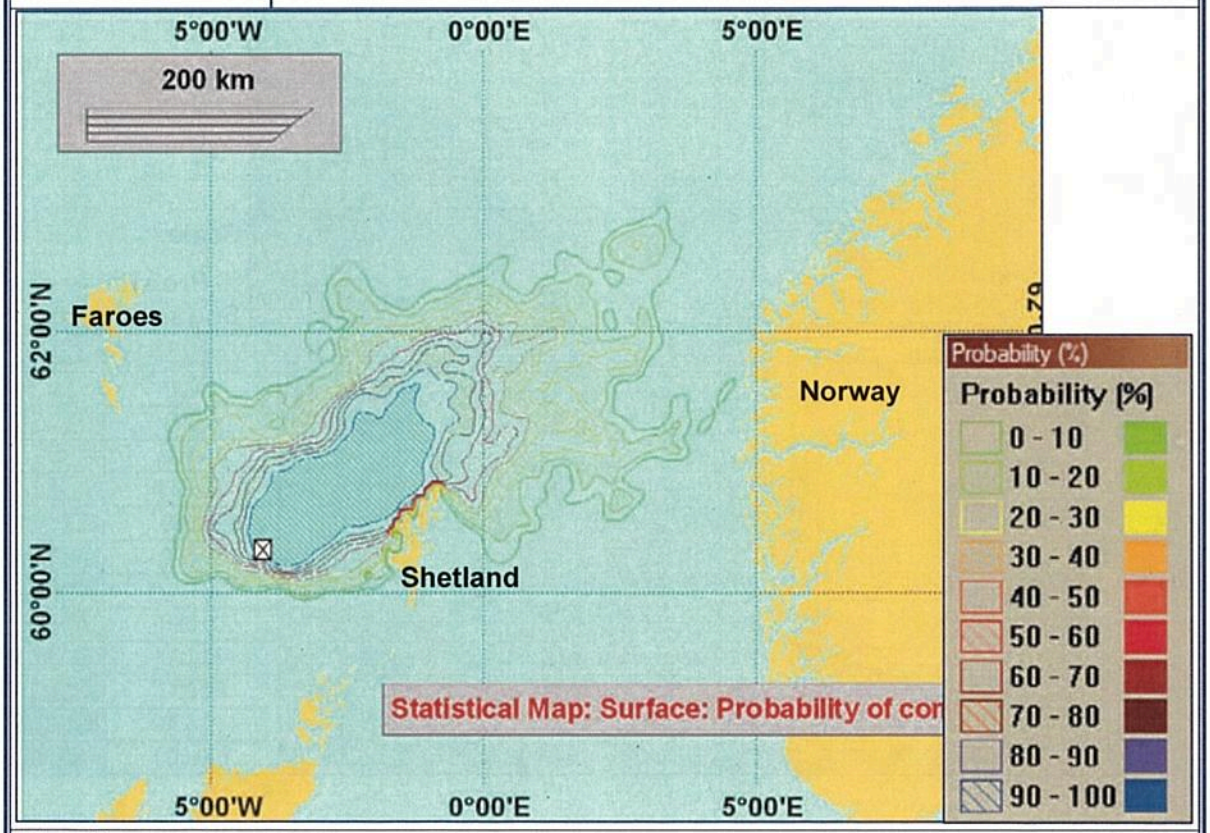
A5.2. Scenarios

A5.2.1 Schiehallion Well Blowout Scenario – OSCAR model

Scenario No 1: Schiehallion Well Blowout Scenario (modelled on OSCAR)	
Hydrocarbon Type	Schiehallion Crude
Quantity	287,280m^3
Latitude	N 60° 20' 08"
Longitude	W 04° 02' 05"
Leak rate	133m^3/h for 2160 hours (90 days – OSCAR)



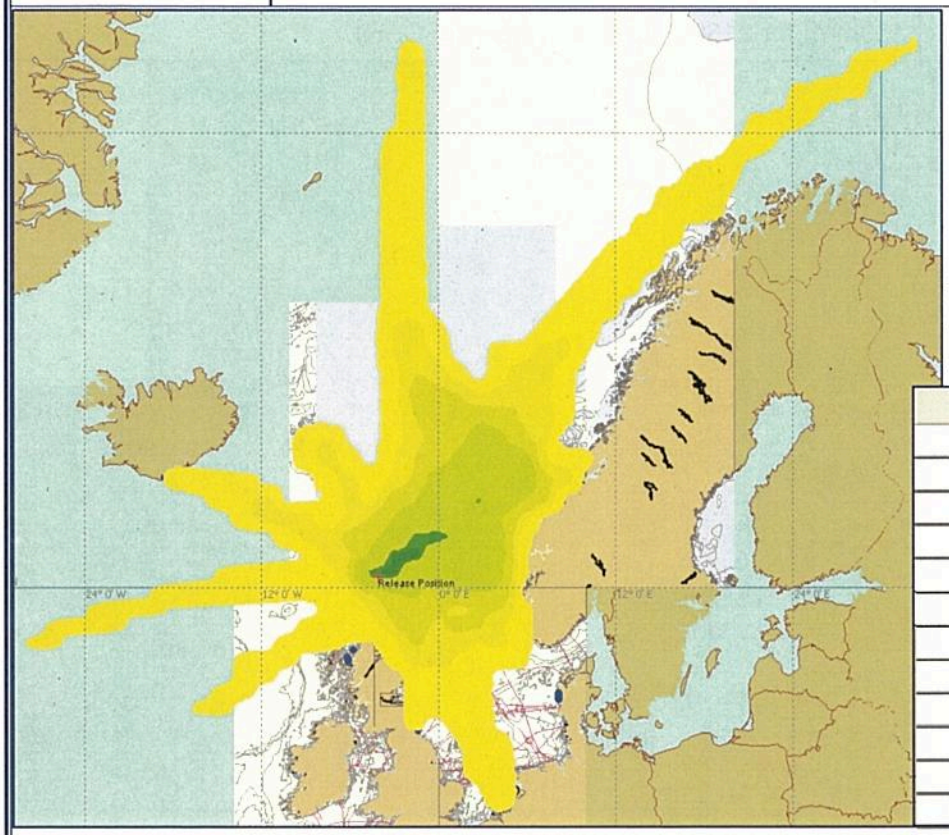
Results:

Modelling indicates the oil moves to the north and north east of the release point and Shetland, by the shelf current and the prevailing south westerly winds, resulting in the majority of oil degrading and dispersing without beaching. Assuming no response is undertaken, a maximum of less than 1.5% (889 to 2,975 tonnes of oil) of the total quantity of oil released is predicted to beach on the Shetland coastline (assuming worst case weather conditions).

The model indicates a 0-10% probability of oil beaching on the coastlines of the north of Scotland, Orkney, Norway and zero probability in the Faroes. Near the release site the oil will disperse throughout the water column. Much of the overall depth of the water column will be affected in a relatively narrow band in the direction of the prevailing currents, to the northeast. At day 90 of the release, when the maximum amount of oil has been released, it is predicted that 32% of the oil will already have decayed in the water column by microbial action. A further 22% is predicted to have evaporated, 13% to have deposited on sediments with 32% dispersed in the water column. Typically less than 1% is predicted to have beached or remain on the surface at 90 days.

A5.2.2 Schiehallion Well Blowout Scenario – OSIS model

Scenario No 2: Schiehallion Well Blowout Scenario (modelled on OSIS)	
Hydrocarbon Type	Schiehallion Crude
Quantity	31,920m^3
Latitude	N 60° 20' 08"
Longitude	W 04° 02' 05"
Leak rate	133m^3/h for 240 hours (10 days – OSIS)



Scale:

% Probability of Surface Oiling

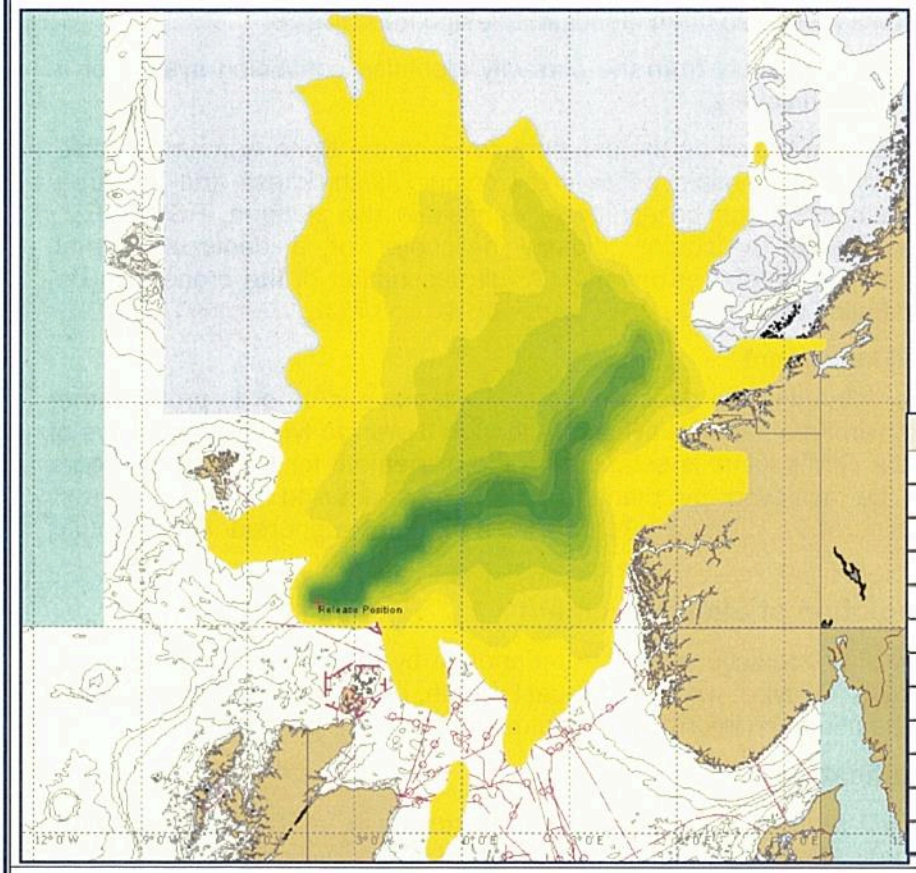
%	Colour
1.000	
5.000	
10.000	
20.000	
30.000	
40.000	
50.000	
60.000	
70.000	
80.000	
90.000	
100.000	

Results:

The stochastic modelling results indicate the prevailing weather and metocean conditions transport the oil primarily in a North Easterly direction towards Shetland and across the median line into the Norwegian Sector. The modelling indicates the total probability of oil beaching is 61.7%.

A5.2.3 Schiehallion Cargo Tank Rupture

Scenario No 3: Schiehallion Cargo Tank Rupture	
Hydrocarbon Type	Schiehallion Crude
Quantity	25,036m^3
Latitude	N 60° 20' 08"
Longitude	W 04° 02' 05"
Leak rate	Instantaneous



Scale:

% Probability of Surface Oiling

%	Colour
1.000	
5.000	
10.000	
20.000	
30.000	
40.000	
50.000	
60.000	
70.000	
80.000	
90.000	
100.000	

Results:

The stochastic modelling results indicate the prevailing weather and metocean conditions transport the oil primarily in a North Easterly direction towards Shetland and across the median line into the Norwegian Sector. The modelling indicates the total probability of oil beaching is 36.8%.

Annex 6. Response Procedures and Guidance

A6.1. Reporting of an Oil (Hydrocarbon) Spill

A6.1.1 Initial Offshore Notification Requirements

It is the responsibility of the OIM to initially report all spills to the regulatory bodies & BP onshore. The offshore notification matrix and PON1 reporting requirements specific to the OIM are detailed in the *Offshore Response Action Plan, Section ROff 1.11.* The relevant onshore initial notification requirements are contained in the Foinaven and Schiehallion DPO Checklist and *ROn 3 - Emergency Contacts Directory*.

A6.1.2 Estimating Spill Size

Two effective techniques have been identified to estimate spill size.

1. Report the known quantity from the correctly identified containing system or if unknown using technique 2.
2. Visual estimation of the oil on the sea surface using the Bonn Agreement table which details the relationship between oil colour, its thickness and the area covered. This method can be achieved from either the platform, RSV/ERRV, infield crew change helicopter, Jigsaw helicopter or a dedicated aerial surveillance aircraft (preferred means). A full description of the process to be followed is detailed in the *Offshore Response Action Plan, Section ROff 1.7.*

A6.1.3 Estimating Spill Movement

It is important to determine the direction the spill will move in order to protect other installations or environmental sensitivities. Although there are two effective ways of achieving this, the OIM's focus is establishing the movement for the first few hours only. This can be achieved by manual tracking, as detailed in the *Offshore Response Action Plan, Section ROff 1.13* and then supported by computer modelling.

A6.2. Computer Prediction of Slick Movement

Computer based slick predictions will be undertaken by the onshore team through OSR, Southampton. Oil type, weather forecast, depth, estimated quantity and initial position will be the minimum information required to conduct a prediction.

A6.3. Tier Size Identification

To enable the OIM to identify the correct level of response, a "Tiered Assessment Checklist" has been developed, detailing a series of subjective criteria designed to assist the OIM and onshore IMT in the decision making process. The checklist will also determine the lead team in terms of response coordination. The Assessment Checklist is contained in the *Offshore Response Action Plan, Section ROff 1.15.*

A6.4. Response Strategy Operational Guidelines

A6.4.1 Selecting an Initial Offshore Response Strategy

The oil type present within the field is Schiehallion crude. This is a relatively persistent oil when released into the marine environment. As indicated within this plan it's fate within the environment can be influenced depending upon the actual weather conditions at the time. Consequently a number of response strategies may be required to manage operations. To assist the OIM and onshore team in identifying the most effective and environmentally beneficial response BP have devised a field specific response strategy flowchart. The offshore response strategy flowchart is located in the *Offshore Response Action Plan, Section ROff 1.16.*

A6.5. Available Response Strategies

There are 3 response strategies that can be implemented for Schiehallion field spills:-

1. *Surveillance & Monitoring*: Strategy to be implemented for light oils such as diesel and small crude spills where the prevailing weather conditions are conducive to naturally dispersing the oil into the environment.
2. *Chemical Dispersant Spraying*: To be implemented for larger more persistent crude spills that may pose a threat to the personnel onboard the platform or have the potential to impact either environmental sensitivities or the beach. Approval from authorities (Scotland – Marine Scotland, England & Wales – MMO) for dispersant use is not required unless the spill occurs within 1 nautical mile of a 20m depth contour. It is strongly advised however that advice from the relevant Authority (Scotland – Marine Scotland, England & Wales - MMO) is sought prior to dispersant use in waters outside of the 20 metre plus one nautical mile contour or waters with a depth of more then 20 metres.
3. *Mechanical Containment and Recovery*: The use of at sea or shoreline containment booms and skimmers which will be mobilised for very large spills where the above two strategies are not viable or insufficient.

The OIM has the ability to implement surveillance and monitoring plus initiate a limited dispersant response. The latter will be done in conjunction with the onshore IMT unless the personnel or installation is considered at risk from the spill. Mechanical Containment and Recovery will be coordinated by the onshore IMT.

A6.6. Tiered Response Resources

BP have in place the resources necessary to provide a commensurate level of response proportionate to the size and type of spills maybe encountered within the Schiehallion field. In doing so they are compliant with the requirements as detailed within the DECC OPRC guidance notes. The system is based upon the standard 3 Tiered system and is defined as follows:

Tier 1 (Local)	Resources on site that can control small spills or spills that will disperse naturally. Tier 1 spills do not require onshore support;
Tier 2 (Regional)	Larger spills that cannot be managed by the resources on-site and require support from a regional location – provided by Oil Spill Response (OSR). It should be noted that for all T2+ incident response co-ordination will lie with the BP IMT.
Tier 3 (National)	Major oil spills requiring full mobilisation of Tier 2 resources plus additional support from government agencies as required.

A detailed matrix containing the Schiehallion specific tiered response resources can be found in the *Offshore Response Action Plan, Section ROff 1.18.*

Annex 7. Additional Information

A7.1. Resource Maintenance, Training and Testing

This section describes the training program in place to ensure personnel with responsibilities for oil pollution incident response are competent and oil spill response equipment is fully operational at all times.

A record of all exercises undertaken will be maintained at the location where the exercise was conducted. Records will contain details of: exercise scenario; aims; lessons learnt; actions put in place. Records will be retained for 5 years and be available upon request by DECC.

A7.1.1 Training & Exercise Program[4]

Personnel	Training
OIM	• Offshore On-scene Commander (OIM) DECC 1 level training repeated every 3 years. • Plan Familiarisation Training
ERRV Staff	• Initial training in the use of the dispersant equipment and regular refreshers (every 6 months).
Personnel	**Exercises**
Installation Staff	• OPEP exercise to ensure familiarisation of OPEP. 1 per shift per year. Can link with onshore exercise.
ERRV	• Dispersant application kit (not dispersant) to be tested every month.

[4] This plan covers offshore training and exercise requirements only. Onshore requirements are covered in the onshore OPEP.

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Table of Contents

1. Introduction

1.1. Document Scope

This document provides supporting information and argument that aims to justify the levels of preparedness specified in the Oil Pollution Emergency Plans (OPEP's) for BP E&P UK assets. It has been prepared in line with guidance provided by DECC, "Guidance Notes to Operators of UK Offshore Oil and Gas Installations (including pipelines)on Oil Pollution Emergency Plan Requirements" dated April 2009.

This document specifically applies to the BP Schiehallion asset and any associated appraisal / development drilling in this field.

1.2. Statutory Requirements

In 2002 the UK regulatory agencies and the offshore oil industry prepared and agreed a set of "Obligatory or minimum Standards" covering size and combat capability for oil spill preparedness in the offshore UKCS oil fields.

With such a Standard given by the Regulatory Authorities, the normal process of producing a risk assessment to justify a level of readiness became somewhat redundant. In 2001 a generic risk assessment for offshore oil and gas installations was produced for Oil and Gas UK (formerly UKOOA) which was permitted to be cited by UK Operators in their risk assessments and arguments for preparedness. The relevant parts of this are produced in this document to indicate general risk and probability.

The main focus of this justification document therefore is to illustrate that the operations of the BP E&P UK fields, as specified, are not out of the ordinary in any aspect and therefore the "Standard" is wholly appropriate.

The document will illustrate this and give evidence of contractual arrangements for response assets.

1.3. The Standard

Section 6 of the DECC guidance requires operators of installations operating in non sensitive blocks, or within blocks wholly outside of the 25 mile coastal water contour, to have in place minimum requirements for surveillance and oil spill combat. The table is reproduced herein for reference and forms the basis for BP's response capability.

1.3.1 Minimum Requirements for Surveillance and Oil Spill Combat

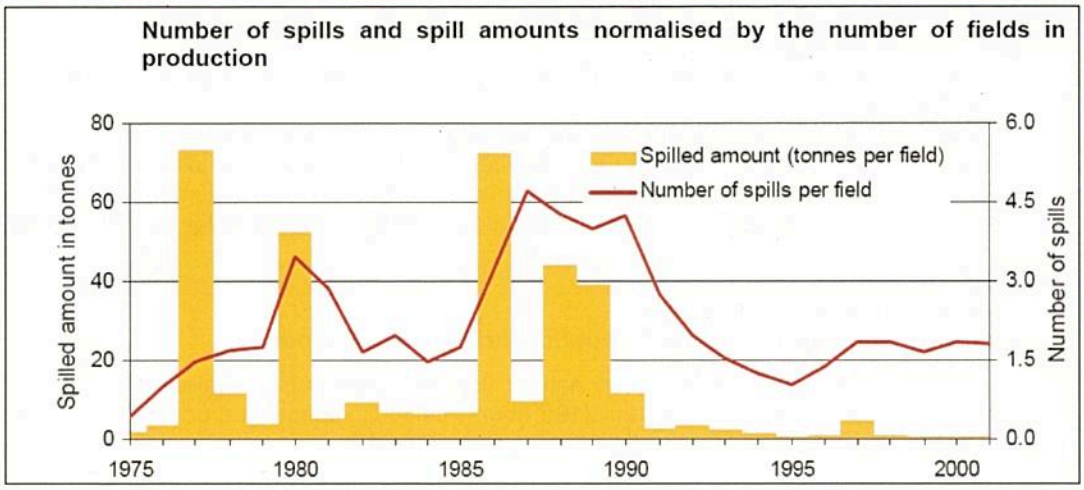
			Block Specific Vulnerability (JNCC 1999)	
Oil Quantity (Estimate)	**Oil Type**	**Aerial Surveillance Response Time**	**1**	**All other Categories**
0 to 25 tonnes	1	4	Monitor and natural dispersion – (dispersant requirement assessed on case by case basis).	Monitor and natural dispersion - No dispersant requirement.
	2; 3 and 4	4	Monitor and dispersant within 1 hour.	Monitor and dispersant available but no "within 1 hour requirement".
25 to 100 tonnes	1	4	Monitor and natural dispersion – (dispersant requirement assessed on case by case basis).	Monitor and natural dispersion - No dispersant requirement.
	2, 3 and 4	4	Monitor and dispersant within 2 hours.	Monitor and dispersant available but no "within 2 hour requirement".
100 to 500 tonnes	1	4	Monitor and natural dispersion – (dispersant requirement assessed on case by case basis).	Monitor and natural dispersion - No dispersant requirement.
	2; 3 and 4	4	Monitor and dispersant within 6 hours.	Monitor and dispersant within 6 hours.
>500 tonnes	1	4	Monitor and natural dispersion – (dispersant requirement assessed on case by case basis).	Monitor and natural dispersion - No dispersant requirement.
	2; 3 and 4	4	Monitor and dispersant within 18 hours.	Monitor and dispersant within 18 hours.

1.4. Probability of Spillage

1.4.1 Industry Figures

The following diagram illustrates spill frequency and quantity analysis from spills in the UKCS 1975-2002. The predicted frequency of Spills per Field is approximately 2 per annum with an amount less than 0.5 tonne per field per annum.

Number of Spills and Spill Amounts

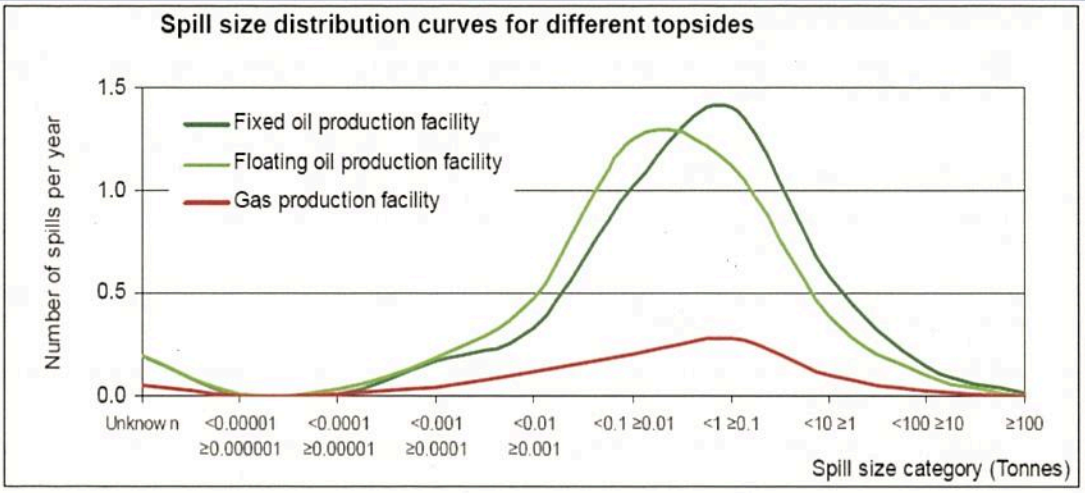


Source: - Oil and Gas UK

The following diagram illustrates the spill size distribution for different topside types.

As can be seen the results for fixed and floating facilities are quite similar with typical spills occurring 1-2 per year per facility with a typical spill size range of between 1 litre and 10 tonnes. The chart illustrates that the frequency of spills greater that 100 tonnes is insignificant.

Spill Size Distribution



Source: - Oil and Gas UK

2. Asset Specific Response Justification

2.1. Schiehallion

Schiehallion

Containing Systems & Spill Sizes

Diesel:-
1,700m^3 stored as diesel fuel. This storage tank represents the largest diesel inventory on board the Schiehallion FPSO.
FPSO – Crude Storage:-
The largest crude storage tank on the FPSO is 25,036m^3 (Cargo Oil 6 – Port & Starboard).
Shuttle Tankers:-
The largest crude storage tank on board the Hanne Knutsen shuttle tanker holds 11,669.7m^3. As this is less than the largest FPSO storage tank capacity this volume has not been modelled. The largest diesel tank on board the shuttle tankers holds 502m^3. As this volume is less than that of diesel stored on Schiehallion, the diesel inventory has not been modelled for the shuttle tankers.

Support Modelling

Stochastic Modelling Justification
Scenario 1: Schiehallion Well Blowout Scenario – OSCAR model

This scenario assumes the worst case natural flow rate from a Schiehallion well. The volume modelled was 287,280m^3 (133m^3/h for 2160 hours) using Schiehallion crude. The well blow out scenario has been modelled for the full 90 days using OSCAR.

Scenario 2: Schiehallion Well Blowout Scenario – OSIS model

This scenario assumes the worst case natural flow rate from a Schiehallion well. The volume modelled was 31,920m^3 (133m^3/h for 240 hours) using Schiehallion crude. The well blow out scenario has been modelled for 10 days using OSIS.

Scenario 3: Schiehallion Cargo Tank Rupture – OSIS model

This scenario assumes the worst case instantaneous release of the one of the cargo tank inventories from the Schiehallion FPSO (25,036m^3). The risk of a spill from this containing system is considered low.

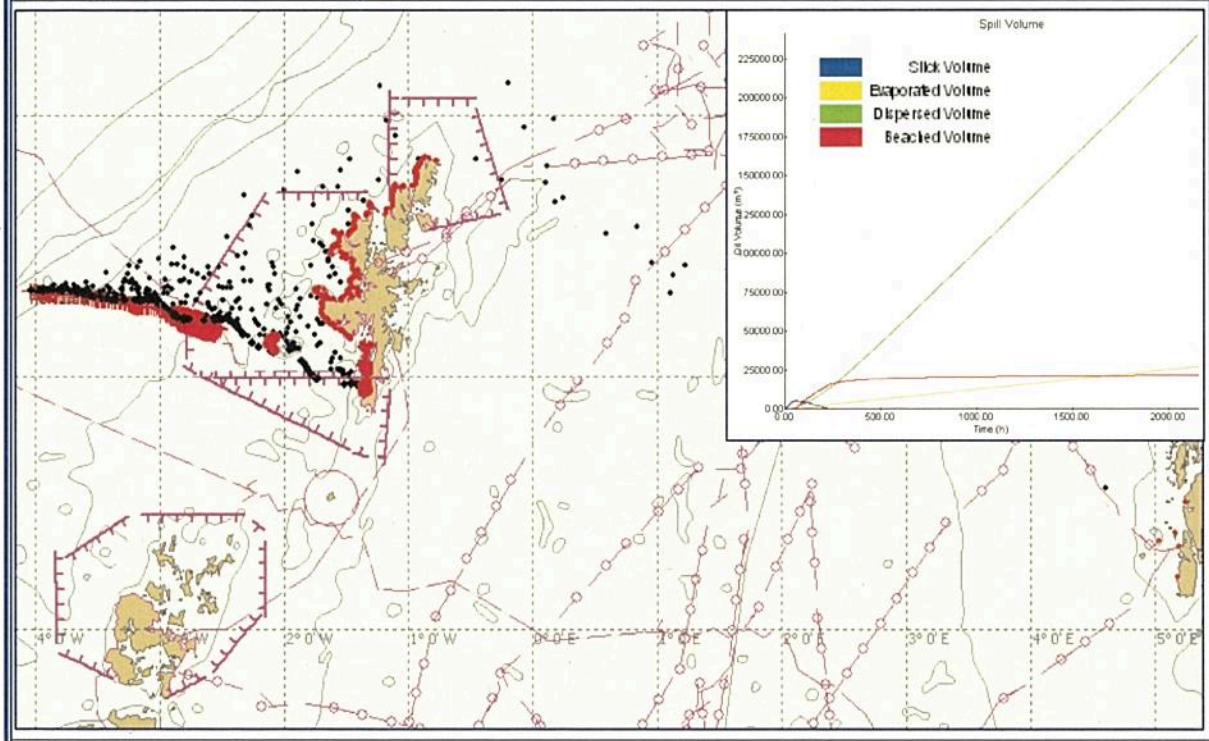
Deterministic Modelling Justification

The following 8 deterministic runs were undertaken to establish potential beaching times under worst case conditions (30 knot wind, onshore and offshore directions). The hydrocarbon types selected are Diesel and Schiehallion Crude as these represent hydrocarbon spills from the largest and most persistent inventories associated with the Schiehallion FPSO.

- 287,280m³ Schiehallion Crude spill from a well blow out (133m^3/h for 2160 hours). Towards Shetland shoreline (onshore).
- 287,280m³ Schiehallion Crude spill from a well blow out (133m^3/h for 2160 hours). Towards UK/Faroes median line (offshore).
- 31,920m³ Schiehallion Crude spill from a well blow out (133m^3/h for 240 hours). Towards Shetland shoreline (onshore).
- 31,920m³ Schiehallion Crude spill from a well blow out (133m^3/h for 240 hours). Towards UK/Faroes median line (offshore).
- 25,036m^3 Schiehallion Crude spill from FPSO cargo storage tank. Towards Shetland shoreline (onshore).
- 25,036m^3 Schiehallion Crude spill from FPSO cargo storage tank. Towards UK/Faroes median line (offshore).
- 1,700m^3 Diesel spill from FPSO diesel storage tank. Towards Shetland shoreline (onshore).
- 1,700m^3 Diesel spill from FPSO diesel storage tank. Towards UK/Faroes median line (offshore).

Schiehallion Response Justification

Scenario No 1:	287,280m³ Schiehallion Well Blow Out (133m³/h for 2160 hours), Onshore
Quantity	287,280m³ Schiehallion Crude
Latitude	N 60° 20' 08"
Longitude	W 04° 02' 05"
Season	Winter
Sea Temp	4°
Air Temp	6°
Wind Speed	30 knots
Wind Direction	295°



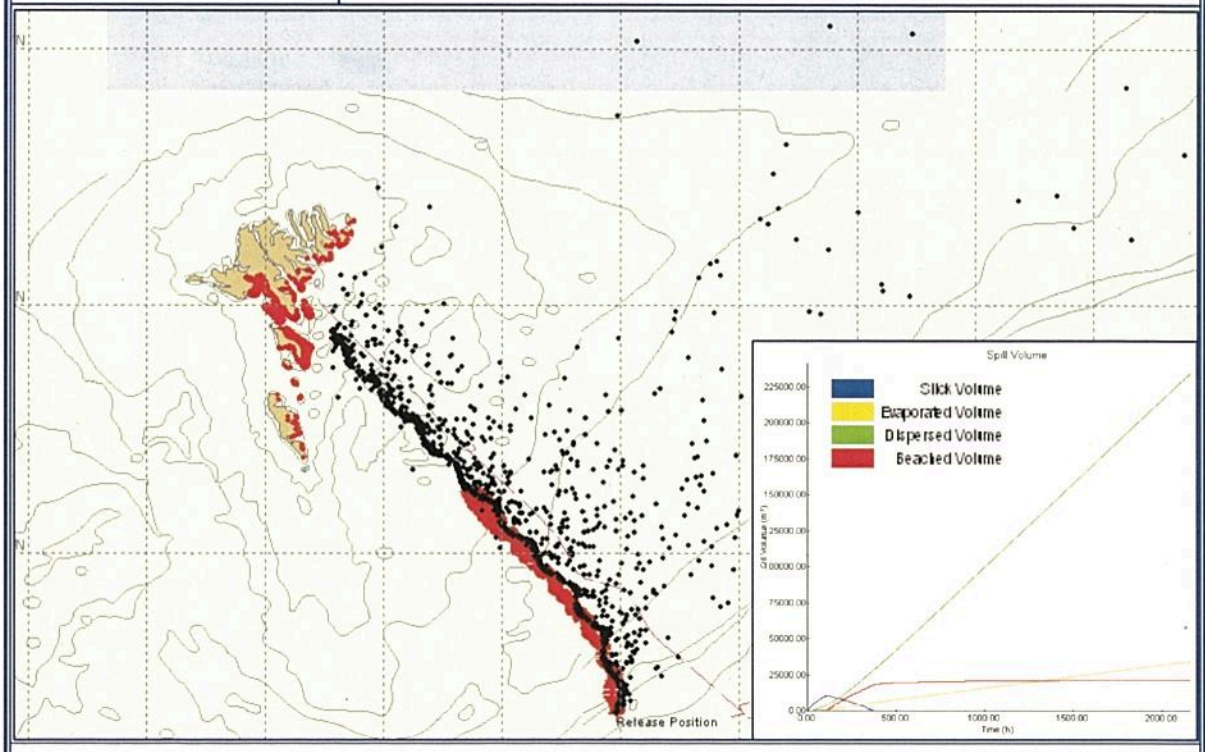
Results:

In this scenario the crude oil tracks towards Foula Island, the West of Shetland and Norwegian coastlines. It is indicated the crude oil will impact the beach after 43 hours. The crude oil will continue to beach with quantities remaining at sea for an additional 2117 hours until becoming insignificant. The maximum spill length was 180km and maximum spill width was 19km.

It is indicated that the oil has emulsified as the volume has increased to 290,776m³; 27,711m³ is lost through evaporation, 241,077m³ disperses into the water column and 21,988m³ beaches on Shetland.

It is estimated that the impact to marine biological resources would be localised and those are likely to be subjected to toxic short term non persistent effects.

Scenario No 2:	**287,280m³ Schiehallion Well Blow Out (133m³/h for 2160 hours), Offshore**
Quantity	287,280m³ Schiehallion Crude
Latitude	N 60° 20' 08"
Longitude	W 04° 02' 05"
Season	Winter
Sea Temp	4°
Air Temp	6°
Wind Speed	30 knots
Wind Direction	140°



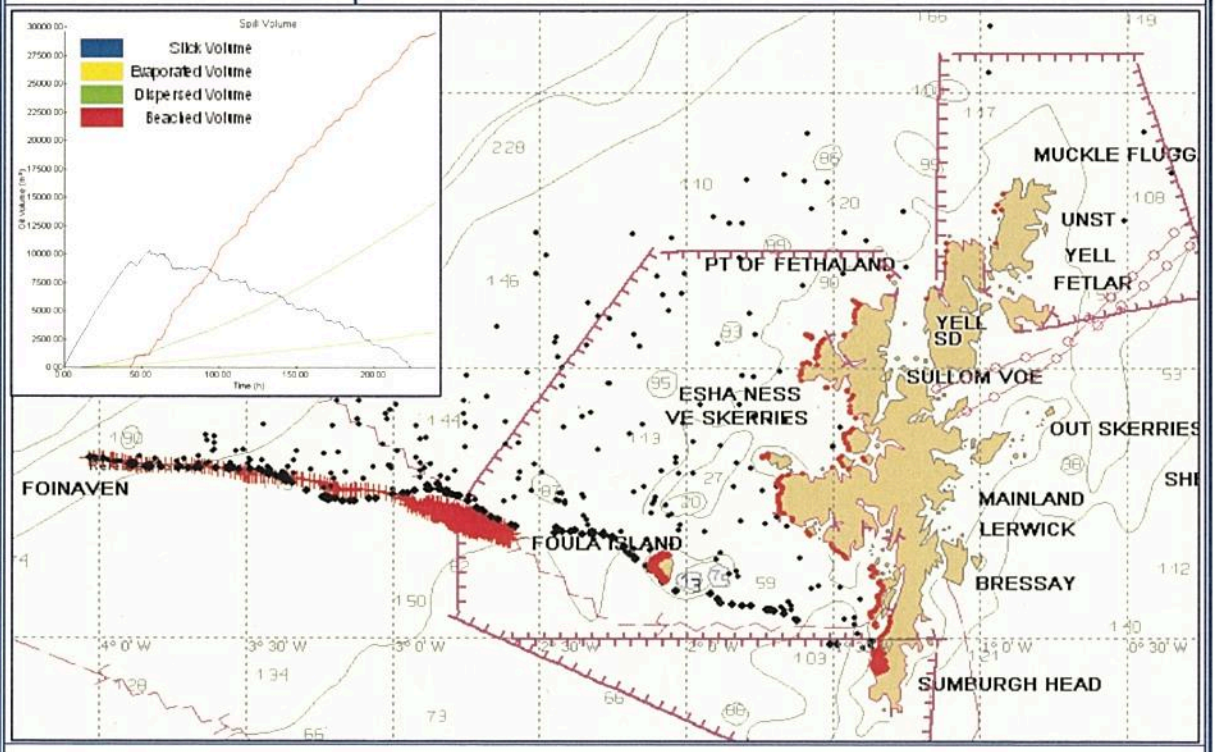
Results:

In this scenario the crude oil tracks towards the Southern and Eastern coastlines of the Faroe Isles. It is indicated the crude oil will impact the beach after 105 hours. The crude oil will continue to beach with quantities remaining at sea for an additional 2055 hours until becoming insignificant. The maximum spill length was 257km and maximum spill width was 24km. It is indicated that the spill will cross the median line after 19 hours.

It is indicated that the oil has emulsified as the volume has increased to 290,727m³; 34,567m³ is lost through evaporation, 234,479m³ disperses into the water column and 21,681m³ beaches on the Faroe Isles.

It is estimated that the impact to marine biological resources would be localised and those are likely to be subjected to toxic short term non persistent effects.

Scenario No 3: 31,920m³ Schiehallion Well Blow Out (133m³/h for 240 hours), Onshore	
Quantity	31,920m³ Schiehallion Crude
Latitude	N 60° 20' 08"
Longitude	W 04° 02' 05"
Season	Winter
Sea Temp	4°
Air Temp	6°
Wind Speed	30 knots
Wind Direction	295°



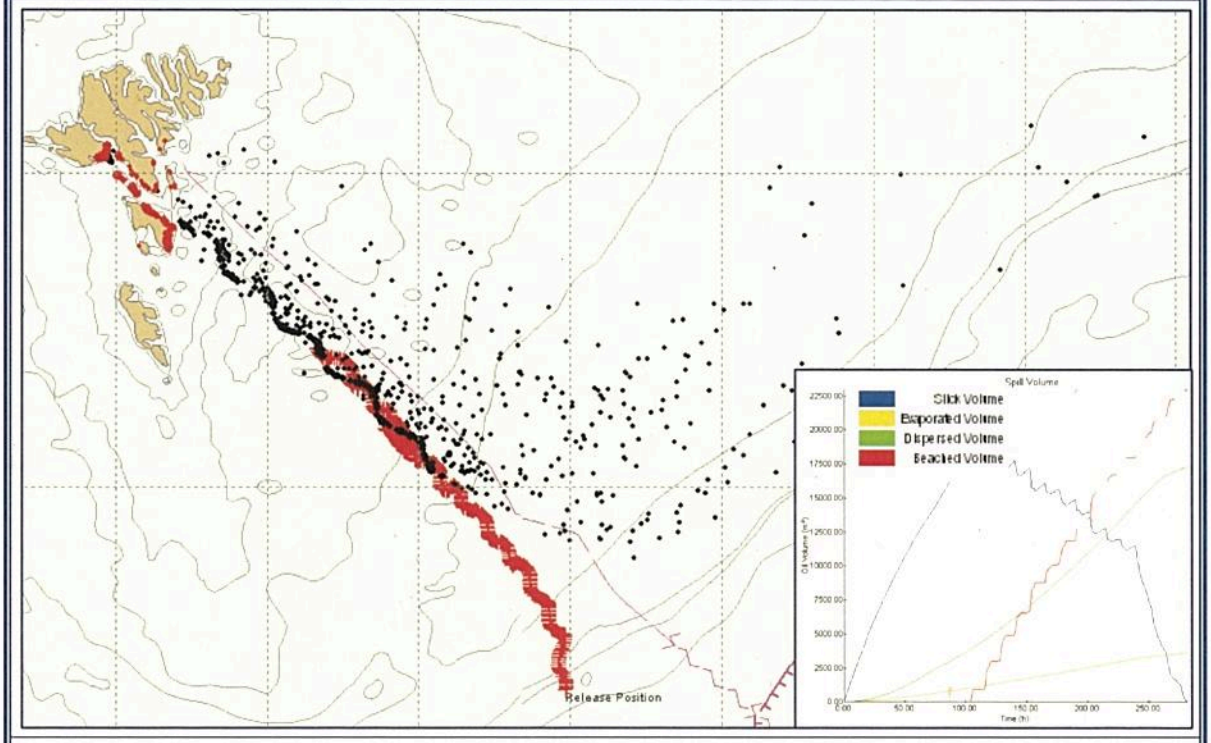
Results:

In this scenario the crude oil tracks towards Foula Island, the West of Shetland and Norwegian coastlines. It is indicated the crude oil will impact the beach after 43 hours. The crude oil will continue to beach with quantities remaining at sea for an additional 197 hours until becoming insignificant. The maximum spill length was 157.5km and maximum spill width was 17km.

It is indicated that the oil has emulsified as the volume has increased to 47,263m³; 3,117m³ is lost through evaporation, 14,582m³ disperses into the water column and 29,564m³ beaches on Shetland.

It is estimated that the impact to marine biological resources would be localised and those are likely to be subjected to toxic short term non persistent effects.

Scenario No 4:	**31,920m³ Schiehallion Well Blow Out (133m³/h for 240 hours), Offshore**
Quantity	31,920m³ Schiehallion Crude
Latitude	N 60° 20' 08"
Longitude	W 04° 02' 05"
Season	Winter
Sea Temp	4°
Air Temp	6°
Wind Speed	30 knots
Wind Direction	140°



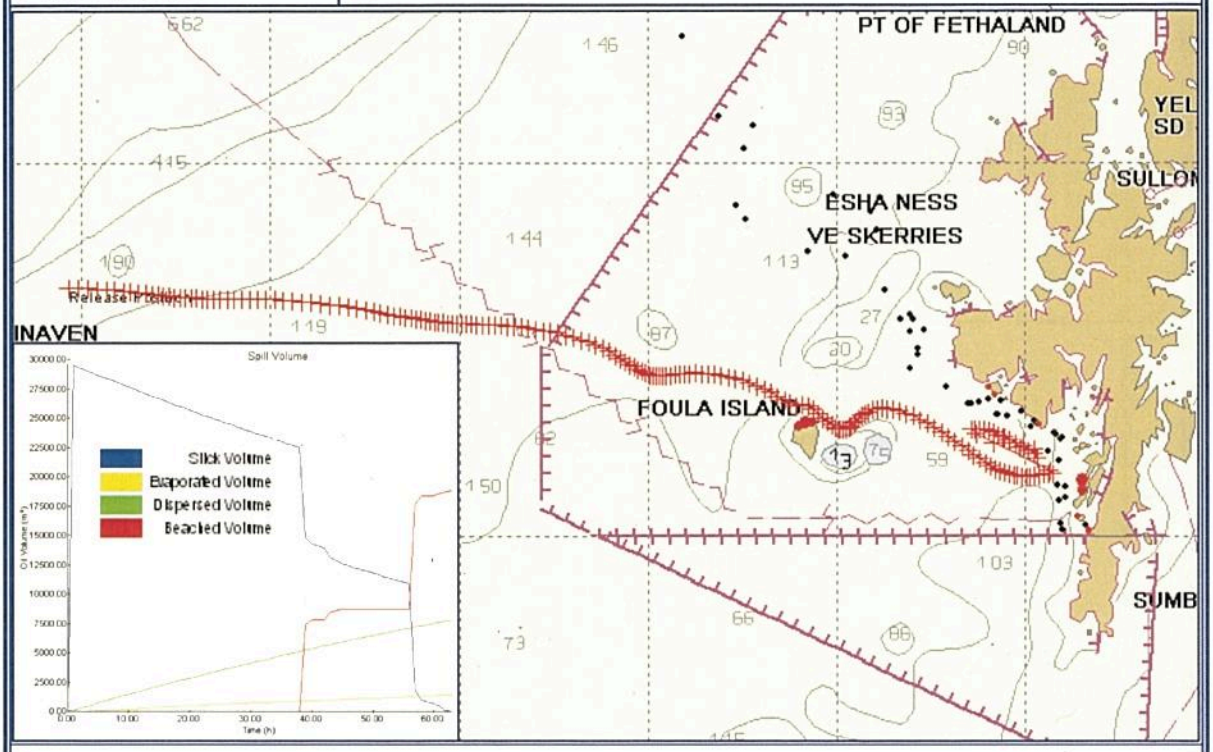
Results:

In this scenario the crude oil tracks towards the Faroe Isles. It is indicated the crude oil will impact the beach after 105 hours. The crude oil will continue to beach with quantities remaining at sea for an additional 177 hours until becoming insignificant. The maximum spill length was 175.2km and maximum spill width was 17.1km. It is indicated that the spill will cross the median line after 18.5 hours.

It is indicated that the oil has emulsified as the volume has increased to 43,826m³; 3,613m³ is lost through evaporation, 17,274m³ disperses into the water column and 22,939m³ beaches on the Faroe Isles.

It is estimated that the impact to marine biological resources would be localised and those are likely to be subjected to toxic short term non persistent effects.

Scenario No 5: 25,036m³ Schiehallion Cargo Tank Spill, Onshore	
Quantity	25,036m³ Schiehallion Crude
Latitude	N 60° 20' 08"
Longitude	W 04° 02' 05"
Season	Winter
Sea Temp	4°
Air Temp	6°
Wind Speed	30 knots
Wind Direction	292°



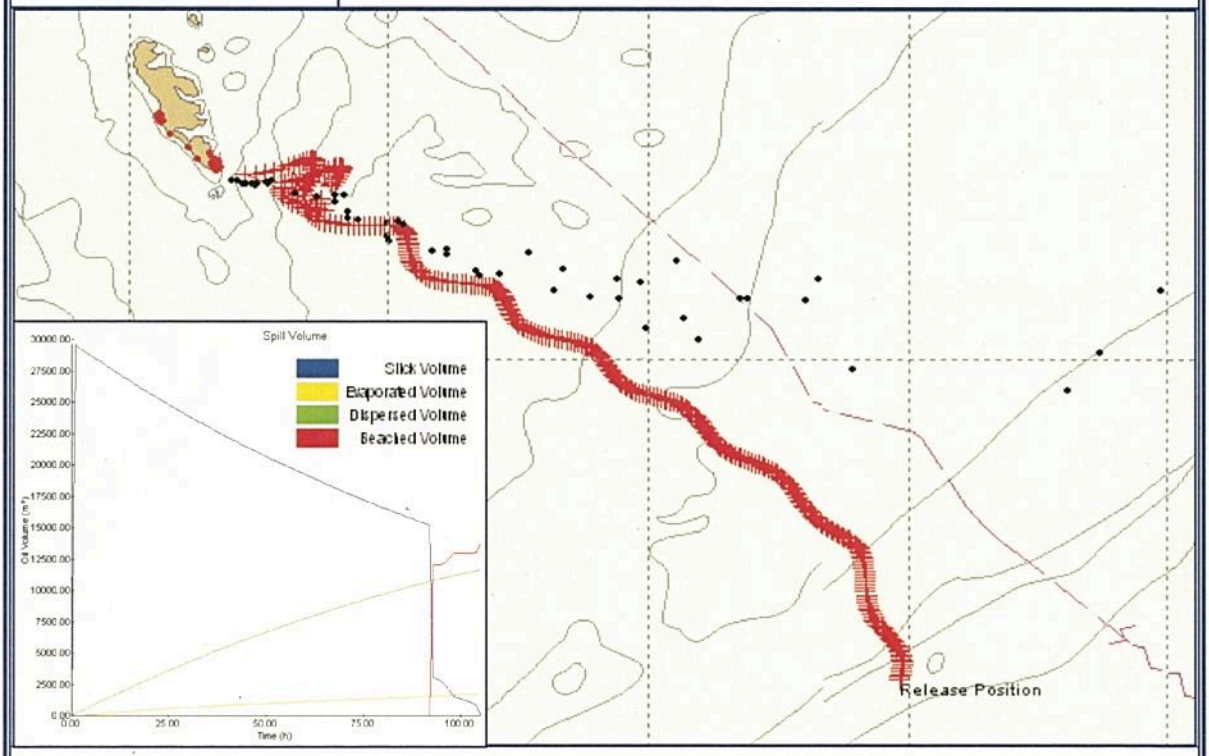
Results:

In this scenario the crude oil tracks towards Foula Island and the West of Shetland coastline. It is indicated the crude oil will impact the beach after 39 hours. The crude oil will continue to beach with quantities remaining at sea for an additional 24 hours until becoming insignificant. The maximum spill length was 48km and maximum spill width was 11km.

It is indicated that the oil has emulsified as the volume has increased to 28,030m³; 1,434m³ is lost through evaporation, 7,765m³ disperses into the water column and 18,831m³ beaches on Shetland.

It is estimated that the impact to marine biological resources would be localised and those are likely to be subjected to toxic short term non persistent effects.

Scenario No 6: 25,036m³ Schiehallion Cargo Tank Spill, Offshore	
Quantity	25,036m³ Schiehallion Crude
Latitude	N 60° 20' 08"
Longitude	W 04° 02' 05"
Season	Winter
Sea Temp	4°
Air Temp	6°
Wind Speed	30 knots
Wind Direction	130°



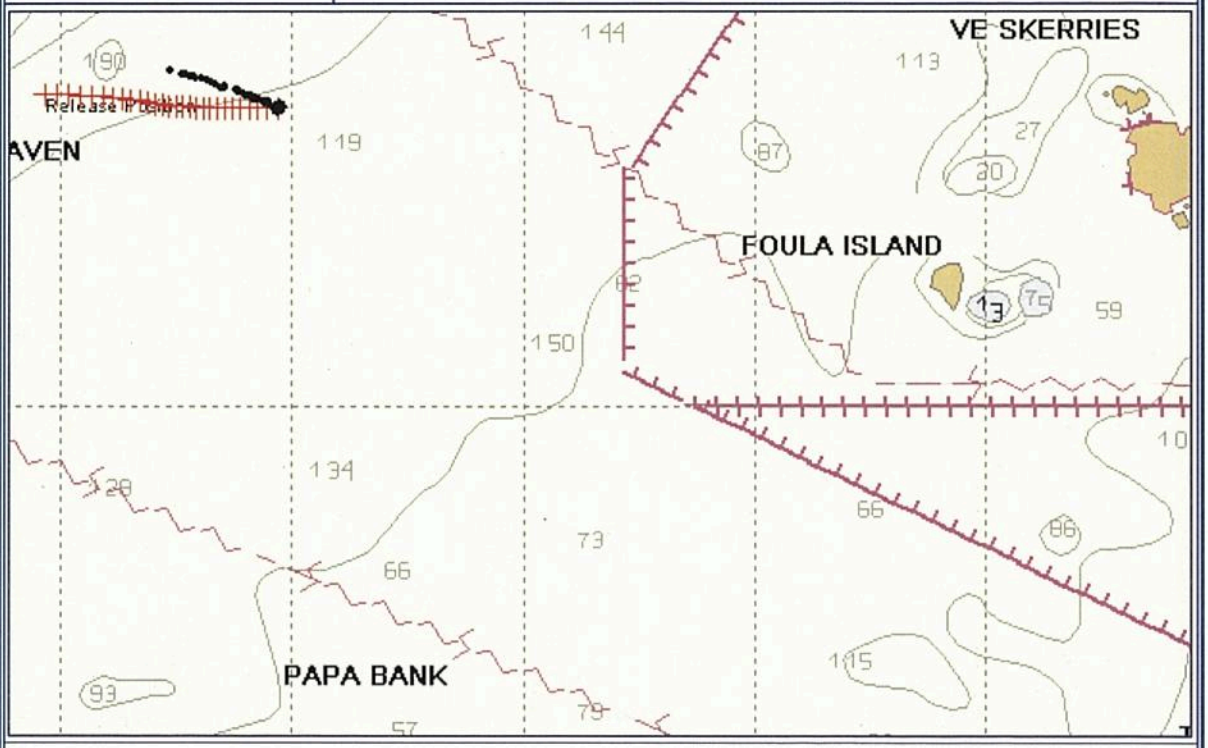
Results:

In this scenario the crude oil tracks towards the Southern coastline of the Faroe Isles. It is indicated the crude oil will impact the beach after 93 hours. The crude oil will continue to beach with quantities remaining at sea for an additional 12 hours until becoming insignificant. The maximum spill length was 94km and maximum spill width was 9km.It is indicated that the spill will cross the median line after 17 hours.

It is indicated that the oil has emulsified as the volume has increased to 27,228m³; 1,770m³ is lost through evaporation, 11,674m³ disperses into the water column and 13,784m³ beaches on the Faroe Isles.

It is estimated that the impact to marine biological resources would be localised and those are likely to be subjected to toxic short term non persistent effects.

Scenario No 7: 1,700m³ Schiehallion Diesel Spill, Onshore	
Quantity	1,700m³ Diesel
Latitude	N 60° 20' 08"
Longitude	W 04° 02' 05"
Season	Winter
Sea Temp	4°
Air Temp	6°
Wind Speed	30 knots
Wind Direction	295°

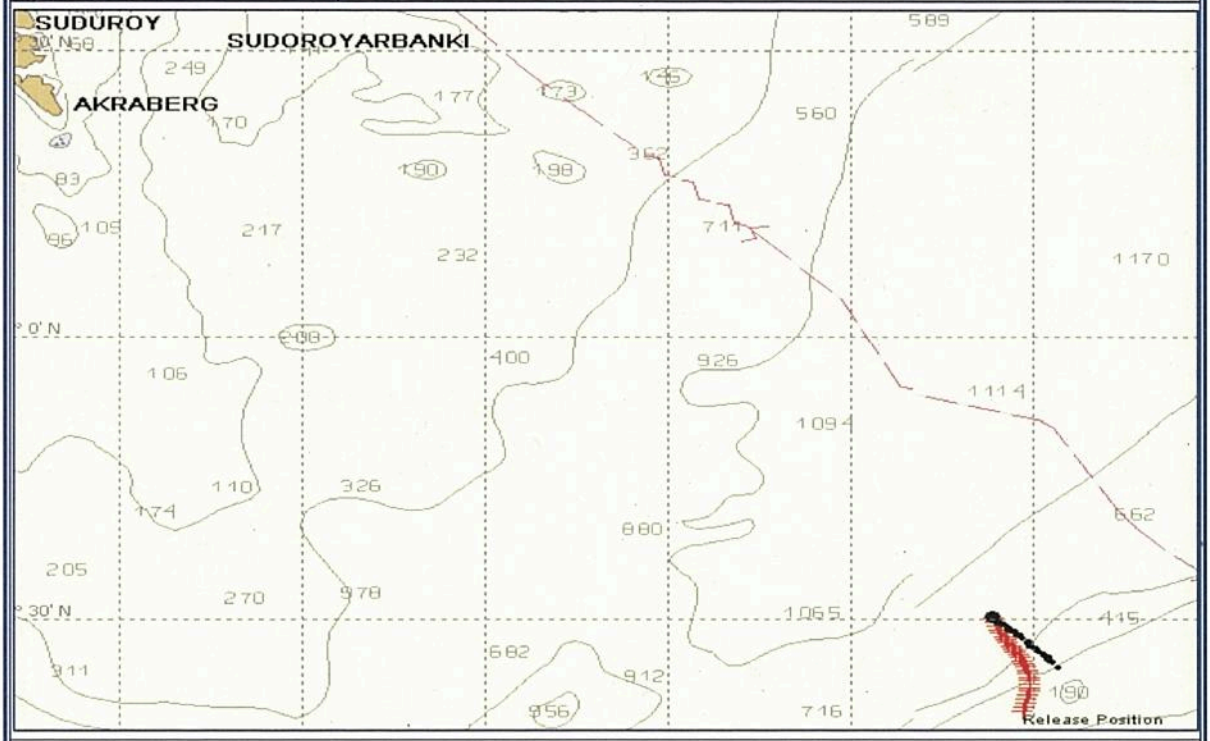


Results:

Modelling results indicate that the diesel persisted for 9 hours before dispersing naturally into the environment. During that time the spill travelled 4km attaining a maximum width of 0.8km. Results indicated that 601m³ of the hydrocarbon evaporated and 1099m³ dispersed into the upper layers of the water column.

It is estimated that the impact to marine biological resources would be localised and those impacted are likely to be subjected to toxic short term non persistent effects.

Scenario No 8: 1,700m³ Schiehallion Diesel Spill, Offshore	
Quantity	1,700m³ Diesel
Latitude	N 60° 20' 08"
Longitude	W 04° 02' 05"
Season	Winter
Sea Temp	4°
Air Temp	6°
Wind Speed	30 knots
Wind Direction	140°



Results:

Modelling results indicate that the diesel persisted for 9 hours before dispersing naturally into the environment. During that time the spill travelled 4km attaining a maximum width of 0.8km. Results indicated that 601m³ of the hydrocarbon evaporated and 1099m³ dispersed into the upper layers of the water column. It is indicated the spill will not cross the median line.

It is estimated that the impact to marine biological resources would be localised and those impacted are likely to be subjected to toxic short term non persistent effects.

Schiehallion Response Justification

Support Modelling & Fate of Oil

Non Modelled Oil Fate

Pipeline modelling was not run as gas is the only hydrocarbon present within the Schiehallion to SVT pipeline.

Oil based mud once released into the marine environment, typically sinks and leaves only a visible sheen on the sea surface.

Receiving Environment

The Schiehallion field OPEP describes the local environmental conditions. The main potential impacts are a) seasonal seabird vulnerability b) seasonal fisheries sensitivities c) seasonal cetacean vulnerability.

- Seabird vulnerability is highest in the months between March and July;
- The greatest vulnerability for fish spawning is from January to July;
- Commercial fishing activity is relatively low in the area surrounding Schiehallion, with deep sea fishing increasing in interest in the Faroe-Shetland Channel;
- Cetacean densities appear moderate in the area with numbers feeding in the area throughout the year ;
- There are no set fishing lanes in the Schiehallion area. Fishing vessels make up the majority of the traffic.

Response

BP has in place the resources necessary to provide a commensurate level of response to the size of spills they may encounter and are compliant with the requirements as detailed within the DECC OPRC guidance notes. The system is based upon the standard 3 Tiered system and is defined as follows:-

Tier 1: Monitoring and surveillance using infield vessels.

Tier 2: Additional aerial surveillance and dispersant spraying capability is available within 4 hours through OSR.

Tier 3: A full Tier 3 capability is available through OSR.

Chemical Dispersant

Schiehallion Crude

Schiehallion crude oil has an asphaltene content of 0.36% indicating this oil is unlikely to form a stable emulsion. Dependent on weather conditions and time of year, the use of chemical dispersant may be recommended as part of the response strategy. There are both Tier 1 & Tier 2 levels of response available in the event of a spill of Schiehallion crude.

Shoreline Response Arrangements

The Schiehallion field is located in the waters West of Shetland with the Faroe transboundary line being a distance of 37km. The nearest points of land are 110km to Foula, 126km to Papa Westray and 129km to Papa Stour. In the event of a spill approaching the Shetland coastline, BP has additional coastal response resources located in Shetland.

2.2. Response Contract

BP E&P UK are full members of Oil Spill Response, based in Southampton, who provide the full range of equipment and personnel necessary to fulfil the response expectations of BP E&P UK and to align with the regulatory requirements.

3. Well Management Description & Strategy

It is understood that the circumstances surrounding the drilling of subsea wells can differ greatly (i.e. deep water, HPHT, exploration, appraisal etc). Due to the presence of these different factors associated with the development of new wells it is difficult to identify all potential risk factors. The following table is intended only as a guide to the areas which will be looked at in further detail when planning a new well and the information which will be inserted into the task specific OPEP.

3.1.1 Well Design

All new BP wells will be designed as per the requirements laid out in BP's Engineering Technical Practices. Specific / anticipated well characteristics will be identified for each individual project. This will allow for project specific planning and design to go ahead.

Planning and design will take into account the varying factors associated with individual wells i.e. type of well (e.g. exploration, appraisal etc), HPHT, deep water, gas lift, double barrier isolation, drilling fluid densities etc.

Any wells abandoned will be as per the isolation requirements specified in the UK Oil and Gas recommended practice (and BP's Group Practice: GP 10-60).

3.1.2 Well Control

Specific well control procedures will be in place during execution of the well. The procedures will address complexities unique to the well type (such as techniques for controlling influxes with high choke line friction and low rock fracture pressure). While drilling, there will be both primary and secondary well control barriers (e.g. the annulus around the drillpipe and BOP equipment) in place.

The procedures will be developed in conjunction with BP's contracted well control specialist, who will be using advanced well simulation techniques. Well control and simulator training will be completed by key members of the associated wells team. This enables personnel critical for monitoring well parameters and for responding to any unplanned influxes to be ready to safely respond to a well control situation.

Specific rig site instructions will be reviewed and posted covering such items as well monitoring, response to an influx, well kill techniques and riser gas handling and other well control measures.

Risk assessment to identify risks and mitigating actions will be conducted as per BP Engineering Technical Practice requirements.

3.1.3 Rig Selection

Drill rig selection will be based on suitability for the specific well environment (e.g. deepwater drilling) in terms of functionality and pressure ratings. The rig will have a UK safety case and will be class certified by a recognised certifying authority. BP will perform assurance audits prior to rig acceptance to confirm all critical systems such as subsea and surface blow out prevention equipment and drilling fluid circulating and processing systems are fully certified and working as designed.

3.1.4 Equipment

Specific equipment requirements will vary with each new well. Given the potential variability of a well failure event, BP will have in place a variety of scenario plans to enhance response effectiveness and reduce response time. These will include consideration of pressure and flow monitoring equipment, backup BOP operation, intervention by suitably rated vessels and equipment, compatibility of BOP and LMRP connectors with capping equipment.

3.1.5 Dispersant – Surface Application

Surface spill response techniques are detailed in the main body of the OPEP response action plan. Surface spill response will comply with UK Regulatory requirements including aerial surveillance capability within 4 hours; dispersant spraying within 6 hours; and the high-rate dispersant application from the C130 Hercules within 9 hours.

The primary decision in the event of a spill is whether BP believes the oil will disperse naturally in the marine environment without affecting sensitive resources, in which case dispersant treatments are to be avoided. Natural dispersion by wave action is the preferred method of dispersion, but should any sensitive resources be threatened by surface oil, it is likely that BP will engage dispersant application onto fresh oil.

In the event of a Tier 3 situation, in the likelihood of a very large spill affecting sensitive coastlines or other environmental sensitivities, it may be that dispersant treatment is justified. The window of dispersant effectiveness will also have an influence on the decision made whether to spray dispersant.

Although OSR are committed to the aerial dispersant response times, it is prudent to also consider that the start of the operation may be delayed to allow for weather and light conditions. In this case, it may be prudent to enhance the local dispersant capability to strengthen the immediate dispersant response. Standby vessels may also be equipped with additional dispersant capabilities.

3.1.6 Relief Well Planning

It is estimated that it would take 20 days for rig mobilisation and 100 days drilling and kill time. Therefore, 120 days to stem the flow from the offending well.

If the well were to flow continually at a rate of 3,192m^3 per day for 120 days, the worst case volume of oil which could be lost is 383,040m^3.

3.2. Response Conclusion

It can be concluded that BP does have a small risk of spillage of oil from its operations. The likely spill will be small and contained. Spills that do reach the ocean are likely to be persistent, although the window of opportunity for use of dispersant is dependent on the time of year and weather conditions at the time of the spill occurring. In the event of a worst case scenario spill it is likely the oil will impact the shoreline. BP have a heightened shoreline response capability to put into practice should this eventuality be reached.

In support of all strategies, the use of early and airborne observation is required to verify and monitor any natural break up of intervention techniques.

4. References

The following documents are submitted along with this justification summary and provide more comprehensive details.

- AEA Technology Report
- Oil and Gas UK Oil Spill Analysis 2002 Tina Consultant Ltd
- Quad204 Project Environmental Statement, November 2010