.

TAP AG Project Title / Facility Name:

Trans Adriatic Pipeline Project

Document Title:

Ecological Management Plan

CAL00-PMT-601-Y-TTM-0007

Appendix 12

1	20-11-2017	Issued for Implementation	IFI	R.Southern	A.Engel	B.Boulton
0	20-07-2017	Issued for Implementation	IFI	R.Southern	A.Engel	B.Boulton
Rev.	Revision Date (dd-mm-yyyy)	Reason for issue and Abbreviation for it, e.g, IFR		Prepared by	Checked by	Approved by

	Contractor Name:	
	Contractor Project No.:	
	Contractor Doc. No.:	
	Tag No's.:	
TAP AG Contract No.:	*Project No.:*	
PO No.:	*RD Code:*	*Page:* **1 of 10**

TAP AG Document No.:

CAL00-PMT-601-Y-TTM-0007

APPENDIX 12
TURTLE MANAGEMENT PLAN (ITALY AND ALBANIA)

Introduction

This Turtle Management Plan is a ‘live’ document that will be adapted through the detailed design and construction phases of the TAP project. This plan provides project wide mitigation required to ensure compliance with ESIA commitments, consent requirements and Lender performance standards in relation to turtles.

TAP in-country offices will develop and maintain this and associated documents, with inputs from local experts as required, immediately prior to, and during the construction phase of the TAP project.

This Plan applies to all marine areas.

This plan should be read in conjunction with the EMP, appednix 13 and appenidx 14.

Turtles in the Adriatic & TAP

Three turtle species are primarily found in the Adriatic, namely the loggerhead (*Caretta caretta*), the green (*Chelonia mydas*) and the leatherback (*Dermochelys coriacea*). While the Hawksbill (*Eretmochelys imbricate*) and Kemp’s Ridley turtle (*Lepidochelys kempii*) are considered to be vagrants in the area. The most abundant turtle species in the Mediterranean is the loggerhead, and several distinct populations and reproductive sub-populations are found regionally. The Critical Habitat Assessment (CHA) found the loggerhead turtle triggered tier 2 critical habitat under both Criterion 1 (Threatened species) and Criterion 3 (Migratory and congregatory species). While the remaining four turtle species were identified as priority biodiversity features.

The Adriatic is one of two main foraging areas for adult loggerhead turtles from a nesting site in Zakynthos, Greece, and is also frequented by individuals from rookeries in Turkey and Cyprus. The Albanian coast of the Adriatic is known to be a significant migratory pathway for juvenile loggerheads passing between foraging grounds further north in Albania and the northern Adriatic and nesting grounds further south (e.g. the Aegean). Tagging of juveniles also shows migratory routes along the western Adriatic coastline as well as some residential behaviour[1]. However based on current information the Adriatic is not understood to be of significance for nesting habitat.

- In **Italy**, as reported in the ESIA, only very occasional nesting by individual turtles has occurred on or near the landfall. Furthermore, intertidal works here will involve a micro-

[1] https://s3.amazonaws.com/academia.edu.documents/44540446/Foraging_grounds_movement_patterns_and_h20160408-1063-1az8mw3.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1510571853&Signature=I77aF7AP4YsUd1kCidgLGUJUSMk%3D&response-content-disposition=inline%3B%20filename%3DForaging_grounds_movement_patterns_and_h.pdf

tunnel to connect the offshore and onshore pipeline sections, thus avoiding any direct impacts on these beaches.

- In **Albania**, very little information was available for the ESIA, and this gap was identified as part of the data gathering process for the CHA. In order to resolve this data gap, TAP commissioned local experts (Herpetofauna Albania Society) in 2017 to conduct surveys of the coast either side of the landfall, including the landfall beach. Survey timings were based on expert advice and in consideration of loggerhead nesting periods elsewhere in the Mediterranean: intensive (morning and night) surveys in July and August, and less intensive (morning only) surveys in September. Extensive informal interviews were also undertaken with beach users and people in the area to collect information on possible nesting activity, and information leaflets were distributed. No direct evidence of loggerhead nesting activity was recorded however some reliable anecdotal evidence of possible occasional nesting, and evidence of occasional nearshore turtle bycatch/mortality was noted. While these surveys cannot conclusively prove nesting never occurs, they infer that any nesting that may occur is likely to be very occasional. This supports desk-top literature that indicated no evidence of nesting in Albania. It should be noted that loggerhead turtle nesting ranges have expanded within the Mediterranean in recent years so future nesting as a result of range changes cannot be discounted. This management plan therefore includes precautionary provisions for nesting turtles.

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 (upto KP12) 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.

Potential impacts

Noting that the likelihood of nesting activity is low, the following key impacts to turtles have the potential to occur from the TAP project:

- Physical damage/injury/entrapment mortality of nests, eggs, hatchlings and emergent nesting females from intertidal construction works and associated activities (e.g. vehicle use, plant, temporary structures, ditches/bunds etc);
- Disorientation of turtles (of hatchlings, juveniles, nesting females) either on the beach or in the nearshore area from the presence of lights (e.g. at cofferdam/landfall construction area);
- Impacts from underwater noise generated by cofferdam piling at the landfall; and
- Direct interactions with vessels (e.g. collision) during construction.

Monitoring Requirements - Albania

As discussed above, nesting potential is considered as possibly absent or low, but cannot be ruled out. A single season survey is insufficient to discount nesting potential due to the periodic 2-3 year return cycle of nesting females. As proposed construction periods overlap with the nesting season in Albania monitoring is recommended to ensure appropriate, targeted and adaptive mitigation actions are identified and implemented as necessary.

Furthermore the recommendations of the 2017 nesting turtle survey report include:

- As anecdotal accounts suggest the possible presence of the nesting in the area, should intertidal and beach works be proposed between mid-June and the end of August, morning monitoring is recommended to look for nesting tracks in the landfall area. The monitoring for tracks of females or hatchlings left in sand should be conducted early in the morning 5am-8am while the beach is not crowded, the sand is not dried, and the sun angle low.
- Should nesting activities be found, slow and methodical localized digging and relocation of the eggs (where appropriate and following a specific methodology)[2] into a new undisturbed location where they are able to hatch shall occur. Detailed translocation methodologies will be developed and executed in consultation with the Herpetofauna Albania Society, and other regional experts and regulators

TAP will conduct an additional nesting turtle survey monitoring plan for 2018 in consultation with the Herpetofauna Albania Society, and other regional experts and regulators as deemed necessary. This is to ensure appropriate monitoring and mitigation measures are identified for the landfall construction works as there is some temporal overlap between the construction windows and nesting season in Albania.

Mitigation and management measures – Italy and Albania

Table 1 summarises mitigation measures to reduce impact to nesting turtles

[2] Boulon, R. H. Jr. (1999). Reducing Threats to Eggs and Hatchlings: In Situ Protection. Pp 169-174. In: Eckert, K. L., K. A. Bjorndal, F. A. Abreu-Grobois and M. Donnelly, (Editors). (1999). Research and management techniques for the conservation of sea turtles. IUCN/SSC Marine Turtle Specialist Group Publication No. 4. 235pp

Table 1: Potential impacts and associated mitigation measures for nesting turtles.

Stressor	Potential impact	Mitigation
Physical presence of intertidal works area	Disturbance/displacement of nesting turtles in the area. Loss/reduction of nesting habitat. Obstruction and works causing injury/mortality to adult turtles that crawl across the beach to their nesting zones or injury/mortality to hatchlings moving to sea. Potential changes to marine physical processes (erosion/ accretion).	Time activity so it avoids damage to nests – the timeframe being dependent on when hatching occurs. Minimising footprint of working area, ensuring site is safe CCPs, ecological management plans – see Table 3. Avoidance of construction works summer period (July – August)
Lighting	Adults could avoid nesting in the area and potentially dump eggs offshore during construction. This could affect local population levels given fidelity issues. Adult post-nesting sea finding navigation can be negatively affected. Hatchlings can be disorientated and mis-orientated, which may lead to mortality. Increased hunting and predation due to exposure in lit areas.	Good practice measures to minimise lighting impacts should be adopted to help reduce impacts (see Table 4). If nesting is recorded a more detailed light mitigation strategy may be required – see Table 4.
Dredging and spoil storage/disposal	Obstruction of turtle movement. Smothering due to disposal.	Management measures for dredging to be discussed with contractor – see Table 5.
Physical presence of people	Movement/activities may disturb adults and hatchlings. Nests can be disturbed or eggs exposed. Uncontrolled activities of contractors including poaching, harassment, lighting fires etc.	Method statements to advise working hours for different activities, education and training for contractors on how to minimise disturbance, restriction of vehicle movements on beach – see Table 7. In Italy beach works are minimised due to micro tunnelling.

Table 2: Potential impacts and associated mitigation measures to be considered for all activities

Light	Adults could avoid nesting in the area and potentially dump eggs offshore during construction. This could affect local population levels given fidelity issues**.**	Adoption of good practice light management practice to seek to reduce emissions as far as possible – see Table 3.
Vessel movements	Death/injury as a result of vessel strikes Entrapment by dredgers (use of a Cutter Suction Dredgers is proposed in Albania and use of a Backhoe Dredger and Split Hopper Barge are proposed in Italy)	Following the Vessel Code of Conduct (see Appendix 14) (max speeds of 5 knots within 100 m of a turtle and maintaining a distance of 100 m from any turtle where possible). Vessels within 50 m of a turtle should be limited to no wake speed. Marine Mammal Observers (MMOs) shall also monitor for turtles (see Appendix 13), all collisions with turtles (or other marine megafauna) must be reported.
Dredging (excluding vessel collision and entrapment)	Increased turbidity reducing visibility	Management measures for dredging to be discussed with contractor – see Table 5.
Liquid waste discharges	Accidental/unplanned discharges of chemicals/fuels resulting in fouling of habitats and/or direct health impacts	Implementing marine pollution prevention control documentation and procedures – see Table 6.
Underwater noise / vibration	Piling of the cofferdam in Albanian waters and sheet piles in Italian waters may result in physiological and/or behavioural impacts upon turtles Construction noise may disturb/displace turtles	Adherence to the Marine Megafauna Mitigation Protocol (Appendix 13).

Tables 3 to 7 expand on mitigation measures for potential impacts of particular stressors for nesting turtles. The mitigation of the impacts of vessel movements and underwater noise is the same for turtles as for marine mammals, and are expanded on in the Vessel Code of Conduct (Appendix 14) and the Marine Mammal Mitigation Protocol (Appendix 13).

Physical presence of intertidal work areas

Turtles nest in the supratidal zone, so the presence of work in the intertidal zone may obstruct pathways to and from the beach, as well as creating obstacles such as ditches or temporary structures that may trap hatchlings, juveniles or nesting females. These impacts then increase the risk of physical damage, injury or mortality to turtles. Habitat fragmentation due to the physical presence of intertidal work areas may also alter turtle behaviour and increase turtle mortality, as the space used for potential nesting habitat may be lost or altered. The mitigation measures shown in Table 3 help reduce the influence of such impact.

Table 3: Mitigation of impacts from physical presence of intertidal work area

Mitigation	Responsibility	Timeframe
Minimise the size of working areas in the turtle crawl and nesting zones and avoid storing materials and siting on-permanent facilities etc in these zones wherever possible.	Contractor	Start of each construction activity
Ensuring site is 'turtle safe': no open pits/ditches, entanglement hazards, obstructions between turtles and sea. Implement good waste management measures to ensure that no waste or other materials are stored on, or disposed of, in the intertidal turtle crawl and nesting zone. Daytime and/or night-time monitoring of site to check for turtles as per the above requirements. During monitoring, active intervention may be necessary to remove obstructions (e.g. spills, waste, litter, logs) from the nesting beach that can be relocated without additional disturbance or damage to the environment.	Contractor Environmental Team	Start of each construction activity Daytime monitoring
Should nesting be identified during monitoring then avoidance of works in the footprint will be required if translocation is not possible.	Contractor	Pre-construction (summer 2017) and construction phase (summer 2018) As required during monitoring
If translocation is required and is possible with respect to the timing of nesting, this should follow a detailed protocol to ensure survivability of eggs and hatching success, which can be provided by the Environmental Team. This will include a protocol on movement of eggs (timing, removal and transfer), relocation (donor site selection, egg placement, marking etc) and monitoring of hatching success.	Environmental Team	As required during monitoring
Restoration of beach/intertidal to as close to former condition using passive or active techniques.	Contractor	Post-construction phase

Lighting

White, broad-spectrum and blue/green colour-tinted lighting is highly disruptive to turtles, particularly hatchlings as they orientate to the brightest horizon when finding the sea. The presence of bright lighting on a nesting beach may lead to hatchlings becoming disorientated, resulting in high hatchling mortality rates from dehydration, starvation or predation by birds. Nesting females may avoid nesting or be disrupted/disorientated both when coming up onto the beach to nest and when returning to the sea. Red light is the least intrusive to turtles, with low pressure sodium lighting, and yellow and amber LEDs, or light of 560nm or longer appropriate alternatives. While the Albanian beach is not known to be a nesting beach, females may still be exploring and the mitigation measures shown in Table 4 are good practice to alleviate the impact of lighting on turtle behaviour.

Table 4: Mitigation of impacts from lighting

Mitigation	Responsibility	Timeframe
General good practice to be adopted irrespective of whether nesting is recorded		
Ensuring lights are positioned at ground/low levels or directed away from the beach where possible, including vessel lights.	Contractor	Start of each construction activity
Shielding, shrouding or screening lights with aluminium flashing or natural vegetation where possible	Contractor	Start of each construction activity
Eliminating unnecessary lighting, especially from transient light sources such as torches, and managing the time when lighting is used.	Contractor	Start of each construction activity
Specific lighting measures if nesting is recorded during monitoring activity		
Review and modification of lighting plan at start during construction phase/when new lighting is required, including spectral properties and recommended luminance levels, applying an ALARP approach while maintaining safety consideration. Including identification of lux limits if nesting is confirmed in future surveys	TAP HSE manager	Start of each construction activity/when any new lighting is required
Ensuring the use of best available technology, such as low pressure sodium (LPS) or LED lights, particularly red light, as appropriate, including vessel/vehicle lights.	Contractor	Start of each construction activity
Monitoring for 'problem lights', and where they cannot be eliminated, lights should be shielded or repositioned lights. Maintain a vigil during both night-time lighting survey patrols and day-time nesting beach surveys (daily and weekly) for adults and hatchlings that have become mis-oriented or disoriented, especially in locations where there are known to be 'problem lights'. Monitor the return of mis-oriented or disoriented adults and hatchlings to the sea	Environmental team Contractor	Continuously
Ensure that areas of the beach that are not currently a priority for construction works are kept dark, and aim to phase construction to enable darker areas of the beach to be maintained throughout	Contractor	Construction
Consider the potential to avoid night-time works during the nesting season if turtle emergence activities are recorded within 1.5 km of the works and negative effects are seen to occur.	Contractor	Start of each construction activity

Dredging and spoil storage/disposal

Dredging and associated vessels may impact turtles due to physical entrapment resulting in injury or mortality. Turbidity may also be increased, which reduces visibility, which may affect foraging resource or activity. The mitigation measures detailed here and the protocols detailed in Appendices 13 and 14 reduce these impacts.

Table 5: Mitigation of impacts from dredging and spoil storage/disposal

Mitigation	Responsibility	Timeframe
Following the Vessel Code of Conduct (Appendix 14) and Marine Megafauna Mitigation Protocol (Appendix 13). Management measures for dredging to be discussed with contractor, including best available technology, visibility, anchorage lines etc. (to be incorportated into next revision of this plan.)	Contractor	Start of each construction activity

Liquid waste disposal

Accidental spillages or leaking liquid waste may have deleterious health impacts for any turtles present. Liquid waste may be ingested or inhaled by turtles, or have a toxic effect, potentially causing disease, injury or mortality. Secondary impacts may also be the disturbance of turtles' food source if fish mortality occurs, or loss of nesting habitat if the beach is affected. Following best practice policy and procedures is the best way of mitigating such impacts.

Table 6: Mitigation of impacts from liquid waste disposal

Mitigation	Responsibility	Timeframe
Implementation of a discharge policy in accordance to local/international practice.	Contractor	Start of contract
Managing all waste discharges and disposal in line with marine pollution prevention procedures.	Contractor	Continuously
Responding to spills and leaks in accordance to the appropriate response plans.	Contractor	As required
Completing/providing all appropriate marine pollution prevention control documentation.	Contractor	Start of contract

Physical presence of people

The movement of people on the beach may disrupt adults or hatchlings, causing them to change behaviour patterns or abandon nests. People may also disturb nests, exposing eggs and leaving them vulnerable to crushing and/or predation. Education about turtle behaviour is the best way to prevent actions such as egg poaching or turtle harassment, while minimising time spent both on foot or in vehicles on the beach will mitigate overall turtle disruption.

Table 7: Mitigation of impacts from physical presence of people

Mitigation	Responsibility	Timeframe
Method statements to advise working hours for different activities.	Contractor	Start of contract
Education and training for contractors on the potential impacts and how to minimise disturbance.	Contractor	Start of each construction activity/crew changes
Prohibition of touching turtles, nests or hatching except for authorised personnel (in the context of nest and hatchling monitoring, research or protection activities) by any project related staff.	Contractor	Continuously
Minimising vehicle movements in the turtle crawl and nesting zone applying an ALARP approach: specified entry/exit points of working area, vehicles removed from beach at night to avoid obstruction, temporary surfaces to support access not to be left in situ. Precede any vehicle movement with monitoring (in line with marine mammal protocol) to ensure no turtle presence.	Contractor Environmental Team	Start of each construction activity
Prohibit recreational activities involving lights or fires within port boundaries at all times and provide awareness materials explaining rationale.	Contractor	Continuously
In Italy beach works are minimised due to micro tunnelling.	Contractor	Start of contract

Level 3 Site files will be developed for all PBFs and CH which will include mitigation, monitoring and if necessary offset requirements to achive NNL and NG.