RISK ASSESSMENT FOR ANNEX IV SPECIES

OFFSHORE CONSTRUCTION ACTIVITIES: BROADHAVEN BAY TO THE CORRIB FIELD 2010/2011

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1. Introduction

This risk assessment is intended to comply with the provisions of Article 12 of Council Directive 92/43/EC in relation to the protection afforded to Annex IV species from disturbance or harm extending throughout the Exclusive Economic Zone (EEZ). Specifically, this Risk Assessment appraises proposed 2010 and 2011 activities, both construction and survey for the Corrib gas field project (including pipeline). It also proposes mitigation measures where there is a possibility of interactions with testudines (marine turtles) and cetaceans (whales, dolphins and porpoises), but also seals (pinnipeds), basking sharks (*Cetorhinus maximus*) and ocean sunfish (*Mola mola*), from the intertidal to the well head/gas field. [Hereinafter, all aforementioned species are collectively referred to as megafauna.] For the entire scope of works, mitigation measures will include the imposition of the "Code of Conduct" (CoC), and independent marine mammal observers (MMOs) will assume the collective role of protected species observers (PSOs), and implement industry-standard and regulatory-compliant protocol for the monitoring and recording of all megafaunal species encountered, in accordance with “Code of Practice for the Protection of Marine Mammals during Acoustic Seafloor Surveys in Irish Waters”. [Hereinafter, the term ‘MMO’ will be used instead of ‘PSO’, as the terminology in this document must remain consistent with that used by both industry and the Irish regulator, National Parks and Wildlife Service, which is a division of the Department of Environment Heritage, and Local Government.] To avoid misinterpretation of the CoC and thereby minimise any hazards, MMOs will be present on construction and survey vessels in an advisory capacity, although they will have the power to delay the commencement of any operations that have been assessed as potentially posing a risk to megafauna. All masters and duty watchkeepers of vessels are required to familiarize themselves with this risk assessment.

The Broadhaven Bay area and general pipeline route out to the Corrib Field support an ecologically diverse range of resident or migratory marine turtles and mammals, which includes the following Annex IV species: loggerhead (*Caretta caretta*), green (*Chelonia mydas*), Kemp's ridley (*Lepidochelys kempii*), hawksbill (*Eretmochelys imbricata*) and leatherback (*Dermochelys coriacea*) turtles; harbour porpoise (*Phocoena phocoena*); bottlenose (*Tursiops truncatus*), common (*Delphinus delphis*), Risso’s (*Grampus griseus*), white-sided (*Lagenorhynchus acutus*), white-beaked (*Lagenorhynchus albirostris*) and striped (*Stenella coeruleoalba*) dolphins; long-finned pilot (*Globicephala melas*), false killer (*Pseudorca crassidens*), killer (*Orcinus orca*), Cuvier’s beaked (*Ziphius cavirostris*), sperm (*Physeter macrocephalus*), minke (*Balaenoptera acutorostrata*), blue (*Balaenoptera musculus*), fin (*Balaenoptera physalus*), sei (*Balaenoptera borealis*) and humpback (*Megaptera novaeangliae*) whales. Grey (*Halichoerus grypus*) and common/harbour (*Phoca vitulina*) seals are also present in Irish waters, but are listed as Annex V species, a status that affords similar levels of protection. Also sighted regularly, is the basking shark, which is protected by various wildlife laws, and the ocean sunfish (*Mola mola*), which is a species of interest.

This section summarises the potential hazards and associated impacts (risks) to megafauna from the offshore activities planned in relation to the construction of the Corrib Field development in 2010 and 2011. All activities have been considered in relation to their potential interactions with megafauna. Where such

potential interactions exist, there are agreed mitigation measures in place that will be implemented, recorded and reported by MMOs.

Listed are the general sources of potential hazard associated with specific activities, as follows:

1. Physical presence and associated noise of vessels e.g. heavy construction vessel (HCV), transportation barges, tugs, safety, security and crew transfer boats;
2. Acoustic sources used to survey the pipeline and seabed topography and monitor the progress of operations e.g. vessel or ROV-mounted sonar systems (this excludes the use of echosounders when employed for safe navigation only);
3. Lifting operations involving cranes, gantries, or Launch and Recovery Systems (LARs), to manoeuvre heavy loads e.g. Flexible Concrete Mattresses, Catenary Protection Structures, 20" Gas Export tie-in spool rigging, Pipeline Stroking System (PSS) tooling basket, Glass Reinforced Plastic (GRP) sub-sea protection covers, and work class ROVs (WROVs);
4. Placement of granular material over the 20" gas pipeline using fall pipe/side stone casting vessels;
5. Physical disturbance of seabed e.g. thrusters employed by heavy construction vessel (HCV) and tugs;
6. Elevated turbidity from physical disturbance of seabed e.g. thrusters employed by heavy construction vessel (HCV) and tugs, or trenching (2011);
7. Laying/fitting 20" Gas Export tie-in spool and other sub-sea structures;
8. Putrescible galley waste and solid food discharges from vessels e.g. heavy construction vessel (HCV), transportation barges, tugs, safety, security and crew transfer boats; and,
9. Umbilical installation (2011): removal of the conduit cap (exposure of the bell mouth) in Broadhaven Bay, retrieval of the messenger wire, pay-out of umbilical from vessel, pull-in of umbilical from vessel to shore, trenching of conduit and tie in of umbilical at manifold.

Aspects of the above developments may result in one or more of the following corresponding potential impacts on megafauna:

1. Disturbance of typical megafaunal ecology (e.g. foraging, socialising, courtship and nurturing) and possible opposite directional movement (or indeed towards source if an attraction, hence increased potential for laceration with propeller), due to visual and/or acoustic impact from local vessels;
2. Disturbance of typical megafaunal behaviour (e.g. foraging, socialising, courtship and nurturing) and possible opposite directional movement (or indeed towards source if an attraction, hence increased potential laceration with propeller), due to acoustic impact from sonar systems; unlikely temporary threshold shifts (TTS) of hearing; no Permanent Threshold Shifts (PTS) anticipated;
3. Injured megafauna from lowering/lifting heavy equipment into/from sea, due to collision impact; disturbance of typical megafaunal behaviour (e.g. foraging, socialising, courtship and nurturing) and possible opposite directional movement (or indeed towards source if an attraction, hence

increased potential for laceration with propeller), due to acoustic impact;

4. Injured megafauna and their potential prey during fall pipe/side stone casting, due to collision impact; disturbance of typical megafaunal behaviour (e.g. foraging, socialising, courtship and nurturing) and possible opposite directional movement (or indeed towards source if an attraction, hence increased potential laceration with propeller), due to acoustic impact; sediment grade changes resulting in altered infaunal or benthic species assemblages and consequent direct or indirect effects of potential megafaunal prey species;
5. Displacement and possible reduction of potential megafaunal prey e.g. sandeels for harbour porpoises; or churning out invertebrate prey for potential megafaunal prey, hence elevated megafaunal abundance in immediate vicinity of vessel, and therefore increased potential for laceration with propeller;
6. Gill irritation causing displacement and possible reduction of potential megafaunal prey e.g. sprat for harbour porpoises; direct effects of elevated turbidity levels on megafauna unknown and undocumented;
7. Reef effects – provision of prey refuge sites and attraction of potential megafaunal prey (vertebrates and invertebrates) and hence higher trophic level predators, hence elevated megafaunal abundance in the long-term, as reef colonisation occurs progressively;
8. Attraction of megafauna or their potential prey (any small vertebrates) and hence higher trophic level predators, hence elevated megafaunal abundance in immediate vicinity of vessel and potential for laceration with propeller or collision impact with lifting operations (as per point 3); and,
9. Umbilical installation includes aspects of points 1, 2, 3, 5, 6, 7 and 8 e.g. vessel activity, ROV multibeam sonar etc, which is already addressed above, so point 9 is concerned with trenching only i.e. elevated noise levels, which may lead to disturbance of typical megafaunal behaviour (e.g. foraging, socialising, courtship and nurturing) and possible opposite directional movement (or indeed towards source if an attraction, hence increased potential laceration with propeller), due to acoustic impact from sonar systems; unlikely TTS of hearing; no PTS anticipated.

The predicted impacts from scheduled operations (those impacts expected to occur despite the mitigation measures proposed) are often referred to as “residual impacts”, and are covered in the first part of the risk assessment, section 1.3, while those impacts which have the potential to occur as a result of accidental events are discussed in the second part, section 1.4.

The development has been broken down into constituent activities and impacts are identified for each activity. Activities which have potential impacts are identified as “**aspects**”. The types of **potential impacts** have been identified for each aspect.

Consideration has been given to **prevention**, **mitigation** or **control** measures incorporated into the project design, or operating strategy, which reduce the potential impacts. Sometimes the potential for impact has been eliminated. In other cases there remains a possibility for impact, in spite of the mitigation measures. The remaining impact is estimated where possible and listed as a **predicted impact.**

2. Evaluation of Relative Significance

This section presents the evaluation of the relative significance of the effects. The relative significance of predicted impact is summarised by applying a keyword from a scale from significant through to negligible (or beneficial).

Criteria for assessing the significance of predicted impacts have been closely defined. **Table 1** presents the definitions.

Table 1: Criteria for assessing significance of impact

Significance Category		Severity of Impact (after implementation of appropriate mitigation measures/actions)
I	Significant	Substantial adverse changes in megafaunal ecology (e.g. less foraging, socialising, courtship and nurturing), reduction in population or complete absence in the region. Changes are well outside the range of natural variation. Recovery may be protracted.
II	Moderate	Moderate adverse changes in megafaunal ecology. Changes may exceed the range of natural variation. Potential for recovery within several years is good; however, it is recognised that a low level of impact may remain.
III	Minor	Minor adverse changes in megafaunal ecology. Changes might be noticeable, but fall within the range of normal variation. Effects are short-lived, with recovery occurring in the near term, however, it is recognised that a low level of impact may remain.
IV	Negligible	Changes in megafaunal ecology that are unlikely to be noticeable (i.e. well within the scope of natural variation).
V	Beneficial	Changes resulting in positive, desirable, or beneficial effects in megafaunal ecology.
Note: The definitions are intended to categorise predicted impacts following the implementation of mitigation measures or controls. An impact that would have been 'Significant' without action by the Project may be assessed to be 'Moderate', 'Minor', or 'Negligible', after effective mitigation or control measures are in place.		

The evaluation considers the vulnerability, temporal sensitivity and recoverability of megafauna and the geographical extent of the effect.

3. Residual Risk Assessment

Table 2 presents the aspects, potential impacts, mitigation measures, predicted impacts and an assessment of the significance of the predicted impacts for the normal scheduled operations associated with the development. The impacts of accidental events are considered separately, later in this document (see **Table 3**).

Table 2: Residual Risk Assessment of Potential Impacts, Proposed Mitigation Measures and Predicted Impacts

	Aspect/Potential Impact	Control / Mitigation Measures	Predicted Impact / Significance
1	MOBILISATION OF VESSEL FROM INTERNATIONAL PORT TO BROADHAVEN BAY OR ANY LOCATION BETWEEN LANDFALL AND WELL HEAD/GAS FIELD: VISUAL AND ACOUSTIC PRESENCE	• The work will be scheduled so as to minimise the duration of project activities and to confine activities to as small an area as possible to minimise visual and acoustic presence • MMO will monitor and report immediately any megafaunal behaviour and/or interactions that cause concern, to enable any preventative or corrective course of action, and in any circumstances where it is deemed that the duty operators fail to act adequately, the MMO will have the power to delay operations and the operators will be reported to the relevant authorities	MINOR • FOR ANY REDUCTION IN MEGAFAUNAL ABUNDANCE, RAPID REPOPULATION IS LIKELY • RESIDUAL RISK OF VISUAL/ACOUSTIC SOURCE TRAUMATISING MEGAFAUNA IS LOW
2	SONAR TO ACOUSTICALLY SURVEY THE PIPELINE AND SEABED TOPOGRAPHY AND MONITOR THE PROGRESS OF OPERATIONS SUCH AS SIDECASTING AND MANOEUVRING SUBSEA STRUCTURES E.G. ANY VESSEL OR ROV-MOUNTED SYSTEMS: ACOUSTIC DISTURBANCE	• The work will be scheduled so as to minimise the duration of project activities and to confine activities to as small an area as possible to minimise acoustic presence • CoC e.g. MMO on-board vessel to carry out 30-min visual monitoring prior to commencement of ops and inform master or duty watchkeeper that it is OK to proceed, and ROV pilots to employ 20-minute 'soft-start' procedure for sonar sources and use preferentially higher frequency systems beyond 200kHz • MMO will monitor and report immediately any megafaunal behaviour and/or interactions that cause concern, to enable any preventative or corrective course of action, and in any circumstances where it is deemed that the duty operators fail to act adequately, the MMO will have the power to delay operations and the operators will be reported to the relevant authorities	MINOR • FOR ANY REDUCTION IN MEGAFAUNAL ABUNDANCE, RAPID REPOPULATION IS LIKELY • RESIDUAL RISK OF TRAUMATISING MEGAFAUNA IS LOW - TEMPORARY THRESHOLD SHIFTS (TTS) OR HEARING UNLIKELY; PERMANENT THRESHOLD SHIFTS (PTS) NOT ANTICIPATED • IF NOISE IS AN ATTRACTION, ELEVATED MEGAFAUNAL ABUNDANCE MAY RESULT IN INCREASED POTENTIAL FOR LACERATION WITH PROPELLOR WHILST VESSEL ACTIVITY UNDERWAY • MULTI-BEAM SONAR SURVEY SYSTEMS TYPICALLY >300 KHZ TO 1200 KHZ; BEYOND THE KNOWN AUDIBLE/HEARING RANGE OF ANY MEGAFAUNAL SPECIES
3	HEAVY LIFTING OPERATIONS: EQUIPMENT COLLISION IMPACT	• The work will be scheduled so as to minimise the duration of project activities and to confine activities to as small an area as possible • Lifting activities undertaken by qualified and experienced personnel only and to be completed as carefully as possible • MMO will monitor and report immediately any megafaunal behaviour and/or interactions that cause concern, to enable any preventative or corrective course of action, and in any circumstances where it is deemed that the duty operators fail to act adequately, the MMO will have the power to delay operations and the operators will be reported to the relevant	NEGLIGIBLE • NO KNOWN RECORDS OF SIMILAR ANIMAL COLLISIONS • RESIDUAL RISK OF ACOUSTIC SOURCE TRAUMATISING MEGAFAUNA IS LOW • FOR ANY REDUCTION IN MEGAFAUNAL ABUNDANCE, RAPID REPOPULATION IS LIKELY • IF NOISE IS AN ATTRACTION, ELEVATED MEGAFAUNAL ABUNDANCE MAY RESULT IN INCREASED POTENTIAL FOR LACERATION WITH PROPELLOR WHILST VESSEL ACTIVITY

	Aspect/Potential Impact	Control / Mitigation Measures	Predicted Impact / Significance
		authorities	UNDERWAY
4	FALL PIPE/SIDE STONE CASTING FROM VESSELS: ROCK COLLISION IMPACT AND ACOUSTIC DISTURBANCE	• The work will be scheduled so as to minimise the duration of project activities and to confine activities to as small an area as possible • Placement of granular material over the 20 " Gas pipeline to be completed as carefully as possible • MMO will monitor and report immediately any megafaunal behaviour and/or interactions that cause concern, to enable any preventative or corrective course of action, and in any circumstances where it is deemed that the duty operators fail to act adequately, the MMO will have the power to delay operations and the operators will be reported to the relevant authorities	MINOR, POSSIBLY BENEFICIAL • ROCK COLLISION IMPACTS WITH MEGAFAUNA UNKNOWN AND UNDOCUMENTED, BUT ROCK FALLS CANNOT BE STOPPED ONCE LOADS ARE RELEASED, WHEREAS LIFTING OPERATIONS (SEE 3) ARE CONTROLLED THROUGHOUT • RESIDUAL RISK OF ACOUSTIC SOURCE TRAUMATISING MEGAFAUNA IS LOW • SEDIMENT-GRADE ALTERATIONS, INFAUNAL/BENTHIC SPECIES ASSEMBLAGE CHANGES, INDIRECT AND DIRECT EFFECTS ON POTENTIAL MEGAFAUNAL PREY • FOR ANY REDUCTION IN MEGAFAUNA OR THEIR PREY ABUNDANCE, RAPID REPOPULATION IS LIKELY • REEF EFFECTS (SEE 7)
5	PHYSICAL DISTURBANCE OF SEABED BY VESSEL PROPULSION AND WORK ACTIVITY: LAYERS OF SEABED SEDIMENT LIFTED	• The work will be scheduled so as to minimise the duration of project activities and to confine activities to as small an area as possible • MMO will monitor and report immediately any megafaunal behaviour and/or interactions that cause concern, to enable any preventative or corrective course of action, and in any circumstances where it is deemed that the duty operators fail to act adequately, the MMO will have the power to delay operations and the operators will be reported to the relevant authorities	MINOR, POSSIBLY BENEFICIAL • DISPLACEMENT AND/OR REDUCTION OF POTENTIAL MEGAFAUNAL PREY AND/OR CHURNING OUT INVERTEBRATE PREY FOR POTENTIAL MEGAFAUNAL PREY AND ATTRACTION OF HIGHER TROPHIC LEVEL PREDATORS • EITHER REDUCED OR ELEVATED MEGAFAUNAL ABUNDANCE • FOR ANY REDUCTION IN MEGAFAUNAL ABUNDANCE, RAPID REPOPULATION IS LIKELY • ELEVATED MEGAFAUNAL ABUNDANCE IS PROBABLY TEMPORARY, BUT MAY BE PERMANENT • ELEVATED MEGAFAUNAL ABUNDANCE MAY RESULT IN INCREASED POTENTIAL FOR LACERATION WITH PROPELLOR WHILST PHYSICAL DISTURBANCE OR VESSEL ACTIVITY UNDERWAY
6	PHYSICAL DISTURBANCE OF SEABED BY VESSEL PROPULSION AND WORK ACTIVITY: ELEVATED TURBIDITY	• The work will be scheduled so as to minimise the duration of project activities and to confine activities to as small an area as possible • MMO will monitor and report immediately any megafaunal behaviour and/or interactions that cause concern, to enable any preventative or corrective course of action, and in any circumstances where it is deemed that the duty operators fail to act adequately, the MMO will have the power to delay operations and the operators will be reported to the relevant	MINOR • DIRECT EFFECTS OF ELEVATED TURBIDITY LEVELS ON MEGAFAUNA UNKNOWN AND UNDOCUMENTED • GILL IRRITATION OF POTENTIAL MEGAFAUNAL PREY SPECIES AND SOME MEGAFAUNA E.G. BASKING SHARKS • DISPLACEMENT AND POSSIBLE REDUCTION OF POTENTIAL MEGAFAUNAL PREY AND CONSEQUENT REDUCED MEGAFAUNAL ABUNDANCE

	Aspect/Potential Impact	Control / Mitigation Measures	Predicted Impact / Significance
		authorities	• **RAPID REPOPULATION OF PREY AND MEGAFAUNA IS LIKELY**
7	**SUB-SEA STRUCTURE: REEF EFFECT**	• MMO will monitor and report immediately any megafaunal behaviour and/or interactions that cause concern, to enable any preventative or corrective course of action, and in any circumstances where it is deemed that the duty operators fail to act adequately, the MMO will have the power to delay operations and the operators will be reported to the relevant authorities • Long-term monitoring study of porpoise and dolphin activity using static acoustic monitoring systems (e.g. PODs) around offshore sub-sea structures to be conducted by suitably qualified and experienced scientists with a track-record in artificial reef studies, to ascertain whether megafaunal activity increases or reduces, and serve as case study for future similar developments	**POSSIBLY BENEFICIAL** • **PROVISION OF PREY REFUGE SITES AND ATTRACTION OF POTENTIAL MEGAFAUNAL PREY (VERTEBRATES AND INVERTEBRATES) AND HENCE HIGHER TROPHIC LEVEL PREDATORS, SO ELEVATED MEGAFAUNAL ABUNDANCE MAY BE ASSOCIATED PERMANENTLY WITH ARTIFICIAL REEFS – PREVIOUS STUDIES MAY INDICATE THAT NUMBERS OF MEGAFAUNA LIKELY TO INCREASE IN LONG TERM AS COLONISATION OCCURS PROGRESSIVELY**
8	**PUTRESCIBLE GALLEY WASTE AND FOOD DISCHARGES: NUTRITION ENRICHMENT**	• The work will be scheduled so as to minimise the duration of project activities and to confine activities to as small an area as possible • Putrescible galley wastes and solid waste foods will be contained and transported to shore or macerated to particles smaller than 25 mm before being released beyond 12-mile limit • MMO will monitor and report immediately any megafaunal behaviour and/or interactions that cause concern, to enable any preventative or corrective course of action, and in any circumstances where it is deemed that the duty operators fail to act adequately, the MMO will have the power to delay operations and the operators will be reported to the relevant authorities	**MINOR** • **FOOD SOURCE AND ATTRACTION OF POTENTIAL MEGAFAUNAL PREY (VERTEBRATES AND INVERTEBRATES) AND HENCE HIGHER TROPHIC LEVEL PREDATORS, SO ELEVATED MEGAFAUNAL ABUNDANCE MAY RESULT IN INCREASED POTENTIAL FOR LACERATION WITH PROPELLER**

Aspect/Potential Impact		Control / Mitigation Measures	Predicted Impact / Significance
9	**TRENCHING: ACOUSTIC DISTURBANCE**	• The work will be scheduled so as to minimise the duration of project activities and to confine activities to as small an area as possible to minimise acoustic presence • CoC e.g. MMO on-board vessel to carry out 30-min visual monitoring prior to commencement of operations and inform master or duty watchkeeper that it is OK to proceed, and ROV and trencher pilots to employ 20-minute 'soft-start' procedure for sonar sources and use preferentially higher frequency systems beyond 200kHz • MMO will monitor and report immediately any megafaunal behaviour and/or interactions that cause concern, to enable any preventative or corrective course of action, and in any circumstances where it is deemed that the duty operators fail to act adequately, the MMO will have the power to delay operations and the operators will be reported to the relevant authorities	**MINOR** • **FOR ANY REDUCTION IN MEGAFAUNAL ABUNDANCE, RAPID REPOPULATION IS LIKELY** • **RESIDUAL RISK OF TRAUMATISING MEGAFAUNA IS LOW - TTS- UNLIKELY; PTS NOT ANTICIPATED** • **IF NOISE IS AN ATTRACTION, ELEVATED MEGAFAUNAL ABUNDANCE MAY RESULT IN INCREASED POTENTIAL FOR LACERATION WITH PROPELLOR WHILST VESSEL ACTIVITY UNDERWAY** • **MULTI-BEAM SONAR SURVEY SYSTEMS TYPICALLY >300 KHZ TO 1200 KHZ; BEYOND THE KNOWN AUDIBLE RANGE OF ANY MEGAFAUNAL SPECIES, BUT TRENCHING OF SEDIMENT IS A SOURCE OF AUDIBLE NOISE**

4. Accidental Risk Assessment

The planned activities have the potential to affect megafauna in the vicinity of the Corrib Field, although upset conditions and accidental events could affect a wider geographic area e.g. a large oil spill.

This section summarises the potential hazards and associated impacts (risks) to megafauna from accidental events which may occur during the offshore activities planned in relation to the construction of the Corrib Field development in 2010. The potential for accidental events to occur during planned activities have been considered and summarised as follows:

1. Vessel collisions and breach of storage tanks containing any potential pollutants, fuel/oil/chemical transfer spillages or system leakages, hydrotest liquid/methanol escape from cluster well/gas pipeline, non-scheduled sewage and solid waste discharges to sea.

These hazards may result in any of the following corresponding potential impacts on megafauna:

1. Poisonous or obstructive ingestion, skin or eye irritation, from pollution released into the sea.

Table 3 presents the aspects, potential impacts, mitigation measures, predicted impacts and an assessment of the significance of the accidental eventualities associated with the development.

Table 3: Accidental Risk Assessment of Potential Impacts, Proposed Mitigation Measures and Predicted Impacts

	Aspect/Potential Impact	Control / Mitigation Measures	Predicted Impact / Significance
1	**FUEL, OIL, CHEMICAL, HYDROTEST LIQUID, METHANOL, SEWAGE AND SOLID WASTE DISCHARGES TO SEA: POISONOUS OR OBSTRUCTIVE INGESTION, SKIN AND EYE IRRITATION**	• The work will be scheduled so as to minimise the duration of project activities and to confine activities to as small an area as possible to minimise presence and risk of discharges • All vessels will have procedures and equipment for preventing any such discharges from entering the sea • Maintenance, audits and inspection plans are in place to identify leaks at an early stage • Spill recovery material available and drip trays used where appropriate • Where refuelling, loading of lubricants, or unloading of waste is necessary, it will be carried out in good weather conditions, either in port or outside Broadhaven Bay in accordance with adequate procedures to minimise risks to the environment • Contained oil/water mixtures and sewage will be stored onboard and/or processed by treatment units to meet the requirements of MARPOL 73/78 Annex IV • In the event of an oil/diesel spill the Oil Spill Contingency Plan will be initiated. • Solid wastes will be contained and transported to shore • MMO will monitor and report immediately any megafaunal behaviour and/or interactions that cause concern, to enable any preventative or corrective course of action, and in any circumstances where it is deemed that the duty operators fail to act adequately, the MMO will have the power to delay operations and the operators will be reported to the relevant authorities	**MINOR** • **OVERALL RISK DEPENDENT ON NATURE OF MATERIAL SPILLED, SIZE OF SPILL AND PROXIMITY TO SHORE** • **ANY DISCHARGES ARE LIKELY TO BE LOW QUANTITIES, SO HIGH DILUTION AND PROBABLE MINOR RISK OF INDIRECTLY AFFECTING MEGAFAUNAL HEALTH VIA THEIR POTENTIAL PREY SPECIES OR DIRECTLY AFFECTING MEGAFAUNAL HEALTH IS LOW** • **RISK OF CONTAMINATING THE WATER COLUMN LEADING TO TOXIC EFFECTS FROM PARTICULAR POLLUTANTS AND SMOTHERING OF THE SEABED, INDIRECTLY AFFECTING MEGAFAUNAL HEALTH VIA THEIR POTENTIAL PREY SPECIES OR DIRECTLY AFFECTING MEGAFAUNAL HEALTH, IS LOW**