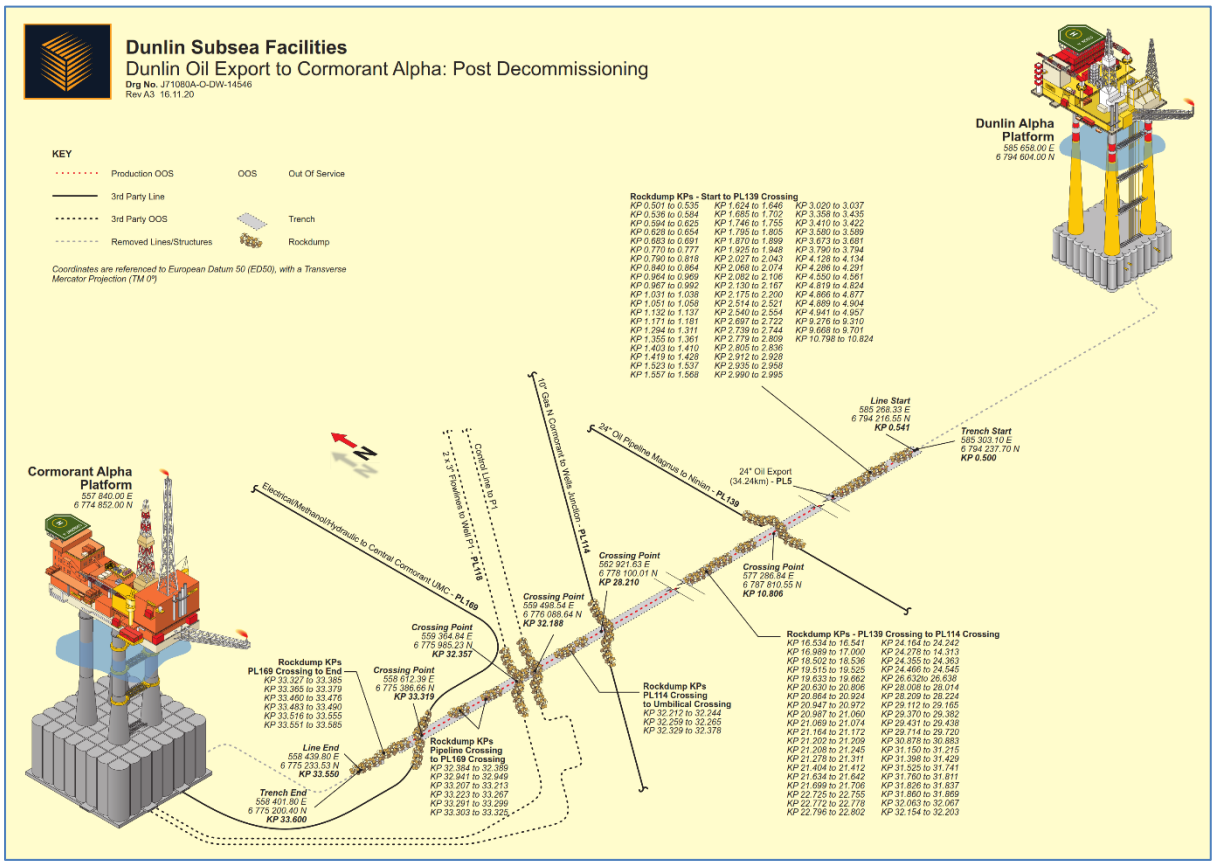
Fairfield Betula Limited

Dunlin Alpha to Cormorant Alpha Pipeline (PL5) Decommissioning Programme

Regulatory Close Out Report



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APPROVALS

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Terms and Abbreviations

Term	Meaning
BEIS	Department of Business, Energy and Industrial Strategy
CGBS	Concrete Gravity Base Substructure
CA	Comparative Assessment
COP	Cessation of Production
COR	Close Out Report
CSV	Construction Support Vessel
DFGI	Dunlin Fuel Gas Import
DP	Decommissioning Programme
DPI	Dunlin Power Import
EMT	Environmental Management Team (OPRED)
FBL	Fairfield Betula Limited
FEL	Fairfield Energy Limited
HS&E	Health, Safety and Environment
MER	Maximising Economic Recovery
N/A	Non Applicable
ODU	Offshore Decommissioning Unit (OPRED)
OGA	Oil and Gas Authority
OGUK	Oil and Gas UK
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
P&A	Plug and Abandonment
PL	Pipeline
PON	Petroleum Operations Notice
PWA	Pipeline Works Authorisation
ROGI	Report of an Oil and Gas Incident
ROV	Remotely Operated Vehicle
SEPA	Scottish Environment Protection Agency
SSIV	Subsea Isolation Valve
t	Tonne (1000 kg)

1 Summary

1.1 Summary of Decommissioning Programme

The PL5 infrastructure Decommissioning Programme (FBL-DUN-DUNA-HSE-01-PLN-00004) was approved on the 3rd July 2019. A summary of the decommissioned infrastructure is outlined below.

The Greater Dunlin Area consists of the Dunlin, Dunlin South West, Osprey and Merlin Fields, located in the Shetland Basin of the northern North Sea. The Dunlin Alpha platform served as the production facility for the Greater Dunlin Area and is located in block 211/23a, approximately 137 km north east of Scotland and 11 km from the UK / Norwegian median line, in a water depth of 151 m.

Pipeline PL5 is a rigid 34.2 km concrete-clad 24" diameter pipeline. Installed in 1975, PL5 historically transported stabilised production fluids from Thistle Alpha, Murchison and the Greater Dunlin Area into the Brent Pipeline System at Cormorant Alpha. Termination of Production from the Greater Dunlin Area was announced in May 2015, having Maximised Economic Recovery (MER) from these oilfields. Termination of Production was agreed with the Oil & Gas Authority (OGA) on 9th July 2015, with Cessation of Production (COP) on 15th June 2015, confirmed by letter dated 15th January 2016. Following COP of the Greater Dunlin Area, PL5 continued to transport fluids from Thistle Alpha until it was taken out of service in June 2019.

In accordance with the approved Decommissioning Programme, the surface laid ends of the pipeline have been cut and removed for recycling, leaving the remainder largely trenched below mean seabed level. Rock cover has been applied at the cut locations of the exposed pipeline ends and identified areas of spanning or crowning in order to mitigate against potential snagging hazards. Partially buried concrete mattresses have also been removed, together with the anode skids and spools at either end of PL5 at the Dunlin Alpha platform and Cormorant Alpha platform.

Buried deposits consisting of concrete mattresses and grout bags that continue to provide pipeline stability to protect against movement and spans have been decommissioned *in situ* and rock coverage has been applied to prevent snagging hazards. Oilfield debris within the pipeline corridor has also been recovered as part of debris clearance operations.

Table 1-1: Overview of the Decommissioned Installation(s)		
Subsea Installations	**Quantity**	
Wells	n/a	
Associated Cuttings Pile(s)	*n/a*	
Other	**Estimated Quantity**	**Actual Removed[1]**
Anode Skids	2	3
Stabilisation Features[2]	**Estimated Quantity**	**Actual Removed**
Concrete Mattresses	17 (8 off partially buried and 9 off buried)	8
Grout Bags	4,340	0
Sand Bags	n/a	n/a

Table 1-2: Decommissioned Pipelines & Controls Umbilicals				
Item being Decommissioned	**Components**	**Total length (km)**	**Total length removed (km)**	**Total length left *in situ* (km)**
Risers	2[3]	0.42993	0.0000	0.42993
Pipeline(s)	1	34.1004[4]	1.0914	33.0090
Tie-in Spools/Jumpers	5	0.1476	0.1476	0.0000
Control Umbilicals/Jumpers	n/a	n/a	n/a	n/a
Total	**6**	**34.67793**	**1.2390**	**33.43893**

[1] Three anode skids were recovered, however only two were connected to the pipeline.
[2] Under the approved Decommissioning Programme, Section 1.5, only the partially buried mattresses were to be removed and returned to shore for disposal. Grout bags, providing pipeline support, were to remain *in situ* with rock cover.
[3] Located in Dunlin Alpha (1 off) and Cormorant Alpha (1 off) Concrete Gravity Base Substructure legs which are covered by other Decommissioning Programmes.
[4] Total length listed in the DP of 34.21787 km was incorrect. Actual length was 34.1004 km as noted in the total lengths of the PWA.

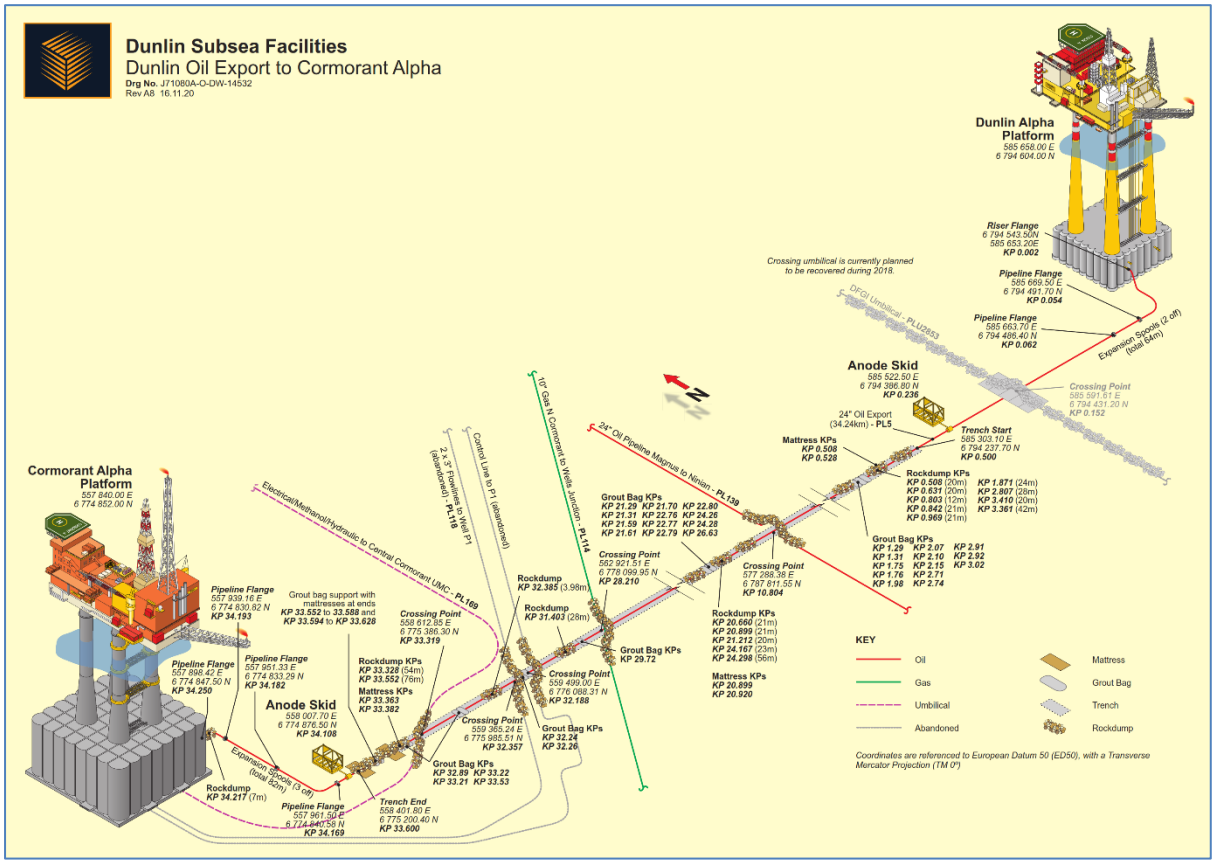
Table 1-3: Summary of the Approved Decommissioning Options		
Selected Option	**Reason for Selection**	**Approved Decommissioning Solution**
Subsea Installations		
n/a	n/a	n/a
Pipelines, Flowlines and Umbilicals[5]		
Group 1: Subsea structures (Anode skids)	Meets OPRED regulatory requirements	Full Removal
Group 2: Deposits (Partially buried)	Meets OPRED regulatory requirements	Full Removal
Group 3: Deposits (Buried)	CA indicates that decommissioning *in situ* provides the best option particularly on Safety, Technical and Environmental grounds.	Leave *in situ*
Group 4: Deposits (Pipeline support)	CA indicates that decommissioning *in situ* provides the best option particularly on Technical and Environmental grounds.	Leave *in situ* with minimum intervention. Spot rock cover over snag hazards added to provide an overtrawlable berm profile.
Group 5: Dunlin Alpha (Topsides items)	Meets OPRED regulatory requirements	Remove with Dunlin Alpha topsides
Group 6: Dunlin Alpha (Riser within Concrete Gravity Base Substructure)	Dunlin Alpha CA indicates that decommissioning *in situ* provides the best option particularly on Safety, Technical and Environmental grounds	Leave *in situ* within Dunlin Alpha Concrete Gravity Base Substructure
Group 7: Pipeline (Surface laid spools)	Meets OPRED regulatory requirements	Full Removal
Group 8: Pipeline (Trenched)	CA indicates that decommissioning *in situ* provides the best option particularly on Environmental and joint technical grounds	Leave *in situ* with minimum intervention. Pipeline ends removed and remedial rock cover provided.
Wells		
n/a	n/a	n/a
Drill Cuttings		
n/a	n/a	n/a

[5] A-301649-S17-TECH-001 - Dunlin Alpha to Cormorant Alpha Pipeline CA – Specific Scope Technical Note, Appendix A: Depth of Burial & Lowering Charts.

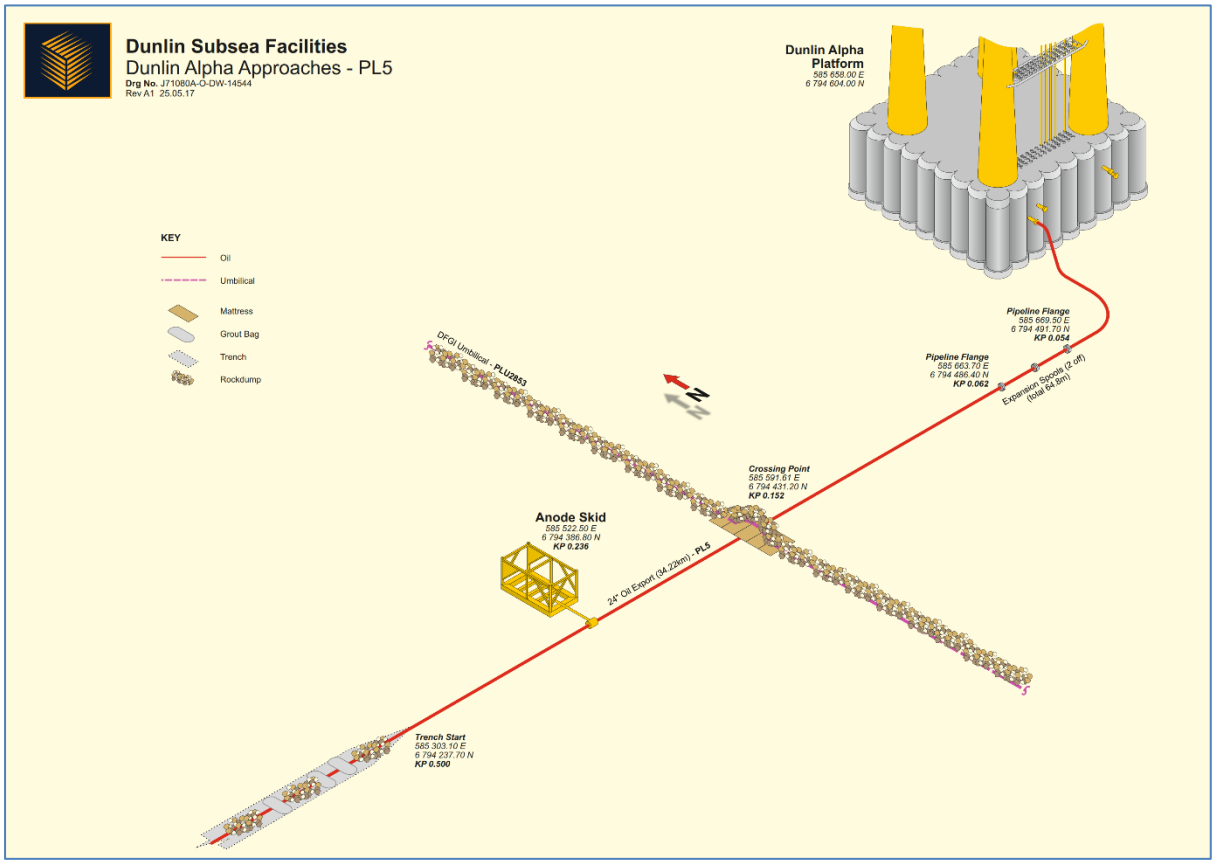
Table 1-3: Summary of the Approved Decommissioning Options		
Selected Option	**Reason for Selection**	**Approved Decommissioning Solution**
Interdependencies (prior to decommissioning)		
The Dunlin Alpha to Cormorant Alpha pipeline (PL5) crosses under the following infrastructure: 1) Dunlin Fuel Gas Import (DFGI) SSIV umbilical PLU2853 (to be decommissioned under a separate approved Decommissioning Programme) 2) 24" oil pipeline from Magnus to Ninian PL139 (operational) 3) 10" gas pipeline from North Cormorant to wells junction PL114 (operational) 4) Control line to Cormorant A well P1 M/H UMB (abandoned) 5) 2 x 3" flowlines to Cormorant A well P1 PL118 (abandoned) 6) Electrical/hydraulic/chemical umbilical to the Central Cormorant Underwater Manifold Centre PL169 (operational)		

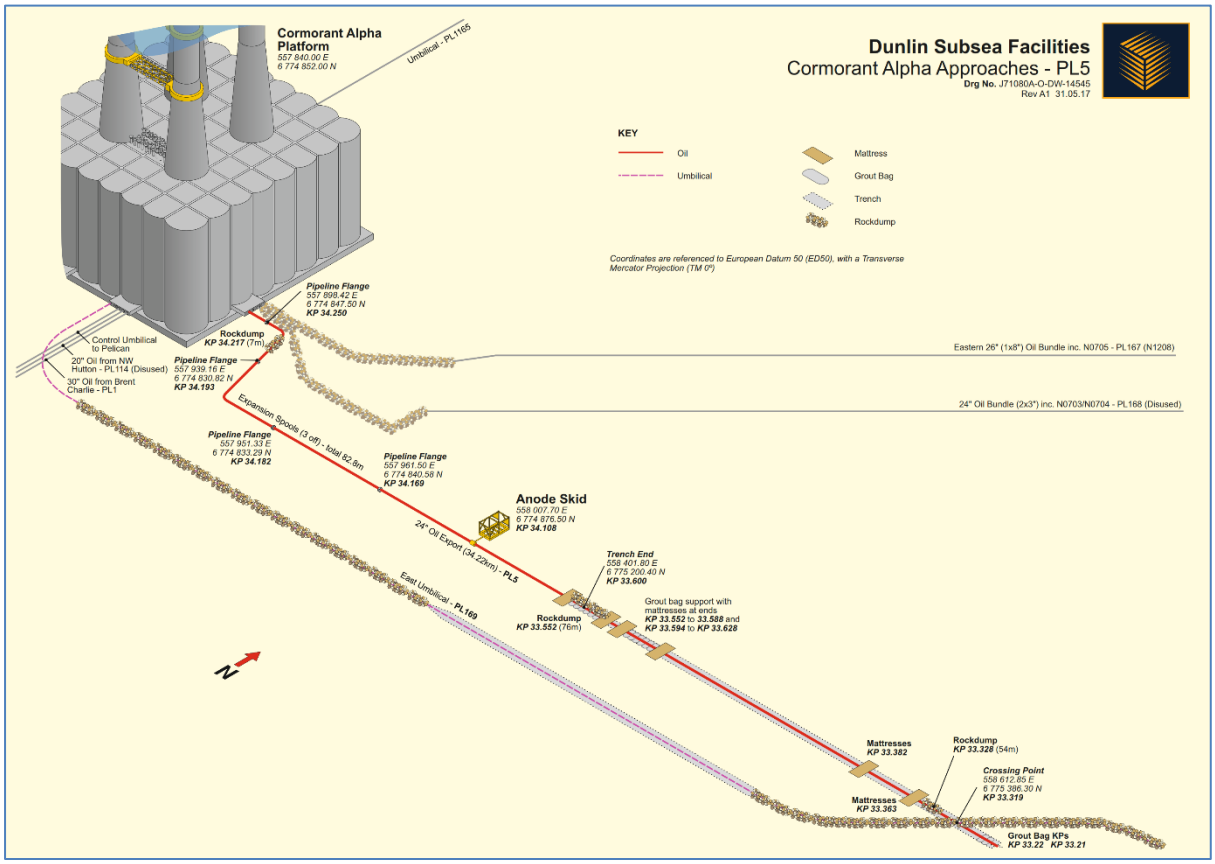
1.2 Schematic of Field Layout[6]

1.2.1 Operational

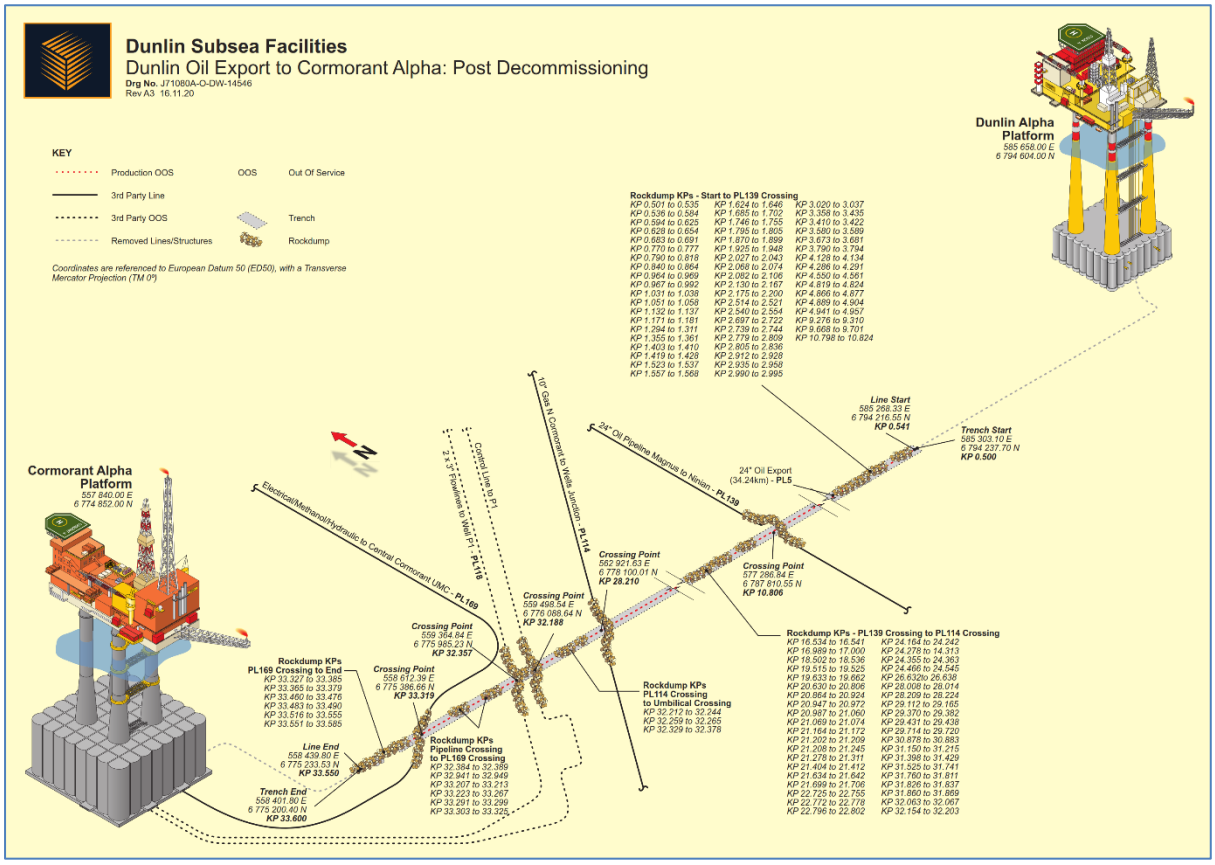


[6] See appendix 1 for larger graphics


Dunlin Subsea Facilities
Dunlin Alpha Approaches - PL5
Drg No. J71080A-O-DW-14544
Rev A1 25.05.17
Dunlin Alpha Platform
585 658.00 E
6 794 604.00 N
KEY
Oil
Umbilical
Mattress
Grout Bag
Trench
Rockdump
DFGI Umbilical - PLU2853
Pipeline Flange
585 669.50 E
6 794 491.70 N
KP 0.054
Pipeline Flange
585 663.70 E
6 794 486.40 N
KP 0.062
Expansion Spools (2 off) (total 64.8m)
Crossing Point
585 591.61 E
6 794 431.20 N
KP 0.152
Anode Skid
585 522.50 E
6 794 386.80 N
KP 0.236
24" Oil Export (94.22km) - PL5
Trench Start
585 303.10 E
6 794 237.70 N
KP 0.500

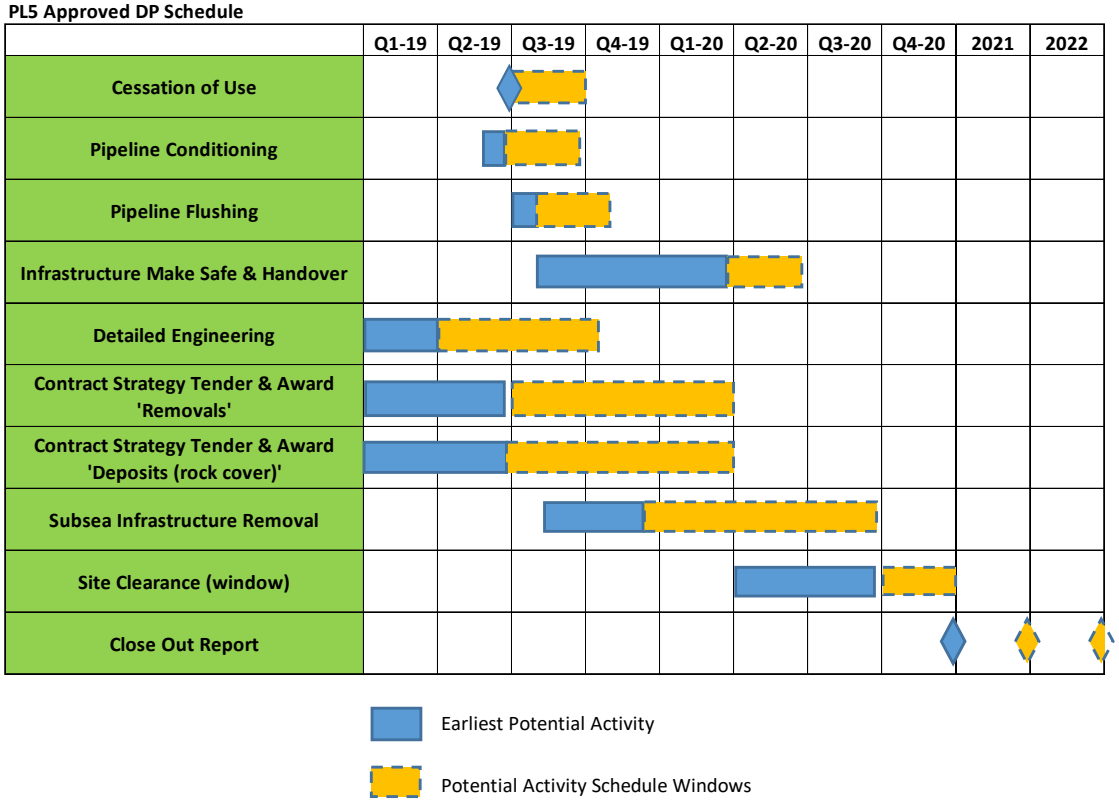

Cormorant Alpha Platform
557 840.00 E
6 774 852.00 N
Umbilical - PL1165
Dunlin Subsea Facilities
Cormorant Alpha Approaches - PL5
Drg No. J71080A-O-DW-14545
Rev A1 31.05.17
KEY
Oil
Umbilical
Mattress
Grout Bag
Trench
Rockdump
Coordinates are referenced to European Datum 50 (ED50), with a Transverse Mercator Projection (TM 0°)
Pipeline Flange
557 898.42 E
6 774 847.50 N
KP 34.250
Rockdump
KP 34.217 (7m)
Control Umbilical to Pelican
20" Oil from NW Hutton - PL114 (Disused)
30" Oil from Brent Charlie - PL1
Pipeline Flange
557 939.16 E
6 774 830.82 N
KP 34.193
Eastern 26" (1x8") Oil Bundle inc. N0705 - PL167 (N1208)
24" Oil Bundle (2x3") inc. N0703/N0704 - PL168 (Disused)
Expansion Spools (3 off) - total 82.8m
Pipeline Flange
557 951.33 E
6 774 833.29 N
KP 34.182
Pipeline Flange
557 961.50 E
6 774 840.58 N
KP 34.169
Anode Skid
558 007.70 E
6 774 876.50 N
KP 34.108
24" Oil Export (94.22km) - PL5
Trench End
558 401.80 E
6 775 200.40 N
KP 33.600
East Umbilical - PL169
Rockdump
KP 33.552 (76m)
Grout bag support with mattresses at ends
KP 33.552 to 33.588 and
KP 33.594 to KP 33.628
Mattresses
KP 33.382
Rockdump
KP 33.328 (54m)
Crossing Point
558 612.85 E
6 775 386.30 N
KP 33.319
Mattresses
KP 33.363
Grout Bag KPs
KP 33.22 KP 33.21

1.2.2 Post-Decommissioning

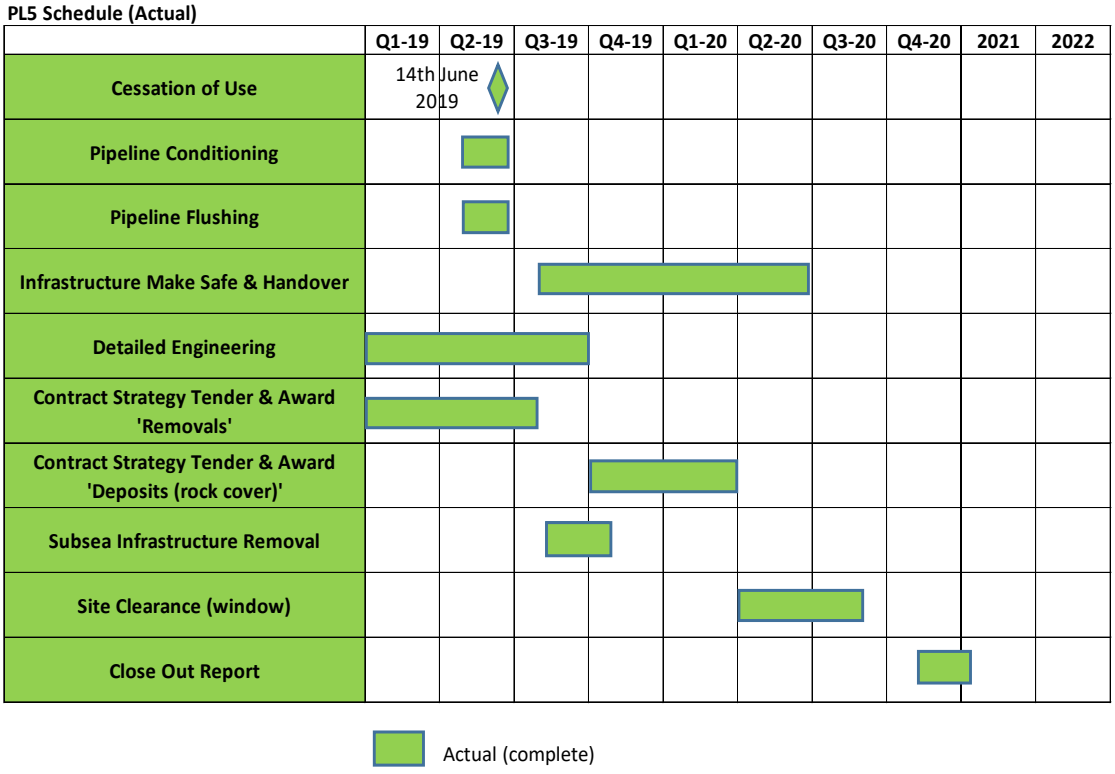


1.3 Project Delivery against Approved Schedule

PL5 Approved DP Schedule



PL5 Schedule (Actual)



1.4 Associated Decommissioning Approvals

Table 1-4: Associated Decommissioning Approvals	
Cessation of Production (COP)	15/06/2015 Greater Dunlin Area 14/06/2019 Thistle up and over services to Cormorant Alpha
Decommissioning Programme Approval	03/07/2019
Well P&A	n/a
Topside Removal	This will be completed as part of the approved Dunlin Alpha Topsides Decommissioning Programme
Subsea Installation Removal	Pipeline Application (PLA) permit PLA/702 (approved 12/09/2019) Required for marine licences and oil/chemical discharges
Pipeline Preparatory Works	Pigging and flushing of PL5 was completed in May 2019 using flushing water provided by Thistle Alpha.
Pipeline Works Authorisation (PWA)	PWA 14/W/11 301/V/19, approved 06/09/2019 Recovery of 5 off Spools & Modification of 1 off Pipeline to remain *in situ* Advised work completed 11/11/2019

Supporting documents are:

1. Dunlin Alpha to Cormorant Alpha Pipeline (PL5) Final Decommissioning Programme (FBL-DUN-DUNA-HSE-01-PLN-00004 rev A6)

   http://www.fairfield-energy.com/assets/documents/PL5-Final-Decommissioning-Programme.pdf

2. PL5 Comparative Assessment Report (A-301649-S17-REPT-003 (Xodus) Rev A01)

   http://www.fairfield-energy.com/assets/documents/A-301649-S17-REPT-003-PL5-CA.pdf

3. PL5 Environmental Statement (XOD-DUN-HSE-RPT-00006 (Xodus) rev A04)

   http://www.fairfield-energy.com/assets/documents/XOD-DUN-HSE-RPT-00006-PL5-EA.pdf

4. PL5 Cost Summary Report (confidential) (FBL-DUN-DUNA-HSE-01-RPT-00006 Rev A2)

No amendments have been made since approval.

2 Decommissioning Activities

The PL5 infrastructure Cessation of Production (COP) occurred on the 14th June 2019 once Thistle fluids were rerouted to the Magnus platform, followed by an approved Decommissioning Programme on the 3rd July 2019.

The following sections detail the PL5 decommissioning activities that have taken place.

2.1 Contracts Awarded

Table 2-1: Contracts Awarded
EnQuest Plc were awarded the contract to disconnect and recover the PL5 spools. The work was sub contracted to Rever Offshore.
Veolia Environmental Services (UK) Plc were awarded the waste management contract for the PL5 spool sections and hazardous materials returned to Lerwick.
Fugro GB North Marine Limited were awarded the post-decommissioning survey and debris removal contract.
ASCO Group were awarded the waste management contract for PL5 debris returned to Peterhead.
DEME Offshore NL BV were awarded the contract for rock installation.

2.2 Platform Operations

Table 2-2: Platform Decommissioning
n/a

2.3 Subsea P&A

Table 2-3: Well Decommissioning			
Subsea Wells	**Designation**	**Status**	**Category of Well**
n/a	n/a	n/a	n/a

2.4 Subsea Installations

Table 2-4: Subsea Installations			
Description	**Planned status (Estimated quantity)**	**Total removed (Actual)**	**Total left *in situ***
n/a	n/a	n/a	n/a

2.5 Pipelines / Umbilicals & Jumpers

Table 2-5: Pipelines / Umbilicals & Jumpers			
PL number	**Description**	**Agreed Decom Solution**	**Status**
PL5	Dunlin Alpha pig launcher	Removal with Dunlin Alpha topsides	*In situ*
PL5	Dunlin Alpha pig launcher pipework to ESDV	Removal with Dunlin Alpha topsides	*In situ*
PL5	PL5 ESDV in Dunlin Alpha leg	Leave *in situ*	*In situ*
PL5	PL5 riser in Dunlin Alpha leg	Leave *in situ*	*In situ*
PL5	Tie-in expansion spools to Dunlin Alpha	Removal	Removed
PL5	PL5 pipeline	Leave *in situ* with the surface laid ends cut	*In situ*
PL5	Tie-in expansion spools to Cormorant Alpha	Removal	Removed
PL5	PL5 riser in Cormorant Alpha leg	To be determined by Cormorant Alpha DP	-
PL5	PL5 ESDV in Cormorant Alpha leg	To be determined by Cormorant Alpha DP	-
PL5	Cormorant Alpha ESDV to pig receiver	Removal with Cormorant Alpha topsides	*In situ*
PL5	Cormorant Alpha pig receiver	Removal with Cormorant Alpha topsides	*In situ*

The Dunlin Alpha pipeline to Cormorant Alpha (PL5) has been disconnected from its respective installations.

The Dunlin Alpha to Cormorant Alpha pipeline (PL5) crossings are detailed below:

1) Dunlin Fuel Gas Import (DFGI) SSIV umbilical PLU2853, this has now been fully removed under a separate approved Decommissioning Programme.
2) PL139 oil pipeline (24”) from Magnus to Ninian Central crosses over PL5. Crossing responsibility belongs to EnQuest Heather Limited. This line is currently operational.
3) PL114 gas pipeline (10”) from North Cormorant to wells junction crosses over PL5. Crossing responsibility belongs to TAQA Bratani Limited. This line is currently operational.
4) Control line to well P1 crosses over PL5. Crossing responsibility belongs to TAQA Bratani Limited. This line is currently abandoned.
5) PL118 flowlines (2 x 3”) to well P1 crosses over PL5. Crossing responsibility belongs to TAQA Bratani Limited. This line is currently abandoned.
6) PL169 Electrical/hydraulic/chemical umbilical to the Central Cormorant Underwater Manifold Centre crosses over PL5. Crossing responsibility belongs to TAQA Bratani Limited. This line is currently operational.

2.6 Pipeline Stabilisation Features

Deposit removal was conducted over the 2019 – 2020 period using both diving and Remotely Operated Vehicle (ROV) techniques for infrastructure decommissioning and ROV for debris removal and survey.

Table 2-6: Pipeline Stabilisation Features		
Description	**Agreed Decom Solution**	**Status**
Concrete mattresses (Partially buried)	Removal (8 off)	The amount removed was 8. All visible / partially buried mattresses have been removed.
Concrete mattresses (Buried)	Leave *in situ* (9 off)	All buried mattresses have been left *in situ*
Grout bags (Buried)	Leave *in situ* (1840 off)	All buried grout bags have been left *in situ*
Grout bags (Buried for pipeline support)	Leave *in situ* (2500 off)	All buried grout bags have been left *in situ*
Other (Anode skids)	Removal (2 off[7])	3 off anode skids have been removed

Under the approved decommissioning programme the exposed deposits were removed and returned to shore for re-use or disposal.

A dynamically positioned fall pipe vessel was mobilised to the PL5 line and installed 19,828 tonnes of rock over 96 locations. Exposed ends, free spans and areas of pipeline crowning were remediated. Rock cover activities were completed 26th Aug 2020

2.7 Drill Cuttings

Table 2-7: Drill Cuttings		
Description	**Agreed Decom Solution**	**Status**
n/a	n/a	n/a

[7] A third redundant Anode Skid was also recovered.

2.8 Results of Post-Decommissioning & Environmental Surveys

Table 2-8: Post Decommissioning & Environmental Surveys Summary
A review of historical seabed surveys relevant to the PL5 area was undertaken and shared with OPRED and relevant stakeholders. It was agreed that the seabed characteristics and associated habitats were fairly consistent and homogenous across the area. As such, it was deemed that an additional environmental baseline survey was not necessary to inform the PL5 Decommissioning Programme. The completed PL5 decommissioning activities have not resulted in any measurable impact on the marine environment or change to the surrounding seabed conditions along the pipeline route, apart from the placement of rock. Observations from completed operations have also indicated that there has been limited disturbance within the Dunlin Alpha and Cormorant Alpha 500 m zones, with no evidence of any additional impact. Surveys of the pipeline corridor were undertaken using visual, Side Scan Sonar (SSS) and Multi-Beam Echo Sounder (MBES) techniques. Targets confirmed as oil field related debris or which presented a significant hazard to other users of the sea, regardless of debris type, were removed. In total, 50 targets were identified and removed. On completion of target removal, the area was re-surveyed to demonstrate and verify a clear seabed. Further details can be found in the Site Clearance Summary referenced below. As agreed with OPRED, Fairfield have undertaken geophysical surveys of the decommissioned pipeline but have not undertaken a post-decommissioning environmental survey. Furthermore, Fairfield do not propose to undertake any future environmental survey of the PL5 pipeline area.

The following reports were produced as part of the final subsea close out documentation:

- PL5 Subsea Assets Site Clearance Summary
  (FBL-DUN-SSP-PL5-RPT-00008)
- PL5 *in situ* Subsea Assets, Post-Decommissioning Status
  (FBL-DUN-SSP-PL5-RPT-00009)
- PL5 Subsea Inventory, Pre Decommissioning - Pipelines, Umbilicals & Structures
  (FBL-DUN-SSP-PL5-RPT-00001)
- PL5 Subsea Inventory, Post-Decommissioning - Pipelines, Umbilicals & Structures
  (FBL-DUN-SSP-PL5-RPT-00007)
- 2020 Post-Decommissioning Survey, PL5 – 24” Pipeline from Dunlin A to Cormorant A, Visual Inspection Survey
  (201449_PL005_VI_001 to 012 – Final POST Rock)

Dispensations

One deviation to the decommissioning programme was sought and approved.

As described in Table 3-1, it had been previously agreed with OPRED that an additional environmental baseline survey was not necessary to inform the PL5 Decommissioning Programme. Meanwhile, the completed PL5 decommissioning activities have not resulted in any measurable impact on the marine environment nor change to the surrounding seabed conditions. As a result, Fairfield sought a deviation from the approved Decommissioning Programme with regards to the requirement for a post-decommissioning environmental survey. Acceptance was received on 2nd December 2019 in an email from OPRED’s Environmental Management Team.

2.9 Key Milestones

Table 2-9: Key Milestone Summary	
June 2015	COP from the Greater Dunlin area
May 2019	Agreement placed with EnQuest (subcontracted to Rever Offshore) for the engineering, preparation and removal of subsea infrastructure
June 2019	COP from Thistle up-and-over services to Cormorant Alpha
June 2019	PL5 pipeline conditioning (pigging) and flushing completed
July 2019	Dunlin Alpha to Cormorant Alpha Pipeline (PL5) Decommissioning Programme approved by OPRED
September 2019	Commenced subsea decommissioning activities
October 2019	Completed subsea decommissioning activities
June 2020	Commenced and completed deposit recovery operations and post-decommissioning survey operations
August 2020	Commenced and completed remedial rock cover operations

2.10 Stakeholder Engagement

Table 2-10: Stakeholder Engagement Summary
1. Engaged with SEPA on 12th January 2018 to discuss decommissioning waste management requirements, which were incorporated in the project waste management plan.
2. Regulatory project execution progress reports (FBL-DUN-DUNA-HSE-01-RPT-00009) post-approval of the Decommissioning Programme were issued to the OPRED for reporting periods Q3-19 (rev A1.1), Q4-19 (rev A2), Q1-20 (rev A3.1), Q2-20 (rev A4) and Q3-20 (rev A5.1). Execution work was completed in Q4-19.
3. No payments to UK Fisheries Offshore Oil and Gas Legacy Trust Fund Limited were required.

3 Impact on the Environment

3.1 Activities

There were no significant environmental impacts resulting from the decommissioning of the PL5 infrastructure. There was limited seabed disturbance associated with the recovery of the spool ends, stabilisation features and debris, with no evidence of any impact on the marine environment.

Marine licence ML/517 was varied during the decommissioning campaign to account for the placement of rock cover.

3.2 Future Monitoring

The following Long Term Legacy Management Plan is in place for future monitoring.

Table-3-1: Future Surveys and Monitoring Proposals
1. Substructure (Jackets)
n/a
2. Pipelines, Flowlines & Umbilicals
In accordance with the approved Decommissioning Programme, the infrastructure remaining *in situ* has been confirmed by post-decommissioning survey to be either trenched below seabed level or covered to greater than or equal to 0.6 m. All spans, crowning and areas of low cover have been remediated with the addition of rock. Based on the line being trenched below seabed level or covered to a depth of greater than or equal to 0.6 m, other users of the sea are unlikely to interact with it. Fairfield Betula Limited (Fairfield) propose that one further condition survey be undertaken to confirm that no further crowning, spans or interactions have materialised. Fairfield believe the interval for this follow-up survey should be in the order of five years. If evidence of anomalies were subsequently found, any necessary remedial action would be undertaken and the survey results used to inform both the owners and the regulator on whether an additional future survey was warranted.
3. Pipeline Stabilisation Features
Monitoring of stabilisation features will form part of the proposed pipeline survey.
4. Drill Cuttings
n/a
5. Environmental Surveys
The completed PL5 decommissioning activities have not resulted in any measurable impact on the marine environment or change to the surrounding seabed conditions, apart from the placement of rock. As agreed with OPRED, Fairfield have undertaken geophysical surveys of the decommissioned pipeline but have not undertaken a post-decommissioning environmental survey. Furthermore, Fairfield do not propose to undertake any future environmental survey of the PL5 pipeline area.

4 Impact on Health, Safety and Environment

4.1 Details of any Incidents / Accidents during Project Execution

Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 reportable injuries and dangerous occurrences, and reportable releases to sea (PON1) were as follows:

Table 4-1: Incidents / Accidents during Project Execution			
Date	**Type**	**Location**	**Details**
15 October 2019	PON1 reported by Fairfield (inside 500 zone)	DSV Rever Sapphire	Pipeline abandonment scope. Diamond wire cutting system. Hydraulic fluid leak from hydraulic fittings. Shell Tellus S2 MX 22 Volume lost: 25 litres
12 June 2020	PON1 submitted on behalf of Fugro	Edda Sun / PL5	Damaged ROV tooling fitting during cable cutting operations resulting in loss of hydraulic fluid.

5 Waste

Fairfield have had ongoing engagement with SEPA who have provided positive feedback on the project waste management strategy (FBL-DUN-HSE-STR-00003). The Waste Management Strategy is a key document for informing the production of an Active Waste Management Strategy to ensure compliance with the Waste Framework Directive.

Subsea waste returned to shore during the decommissioning of PL5 is detailed below.

Table 5-1: Waste Returned to Shore	
Infrastructure	**Weight Returned (t)**
Ferrous Metal - *Steel all grades* Anode skids / steel pipe / debris clearance	324.22
Non-ferrous Metal - *Non-ferrous (copper; aluminium; zinc; indium)* Anodes	4.78
Concrete - *Aggregates (mattresses; grout bags; sand bags)* Mattresses; grout; pipeline coating	291.6
Plastics - *Rubbers; Polymers* None reported	n/a
Hazardous - *Asbestos containing materials,* Residual Fluids (hydrocarbons; chemicals; control fluid) Asbestos bitumen/bagged waste	23.4
Hazardous - *NORM Scale* None reported	n/a
Other- *Debris* Tyres; Poly sheeting (landfilled); General waste	5.7
Total	**649.7**

It should be noted that the weights recorded above are approximate wet weights.

All recovered infrastructure materials were returned to shore and recycled utilising 'Fairfield contracted', appropriately licensed, waste management and recycling contractors. These were located at either Veolia Environmental Services (UK) Plc, Greenhead Base, Gremista, Lerwick for recovered infrastructure[8] or ASCO Group in Peterhead for cleared debris for processing. Steel was forwarded on to either John Lawrie Group or John Williamson for recycling.

6 Lessons Learned

The project was delivered as expected, without any significant learnings to report.

[8] Waste figures were captured in the report VEOLIA-FBL-RE-0001

7 Cost Summary

Project cost data has been redacted for this uncosted PL5 COR version. The costed PL5 COR version has been forwarded to OPRED and the OGA separately

8 Photographs

PL5 Decommissioning Album

Normand Clipper Cut Line Recovery

PL5 Route Debris

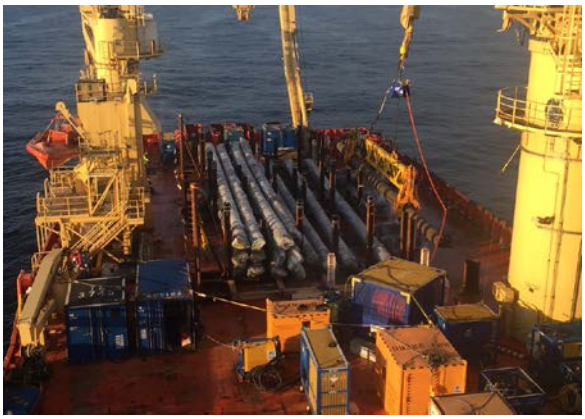
PL5 Route Debris

PL5 Route Debris

PL5 Route Debris

PL5 Route Debris

PL5 Route Debris Recovered to Deck



PL5 Recovery Operations

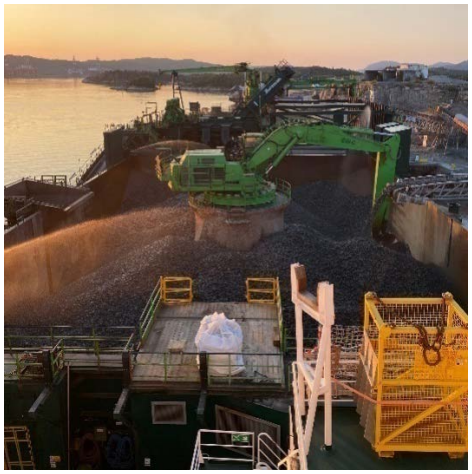
Rever Sapphire undertaking PL5 Disconnect at Dunlin Alpha

PL5 Spool Sections Recovered to CSV (Asbestos Precautions Visible)

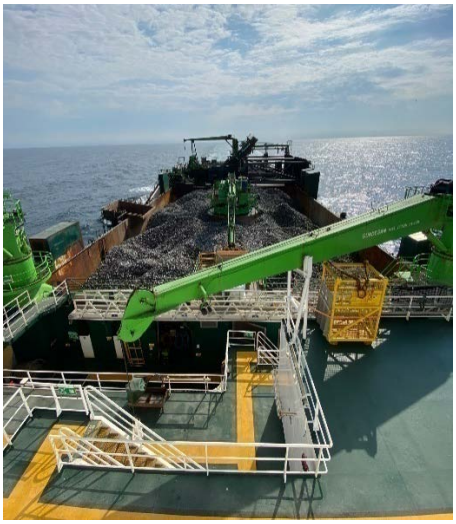
Discharge of PL5 Sections in Lerwick

PL5 Spool Sections on Quayside

DPFPV Flintstone



Rock Loading for PL5 Remedial Operations



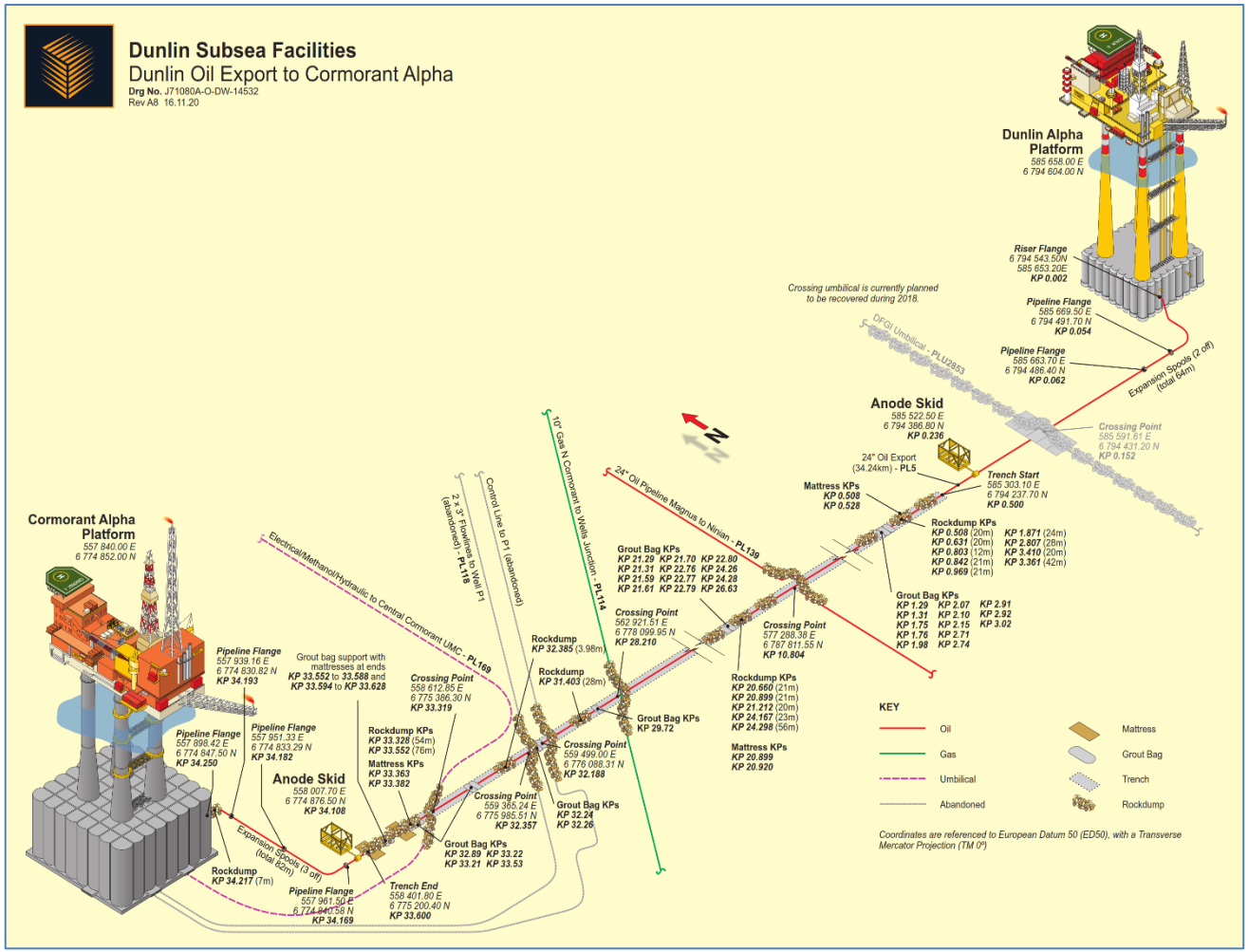
Rock Placement Operations on PL5

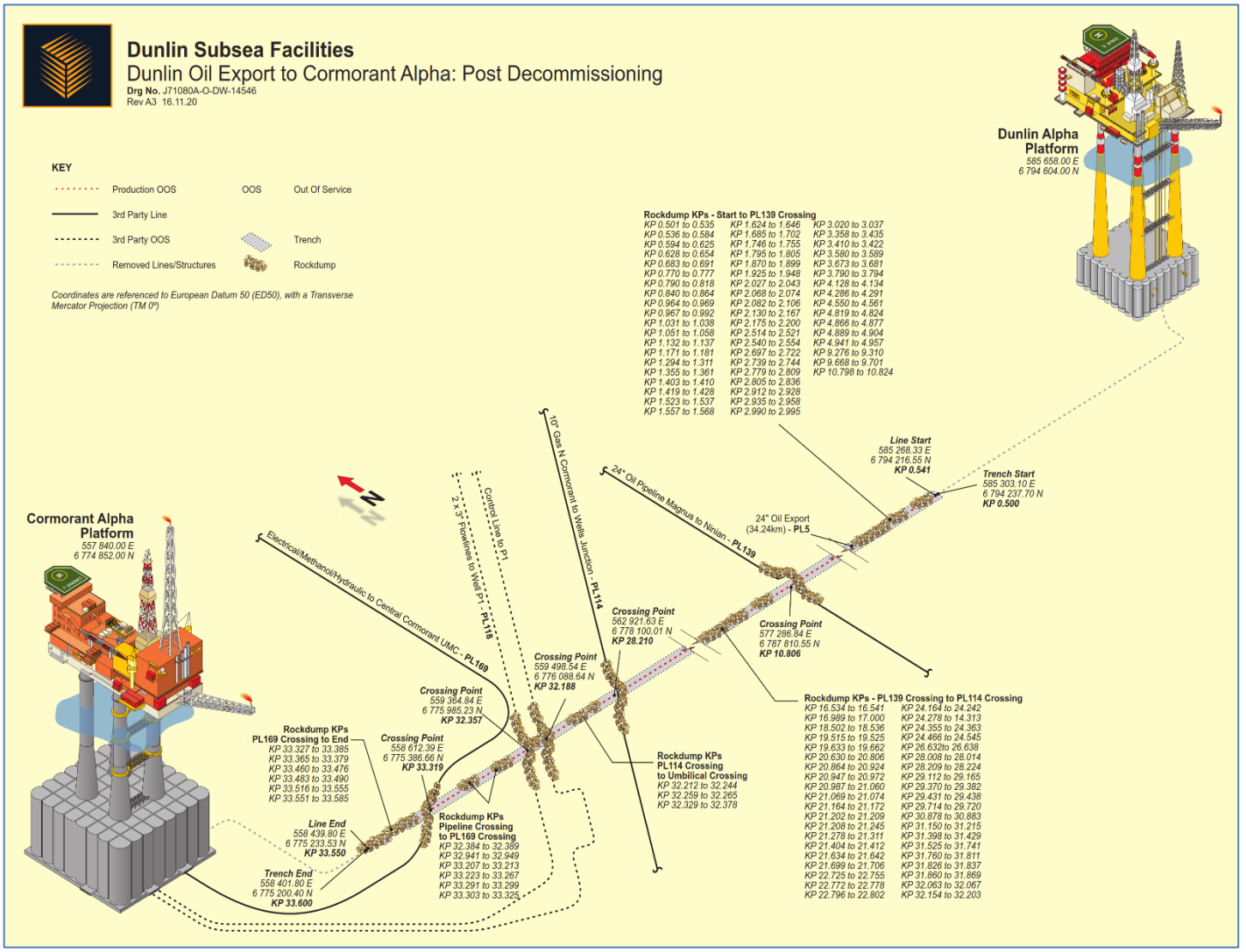
PL5 cut section

PL5 pipeline sections for controlled disposal:


CORM-PL5-SPO-008

9 Appendix 1


Dunlin Subsea Facilities
Dunlin Oil Export to Cormorant Alpha
Drg No. J71080A-O-DW-14532
Rev A8 16.11.20
Dunlin Alpha Platform
585 658.00 E
6 794 604.00 N
Riser Flange
6 794 543.50N
585 653.20E
KP 0.002
Pipeline Flange
585 669.50 E
6 794 491.70 N
KP 0.054
Pipeline Flange
585 663.70 E
6 794 486.40 N
KP 0.062
Expansion Spools (2 off) (total 64m)
Crossing umbilical is currently planned to be recovered during 2018.
DFGI Umbilical - PLU2853
Anode Skid
585 522.50 E
6 794 386.80 N
KP 0.236
Crossing Point
585 591.81 E
6 794 431.20 N
KP 0.152
24" Oil Export (34.24km) - PL5
Trench Start
585 303.10 E
6 794 237.70 N
KP 0.500
Mattress KPs
KP 0.508
KP 0.528
Rockdump KPs
KP 0.508 (20m) KP 1.871 (24m)
KP 0.631 (20m) KP 2.807 (28m)
KP 0.803 (12m) KP 3.410 (20m)
KP 0.842 (21m) KP 3.361 (42m)
KP 0.969 (21m)
Grout Bag KPs
KP 1.29 KP 2.07 KP 2.91
KP 1.31 KP 2.10 KP 2.92
KP 1.75 KP 2.15 KP 3.02
KP 1.76 KP 2.71
KP 1.98 KP 2.74
24" Oil Pipeline Magnus to Ninian - PL139
10" Gas N Cormorant to Wells Junction - PL114
Control Line to P1 (abandoned)
2 x 3" Flowlines to Well P1 (abandoned) - PL115
Electrical/Methanol/Hydraulic to Central Cormorant UMC - PL169
Grout Bag KPs
KP 21.29 KP 21.70 KP 22.80
KP 21.31 KP 22.76 KP 24.26
KP 21.59 KP 22.77 KP 24.28
KP 21.61 KP 22.79 KP 26.63
Crossing Point
562 921.51 E
6 778 099.95 N
KP 28.210
Crossing Point
577 288.38 E
6 787 811.55 N
KP 10.804
Rockdump
KP 32.385 (3.98m)
Rockdump
KP 31.403 (28m)
Grout Bag KPs
KP 29.72
Crossing Point
559 499.00 E
6 776 088.31 N
KP 32.188
Crossing Point
559 365.24 E
6 775 985.51 N
KP 32.357
Grout Bag KPs
KP 32.24
KP 32.26
Rockdump KPs
KP 20.660 (21m)
KP 20.899 (21m)
KP 21.212 (20m)
KP 24.167 (23m)
KP 24.298 (56m)
Mattress KPs
KP 20.899
KP 20.920
Cormorant Alpha Platform
557 840.00 E
6 774 852.00 N
Pipeline Flange
557 939.16 E
6 774 830.82 N
KP 34.193
Grout bag support with mattresses at ends
KP 33.552 to 33.589 and
KP 33.594 to KP 33.628
Crossing Point
558 612.85 E
6 775 386.30 N
KP 33.319
Pipeline Flange
557 898.42 E
6 774 847.50 N
KP 34.250
Pipeline Flange
557 951.33 E
6 774 833.29 N
KP 34.182
Anode Skid
558 007.70 E
6 774 876.50 N
KP 34.108
Rockdump KPs
KP 33.328 (54m)
KP 33.552 (76m)
Mattress KPs
KP 33.363
KP 33.382
Expansion Spools (3 off) (total 82m)
Rockdump
KP 34.217 (7m)
Pipeline Flange
557 961.50 E
6 774 840.58 N
KP 34.169
Trench End
558 401.80 E
6 775 200.40 N
KP 33.600
Grout Bag KPs
KP 32.89 KP 33.22
KP 33.21 KP 33.53
KEY
Oil
Gas
Umbilical
Abandoned
Mattress
Grout Bag
Trench
Rockdump
Coordinates are referenced to European Datum 50 (ED50), with a Transverse Mercator Projection (TM 0°)


Dunlin Subsea Facilities
Dunlin Oil Export to Cormorant Alpha: Post Decommissioning
Drg No. J71080A-O-DW-14546
Rev A3 16.11.20
KEY
Production OOS
OOS Out Of Service
3rd Party Line
3rd Party OOS
Trench
Removed Lines/Structures
Rockdump
Coordinates are referenced to European Datum 50 (ED50), with a Transverse Mercator Projection (TM 0°)
Dunlin Alpha Platform
585 658.00 E
6 794 604.00 N
Rockdump KPs - Start to PL139 Crossing
KP 0.501 to 0.535
KP 0.536 to 0.584
KP 0.594 to 0.625
KP 0.628 to 0.654
KP 0.683 to 0.691
KP 0.770 to 0.777
KP 0.790 to 0.818
KP 0.840 to 0.864
KP 0.964 to 0.969
KP 0.967 to 0.992
KP 1.031 to 1.038
KP 1.051 to 1.058
KP 1.132 to 1.137
KP 1.171 to 1.181
KP 1.294 to 1.311
KP 1.355 to 1.361
KP 1.403 to 1.410
KP 1.419 to 1.428
KP 1.523 to 1.537
KP 1.557 to 1.568
KP 1.624 to 1.646
KP 1.685 to 1.702
KP 1.746 to 1.755
KP 1.795 to 1.805
KP 1.870 to 1.899
KP 1.925 to 1.948
KP 2.027 to 2.043
KP 2.068 to 2.074
KP 2.082 to 2.106
KP 2.130 to 2.167
KP 2.175 to 2.200
KP 2.514 to 2.521
KP 2.540 to 2.554
KP 2.697 to 2.722
KP 2.739 to 2.744
KP 2.779 to 2.809
KP 2.805 to 2.836
KP 2.912 to 2.928
KP 2.935 to 2.958
KP 2.990 to 2.995
KP 3.020 to 3.037
KP 3.358 to 3.435
KP 3.410 to 3.422
KP 3.580 to 3.589
KP 3.673 to 3.681
KP 3.790 to 3.794
KP 4.128 to 4.134
KP 4.286 to 4.291
KP 4.550 to 4.561
KP 4.819 to 4.824
KP 4.866 to 4.877
KP 4.889 to 4.904
KP 4.941 to 4.957
KP 9.276 to 9.310
KP 9.668 to 9.701
KP 10.798 to 10.824
Line Start
585 268.33 E
6 794 216.55 N
KP 0.541
Trench Start
585 303.10 E
6 794 237.70 N
KP 0.500
10" Gas N Cormorant to Wells Junction - PL114
24" Oil Pipeline Magnus to Ninian - PL139
24" Oil Export (34.24km) - PL5
Control Line to P1
2 x 3" Flowlines to Well P1 - PL118
Electrical/Methanol/Hydraulic to Central Cormorant UMC - PL169
N
Cormorant Alpha Platform
557 840.00 E
6 774 852.00 N
Crossing Point
562 921.63 E
6 778 100.01 N
KP 28.210
Crossing Point
577 286.94 E
6 787 810.55 N
KP 10.806
Crossing Point
559 498.54 E
6 776 088.64 N
KP 32.188
Crossing Point
559 364.84 E
6 775 985.23 N
KP 32.357
Crossing Point
558 612.39 E
6 775 386.66 N
KP 33.319
Rockdump KPs - PL139 Crossing to PL114 Crossing
KP 16.534 to 16.541
KP 16.989 to 17.000
KP 18.502 to 18.536
KP 19.515 to 19.525
KP 19.633 to 19.662
KP 20.630 to 20.806
KP 20.884 to 20.924
KP 20.947 to 20.972
KP 20.987 to 21.060
KP 21.069 to 21.074
KP 21.164 to 21.172
KP 21.202 to 21.209
KP 21.208 to 21.245
KP 21.278 to 21.311
KP 21.404 to 21.412
KP 21.634 to 21.642
KP 21.699 to 21.706
KP 22.725 to 22.755
KP 22.772 to 22.778
KP 22.796 to 22.802
KP 24.164 to 24.242
KP 24.278 to 14.313
KP 24.355 to 24.363
KP 24.466 to 24.545
KP 26.632to 26.638
KP 28.008 to 28.014
KP 28.209 to 28.224
KP 29.112 to 29.165
KP 29.370 to 29.382
KP 29.431 to 29.438
KP 29.714 to 29.720
KP 30.878 to 30.883
KP 31.150 to 31.215
KP 31.398 to 31.429
KP 31.525 to 31.741
KP 31.760 to 31.811
KP 31.826 to 31.837
KP 31.860 to 31.869
KP 32.063 to 32.067
KP 32.154 to 32.203
Rockdump KPs PL114 Crossing to Umbilical Crossing
KP 32.212 to 32.244
KP 32.259 to 32.265
KP 32.329 to 32.378
Rockdump KPs PL169 Crossing to End
KP 33.327 to 33.385
KP 33.365 to 33.379
KP 33.460 to 33.476
KP 33.483 to 33.490
KP 33.516 to 33.555
KP 33.551 to 33.585
Line End
558 439.80 E
6 775 233.53 N
KP 33.550
Trench End
558 401.80 E
6 775 200.40 N
KP 33.600
Rockdump KPs Pipeline Crossing to PL169 Crossing
KP 32.384 to 32.389
KP 32.941 to 32.949
KP 33.207 to 33.213
KP 33.223 to 33.267
KP 33.291 to 33.299
KP 33.303 to 33.325