



LEMAN BH DECOMMISSIONING PROGRAMME (LBT-SH-AA-7180-00001-001, REV A10)

CLOSE OUT REPORT

Project	Leman BH Decommissioning
Originating company	Shell UK Limited
Document type	Close Out Report
Document number	EP201712203007
Security Classification	Unrestricted
Issue Date	19 th March 2019

Rev #	Date of Issue	Status Description	Originator	Checker (role)		Approver (role)	
A01	03/12/18	Approved for Issue	Y. Ghorashi	G. Saunders	✓	D. Mckie	✓
A02	19/03/19	Approved for Issue	Y. Ghorashi	G. Saunders	✓	G. Saunders	✓

Rev	Date	Details
R01	18/12/2017	Draft for comment / Issued for Review
R02	26/11/2018	Updated draft
A01	03/12/2018	Issued to ODU
R03	27/02/2019	Updated per comments for internal review
A02	19/03/2019	Issued to ODU



CONTENTS

1.	Decommissioning Programme	4
2.	Decommissioning activities.....	5
2.1.	Platform Operations.....	6
2.1.1.	Activities completed under approved DP	6
2.2.	Platform Well P&A	6
2.3.	Subsea P&A	6
3.	Pipeline status.....	6
4.	Impact on Environment	6
4.1.	Decommissioning OPEP	6
4.2.	Summary of licences, permits and consents.....	7
4.3.	Waste	7
4.3.1.	Compliance with Waste Framework Directive	7
4.3.2.	Waste Disposal Summary	7
4.3.3.	Post-decommissioning Survey	8
5.	Impact on HSE	9
6.	Key Milestones.....	9
7.	Progress	9
8.	Cumulative Cost Trend.....	10
9.	Photographs.....	11
10.	Amendments or revisions to DP	11
11.	Acronyms and Abbreviations.....	11



Figures

Figure 1-1 Leman BH Location.....	4
Figure 1-2 Leman field layout.....	5
Figure 7-1 Leman BH Decommissioning Progress	10
Figure 9-1 Leman BH Decommissioning Budget.....	10

Tables

Table 1 Leman BH Decommissioning Project Program.....	9
---	---



1. DECOMMISSIONING PROGRAMME

The Leman Field is located in the Southern Basin of the United Kingdom Continental Shelf (UKCS) in license block 49/26. The Leman BH platform is located approximately 50 km east of the Norfolk coast and 62 km west of the UK/Netherlands median line (Figure 1-1). The Leman gas field was discovered in December 1965 and comprises of three main complexes, Leman A, B and C and four additional platforms, Leman D and E to the south and Leman F and G to the north (Figure 1-2).

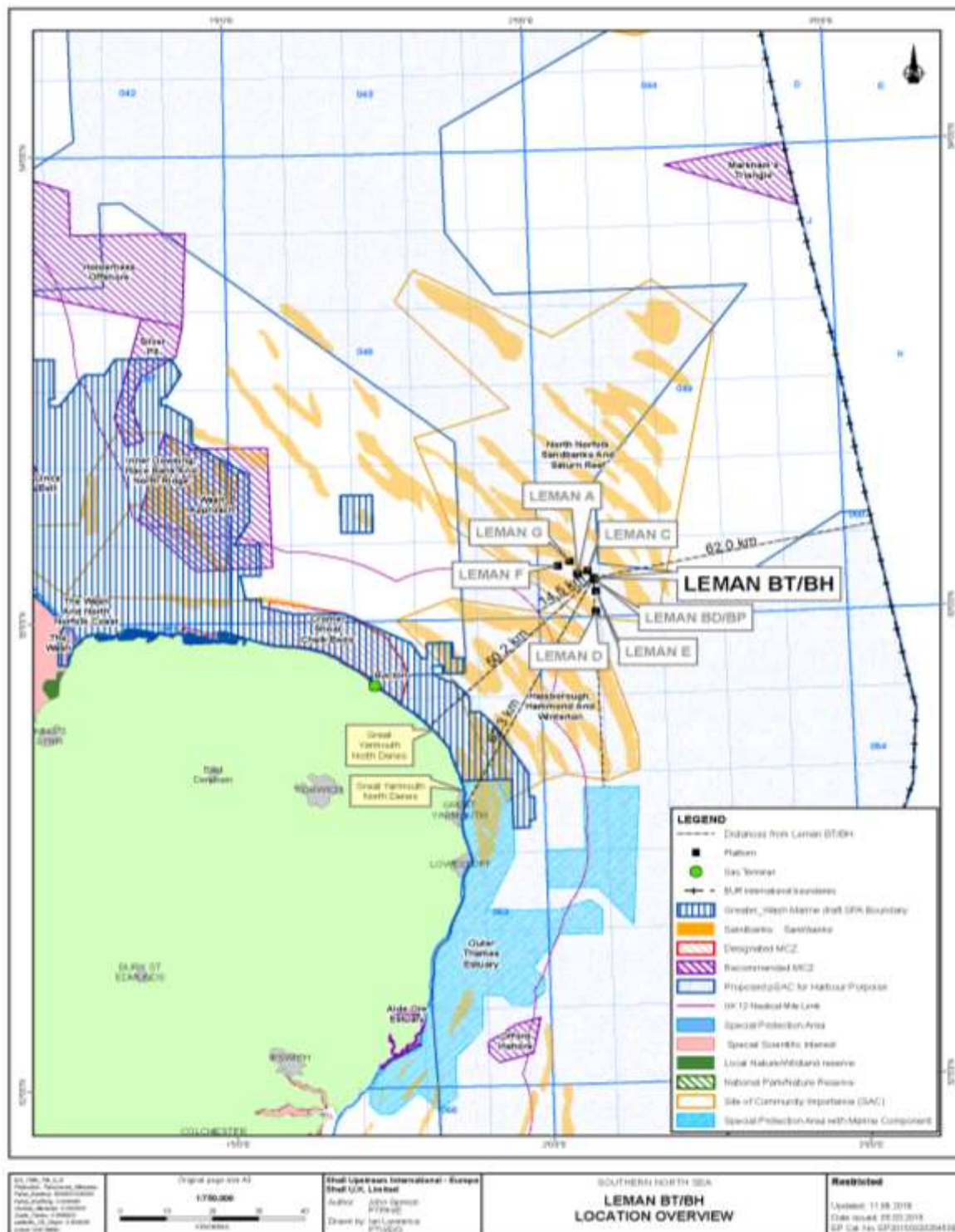


Figure 1-1 Leman BH Location

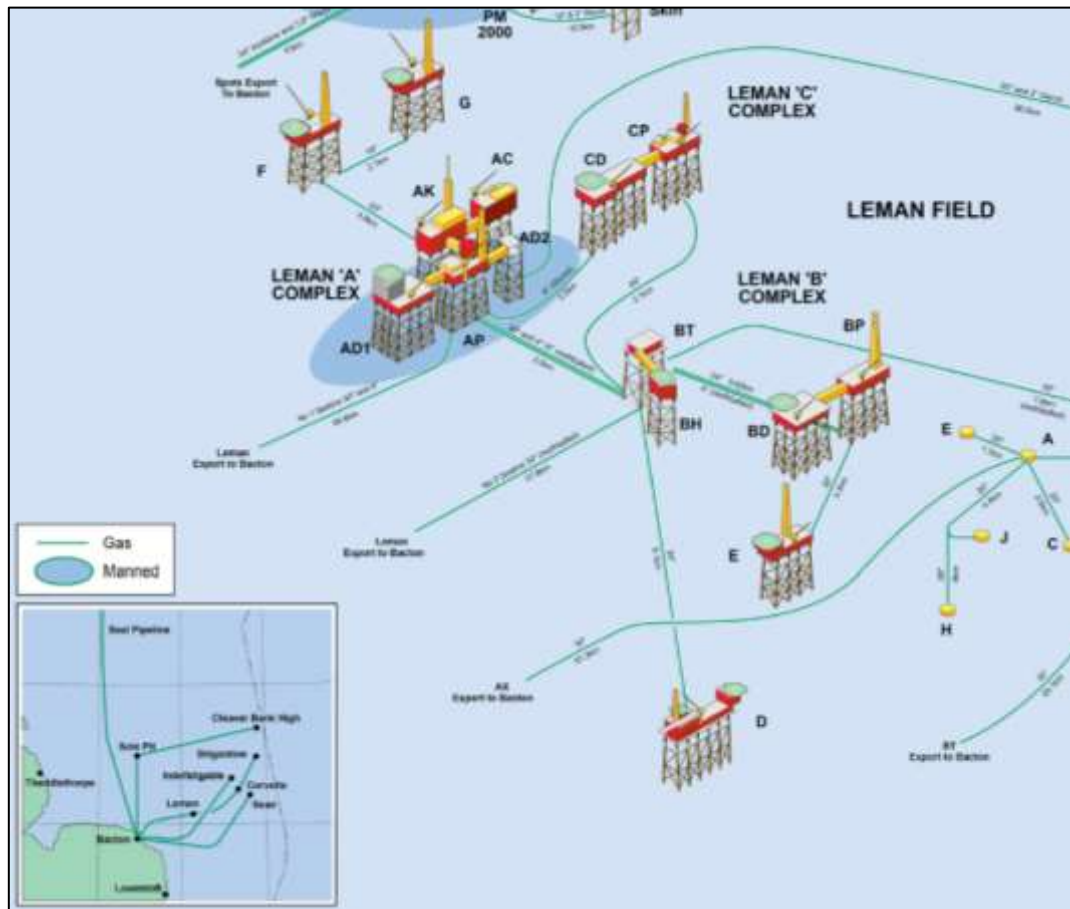


Figure 1-2 Leman field layout

The Shell-operated Leman B complex consists of two pairs of bridge-linked platforms, Leman BT/BH and Leman BD/BP. The Leman BH and BT platforms are Normally Unattended Installations (NUI). The Leman BT gas transportation platform was installed in June 1970 and the Leman BH living quarter platform, which is bridge-linked to BT, was installed in February 1981.

The Leman BH living quarters became redundant as full-time facilities when compression stopped at the bridge-linked Leman BT and was transferred to Leman AK platform in 1996. The remaining purpose of Leman BH was to provide personnel access to Leman BT and to provide shelter for personnel visiting Leman BT. Because of rising maintenance costs, it was decided to decommission Leman BH and to transfer the functionality to Leman BT.

In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Leman BH living quarter platform, Shell applied for approval of a decommissioning programme (DP) to the Department of Business, Energy and Industrial Strategy (BEIS). The final version of the DP (document reference: LBT-SH-AA-7180-00001-001, Rev A10) was submitted to BEIS on 5th April 2017, and approved on 27th April 2017.

2. DECOMMISSIONING ACTIVITIES

The decommissioning works began on 5th July 2017 and was completed on 28th November 2017, with only minor amount of waste remaining on-site awaiting disposal (discussed further below). The activities carried out within the previous months under the approved DP include the following.



2.1. PLATFORM OPERATIONS

2.1.1. Activities completed under approved DP

- Completed final enabling work scopes on Leman BH, including:
 - Installation of leg scaffold for final leg cut
 - Removal of stair access from cellar deck to spider deck
 - Fit lifting of rigging equipment for Topsides lift
- Cut the 4 legs above spider deck
- Lift topsides with heavy lift vessel Taklift4
- Deliver Topsides to decommissioning facility
- Return to Leman BH
- Dredge sand plug (4 legs) in preparation to cut at the 3 meter below seabed level
- Cut piles at 3 meter below seabed level
- Insert lifting pins
- Lift jacket
- Deliver Jacket to decommissioning facility
- Soft strip of the topside
- Felling, dismantling and disposal of the jacket
- Dismantling and disposal of the topside.

2.2. PLATFORM WELL P&A

There are no well P&A associated with decommissioning of the Leman BH platform.

2.3. SUBSEA P&A

There are no subsea P&A associated with decommissioning of the Leman BH platform.

3. PIPELINE STATUS

During the topside and jacket lifting activities, the pipeline from Leman BT to Leman Delta was depressurized 3 times to enable heavy lifts over pipelines. There were no other pipeline activities associated with the decommissioning of the Leman BH platform.

4. IMPACT ON ENVIRONMENT

The environmental impact of the decommissioning programme were outlined in the Leman BH Decommissioning Project Environmental Impact Assessment (document reference LBT-SH-HX-0702-00003-001) dated 22nd December 2016.

4.1. DECOMMISSIONING OPEP

A decommissioning OPEP was not prepared for the project, as the Leman BH platform was an accommodation platform with no oil storage and/or oil and gas pipeline connections. The works were carried out per the approved Leman BH/BT OPEP (document reference 15023) approved by BEIS on 29 July 2015, and valid until July 2020, as well as a Ship OPEP prepared for the heavy lift vessel.



4.2. SUMMARY OF LICENCES, PERMITS AND CONSENTS

A marine licence (reference ML/232/0 (Version 2)) was obtained for the removal and placement of the sediments within the jacket legs. The marine licence was issued on 13th June 2017, and remained valid until 30th September 2017, within which period all offshore activities associated with the Leman BH decommissioning were completed. No other consents, licenses and/or permits were required for completion of the decommissioning activities at Leman BH.

4.3. WASTE

4.3.1. Compliance with Waste Framework Directive

From May 2017, Shell had been involved in discussions with Veolia (UK), the selected waste contractor, in planning the waste management related to the dismantling of the Leman BH topside and jacket. Activities that Shell carried out to ensure proper management of duty of care include the following:

- Held an initial kick-off meeting to ensure proper understanding of the scope of the works to be carried out, timing of the topside and jacket delivery and expectations with respect to implementation of the waste hierarchy and selection of appropriate waste disposal facilities
- Reviewed the Environmental Permits issued for the Great Yarmouth Outer Harbour decommissioning yard to confirm appropriate measures are in place and the waste expected to be generated by the Leman BH dismantling can be managed/handled by the yard.
- Reviewed all the procedures with respect to on-site waste management, surface water run off management, waste segregation, selection of waste disposal facilities, marine growth management and washwater and bunding management to confirm adequate level of controls are in place.
- Completed an on-site visit one month prior to arrival of the topside to the yard to assess the actual set up of the yard and that control measures were in place.
- Completed three duty of care audits at the Great Yarmouth Outer Harbour decommissioning yard, including compliance checks of the activities completed at the facility versus the facility's EPR permit and on-site environmental and waste management related procedures. No major non-compliances had been identified.

4.3.2. Waste Disposal Summary

The following amount of waste was generated and disposed from the decommissioning of the Leman BH topside and jacket:

- Structural material (metals and cables) – 1376.9 tonnes
- Non-hazardous waste (mixed demolition waste/general waste) – 113.2 tonnes
- Hazardous waste (asbestos and fluorescent tubes) – 0.2 tonnes

The hazardous waste generated during the demolition of the Leman BH structure was retained on-site until July 2018 to allow adequate amount of accumulation for disposal.

The generated waste was disposed of in following manner:

- Recovered – 101.6 tonnes
- Recycled – 1386.8 tonnes
- Landfilled – 1.9 tonnes

In summary, 99.87% of the waste was recovered/recycled and 0.13% of the waste was disposed of at landfill.



4.3.3. Post-decommissioning Survey

A post decommissioning survey will not be performed as part of the Leman BH Decommissioning programme because the 500 metre (m) zones of Leman BH and Leman BT overlap each other to a great extent (the distance between the centre points of the two platforms is 66 m, as shown

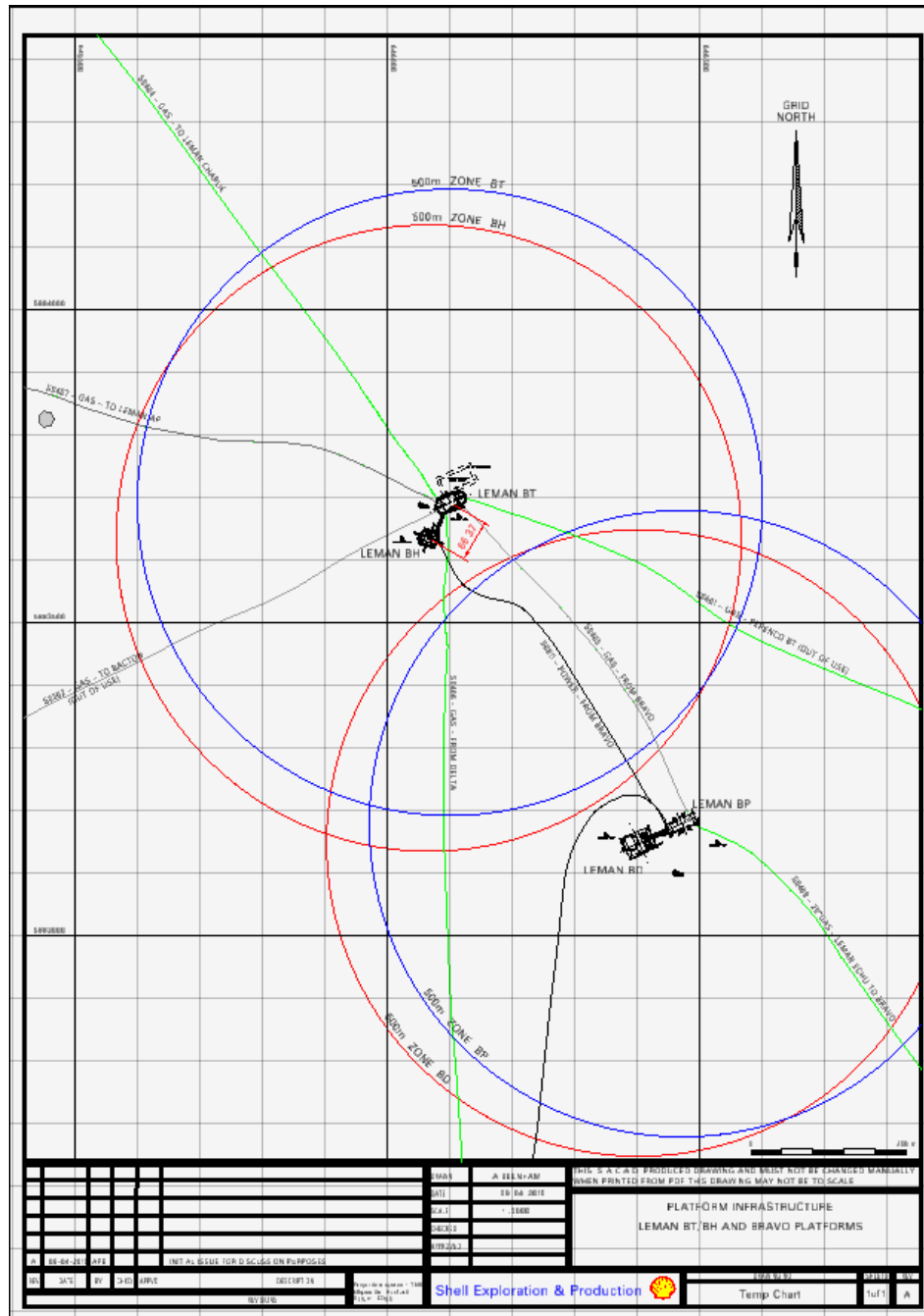


Figure 4-1 Leman BH and BT 500 m zones

A post decommissioning site survey will be carried out within the 500 m radius of the Leman BH installation as part of the Leman BT decommissioning in the future. Following this survey, seabed debris will be recovered for onshore disposal or recycling in line with existing disposal methods. Independent verification of seabed state will then be obtained by trawling the platform area. This will be followed by a statement of clearance to all relevant governmental departments and non-governmental organisations.



5. IMPACT ON HSE

No incident/accidents were reported during the completion of the Leman BH Decommissioning activities.

Prior to commencement of the decommissioning activities, discussions were held with HSEx regarding the Leman BH/BT Safety Case. The result of the discussion was that the decommissioning of the Leman BH will not be considered a material change to the safety case. As such, a Decommissioning Safety Case was submitted to the HSEx in February 2017 for the Leman BH Decommissioning project and approved by the HSEx on 2nd May 2017.

During the discussions with the HSEx, it was also decided that the variation to the Leman BH/BT Safety Case was to be submitted by 1st October 2017 to include the removal of the Leman BH platform as well as other required changes per the new Offshore Safety Directive Regulations 2015. The updated Safety Case was submitted to HSEx on 28th September 2017, and accepted/approved by the HSEx on 5th December 2017.

Emergency response exercises or "Safety Roadshows" were neither planned nor completed as part of this decommissioning project. Also, no BEIS OEI inspections were undertaken.

6. KEY MILESTONES

Planned and actual project milestones associated with the Leman BH Decommissioning Project are presented in Table 1 below.

Table 1 Leman BH Decommissioning Project Programme

Milestone Summary	Plan	Actual
Financial Investment Decision	7 July 2015	7 Jul 2015
Seafox 4 arrival for enabling scope	20 Oct 2015	20 Oct 2015
Award heavy lift and disposal contract	28 Feb 2016	30 Jun 2016
Obtain approval Dismantlement Safety Case	1 Mar 2016	2 May 2017
Obtain approval for Decommissioning Programme	1 Mar 2016	27 Apr 2017
Completion of Leman BH enabling scope	24 Apr 2016	23 May 2016
Lift topsides	12 Aug 2016	11 Jul 2017
Lift jacket	17 Aug 2016	1 Aug 2017
Disposal of jacket and topsides	20 Dec 2016	29 Nov 2017
Project close out	18 Apr 2017	31 Dec 2017

7. PROGRESS

The progress of the Leman BH Decommissioning project is shown in Gantt chart below (Figure 7-1). The completion dates for various activities are included in Table 1 in previous section.

Activity	2014				2015				2016				2017			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Lifting concept and detailed engineering																
Seabed survey																
Develop decommissioning programme																
Detailed removal engineering																



Activity	2014				2015				2016				2017			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Tender and award																
Refurbishment campaign for Leman BT																
Topsides clean and make safe																
Place heavy lift contract																
Lift preparations (combined with BT)																
Platform removal																
Onshore disposal																
Project close-out																
Close-out report submission to BEIS																
Notes:																
Completed Tasks																

Figure 7-1 Leman BH Decommissioning Progress

8. CUMULATIVE COST TREND

The approved budget for the Leman BH Decommissioning Programme, including estimated forecast, is shown in Figure 8-1 below.

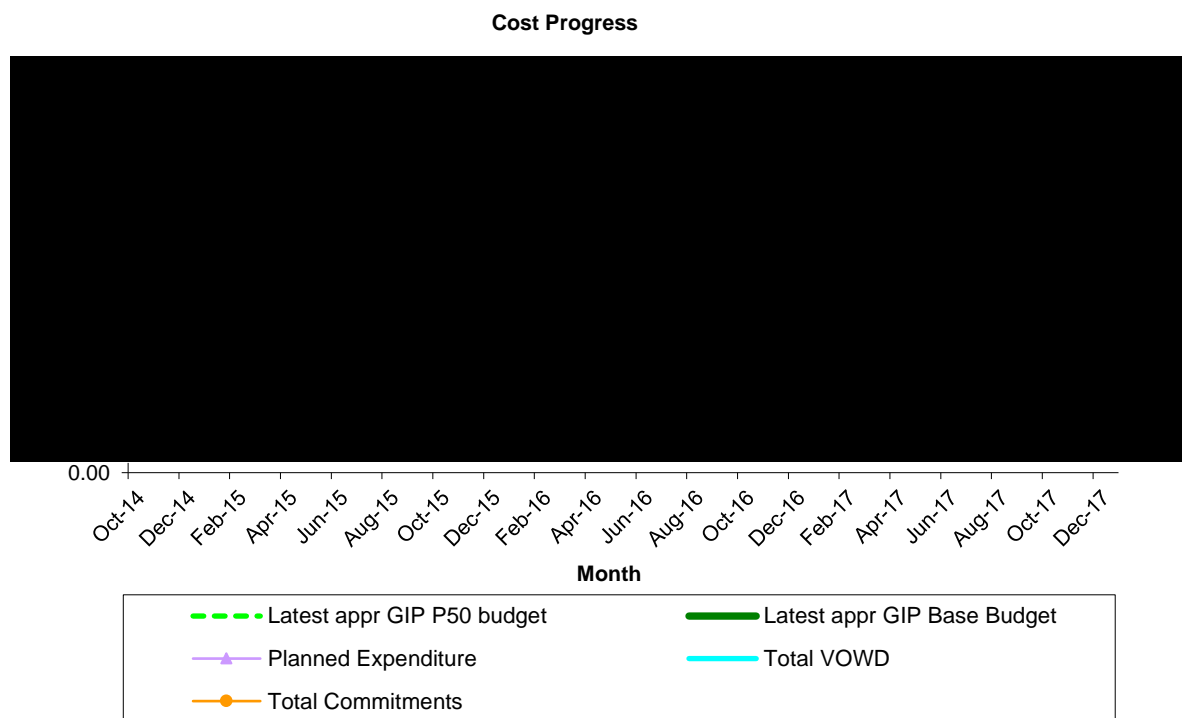


Figure 8-1 Leman BH Decommissioning Budget

The estimated forecast for various cases is as follows:

- Low case (P10) = [REDACTED]
- Base case (P50) = [REDACTED]



- High case (P90) = [REDACTED]

The actual value of work done was [REDACTED].

9. PHOTOGRAPHS

Selected photographs of activities undertaken within the period are shown in Attachment A of this progress report.

10. AMENDMENTS OR REVISIONS TO DP

No amendment or revisions have been made to the DP since its final submission.

11. ACRONYMS AND ABBREVIATIONS

BEIS	Department of Business, Energy and Industrial Strategy
DP	Decommissioning Programme
EA	Environment Agency
EUR	European
GIP	Gas in place
GTU	Great Yarmouth Yard
HSE	Health, Safety and Environment
HSEx	Health and Safety Executive
Km	Kilometres
MCZ	Marine Conservation Zone
NFFO	National Federation of Fishermen's Organisations
NUI	Normally Unmanned Installation
ODU	Offshore Decommissioning Unit
OEI	Offshore Environmental Inspectorate
OPEP	Oil Pollution and Emergency Plan
P&A	Plug and Abandonment
SAC	Site of Community Importance
UKCS	United Kingdom Continental Shelf
VOWD	Value of Work Done



ATTACHMENT A: PHOTOGRAPH LOG



Photo 1 – Leman BT (left) and BH (right) platforms (August 2006)



Photo 2 – Leman BH Platform (August 2006)



Photo 3 – Leman BH topside being prepared for lift (July 2017)



Photo 4 – Preparation work on Leman BH topside (July 2017)



Photo 5 – Leman BH topside being lifted (July 2017)



Photo 6 – Tidying up of Leman BH jacket (July 2017)



Photo 7 – Leman BH topside arriving at GTY (July 2017)



Photo 8 – Transfer of Leman BH topside to decommissioning yard (July 2017)



Photo 9 – Installation of rigging platform on Leman BH jacket (July 2017)



Photo 10 – Dredging of jackets at Leman BH (July 2017)



Photo 11 – Cutting holes for the lifting pins (July 2017)



Photo 12 – Holes cut for lifting pins (July 2017)



Photo 13 – Cutting of jacket piles (July 2017)



Photo 14 – Lifting of jacket (August 2017)



Photo 15 – Arrival of Leman BH jacket at GTY (August 2017)



Photo 16 – Moving jacket to decommissioning site (August 2017)



Photo 17 – Arrival of Leman BH jacket at decommissioning site (August 2017)



Photo 18 – Soft strip of the topside (August 2017)



Photo 19 – Jacket Felling (September 2017)



Photo 20 – Jacket Dismantling (September 2017)



Photo 21 – Topside dismantling (October 2017)



Photo 22 – Topside dismantling (October 2017)



Photo 23 – Topside dismantling (November 2017)



Photo 24 – Topside dismantling (November 2017)



Photo 25 – Topside waste segregation (November 2017)

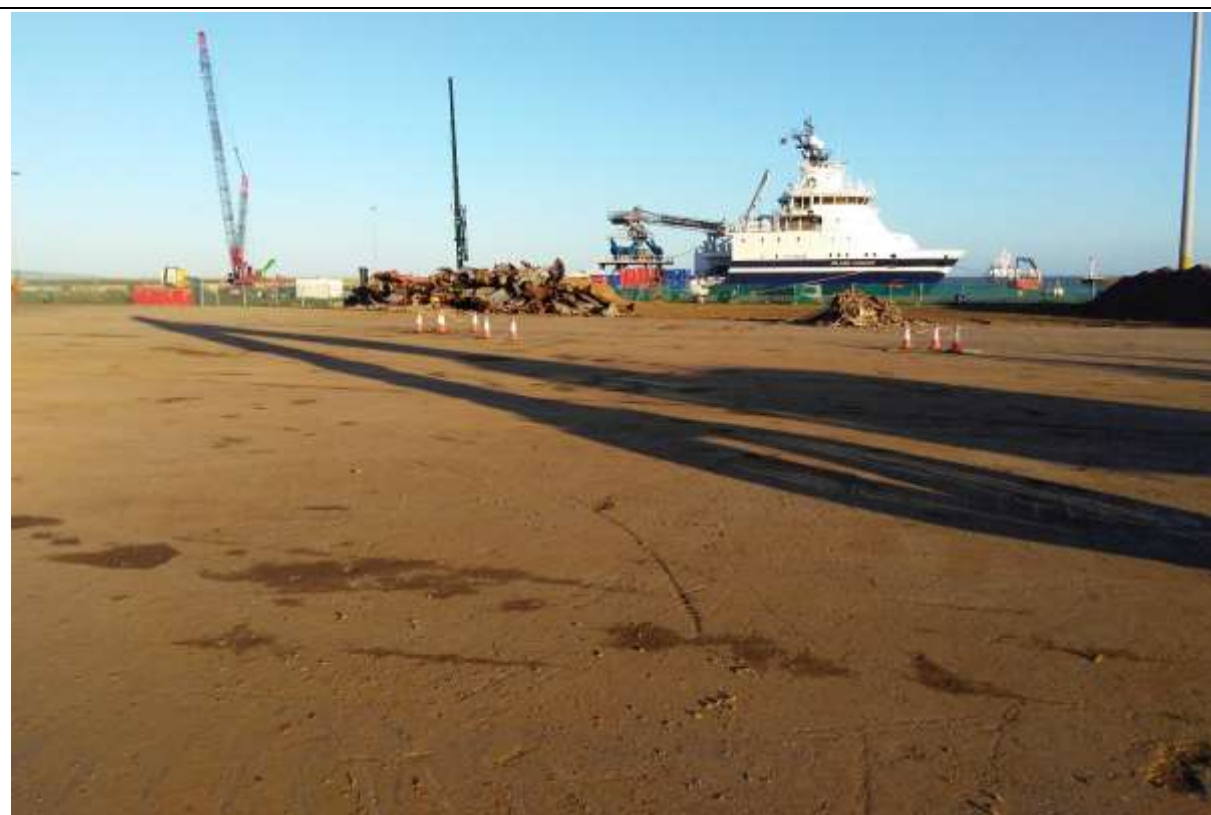


Photo 26 – Dismantling yard following demolition of topside (November 2017)