

## **Section 9. Selected Decommissioning Option for the Moira Subsea Facilities**

### **CONTENTS**

<b>9.1</b>	<b>Introduction</b>	<b>3</b>
<b>9.2</b>	<b>Overview</b>	<b>3</b>
<b>9.3</b>	<b>Preparatory Work</b>	<b>3</b>
<b>9.4</b>	<b>Removal</b>	<b>3</b>
9.4.1	Wellhead Protection Structure and Concrete Mattresses	3
9.4.2	Pipelines	4
9.4.3	Umbilical	5
<b>9.5</b>	<b>Disposal of the Moira Subsea Facilities</b>	<b>5</b>
<b>9.6</b>	<b>Environmental Considerations</b>	<b>5</b>
9.6.1	Energy Consumption/Emissions	6
9.6.2	Discharges to Sea	6
9.6.3	Seabed Disturbance	6
<b>9.7</b>	<b>Notes and References</b>	<b>6</b>

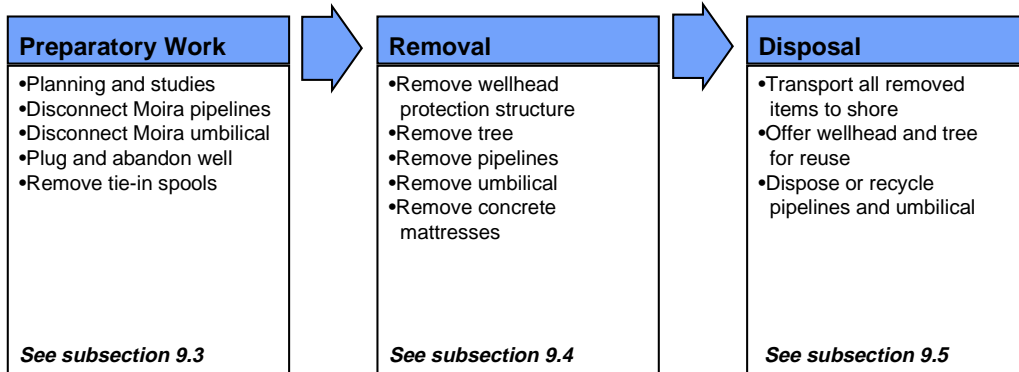
### **List of Figures**

Figure 9-1	Set up for Recovery – Pick Up	4
Figure 9-2	Set up for Recovery – Reel In	4
Figure 9-3	Ramp Assembly Detail	5
Figure 9-4	Pipelines Secured to Reels and Spooled On	5

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## **9.1 Introduction**

## **9.2 Overview**



## **9.3 Preparatory Work**

The Moira decommissioning preparatory work was completed in November 1999 and comprised the following activities:

- The Moira 6" and 2" pipelines were disconnected at the Moira well and at the Platform riser caisson.
- The Moira umbilical was disconnected at the Moira well and cut (released) at the Platform.
- The Moira well was plugged and abandoned and the production hardware was recovered.
- The flexible 4" and 2" tie-in spools and isolation valve assemblies were disconnected and recovered from the Moira pipelines. Pipeline ends were sealed.

Further details concerning the plugging and abandonment of the Moira Well are contained in the Report for the Application for Consent to Plug and Abandon the Moira Well<sup>1</sup>.

## **9.4 Removal**

### **9.4.1 Wellhead Protection Structure and Concrete Mattresses**

The steel gravity Wellhead Protection Structure (WPS) and the cooling loop assembly will be recovered from the seabed during the ongoing decommissioning works programme. Because of its weight it will be cut and lifted in sections. Relocation/reuse of the Moira WPS is not considered a practical option because of its design and physical size. The WPS will be transported in sections to an onshore site for disposal/recycling.

The concrete over-protection mattresses placed over the flexible tie-in spools and umbilical will be recovered from the seabed by the diving support vessel. These mattresses will then be taken ashore for disposal.

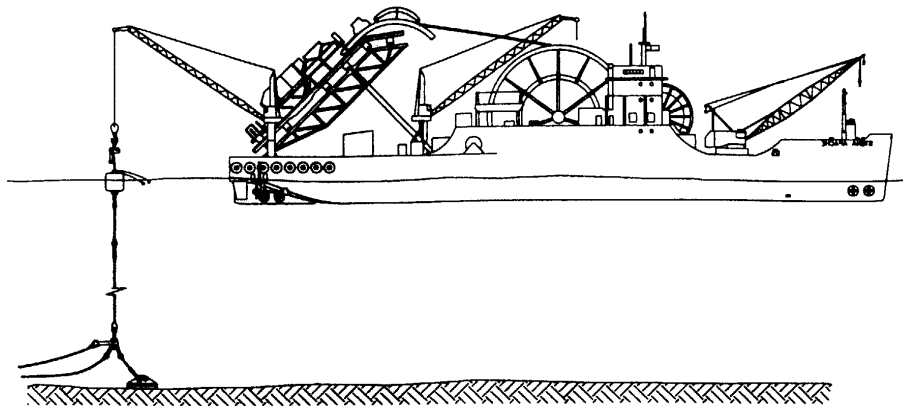
#### **9.4.2 Pipelines**

The Moira 6" and 2" pipelines will be recovered from the seabed by a reel ship reverse lay operation. This is briefly described below.

In preparation for the reel ship arriving on site, divers working from a DSV will attach recovery rigging to the pipeline end which will be buoyed off on the surface. This wire can then be picked up by the reel ship.

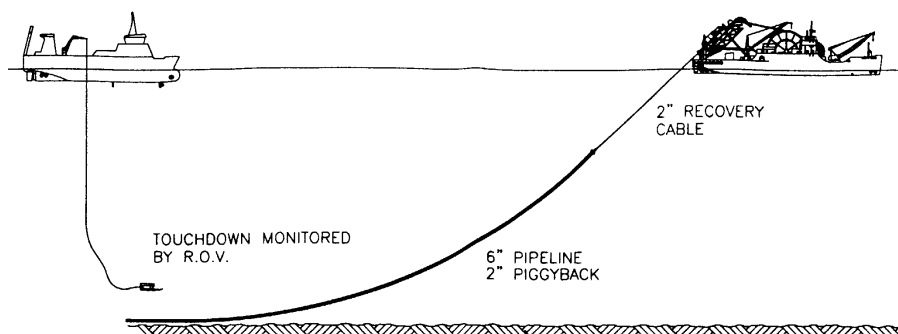
First, a reel ship will be positioned and pipeline recovery rigging will be hauled on board as shown in Figure 9-1.

**Figure 9-1 Set up for Recovery – Pick Up**



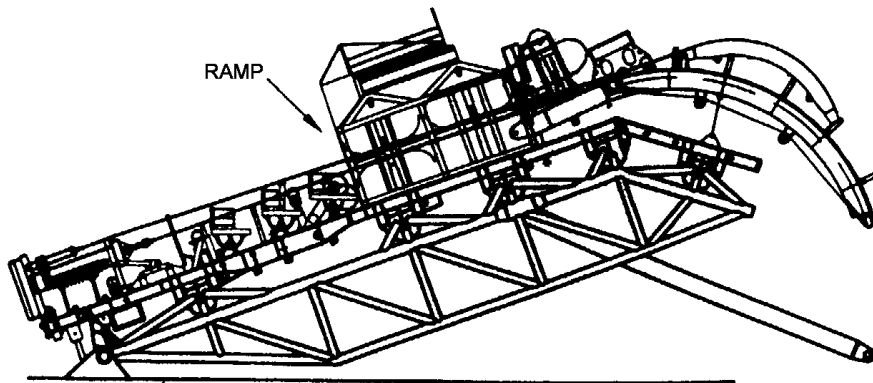
The reel ship will then relocate to a position as shown in Figure 9-2 to commence recovery of the pipelines. A survey vessel Remotely Operated Vehicle (ROV) will be positioned to continuously monitor the pipeline at the "touchdown" position.

**Figure 9-2 Set up for Recovery – Reel In**



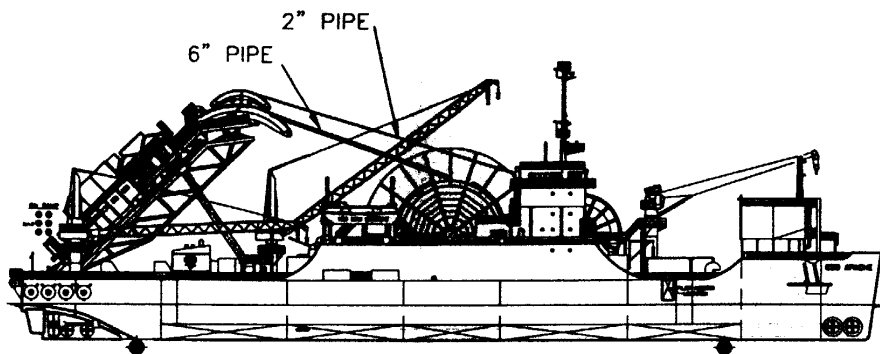
When the pipelines reach the surface and are in place on the reel ship ramp, shown in Figure 9-3, the pipelines will be separated and the anodes removed.

**Figure 9-3 Ramp Assembly Detail**



The pipelines will then be spooled onto their individual reels as shown in Figure 9-4. When the pipelines are fully spooled to the reels, they will be secured and transported to an onshore site for reuse or recycling.

**Figure 9-4 Pipelines Secured to Reels and Spooled On**



#### **9.4.3 Umbilical**

The control umbilical will be recovered by a reverse lay operation, similar to that described for the pipelines, for reuse or onshore disposal. This operation might be completed by the reel ship or DSV subject to operational priorities.

### **9.5 Disposal of the Moira Subsea Facilities**

The wellhead and tree are being offered for refurbishment/reuse following the highest part of the waste hierarchy principles. Failing this, all tree and wellhead materials are likely to be recycled.

### **9.6 Environmental Considerations**

The main environmental impacts expected to arise from the activities to decommission the Moira Subsea Facilities are briefly discussed below.

### **9.6.1 Energy Consumption/Emissions**

Removing the Moira pipelines, umbilical, Wellhead and Protective Structure will result in impact from energy consumption and emissions owing to the marine operations involved in recovering the items to surface.

### **9.6.2 Discharges to Sea**

There will be some impact from discharges to sea as the water in the pipeline will be released from the pipelines as they are recovered to the surface. The pipelines have been thoroughly flushed clean so that the remaining water has a hydrocarbon content less than 40 ppm. The volume of water that will be discharged from the 6" pipeline is approximately 175m<sup>3</sup> and from the 2" pipeline approximately 20 m<sup>3</sup>. Owing to the rapid dilution effects the impact on the local ecosystem of this small volume of water with low hydrocarbon content is considered to be insignificant.

### **9.6.3 Seabed Disturbance**

There is a thin layer of drill cuttings around the Moira Wellhead and Protection structure. Removing these items will have some impact, as dislodging some of the cuttings is unavoidable. Because of the thin layer, impact will be minimal.

The action of recovering the pipelines and umbilical from the seabed will cause some disturbance of the surface sediments, as they are in trenches and covered. The disturbance would affect an area approximately 2 m wide for the length of the pipelines. There would be some impact on organisms living immediately adjacent to the disturbance but it is anticipated the communities would recover quickly along that length.

At the ends of the pipelines where they are removed through a layer of drill cuttings there would be a resettling of cuttings after removal. It is expected they would resettle within the existing area they cover, and thus the impact is considered minor.

## **9.7 Notes and References**

The notes below, provide additional reference information relevant to this section. A Glossary of terms and abbreviations is also included within Appendix A, and a complete list of supporting studies is contained within Section 17.

<sup>1</sup> The Report for the Moira Application for Consent to Plug and Abandon the Moira Well may be viewed at the offices of Phillips Petroleum Company United Kingdom Limited.