

12 CONCLUSIONS AND RECOMMENDATIONS

12.1 Conclusions

The conclusions from a consideration (Sections 10 and 11) of potential effects of implementation of the DTI draft plan for a 23rd round of offshore oil and gas licensing are summarised in the table below:

Issue	Potential sources of significant effect	Section
Biodiversity	Physical damage to biotopes, associated with pipeline construction – concluded to be very small in comparison to the extent of physical disturbance from trawling and other activities. Recovery of affected seabed through sediment mobility, and faunal recovery and re-colonisation, is expected to be rapid where the source of effects is transient (e.g. anchoring); less than five years in most cases. Mitigation measures, principally the identification and avoidance of habitats and populations of particular sensitivity, can be expected to be implemented through established project assessment and planning controls	10.3.2
	Marine discharges – potential effects of non-native species introductions in ballast water discharges – considered very unlikely	10.3.4
	Major oil spill effects could result in long-term, severe damage to habitats and ecosystem function , although incremental risk associated with the predicted level of activity is low. DTI has regulatory mechanisms in place to require Operators to develop effective oil spill mitigation measures, covering organisational aspects and the provision of physical and human resources; and to refuse consents for specific activities (including exploration drilling and development) where adequate risk management cannot be provided	10.3.8
Population	Interactions with other users are principally associated with commercial implications of exclusion of fishing activities in the vicinity of infrastructure, and safety risks of interactions between fishing gear and subsea infrastructure. Mitigation measures are in place and overall effect is considered acceptable	10.3.3

Issue	Potential sources of significant effect	Section
	Interactions with shipping, military and other human uses of the offshore environment (excluding fishing) are minimal	10.3.3
	Socio-economic consequences of oil spills are potentially significant although incremental risk associated with the predicted level of activity is low. Effective oil spill mitigation measures will be required prior to operations	10.3.8
	Socio-economic effects of potential activities, in terms of employment, expenditure and tax revenue are reviewed and considered beneficial, although limited in magnitude	10.6
	Atmospheric emissions have potential effects on local air quality , but no potential for significant effects on human health	10.3.6
Human health	Potential food chain effects of major oil spills - incremental spill risk associated with the predicted level of activity is low; and significant effects would be prevented by regulatory and other mechanisms	10.3.8
Fauna: zooplankton benthos cephalopods fish marine reptiles birds marine mammals	Underwater noise - potential behavioural and physiological effects on marine mammals and fish associated with seismic surveys – it is concluded that there is an acceptably low risk of potential effects of underwater noise resulting from forecast activity. Mitigation measures appear to provide some degree of protection from acute effects and there is no obvious possibility of further mitigation through seasonal timing of seismic operations, and no localised areas which would justify exclusion from licensing. However, the increasingly precautionary approach being taken internationally to marine noise in general is also noted and various recommendations to improve understanding of the receptor and effects are made	10.3.1
	Physical damage to biotopes – potential effects on benthos, associated with anchoring and infrastructure construction – concluded to be very small in comparison to the extent of physical disturbance from trawling and other activities. Faunal recovery and re-colonisation, is expected to be rapid where the source of	10.3.2

Issue	Potential sources of significant effect	Section
	<p>effects is transient (e.g. anchoring); less than five years in most cases. Mitigation measures, principally the identification and avoidance of habitats and populations of particular sensitivity, will be implemented through established project assessment and planning controls</p> <p>Physical presence of infrastructure and support activities may cause behavioural disturbance to fish, birds, marine mammals, although scale of effects is generally small</p> <p>Marine discharges – potential effects of produced water discharges on zooplankton and fish; drilling wastes effects on benthos – both largely mitigated either by reinjection or land disposal</p> <p>Oil spills – risks of effects on all faunal groups – although SEA notes that prospective areas coincide with coastal and offshore waters characterised as high vulnerability in terms of seabirds, and that there is little scope for mitigation of risk through operational timing. Incremental risk associated with the predicted level of activity is low; and DTI has regulatory mechanisms in place to require Operators to develop effective oil spill mitigation measures</p>	<p></p> <p>10.3.3</p> <p>10.3.4</p> <p>10.3.8</p>
<p>Flora: phytoplankton macroalgae seagrass</p>	<p>Marine discharges – potential effects of non-native phytoplankton species introductions in ballast water discharges – significant effects as a direct result of E&P activities in the SEA 5 area considered very unlikely</p> <p>Oil spills – risks of effects of beached oil on intertidal algal and macrophyte populations – incremental risk is low and contingency measures would be in place</p>	<p>10.3.4</p> <p>10.3.8</p>
<p>Soil</p>	<p>Physical effects of anchoring and infrastructure construction on seabed sediments – spatial scale of effects considered to be relatively minor. Most effects are short-term and similar to natural disturbance, although some (e.g. presence of trenched pipelines) may be effectively permanent</p>	<p>10.3.2</p>

Issue	Potential sources of significant effect	Section
	<p>Marine discharges – sediment modification and contamination by particulate discharges - spatial scale of effects considered to be relatively minor, and discharges of persistent contaminants effectively regulated</p>	10.3.4
	<p>Permanent effects of reinjection of produced water and cuttings – results in positive benefits, although energy intensive. Overall effects concluded to be minor in context of alternative disposal options</p>	10.3.5
	<p>Onshore disposal of returned wastes will require landfill, although scale is small in context of onshore waste generation</p>	10.3.7
	<p>Oil spills (with or without chemical dispersion) could result in sediment contamination – incremental risk is low and contingency measures are in place</p>	10.3.8
Water	<p>Marine discharges – contamination by soluble and dispersed discharges – effectively mitigated by reinjection, with spatial scale of residual effects considered to be relatively minor, and discharges of persistent contaminants effectively regulated</p>	10.3.4
	<p>Oil spills (with or without chemical dispersion) – risk of contamination of the water column by dissolved and dispersed hydrocarbons – probability of significant effects is low</p>	10.3.8
Air	<p>Local air quality effects resulting from exhaust emissions, flaring and venting are expected to be of very limited spatial extent</p>	10.3.6
	<p>Emissions of acid gases are expected to make negligible contribution to overall industrial emissions</p>	10.3.6
	<p>Air quality effects of a major gas release or volatile oil spill may be significant, although overall risks are considered to be low</p>	10.3.8
Climatic factors	<p>Contributions to greenhouse gas emissions directly associated with exploration and production activities are considered to be</p>	10.3.6

Issue	Potential sources of significant effect	Section
	negligible in the context of industry, national and global emissions	
	Greenhouse gas emissions associated with combustion of hydrocarbons produced as a result of proposed activities, are outside scope of assessment	10.3.6 See also below
Material assets	None	
Cultural heritage, including architectural and archaeological heritage	Potential effects in relation to postulated archaeological heritage are considered positive (associated with site survey), and risk of damage to sites / artefacts (including wrecks) is low	10.3.2
	None , assuming offshore locations of proposed activities	10.3.3
Landscape	Duration of nearshore exploration would be limited; and seascape effects of nearshore development would be subject to detailed assessment with stakeholder input	10.3.3
The inter-relationship between the issues	Multiple effects (e.g. biodiversity and faunal effects associated with habitat disturbance; contamination of water, sediment and fauna) – both receptor-based and source-based approaches to SEA highlight the inter-relationship between different environmental “compartments” (i.e. air, water and sediments) and between biological communities and physical habitat	10.3.2, 10.3.4
	Conflicts between issues and receptors – notably reinjection vs marine discharges; and options for oil spill contingency – are noted by the SEA	10.3.4, 10.3.5 10.3.8

Wider policy objectives - At a wider scale of assessment it is clear that, with the possible exception of seismic noise, the major present day environmental pressures on the areas considered in SEA 5 are not associated directly with hydrocarbon exploration and production, but with other sources of disturbance (OSPAR 2000). Fishing mortality (of both target species and bycatch of fish and other animals), and trawling disturbance effects are probably the most significant direct anthropogenic effects on regional ecology. In a longer timeframe, the potential interruption of the thermohaline circulation as an outcome of climate change would result in a dramatic (but not unprecedented) ecological shift to cold water communities.

Provision of oil and gas from UK resources will contribute to the security of national energy supply. Activities resulting from the implementation of the DTI's draft plan for further licensing would have positive socio-economic effects on Shetland, Orkney and north eastern Scotland as well as the UK as a whole.

The SEA Directive requires that, in considering the likely significance of effects, the degree to which the plan or programme influences other plans and programmes should be addressed, together with the promotion of sustainable development. No significant effect of activities following the proposed 23rd Licensing Round are predicted on UK Government or other wider policy and commitments.

12.2 Information gaps

A number of significant gaps identified during the assessment of the DTI's draft plan (several of which were also identified during earlier SEAs) are summarised as follows:

- Further information on the "uniqueness" or otherwise of the benthic habitats and fauna of the deeper water areas to the west and north of Scotland
- The location of cephalopod spawning areas
- Seasonal data gaps in the information on offshore seabird distribution
- The location of offshore SACs and SPAs
- The potential presence of chemosynthetic seep communities on the Pilot Whale Diapirs
- Further definition of cetacean occurrence (both spatial and temporal) and abundance
- The importance of and key habitats for beaked whales to the west of Scotland
- Sound propagation and the effects of noise on marine mammals

These gaps are important for overall consideration of management and minimisation of adverse effects on the environment of the areas potentially covered by a 23rd licensing round. However, in view of the projected scale and location of activity that could result from the implementation of the DTI's draft plan, coupled with the array of control (and mitigation) mechanisms now in place, these gaps were not viewed as preventing or invalidating the assessment documented in this Environmental Report.

12.3 Recommendations

In the process of conducting this SEA a number of gaps in understanding and potential improvements in control and mitigation measures were identified. Recommendations for these are made below. A number of recommendations have also been made in previous SEAs, many of which have been addressed as a direct or indirect result of the SEA process. It should be noted that the recommendations made below are predicated on the understanding that because of poor hydrocarbon prospectivity, nearshore blocks are unlikely to be applied for.

Licensing

1. Blocks recommended for possible exclusion from licensing in previous SEAs should not be offered for licensing unless there is new information which permits better understanding of the features or attributes of concern. This would inform explicit controls needed to avoid potentially damaging activities if the blocks are licensed.

Regulatory and Other Controls

2. Feedback mechanisms should be explored with the DTI Licensing & Consents Unit so that the accuracy of activity scenarios used as the basis for SEA can be monitored over time. With existing information sources there is a particular difficulty in relating seismic surveys to specific blocks considered in a SEA.
3. The improvements to the mitigation methods for seismic survey proposed in the recent JNCC Report No. 323 (Stone 2003b) and extended in Section 10.3.1.7 of this SEA should be considered in any revision of the regulatory regime and guidelines.
4. In recognition of the importance of several of the SEA areas for cetaceans and the raising profile of marine noise pollution, reduction of noise transmission into the sea should be considered in the design of new FPSOs (and other vessels) intended for use in the area. The assessment of underwater noise/vibration and proposed mitigation measures for development projects should be reflected as appropriate in Environmental Statements (as required by the EIA Directive 85/337/EEC and implementing UK regulations).
5. The potential for effects on marine mammals during removal of suspended wellheads using explosives was raised (Hammond *et al.* 2003) and it is recommended that the PON 5 applications to the DTI for such activities should be supported by specific risk assessments for this aspect.
6. The current system of control over discharges from exploration and production appears comprehensive and effective, suggesting that environmental monitoring in the area should be primarily regional.

Environmental Monitoring and Understanding

Monitoring is a requirement of the SEA Directive. The DTI currently require and record a range of environmental performance metrics on offshore oil and gas activities including chemical use and discharge, produced water discharges, atmospheric emissions, oil and chemical spills etc. The DTI can (and does) request environmental monitoring of individual projects through activity consenting.

7. For SEA monitoring, in addition to the project specific monitoring, the DTI chaired offshore monitoring group should develop an effects monitoring strategy for the offshore oil and gas activities, coordinating with the range of national and regional monitoring offshore monitoring efforts.

It is recognised that there are many stakeholders with interests and involvement in efforts to improve environmental understanding (e.g. DTI, Operators, Conservation Agencies, Research Councils, NGOs etc). The following recommendations are made to the group of stakeholders in general, and to the DTI to champion their implementation as appropriate.

8. There remain a number of areas of uncertainty about the environmental effects of oil and gas exploration and production. These include the effects of noise on marine mammals and the sublethal effects of drilling discharges, both of which could have long term implications at an ecosystem level but which would be unlikely to be detected by routine monitoring. Experimental studies are recommended on the effects of underwater noise and water based mud drilling discharges to guide if further precautionary action is needed.

9. The ecology of marine mammals in the Moray Firth and adjacent areas, and off the continental shelf to the west of Scotland, should continue to be a focus of research to identify areas and times of special importance particularly for endangered species and very poorly understood species such as beaked whales.
10. Basic research into the identity, distribution and biological functioning of the species and communities present in UK waters should be promoted and as appropriate supported, consistent with Government policies on biodiversity and conservation.

12.4 Overall conclusion

Alternatives proposed for the DTI's draft plan to facilitate the finding and development of oil and gas resources within the proposed 23rd round area were identified as:

1. Not to offer any blocks for Production Licence award
2. To proceed with the licensing programme as proposed
3. To restrict the area licensed temporally or spatially

After consideration of the nature of the area and the potential effects and benefits of 23rd round licensing, both in isolation and in the context of existing activities in the adjacent area (as considered in previous SEAs), it is recommended that the DTI proceed with licensing under Alternative 3. Within the SEA 5 area, although the national and international importance of various populations and features is recognised, no blocks from the areas with good hydrocarbon prospectivity have been identified for exclusion since individual project consenting is expected to provide adequate spatial and temporal controls. Previous SEAs had identified a few blocks recommended for exclusion from licensing on environmental grounds or until better information becomes available. These recommended exclusions remain valid for the consideration of the blocks to be included in the 23rd licensing round.

These conclusions are based on the projections of the likely scale and location of activities that could follow licensing, and would need to be revisited if activity levels were substantially greater or technologies changed.