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Appendix 13

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APPENDIX 13
MARINE MEGAFAUNA MITIGATION PROTOCOL (ITALY & ALBANIA)

Introduction

This overarching, project-wide Marine Megafauna Mitigation Protocol (MMMP) is a live document that has been produced to identify mitigation and management provisions for critical habitat triggering species and those identified as priority biodiversity features.

In the absence of specific regulatory provisions, the JNCC Protocol shall be adopted in Albanian waters through consultation with regulators and appropriately qualified in-country or regional experts.

In some regards (e.g. monitoring distances), the Italian regulatory requirements exceed the JNCC recommendations. However, it is advised that a comparison of the two is made to ensure any gaps that may be present (e.g. provisions for breaks in piling) are addressed to ensure consistency across the project. This will be done through consultation with regulators and appropriately qualified in-country or regional experts.

This draft plan will be adapted in line with engagement with the competent Italian authorities.

This plan is applicable to all construciton activities throughout the entire length of the offshore section. The purpose of this draft MMMP is to reduce to negligible levels the potential risk of mortality or injury to marine mammals, turtles and fish during construction activities. It does not extend to mitigation of behavioural disturbance effects which in themselves may reduce impacts through avoidance responses.

MMOs will be present during all construciton activities and will apply the mega fauna protcols described within this plan prior to activities such as dredging and rock dumping.

This MMMP has focused on the proposed installation of sheet piling at the Albanian and Italian landfalls and is based upon the modelling and conclusions of the independently produced, site-specific underwater noise reports[1][2]. It also draws from, and defers to, the specifics of the Environmental Monitoring Project[3] for marine megafauna mitigation in Italian waters.

The Trans-Adriatic Pipeline (TAP) will transport natural gas through Greece and Albania before crossing the Adriatic Sea and making landfall in southern Italy. The pipeline will be buried onshore and laid on the seabed offshore. At the Albanian landfall, a cofferdam will be constructed to enable the onshore and offshore sections to align and be connected. At the Italian landfall, temporary sheet piles will be installed to restrict sediment movements at the micro-tunnel exit point near (mapped) seagrass.

[1] OPL00-C5577-640-Y-TRC-0002
[2] IAL00-ERM-643-Y-TAE-1035 (including Annex A)
[3] IAL00-ERM-643-Y-TAE-1028

Underwater noise modelling

The underwater noise modelling for the Albanian landfall determined the potential distances from the piling location at which the underwater noise decreases to below threshold levels for potential mortality, injury, permanent threshold shift (PTS), temporary threshold shift (TTS) and strong and weak behavioural impacts to the marine mammal, turtle and fish species. This is in relation to applicable thresholds, where known, noting the limited data on physiological impacts of noise on turtles.

The underwater noise modelling for the Italian landfall was undertaken in accordance with prescription A.43 of the environmental compatibility decree of the project (Italian Ministerial Decree 223 of 11/09/2014). It identifies and characterises potential sources of underwater noise in relation to 'absolute' and 'specific' impacts, equating broadly to physiological impacts (i.e. mortality, injury) and inferred behavioural responses respectively. It considers impacts on fish, turtles and cetaceans.

Seasonal restrictions to works

The following seasonal restrictions are in place in Italian waters and coastal areas:

- Nearshore and coast construction will take place avoiding the peak holiday season (June - August inclusive) and avoiding the turtle nesting period.
- The project will conduct offshore construction activities outside the summer season (June – August inclusive) in order to avoid having a negative effect on seaside and tourist activities; and

In Albania the following seasonal restrictions are in place in Albanian waters and coastal areas:

- Nearshore and coast (up to KP 12)construction will take place avoiding the peak holiday season (June - August inclusive) and avoiding the turtle nesting period.

Should TAP be unable to honour any of these agreed lock out periods a Management Change would be required.

Should TAP be unable to honour any of these agreed lock-out periods, a Management of Change would be required.

Marine mammals and turtles known to be present, or potentially occur, in the vicinity of the TAP Project Area include:

- Bottlenose dolphin (*Tursiops truncatus*)
- Short beaked common dolphin (*Delphinus delphis*)
- striped dolphin (*Stenella coeruleoalba*)
- Fin whale (*Balaenoptera acutorostrata*)
- Risso's dolphin (*Grampus griseus*)
- Sperm whale (*Physeter macrocephalus*)
- Cuvier's beaked whale (*Ziphius cavirostris*)
- Loggerhead turtle (*Caretta caretta*)

A number of bony fish species of commercial interest, including gilt head bream (*Sparus aurata*), hake (*Merluccius merluccius*), pilchard (*Sardina pilchardus*) and sole (*Solea solea*), are also

present in the Adriatic. Many of these species are known to be sensitive to underwater noise and are thus vulnerable to disturbance during piling works. Elasmobranchs (cartilaginous fish: sharks, skates and rays) are non-hearing specialists with no swim bladder and are widely considered to have a low sensitivity to underwater noise (*Nedwell et al., (2004[4])*. However, sharks are included in the marine megafauna monitoring of Italian waters.

Annex IV of the European Union Habitats Directive (92/45/EEC) classifies all cetaceans as European Protected Species (EPS). It also lists the Mediterranean monk seal (*Monachus monachus*) and five species of turtle including loggerhead, as they are classified as endangered, vulnerable or rare. Under Article 12 of the Directive, Member States are required to take the requisite measures to establish a system of strict protection for EPS in their natural range prohibiting:

- All forms of deliberate capture or killing of specimens of these species in the wild.
- Deliberate disturbance of these species, particularly during the period of breeding, rearing, hibernation and migration.
- Deterioration or destruction of breeding sites or resting places.

Furthermore, the Critical Habitat Assessment (CHA) found that a number of cetacean species and loggerhead turtle triggered tier 2 critical habitat under both Criterion 1 (Threatened species) and Criterion 3 (Migratory and congregatory species). A number of other marine mammal and turtle species were identified as priority biodiversity features.

The UK2010 Joint Nature Conservation Commission's (JNCC) 2010 guidelines for minimising the risk of injury and disturbance to marine mammals from piling activities[5] and seismic surveys[6] are used internationally. The protocols were developed to minimise the risk of injury to marine mammals (as well as less noise-sensitive species such as turtles, basking sharks and fish) from underwater noise associated with piling and seismic surveys. They do not seek to mitigate behavioural disturbance effects but aim to reduce to negligible levels the potential risk of mortality, death or injury to marine mammals in close proximity to piling or seismic operations. The protocol stipulates a >500m radius zone of mitigation (within which visual observation and/or passive acoustic monitoring is undertaken) from the source of underwater noise (e.g. piling). This is deemed adequate for preventing any potential lethal, physical or auditory injury in marine mammals.

The underwater noise modelling undertaken for the proposed piling works at the Albanian landfall predicts that all impacts associated with mortality/potential injury/PTS and TTS will fall well within the 500m mitigation zone for all species modelled. The only impacts modelled to extend beyond the 500m zone are those that may elicit weak behavioural reactions in both medium hearing frequency cetaceans and pinnipeds, with 38km and 16km ranges respectively.

The underwater noise modelling results for construction works in Italian waters did not predict any sound levels associated with mortality or potential injury for any marine species. Behavioural impacts on Odontocetes[7] (medium hearing frequency) were predicted within a 6km radius of nearshore construction and monitoring provisions extend to 5.5.km in Italian waters. Behavioural

[4] Nedwell J.R., Edwards, B., Turnpenny, A.W.H. and Gordon, J. (2004). Fish and marine mammal audiograms: a summary of available information. Subacoustech Report Reference: 534R0214

[5] http://jncc.defra.gov.uk/pdf/jncc_guidelines_piling%20protocol_august%202010.pdf

[6] http://jncc.defra.gov.uk/pdf/jncc_guidelines_seismic%20guidelines_aug%202010.pdf

[7] Includes all dolphins and porpoises as well as toothed whales, such as the sperm whale.

impact ranges of 700- 2,200m from source of noise for fish, and 400-1000m for turtles were also predicted. The JNCC protocol is therefore deemed to provide effective mitigation for marine mammals against physiological impacts (i.e. mortality, injury) from underwater noise associated with intertidal, nearshore and offshore construction activities at both landfalls.

These measures also provide mitigation for turtles, but with associated limitations (*Nelms et al., 2016*[8]). Limitations for visual observation of turtles at night and in times of poor visibility are greater than for mammals as it is not possible to track them acoustically in the same way underwater. Due to their cold-blooded nature, they are also difficult to detect with night vision goggles. The outer limits of a 500m mitigation zone may be beyond the optimum range for detecting turtles at the surface, meaning extra vigilance is required. However, there is no accepted policy or guidance to determine an effective mitigation zone for sea turtles. This is therefore the best available approach at this time, hence its adoption.

This overarching MMMP is a live document and should be updated with new project information as it becomes available, be developed in consultation with regulators and regional experts, and reviewed when appointing the marine mammal mitigation teams for each country. It broadly follows the JNCC 2010 guidelines for piling operations and will:

- Identify a marine mammal/turtle/ other megafauna monitoring range, known as the mitigation zone.
- Propose approaches, timings and durations for the detection of marine mammals/turtles/ other megafauna (visually and acoustically as appropriate for both species present and selected construction methods e.g. working hours) within the mitigation zone.
- Describe the soft-start procedure to be used on commencement of piling activity and discuss procedures following any breaks in piling.
- Describe the training and experience requirements of the Marine Mammal Observers (MMOs) and Passive Acoustic Monitors (PAMs) that will comprise the MMO Team (henceforth this term refers to both MMOs and PAMs).
- Detail reporting; sightings sheets, daily and weekly reports once agreed with regulators in host countries.

A detailed MMO monitoring plan will be developed prior to construction.

Additional Italian Provisions for Marine Megafauna Observation in accordance with Italian Ministerial Decree 223 of 11/09/2014

A.42 *In order to safeguard the marine mammals from any impact caused by underwater noise:*

[8] https://ore.exeter.ac.uk/repository/bitstream/handle/10871/23049/1-s2.0-S0006320715301452-main.pdf?sequence=3

a) *Two qualified Marine Mammal Observers (MMO) from accredited agencies (including ISPRA), who are experts in the recognition of cetaceans, must be in the construction area and on board marine vessels during the operations at sea; the sighting techniques must be both visual, with the aid of binoculars, and acoustic, through the use of hydrophones.*

b) *All activities must be suspended should the presence of marine mammals be ascertained within a radius of at least one nautical mile from the site, especially if the mammals are accompanied by their young. The start of the work will be deferred until the animals have left, waiting at least 30 minutes from the time of the last sighting; in the case of sightings of animals found within a distance of 1-3 nautical miles from the site, a soft-start of the construction vessels and equipment must be made. In addition, during the 30 minutes preceding the start of the work, the observers must ascertain that there are no individual animals in the surrounding area.*

   A report must be written at the end of the works at sea. The report must provide the date and location of the works at sea, the type and specifications of the equipment used, the number and type of marine vessels involved and the recording of all the events (suspensions of work, duration of suspensions, number of soft-starts, etc.); regarding the observations of the mammals, the following elements must be indicated: the methods of sighting, the species, number of individuals, the co-ordinates, the time and the weather conditions; in addition, the observations of the qualified MMOs must be reported. The report must be sent to the Ministry of the Environment (Department for Environmental Assessments and Department for the Protection of the Countryside and the Sea) and ISPRA; the data must be in both paper and electronic formats; the latter must be in compliance with the specifications published on the website of the Ministry of the Environment.

Provisions are also detailed in the Italian Environmental Monitoring Project[9] Methodology.

Pre-piling survey/search

As discussed above, a 500m mitigation zone, in accordance with JNCC 2010[5], is deemed appropriate to minimise potential impacts from underwater noise that may result in mortality, physical injury, permanent or temporary auditory injury (where modelled), and strong behavioural reactions as for all species considered in the underwater noise modelling report, this will be increased to 1-3 nautical miles where required as per A.42

Piling activity <u>cannot commence</u> at any level without the MMO[5] (marine mammal observer) team conducting their pre-piling search and confirming that no marine mammals or turtles have been sighted in the mitigation zone during the 30-minute search period. Piling will only commence if the MMO team are satisfied that conditions have allowed satisfactory survey in accordance with JNCC guidelines[2].

As a number of Oodontocetes[10], such as the bottlenose dolphin, are listed as potentially present in the area, the use of PAMs[5] (Passive Acoustic Monitors) is recommended in conjunction with the MMOs as the vocalisations of these species can be detected via PAMs. This complementary approach increases the likelihood of detection of marine mammals within the mitigation zone.

[9] IAL00-ERM-643-Y-TAE-1028

[11] A qualified and experienced MMO is a person who has undergone marine mammal observation training (JNCC MMO training course or equivalent) and has spent a minimum of six weeks of marine mammal survey experience at sea over a three-year period.

Within the mitigation zone, appropriately qualified and experienced MMOs and PAMs[11] shall undertake visual and acoustic the pre-piling search for marine mammals and turtles. The MMO survey vessel must have a suitable, elevated platform for the observers to stand on enabling a 360º view around the noise source (piling hammer).

It is proposed that the MMO team are situated on a vessel suitable to both nearshore working and operating in the same sea-states and weather conditions as the piling will be undertaken in. Consideration will have to be given to the water depths to which the vessel will operate close to shore as it will not be possible to encircle the noise source due to the works being located in the intertidal zone. It may therefore be necessary to have a very shallow draft vessel.

Each of the MMOs/PAMs operators must have the following equipment when on shift (to be provided by the MMO contractor not TAP):

- Binoculars
- Night-vision goggles, if it is possible that piling operations might continue into or re/commence following a break in piling during darkness[12].
- Range-finding equipment for identification of distance of marine mammals and turtles within the mitigation zone, taking into consideration vessel size and MMO elevation.
- Radios/walkie-talkies for communication with other members of the MMO team, and with the engineering contractor.
- Standardised (pre-agreed) sightings sheets (e.g. JNCC forms or equivalent as required by regulators in host countries) and potentially a Dictaphone for ease of recording, with the caveat that sighting sheets are also completed at the end of each shift; Sighting sheets will be formalised prior to construction in following consultation with the competent authorities.
- Appropriate PAM system, hydrophones and software and working knowledge of the installation, operation and interpretation of the recordings.

The pre-piling search will be undertaken by the MMOs and PAMs for a minimum of 30 minutes before any piling activity can commence. If marine mammals or turtles are observed/detected within the mitigation zone during the pre-piling search, piling activities are not permitted to start. The MMO team shall continue their search and 20 minutes after the last sighting and/or detection within the mitigation zone, allowing any animal sufficient time to leave the area, soft-start piling activities can commence.

Once the MMO team have conducted their pre-piling search and confirmed that no marine mammals or turtles have been sighted/detected in the mitigation zone, the Designated Person in the MMO team will notify the Designated Person responsible for operating the hammer that the 20-minute soft-start piling procedure can commence.

[11] A qualified and experienced MMO is a person who has undergone marine mammal observation training (JNCC MMO training course or equivalent) and has spent a minimum of six weeks of marine mammal survey experience at sea over a three-year period.

[12] A distinction should be made between piling which commences during times of good visibility and continues into a period of poor visibility/night-time, and piling that commences during times of poor visibility (including night-time conditions). Refer to JNCC (2010) Section 4 (Variation of Standard Protocol) for further details.
http://jncc.defra.gov.uk/pdf/JNCC_Guidelines_Piling%20protocol_August%202010.pdf

Soft-start piling

Gradual ramping up of the hammer blow force and frequency over a 20-minute period for each period of continual piling (see breaks in piling) allows marine mammals, turtles and fish to disperse from the area before the full force of the hammer is used. Although it should be noted that start-up can result in animals diving, making detection more difficult. If a marine mammal or turtle enters the mitigation zone during the soft start procedure piling operations should cease, or the power is not to be increased further until the marine mammal/turtle exits the mitigation zone and no further sightings/detections occur for 20 minutes. However, if full power has been reached piling may continue.

During the soft-start, the MMOs will maintain their search within the mitigation area. If by the time the 20 minutes of soft-start is complete and no marine mammals or turtles have been observed, full hammer energy can be used on the sheet pile.

The Designated Persons from both contractors should maintain good communications during the ramp-up period, particularly the last 5 minutes, to ensure that all parties are aware full power will be used. If a marine mammal or turtle is sighted when the hammer is at full power, piling should continue regardless.

MMOs shall prioritise pre-piling watches but also, allowing for breaks, continue to undertake monitoring during piling works.

Breaks in piling

The Designated Person responsible for the hammer operation must maintain communications with the MMO team regarding any breaks in piling so that visual and acoustic monitoring can be undertaken during the break to minimise any delays to restarting of activities.

Should there be a break in piling >10 minutes, it is possible that marine mammals/turtles may re-enter the mitigation zone. However, if the MMO/PAM have maintained a continuous watch during the break, thus allowing them to confirm that no marine mammals/turtles are present within the mitigation zone, piling operations can recommence without the need to repeat the soft-start procedure.

However, if no MMO or PAM watch was maintained, another 30-minute pre-piling search and then a 20-minute soft-start procedure will be required.

Recording and reporting

All piling activities and marine mammal/turtle mitigation and monitoring must be recorded by the MMO team. At the end of each shift, the survey team must complete all documentation for that shift.

Information to be recorded includes:

- Record of piling operations- start/end time, duration of soft starts etc.
- Survey effort – number of MMOs/PAMs on watch, duration of all watches, names of individuals on shift.
- Description of marine mammal sightings/encounters/behaviours etc as per JNCC sheets or equivalent, and any actions taken.

- Any issues encountered with regard to application of the MMMP, any breaches of protoco, etc.

Weekly reports shall also be produced as required by client/regulators.