	Comments / Status	
Wellheads		5.0.4.0		WGS84 Decimal	59.177 N 1.619 E	S1 wellhead, guide	
/ Xmas Trees	1	5.6 x 4.3 x 4.9	76.0	WGS84 Decimal Minute	59 10' 36.688" N 01 37' 09.904" E	Tigure 2.1)	
Manifold	1	14 x 8.5 x 6	242.0	WGS84 Decimal	59.169 N 1.600 E	The Manifold Structure includes various equipment inc. valves, subsea control modules, multi-phase flowmeter, distribution units and	
Mannolu	·	17 X 0.0 X 0	242.0	WGS84 Decimal Minute	59 10' 09.225" N 01 36' 00.957" E	control jumpers. The Manifold Structure is secured to the seabed by four foundation piles. (See Figure 2.3)	
SSIV	1	10.75 x 6.5 x 4.25	72.5	WGS84 Decimal	58.877 N 1.528 E	The SSIV structure is located within the East	
				WGS84 Decimal Minute	58 52' 38.803" N 01 31' 42.624" E	Brae Platform 500m zone. The SSIV structure is similar to, but smaller than, the Manifold structure shown in Figure 2.3.	
				WGS84 Decimal	59.177 N 1.619 E	S1 WHPS is secured to	
S1 WHPS	1	14 x 14 x 7	120.0	WGS84 Decimal Minute	59 10' 36.681" N 01 37' 09.904" E	foundation piles. (See Figure 2.1)	
S1				WGS84 Decimal	59.177 N 1.620 E	Part of Section S1 Cooling Spool	
Protection Frame Type A	1	15 x 5.2 x 2.5	40.0	WGS84 Decimal Minute	59 10' 37.006" N 01 37' 09.397" E	Protection Frame. This frame is protected by rock cover. (See Figure 2.2)	
S1				WGS84 Decimal	59.177 N 1.620 E	Part of Section S1 Cooling Spool	
Protection Frame Type B	1	15 x 5.2 x 2.5	35.0	WGS84 Decimal Minute	59 10' 37.307" N 01 37' 08.818" E	Protection Frame. This frame is protected by rock cover. (See Figure 2.2).	



Table 2.1: Subsea Installations

ltem	Number	Size (m) [LxWxH]	Weight (tonne)	Lo	ocation	Comments / Status
S1				WGS84 Decimal	59.177 N 1.620 E	Part of Section S1 Cooling Spool
Protection Frame Type C	1	15 x 5.2 x 2.5	32.5	WGS84 Decimal Minute	59 10' 37.654" N 01 37' 08.154" E	Protection Frame. This frame is protected by rock cover. (See Figure 2.2)
S1				WGS84 Decimal	59.177 N 1.619 E	Part of Section S1 Cooling Spool
Protection Frame Type D	1	18 x 3.9 x 1.5	28.0	WGS84 Decimal Minute	59 10' 38.032" N 01 37' 07.425" E	Protection Frame. This frame is protected by rock cover. (See Figure 2.2)
S2 Protection Frame Type A				WGS84 Decimal	59.163 N 1.618 E	Part of Section S2 Cooling Spool
	1	15 x 5.2 x 2.5	40.0	WGS84 Decimal Minute	59 09' 45.809" N 01 37' 04.710" E	Protection Frame. This frame is protected by rock cover. (See Figure 2.2)
S2	1			WGS84 Decimal	59.163 N 1.618 E	Part of Section S2 Cooling Spool
Protection Frame Type B		15 x 5.2 x 2.5	35.0	WGS84 Decimal Minute	59 09' 45.802" N 01 37' 04.040" E	Protection Frame. This frame is protected by rock cover. (See Figure 2.2)
S2				WGS84 Decimal	59.163 N 1.618 E	Part of Section S2 Cooling Spool
Protection Frame Type C	1	15 x 5.2 x 2.5	32.5	WGS84 Decimal Minute	59 09' 46.502" N 01 37' 03.343" E	Protection Frame. This frame is protected by rock cover. (See Figure 2.2)
S2				WGS84 Decimal	59.163 N 1.617 E	Part of Section S2 Cooling Spool
Protection Frame Type D	1	18 x 3.9 x 1.5	28.0	WGS84 Decimal Minute	59 09' 46.880" N 01 37' 02.621" E	 Protection Frame. This frame is protected by rock cover. (See Figure 2.2)

Table 2.2: Subsea Installations Stabilisation Features Weight Exposed / Buried / Stabilisation **Total Number** Locations Condition Feature (te) Exposed over & around Rock cover distributed At S1 Well cooling spool over 63m of protection cooling spool protection Rock Cover 1,600 protection frames frames frames Exposed over & around Rock cover distributed At S2 Well cooling spool Rock Cover over 63m of protection 1,700 cooling spool protection protection frames

frames

frames





Figure 2.1: Well 9/24b (S1) WHPS & Xmas Tree



Figure 2.2: Typical Cooling Spool Protection Structures at Approach to Well





Figure 2.3: Devenick Manifold

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2.2 Pipelines including Stabilisation Features

Table 2.3: Pipeline / Flowline / Umbilical Information									
Description	Pipeline Number	Diameter	Length (km)	Description of Component Parts	Product Conveyed	From – To	Burial Status	Pipeline Status	Current Contents
Production Pipeline	PL 2746	10"/16"	33.817	PIP – 16" Carbon steel outer, 10" 13%Cr inner, insulation between	Hydrocarbons	Devenick Manifold – East Brae Platform	Trenched and backfilled, with spot rock cover & rock cover at crossings 1, 2, 3.	Operational	Production Fluids & Chemicals
Methanol Pipeline	PL 2747	3"	33.804	Piggybacked to PL 2746	Methanol	East Brae Platform – Devenick Manifold	Trenched and backfilled, with spot rock cover & rock cover at crossings 1, 2, 3.	Out of Service	Methanol
S1 Production Pipeline	PL 2748	8"/14"	1.490	PIP – 14" Carbon steel outer, 8" 13%Cr inner, insulation between	Hydrocarbons	Well S1 – Devenick Manifold	Trenched and backfilled, with spot rock cover ^{1, 4.}	Operational	Production Fluids & Chemicals
S1 Methanol 2" Service Line	PL 2749	2"	1.490	Piggybacked to PL 2748	Methanol	Well S1 – Devenick Manifold	Trenched and backfilled, with spot rock cover ^{1, 4.}	Operational	Methanol
S2 Production Pipeline	PL 2750	8"/14"	1.279	PIP – 14" Carbon steel outer, 8" 13%Cr inner, insulation between	Methanol (No production since installation)	Well S2 – Devenick Manifold	Trenched and backfilled, with spot rock cover ^{1, 4.}	Out of Service (Never commissioned)	Treated sea water (S2 Well never produced)
S2 2" Service Line	PL 2751	2"	1.277	Piggybacked to PL 2750	Methanol	Well S2 – Devenick Manifold	Trenched and backfilled, with spot rock cover ^{1, 4.}	Out of Service (Never commissioned)	Treated sea water (S2 Well never produced)
Control Umbilical	PLU 2752	105mm	33.780	Composite Flexible	Chemicals & Power	East Brae Platform – Devenick Manifold	Trenched and backfilled, with spot rock cover & rock cover at crossings 1, 2, 3.	Operational	Methanol; & Hydraulic fluid, Combined Power/Signal Unscreened Twisted Quad, and fibre optic



Table 2.3: Pipeline / Flowline / Umbilical Information

Description	Pipeline Number	Diameter	Length (km)	Description of Component Parts	Product Conveyed	From – To	Burial Status	Pipeline Status	Current Contents
SSIV Control Umbilical	PLU 2753	71.3mm	0.5	Composite Flexible	Chemicals & Power	East Brae Platform – Devenick SSIV	Surface laid on seabed	Operational	Methanol & Hydraulic fluid, Signal Unscreened Twisted Quad
S1 Infield Control Umbilical	PLU 2754	98.6mm	1.510	Composite Flexible	Chemicals & Power	Devenick Manifold – Subsea Umbilical Termination	Trenched and backfilled, with spot rock cover ^{1, 4.}	Operational	Methanol, Scale Inhibitor & Hydraulic fluid, Combined Power / Signal Unscreened Twisted Quad
S2 Infield Umbilical	PLU 2755	115mm	1.390	Composite Flexible	Chemicals & Power	Devenick Manifold – Umbilical Termination Assembly	Trenched and backfilled, with spot rock cover ^{1, 4.}	Out of Service (Never commissioned)	Treated sea water (S2 Well never produced)

Notes:

1. All buried pipelines are buried to a depth of > 600 mm. This is subject to confirmation by a programme of ongoing surveys. Where the burial depth is less than 600 mm, TAQA will carry out remediation as necessary. Data from successive surveys indicate that the burial depths of Devenick pipelines and umbilicals are generally increasing over time [3].

2. PL2746, PL2747, and PLU2752 cross telecommunication cables AC1, TAT10 and TAT14, and are crossed by telecommunication cable Havfrue / AEC-2 and the Utsira High gas export pipeline. The crossings are all in the trenched and buried portions of the Devenick lines. At AC1, TAT10 and TAT14, the Devenick lines are not in trenches for \approx 200m. These crossings are extensively rock covered. The Havfrue / AEC-2 telecommunication cable and Utsira High pipeline cross the Devenick lines at a point where they are trenched and buried, and these crossings are also rock covered. The Devenick lines will be left in situ at all five crossings.

 Pipelines PL2746 and PL2747, and umbilical PLU2752 are trenched and buried over most of their length between East Brae platform and the Devenick manifold. At either end of these lines short sections are surface laid. In aggregate, approximately 1% of the length of each of these lines is surface laid.
 The infield lines PL2748, PL2749, PL2750, PL2751, PLU2754, and PLU 2755 are trenched and buried over most of their length between the Devenick manifold and the S1 and S2 well locations. At either end of these lines short sections are surface laid. In aggregate, approximately 15% of the length of each of these lines is surface laid.



Table 2.4: Subsea Pipeline / Flowline / Umbilical Stabilisation Features								
Stabilisation Feature	Total Number	Weight (te)	Locations	Exposed/Buried/Condition				
Concrete mattresses	67	4.7 each Total 314.9	Over PL2746 & Piggybacked PL2747 at East Brae Platform	Exposed on seabed				
Salt Sack/Grout Gabion	2	2 x Sack/gabion each containing 40 Grout Bags Total 80 x 25 kg Grout Bags = 2.0	Over PL2746 at East Brae Platform	Exposed on seabed				
Grout Bags	30	25kg each Total 0.75	Over PL2746 at East Brae Platform	Exposed on seabed				
Grout Bags	10	25kg each Total 0.25	Over PL2747 at East Brae Platform	Exposed on seabed				
Concrete mattresses	29	4.7 each Total 136.3	Over PL2746 & Piggybacked PL2747 at Manifold	Exposed on seabed				
Salt Sack/Grout Gabion	3	3 x Sack/gabion each containing 40 Grout Bags Total 120 x 25 kg Grout Bags = 3.0	Over PL2746 at Manifold	Exposed on seabed				
Rock	Spot Rock Cover	UHB = 33,000, Telecoms cable crossings (x 3) 16,300 Total 49,300	Over PL2746 and Piggybacked PL2747	Exposed on seabed				
Concrete mattresses	43	4.7 each Total 202.1	Over Control Umbilical PLU2752 at East Brae Platform	Exposed on seabed				
Rock	Spot Rock Cover	Telecoms cable crossings (x 3) Total 4,800	Over Control Umbilical PLU2752	Exposed on seabed				
Concrete mattresses	59	4.7 each Total 277.3	Over Control Umbilical PLU2752 at Devenick Manifold	Exposed on seabed				
Concrete mattresses	16	4.7 each Total 75.2	Over SSIV Control Umbilical PLU2753 at East Brae Platform to SSIV structure	Exposed on seabed				
Concrete mattresses	31	4.7 each Total 145.7	PL2748 & piggybacked PL2749 at Manifold	Exposed on seabed				

BRAE AREA DEVENICK SUBSEA FACILITIES DECOMMISSIONING PROGRAMME



Table 2.4: Subsea P	ipeline / Flowline /	Umbilical Stabilisation	Features
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Stabilisation Feature	Total Number	Weight (te)	Locations	Exposed/Buried/Condition
Rock	Spot Rock Cover	UHB Total 7,600	PL2748 & piggybacked PL2749	Exposed on seabed
Concrete mattresses	33	4.7 each Total = 155.1	PL2748 & piggybacked PL2749 at Well S1	Exposed on seabed
Concrete mattresses	17	4.7 each Total 79.9	S1 Well Control Umbilical PLU2754 at Manifold	Exposed on seabed
Concrete mattresses	48	4.7 each Total 225.6	S1 Well Control Umbilical PLU2754 at Well S1	Exposed on seabed
Concrete mattresses	24	4.7 each Total 112.8	PL2750 & piggybacked PL2751 at Manifold	Exposed on seabed
Rock	Spot Rock Cover	UHB Total 7,600	PL2750 & piggybacked PL2751	Exposed on seabed
Concrete mattresses	30	4.7 each Total 141.0	PL2750 & piggybacked PL2751 at Well S2	Exposed on seabed
Grout Bags	60	25 kg Each Total 1.5	PL2750 & piggybacked PL2751 at Well S2 end of cooling spool protection structure	Exposed on seabed
Grout Bags	480	25 kg Each Total 12.0	PL2750 & piggybacked PL2751 at Well S2 end of cooling spool protection structure	Exposed on seabed
Concrete mattresses	20	4.7 each Total 94.0	S2 Well Control Umbilical PLU2755 at Manifold	Exposed on seabed
Concrete mattresses	58	4.7 each Total 272.6	S2 Well Control Umbilical PLU2755 at Well S2	Exposed on seabed

The total quantities of pipeline stabilisation features are:

Mattresses: Total number = 475. Total weight = 2232.5 te

Grout Bags: Total number = 780. Total weight = 19.5 te

Rock cover: Total weight = 69300 te (N.B. The installation of the Utsira High pipeline and Havfrue / AEC-2 telecommunication cable postdate the installation of the Devenick facilities. Any rock cover placed at the Utsira High and Havfrue / AEC-02 crossings over the Devenick facilities is therefore part of these later developments and is outside the scope of this decommissioning programme).



2.2.1 **Pipeline and Umbilical Risers**

There are four Devenick lines that terminate at the East Brae platform;

- PL2746 10" Production Pipeline
- PL2747 3" Methanol Pipeline
- PLU2752 Main Umbilical
- PLU2753 SSIV Umbilical

The pipelines run up the side of the East Brae jacket as "risers" in a riser caisson and terminate on the platform topsides. Similarly, the Devenick umbilicals run up the jacket in a caisson and terminate on the platform topsides.

The Devenick topsides equipment will be removed to shore for reuse, recycling, or disposal in conjunction with the platform topsides. The lengths of riser and umbilical attached to the platform upper jacket will be removed to shore for reuse, recycling, or disposal in conjunction with the upper jacket. The lengths of riser and umbilical attached to the platform footings will be removed with the footings or left in place with the footings, dependent on whether derogation is obtained to leave the footings in place.

2.3 Wells

Table 2.5 lists the well information pertinent to the S1 well covered by this decommissioningprogramme.The Devenick E&A well and S2 production well were decommissioned in 2017.

Table 2.5: Well Informatio	n		
Subsea Wells	Designation	Status	Category of Well
9/24b-4 (S1)	Gas Condensate Producing	Live	SS3

2.4 Drill Cuttings Piles

There are no drill cuttings piles associated with the Devenick Field.

2.5 Inventory Estimates

The approximate amounts of key materials that make-up the Devenick subsea facilities have been evaluated. A focused review of the inventories of materials will be conducted during the detailed engineering phase of decommissioning.

A summary of the material inventories for Devenick is presented in Table 2.6 to Table 2.9 and in Figure 2.4 to Figure 2.7. The inventories are described in section 2.5 of the Environmental Appraisal [3].

The anticipated quantities of marine growth associated with the Devenick facilities are very small as most of the facilities are on the seabed in a water depth of over 100m. Marine growth may be encountered on the Devenick risers. However, these will be treated as part of the East Brae jacket decommissioning.



Table 2.6: Devenick Subsea installations inventory including Stabilisation Materials				
Material	Weight (tonnes)	% of Total		
Carbon Steel	426.63	10.7		
Alloy	130.17	3.3		
Inconel	2.09	0.1		
Duplex	100.13	2.5		
Aluminium	3.34	0.1		
Plastics	5.42	0.1		
Paint	3.34	0.1		
Other	0.83	0.02		
Barium Ba133 10mCi ¹	0.001	0.00		
Rock Cover	3300	83		
Total	3972	100		

Note 1: The Barium Ba133 is present in a sealed source used for density measurement.



Installations Inc Stabilisation Materials Total Weight = 3,972 te



Table 2.7: Devenick Subsea Installations Material Inventory Excluding Stabilisation Materials

Material	Weight (tonnes)	% of Total
Carbon Steel	426.63	63
Alloy	130.17	19.4
Inconel	2.09	0.3
Duplex	100.13	14.9
Aluminium	3.34	0.5
Plastics	5.42	0.8
Paint	3.34	0.5
Other	0.83	0.1
Barium Ba133 10mCi	0.001	0.00
Total	672	100

Installations Exc. Stabilisation Materials Total Weight = 671 te



Figure 2.5: Subsea Installations Inventory – Excluding Stabilisation Materials



Table 2.8: Devenick Pipelines, etc., Inventory Including Stabilisation Materials				
Material	Weight (tonnes)	% of Total		
Carbon Steel	8342	9.71		
Duplex	5567	6.48		
Other	430	0.50		
Aerogel	34	0.04		
Concrete Mattresses	2234	2.60		
Grout Bags	19.5	0.02		
Rock Cover	69,297	80.65		
Total	85,923.524	100		



Figure 2.6: Pipelines, etc., Inventory – Including Stabilisation Materials



Table 2.9: Devenick Pipelines, etc. Inventory Excluding Stabilisation Materials				
Material	Weight (tonnes)	% of Total		
Carbon Steel	8342	58.06		
Duplex	5567	38.71		
Other	429	2.99		
Aerogel	34	0.23		
Total	14373	100		

Pipelines Exc Stabilisation Materials Total Weight = 14373 te



Figure 2.7: Pipelines Inventory – Excluding Stabilisation Materials



3 Removal and Disposal Methods

TAQA will implement a Materials Management Plan to identify and quantify available disposal options for materials resulting from the decommissioning activities. The plan will detail the disposal route for recovered structures and equipment, and their materials and contents.

It is the intent that, where possible, materials and equipment will be re-used or recycled. Materials management options will take account of the materials and waste hierarchy, with reduction in volume of waste being the preferred option. Existing materials and waste disposal routes and contractors will be used where possible.

3.1 Subsea Installations and Stabilisation Features

The options considered for the disposal of the subsea installations and stabilisation features and the selected disposal route are listed in Table 3.1.

Table 3.1: Subsea Installations and Stabilisation Features				
Installation / Feature	No.	Option	Disposal Route	
Xmas Trees	1	Full recovery as part of MODU campaign to P&A S1 Well	Return to shore for reuse or recycling	
Wellheads	1	Full recovery to -3 m below seabed as part of MODU campaign to P&A S1 Well	Return to shore for reuse or recycling	
S1 WHPS and associated foundation piles	1	Full recovery to -3 m below seabed	Return to shore for reuse or recycling	
Manifold and associated foundation piles	1	Full recovery to -3 m below seabed	Return to shore for reuse or recycling	
SSIV Structure	1	Full recovery	Return to shore for reuse or recycling	
S1 Cooling Spool Protection Frames	4	Full recovery	Return to shore for reuse or recycling	
S1 Cooling Spool Protection Frame Rock Cover	1,600 (te)	Make safe and leave in- situ	N/A	
S2 Cooling Spool Protection Frames	4	Full recovery	Return to shore for reuse or recycling	
S2 Cooling Spool Protection Frame Rock Cover	1,700 (te)	Make safe and leave in- situ	N/A	

3.2 Pipelines

TAQA conducted a CA (Comparative Assessment) of the decommissioning options for the Devenick facilities including pipelines and umbilicals [4]. Available decommissioning options are listed in Table 3.2, the options considered by the CA are listed in Table 3.3 and the conclusions are presented in Table 3.4.



Table 3.2: Pipeline Decommissioning Options

Key to Options

1.	Remove - reverse reeling	2.	Remove - Reverse 'S' lay	3.	Trench and Bury
4.	Full Removal	5.	Remedial Trenching	6.	Partial Removal
7.	Leave in place	8.	Section Cut and Removal	9.	Remedial Rock-Dump

Table 3.3: Pipeline or Pipeline Group Decommissioning Options Considered

Pipeline or Group	Condition of Line / Group	Whole or Part of Pipeline/Group	Decommissioning. Options Considered
	Surface laid	Part (exposed ends)	3, 4, 6, 7, 9
PL 2746, PL 2747	Trenched and backfilled	Part	3, 4, 5, 6, 7
	Surface Laid & Rock Covered	Part (Crossings)	3, 4, 6, 7
0740 01 0740	Surface laid	Part (exposed ends)	3, 4, 6, 7, 9
PL 2740, PL 2749	Trenched and backfilled	Part	3, 4, 5, 6, 7
PL 2750, PL 2751	Surface laid	Part (exposed ends)	3, 4, 6, 7, 9
	Trenched and backfilled	Part	3, 4, 5, 6, 7
	Surface laid	Part (exposed ends)	3, 4, 6, 7
PLU 2752	Trenched and backfilled	Part	4, 6, 7
	Surface Laid & Rock Covered	Part (Crossings)	4, 6, 7
PLU 2753	Surface laid	Whole	3, 4, 6, 7
PLU 2754	Surface laid	Part (exposed ends)	3, 4, 6, 7
	Trenched and backfilled	Part	4, 6, 7
DI 11 0755	Surface laid	Part (exposed ends)	3, 4, 6, 7
PLU 2755	Trenched and backfilled	Part	4, 6, 7



Table 3.4: Pipelii	ne or Pipeline Group Decomm	issioning Options Select	ted
Pipeline or Group	Condition of Line / Group	Whole or Part of Pipeline/Group	Decommissioning. Options Selected
	Surface laid	Part (portions of pipelines at the East Brae Platform and Devenick Manifold are surface laid)	4 – Removal to shore for recycling or disposal ¹
PL 2746, PL 2747	Trenched and backfilled	Part (majority of length of these lines (approximately 99%) is trenched and backfilled)	7 – Leave in place ²
	Surface Laid & Rock Covered	Part (Crossings)	7 – Leave in place
	Surface laid	Part (portions of pipelines at the Devenick Manifold and S1 well are surface laid)	4 – Removal to shore for recycling or disposal
PL 2748, PL 2749	Trenched and backfilled	Part (majority of length of these lines (approximately 85%) is trenched and backfilled)	7 – Leave in place ²
PL 2750, PL 2751	Surface laid	Part (portions of pipelines at the Devenick Manifold and S2 well location are surface laid)	4 – Removal to shore for recycling or disposal
	Trenched and backfilled	Part (majority of length of these lines (approximately 85%) is trenched and backfilled)	7 – Leave in place ²
PLU 2752	Surface laid	Part (portions of pipelines at the East Brae Platform and Devenick Manifold are surface laid)	4 – Removal to shore for recycling or disposal ¹
	Trenched and backfilled	Part (majority of length of these lines (approximately 99%) is trenched and backfilled)	7 – Leave in place ²
	Surface Laid & Rock Covered	Part (Crossings)	7 – Leave in place
PLU 2753	Surface laid	Whole	4 – Removal to shore for recycling or disposal ¹
PLU 2754	Surface laid	Part (portions of pipelines at the Devenick Manifold and S1 well are surface laid)	4 – Removal to shore for recycling or disposal
	Trenched and backfilled	Part (majority of length of these lines (approximately 85%) is trenched and buried)	7 – Leave in place ²



Table 3.4. Fipeline of Fipeline Group Decommissioning Options Selected					
Pipeline or Group	Condition of Line / Group	Whole or Part of Pipeline/Group	Decommissioning. Options Selected		
PLU 2755	Surface laid	Part (portions of pipelines at the Devenick Manifold and S1 well location are surface laid)	4 – Removal to shore for recycling or disposal		
	Trenched and backfilled	Part (majority of length of these lines (approximately 85%) is trenched and buried)	7 – Leave in place ²		

Table 3.4: Pipeline or Pipeline Group Decommissioning Options Selected

Table 3.4 Notes:

1 Small sections of surface laid lines in close proximity to the East Brae jacket/sub-structure footings may be left in place if derogation is granted to leave the footings in place. If derogation is not granted for the footings, then these surface laid portions will be removed.

2 Any exposures or spans in buried lines will be remediated as part of the decommissioning process.

3.3 Pipeline Stabilisation Features

Table 3.5: Pipeline Stabilisation Features Disposal Route					
Stabilisation Features	Number	Option	Disposal Route		
Concrete Mattresses	475	Full recovery at end of field life. (If practical difficulties are encountered, TAQA will consult with OPRED to agree an alternative approach).	Returned to shore for recycling or disposal to landfill.		
Grout Bags	780	Full recovery at end of field life. (If practical difficulties are encountered, TAQA will consult with OPRED to agree an alternative approach)	Recycled offshore or returned to shore for recycling or disposal to landfill.		
Rock Cover	69,300 te	Make safe and leave in-situ	Leave in Situ		

3.4 Wells

Table 3.6: Wells Decommissioning Options

The Devenick S1 well, 9/24b-4, will be plugged and abandoned in compliance with Oil and Gas UK Guidelines for the suspension and abandonment of wells.

Operations will be supported by appropriate regulatory applications and submissions.

(Wells 9/29a-2Z (S2) and 9/29a-1 (Exploration and & Appraisal) have previously been plugged and abandoned).



3.5 Materials and Waste Streams

Table 3.7: Materials and Waste Streams			
Materials	Removal and Disposal Method		
Bulk Liquids	Pipelines and umbilicals will be flushed and cleaned to facilitate abandonment scopes utilising East Brae topsides facilities. Any discharges offshore will be managed, and risk assessed under the existing permitting regime. Any effluent shipped to shore will be treated and disposed of according to relevant regulations and guidance.		
Marine Growth	Marine growth is only anticipated on the PL2746, PL2747 and PLU2752 risers at the East Brae platform. These risers will form part of the East Brae jacket decommissioning scope. Marine growth is not anticipated on any of the other Devenick equipment. If Marine growth is present, it will be disposed of in accordance with relevant regulations and guidance, either offshore under marine licence, or onshore.		
NORM	NORM is not anticipated. However, monitoring and sampling will be carried out to verify the absence of NORM. If it is identified, it will be contained and treated in accordance with relevant regulations and circumstances.		
Asbestos	No asbestos materials are anticipated. However, if asbestos containing materials are found they will be recovered to shore and disposed of appropriately.		
Other Hazardous Materials	Any other hazardous materials will be disposed of in accordance with relevant regulations and guidance.		
Onshore Dismantling Sites	The removal contractor will use appropriately licenced dismantling and disposal sites. TAQA will ensure that the removal contractor and selected site has proven ability to manage waste streams throughout the deconstruction process. The process will follow the "reduce, reuse, recycle" paradigm. TAQA will conduct assurance activities of the dismantling yard(s) and disposal site(s) to confirm that they are compliant with applicable legislation.		

Table 3.8: Inventory DispositionTable 3.8: Inventory DispositionTotal Inventory
Tonnage (te)Planned Tonnage to
Shore (te)Planned Tonnage Left
in Situ (te)Subsea Installations3,9726723,3001Pipelines / Umbilicals85,9132,35983,554

Notes:

1 The weight of material left in situ solely consists of rock cover.

Total inventory weights noted are approximate and include the S1 Xmas tree and all stabilisation features, including rock cover materials. It is TAQA's intention to maximise re-use or recycling of recovered inventory.



4 Environmental Appraisal Overview

4.1 Environmental Sensitivities

The environmental sensitivities in the Brae Area are summarised in Table 4.1. The impacts of decommissioning operations on these sensitivities are listed in Table 4.1. Further details can be found in the supporting Devenick Environmental Appraisal [3].

Table 4.1: Environmental Sensitivities			
Environmental Receptor	Main Feature		
Conservation Interests	The Braemar Pockmarks Special Area of Conservation (SAC) is located 1.5 km west of the Devenick pipeline. Low abundances of ocean quahog were identified at Devenick and other nearby fields therefore it is expected that small numbers may be present along the pipelines. However, the area is not expected to be of high importance for this species. The OSPAR habitat 'seapens and burrowing megafauna communities' could also be present along the pipeline route.		
Seabed	Sediments at Devenick comprise well sorted medium to dense silty sand. The benthic communities can be described as typical of the region and are characterised by polychaete worms, bivalve molluscs, and brittle stars, as well as occasional amphipods.		
Fish	Several fish species use the area for spawning and/or nursery grounds; these include saithe, cod, mackerel, haddock, Norway pout, Norway lobster, blue whiting, European hake, common ling sandeel, spotted ray and whiting.		
Fisheries	The Devenick infrastructure is in ICES rectangles 47F1 and 46F1. Commercial fishing is dominated by demersal fisheries with trawls the dominant gear type used. Seine nets and traps are also used in the area. Fishing effort is observed throughout the year and in 2019, fishing effort amounted to 329 days and 403 days in ICES rectangles 47F1 and 46F1 respectively.		
Marine Mammals	Harbour porpoise, Atlantic white-sided dolphin, killer whale, white-beaked dolphin and minke whale have all been recorded in the vicinity of the Devenick Field. Grey and harbour seals may also be encountered in the area.		
Birds	The Devenick area is located within, or in the vicinity of, a wider area of aggregation for little auk during the winter months. However, during the breeding season, the densities of breeding birds are low. Species include northern fulmar, common guillemot, northern gannet, lesser black-backed gull Atlantic puffin, black-legged kittiwake, herring gull, razorbill, great skua, common gull and Arctic skua. Overall, seabird sensitivity to oil pollution in the region of the Devenick infrastructure is considered low from June to September/October but high to extremely high from January to May (except for March).		
Onshore Communities	Onshore communities are potentially sensitive to disturbance from cleaning, dismantling and disposal activities. An onshore decommissioning facility will be selected that complies with all regulatory requirements to ensure that potential impacts are appropriately controlled.		
Other Users of the sea	The level of shipping activity is considered low or very low in the area. There are no charted Military Practice and Exercise Areas in the vicinity. There are no renewable energy developments within 40 km of the Devenick Field. The Devenick pipelines and umbilical from the manifold to the East Brae platform cross three telecommunication cables, AC1 is operational, TAT10 and TAT 14 are no longer in operation. All these crossings are extensively rock dumped. The Devenick lines are crossed by the Havfrue / AEC-2 telecommunication cable and the Utsira High gas export pipeline. These crossings are at locations where the Devenick lines are trenched and buried. The Havfrue cable and Utsira High pipeline are both operational. Decommissioning the Devenick facilities will have no impact on the telecommunication cables or the Utsira High pipeline.		



Table 4.1: Environmental Sensitivities		
Environmental Receptor	Main Feature	
Atmosphere	The primary source of atmospheric emissions will be from vessel activity during decommissioning however this will be localised and short term.	

4.2 Potential Environmental Impacts and their Management

The Environmental Appraisal [3] (EA) process has considered the potential for significant environmental effects as a result of the decommissioning activities described within this decommissioning programme. The appraisal has not identified any significant residual environmental impacts and it is anticipated that any physical, biological or socio-economic impact during the decommissioning activities will be negligible and short term.

Table 4.2 details the potential environmental impacts and the management and mitigation measures that will be put in place to further reduce the potential for environmental effects.

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Table 4.2: Environmental Impacts and Management		
Activity	Main impacts	Management
Subsea installation removal (including stabilisation materials)	Seabed disturbance impacts from excavation and removal of subsea installations and associated stabilisation materials.	 Impacts to the seabed from project activities have been assessed fully in the EA [3] The following mitigation measures are proposed to minimise impacts: Currently it is envisaged that all vessels undertaking the decommissioning and removal works would be dynamically positioned vessels. As a result, there will be no direct interaction between vessel positioning and the seabed. All activities which may lead to seabed disturbance will be planned, managed and implemented in such a way that disturbance is minimised. Activities will be risk assessed and permitted under a Marine Licence. A debris survey will be undertaken at the completion of the decommissioning activities. Any debris identified as resulting from oil and gas activities will be recovered from the seabed where possible. Any remedial rock armour will be placed to reduce unnecessary spreading of the rock footprint and ensure the minimum safe quantity or rock is used. Clear seabed verification will ensure there is no residual risk to other sea users. Non-intrusive verification techniques will be considered in the first instance and in agreement with OPRED and fishing bodies.

Table 4.2: Environmental Impacts and Management			
Activity	Main impacts	Management	
Decommissioning surface laid flowlines (including stabilisation materials)	Seabed disturbance impacts from excavation and removal of subsea installations and associated stabilisation materials.	 Impacts to the seabed from project activities have been assessed fully in the EA [3] The following mitigation measures are proposed to minimise impacts: Currently it is envisaged that all vessels undertaking the decommissioning and removal works would be dynamically positioned vessels. As a result, there will be no direct interaction between vessel positioning and the seabed. All activities which may lead to seabed disturbance will be planned, managed and implemented in such a way that disturbance is minimised. Activities will be risk assessed and permitted under a Marine Licence. Careful planning, selection of equipment, management and implementation of activities. Any debris identified as resulting from oil and gas activities will be recovered from the seabed where possible. Any remedial rock armour will be placed by a fall pipe vessel equipped with an underwater camera on the fall pipe. This will ensure accurate placement of the rock armour and reducing unnecessary spreading of the rock armour footprint and ensuring that minimum safe quantity or rock is used; and Clear seabed verification will ensure there is no residual risk to other sea users. Non-intrusive verification techniques will be considered in the first instance and in agreement with OPRED and fishing bodies. 	

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Table 4.2: Environmental Impacts and Management			
Activity	Main impacts	Management	
Decommissioning buried flowlines (including stabilisation materials)	Seabed disturbance impacts from excavation and removal of subsea installations and associated stabilisation materials. Snagging risk to commercial fisheries associated with pipelines decommissioned <i>in situ</i> .	 The following mitigation measures are proposed to minimise impacts: All activities which may lead to seabed disturbance will be planned, managed and implemented in such a way that disturbance is minimised. Currently it is envisaged that all vessels undertaking the decommissioning and removal works would be dynamically positioned vessels. As a result, there will be no direct interaction between vessel positioning and the seabed. Activities will be risk assessed and permitted under a Marine Licence. Pipelines will be cleaned and flushed prior to decommissioning. Any residual discharges during decommissioning activities will be risk assessed under the existing permitting regime. A debris survey will be undertaken at the completion of the decommissioning activities. Any debris identified as resulting from oil and gas activities will be recovered from the seabed where possible. Any exposures or cut pipeline ends will undergo rock placement to ensure they are overtrawlable to active fishing gears. Any remedial rock armour will be placed to reduce unnecessary spreading of the rock footprint and ensure the minimum safe quantity or rock is used. Clear seabed verification will ensure there is no residual risk to other sea users. Non-intrusive verification techniques will be considered in the first instance and in agreement with OPRED and fishing bodies. Admiralty charts and the FishSAFE system will be updated. TAQA will monitor the seabed to assess any seabed depressions or clay berms which may present a snag risk. Post-decommissioning monitoring will be undertaken at a frequency agreed with OPRED. 	



5 Interested Party Consultations

The Brae Operator consulted a wide range of interested parties during the planning and preparation stages of the Brae Area subsea comparative assessment process. Workshops and individual consultations with stakeholders were held to describe the CA process, to invite feedback and to understand stakeholder's particular interests regarding the impacts of decommissioning. Following this, a toolkit listing recommended decommissioning options for subsea infrastructure was developed.

The consultees included:

- BEIS Environmental Management Team
- BEIS Offshore Decommissioning Unit
- Health and Safety Executive
- Greenpeace
- Joint Nature Conservation Committee
- Marine Scotland
- National Federation of Fishermen's Organisations
- Scottish Environment Protection Authority
- Scottish Fishermen's Federation

Given that Devenick is tied-back to the East Brae platform, the principles and recommendations from this CA have been applied to Devenick [3].

This Decommissioning Programme is still to be considered by the stakeholders. Following completion of the formal Decommissioning Programme consultation process, TAQA will complete Table 5.1 with comments received from stakeholders, and the company's responses.

Table5.1: Summary of Stakeholder Comments		
UK		
Stakeholder	Comment	Response
The National Federation of Fishermen's Organisations		
Scottish Fishermen's Federation		
Northern Irish Fish Producers' Organisation		
Global Marine Systems Limited		
Public		



6 Programme Management

6.1 Project Management and Verification

TAQA, on behalf of the Section 29 Notice Holders, has appointed a project management team to manage the planning and execution of this decommissioning programme. The team will ensure that decommissioning is conducted in accordance with TAQA health, environmental and safety management principles, and relevant legislation. TAQA's management principles will govern operational controls, hazard identification and risk management. The work will be coordinated with due regard to interfaces with other operators' oil and gas assets and with other users of the sea.

TAQA will control and manage the progress of all permits, licences, authorisations, notices, consents, and consultations required. Any significant changes to the decommissioning programmes will be discussed and agreed with OPRED.

6.2 Post-decommissioning Debris Clearance and Verification

A post-decommissioning site survey will be carried out within a 500m radius of the Devenick subsea installations sites and along corridors defined as 50 m either side of each pipeline route. Any oilfield-related seabed debris that is found will be recovered and returned to shore for recycling or appropriate disposal.

Following P&A of well S2 in 2017, debris remained at the S2 well site. This debris will be surveyed and cleared as part of Phase 3 of the Devenick decommissioning works.

Independent verification of the state of the seabed will be obtained by non-intrusive methods, e.g., side-scan SONAR, in the first instance, or trawling within the area around the Devenick facilities as appropriate. Following verification, TAQA will issue a statement of clearance to all relevant governmental departments and non-governmental organisations.

The post-decommissioning survey results will be notified to the UK Fisheries Offshore Oil and Gas Legacy Trust Fund Ltd for inclusion in their FishSAFE system, and to the United Kingdom Hydrographic Office for notification and marking on Admiralty charts and notices to mariners.

6.3 Schedule

The main milestones in the Devenick decommissioning process were, or are anticipated to be:

•	S2 well plug and abandon:	2017
•	E & A well plug and abandon:	2017
•	Devenick cessation of production:	2022 ¹
•	S1 well plug and abandon window:	2025 - 2028
•	Devenick subsea installation & pipeline removal:	2028 - 2030
•	Post removal survey:	2030

Note 1: The Cop Application states no earlier than 1st January 2022, however actual CoP is expected to be 2024.

This schedule may change to maximise economic recovery, or to exploit opportunities to minimise decommissioning impacts by combining Brae Area decommissioning activities into campaigns, or by combining Brae Area decommissioning operations with third-party decommissioning. The envisaged Devenick decommissioning programme is illustrated in Figure 6.1.







6.4 Long Term Facilities Management

Decommissioning of the Brae Area facilities will take place over an extended period. Throughout this period, the assets and infrastructure will be in various stages of dismantlement and remediation. At all times, the facilities will be maintained to a standard that enables completion of the programmes safely and in compliance with regulations and TAQA's corporate standards.

6.5 Costs

TAQA has used the Oil and Gas UK work breakdown structure presented in Table 6.1 to develop cost estimates for the Devenick decommissioning programmes. The provisional estimated costs have been provided to OPRED in confidence.

Table 6.1: Provisional Decommissioning Costs	
Item	Estimated Cost (£MM)
WBS 1 - Project Management	-
WBS 2 – Post CoP OPEX	-
WBS 3 – Well Abandonment	-
WBS 4 – Facilities & Pipelines Permanent Isolation & Cleaning	-
WBS 5 – Topsides Preparation	-
WBS 6 – Topsides Removal	-
WBS 7 – Substructure Removal	-
WBS 8 – Onshore Recycling	-
WBS 9 – Subsea Infrastructure	-
WBS 10 – Site Remediation	-
WBS 11 – Monitoring	-



6.6 Close Out

A close out report will be submitted to OPRED within twelve months of the completion of the offshore decommissioning scopes and disposal. Any variances from the approved decommissioning programmes will be explained in the close out report.

6.7 Post-Decommissioning Monitoring and Evaluations

TAQA will carry out a post-decommissioning environmental seabed survey, centred around the sites of the Devenick facilities.

All Devenick sites will be the subject of surveys when decommissioning activity has concluded. A survey of the condition of these areas and the adjacent seabed will also be undertaken at the end of the removal activities. The facilities that are proposed to be left in place, i.e., buried pipelines and equipment in close proximity to the East Brae jacket/sub-structure will be subject to a monitoring programme to be agreed between TAQA and OPRED.

A copy of the survey results will be forwarded to OPRED. After the survey results have been sent to OPRED and reviewed, a post decommissioning survey regime will be agreed between TAQA and OPRED taking account of ongoing liability, the findings of previous surveys, and a risk-based approach to the frequency and scope of subsequent surveys.

6.8 Management of Residual Liability

Any equipment that is left in place will remain the property and responsibility of the Devenick parties to the decommissioning programme.

TAQA recognises that the parties to the programme will continue to retain ownership of, and residual liability for, the infrastructure left in situ after decommissioning.

TAQA will engage with OPRED on all future legacy and liability matters and requirements relating to the infrastructure left in place.



7 Supporting Documents

- [1] Guidance Notes Decommissioning of Offshore Oil and Gas Installations and Pipelines November 2018, BEIS
- [2] Devenick S2 Technical Close Out Summary, Issue 3, TAQA, April 2021.
- [3] Devenick Environmental Appraisal (77IFS-175422-H99-0002-000)
- [4] Brae Area Devenick Subsea Equipment CA and Selected Decommissioning Options, TAQA, 9000-TAQ-99-SU-RT-00001-000, Revision 1, March 2022



8 Section 29 Holders' Letters of Support

Letters of Support will be obtained from the Section 29 Holders on final approval of the Decommissioning Programme, in advance of CoP and full field decommissioning, and will be provided within this section of the Programme.



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