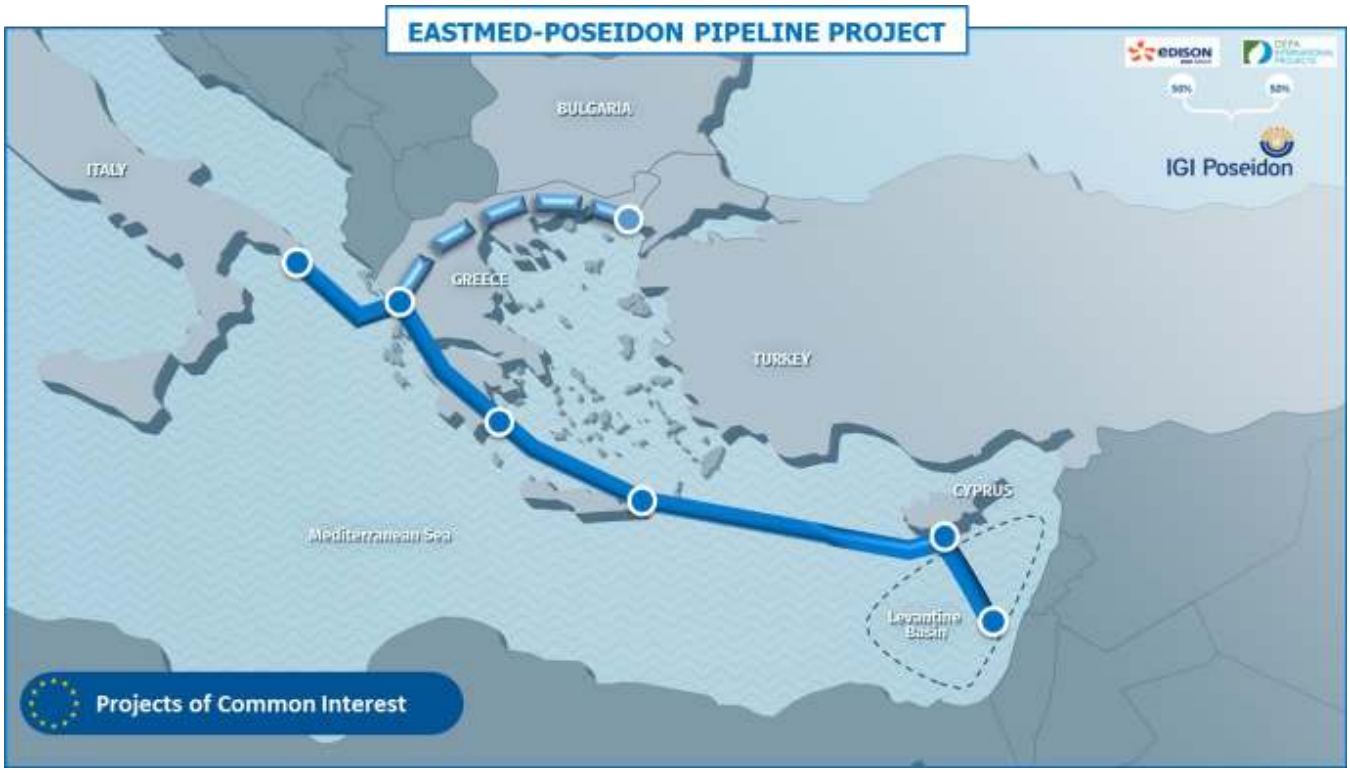
IGI Poseidon

PROJECT:

EastMed Pipeline Project



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Abbreviations

Abbreviation	Description
AA	Appropriate Assessment
C/S	Compressor Station
C-M/S	Compressor and Fiscal Metering Station
Contractor	The contractor to which the construction will be awarded. Currently, the method of awarding the contract is not defined nor the number of engaged contractors.
EC	European Commission
ECP	EastMed Compression Platform
EIA	Environmental Impact Assessment
EKPAA	National Centre for Environment and Sustainable Development
ESAS	European Seabird At Sea
ESIA	Environmental and Social Impact Assessment
ETA	Environmental Terms Approval
EU	European Union
FSA	Field Survey Area
ha	Hectares
HDD	Horizontal Directional Drilling
Investigated Project	The EastMed consisting of an Onshore and an Offshore section and associated onshore facilities
IP	Interconnection Point
ITA	Inline Tee Assembly
IUCN	International Union for Conservation of Nature
JMD	Joint Ministerial Decision

kHz	kilohertz
km	Kilometres
m	meters
LFi	Landfall
MARPOL	International Convention for the Prevention of Pollution from Ships
MD	Ministerial Decision
MEE	Ministry of Environment and Energy
NCC	Nature Conservation Consultants Ltd.
O&M	Dispatching and Operation & Maintenance Building
OFYPEKA	Organization of Natural Environment and Climate Change
Onshore Stations	• Compressor and Metering Stations at Crete, • Compressor Station at Achaia, • Metering/ Pressure Regulating and Heating Station at Megalopoli.
OSPAR	Oslo/Paris Convention (for the Protection of the Marine Environment of the North-East Atlantic)
PGM	Permanent Ground Markers
PLONOR	Pose Little or No Risk to the Environment
PIER	Preliminary Environmental Identification Requirements
PPS	Pipeline Protection Strip and Safety Zone (PPS)
Project	Construction and Operation of the EastMed Project
Project Owner	IGI Poseidon: a 50-50% Joint Venture between DEPA and Edison incorporated under Greek law
RCM	Reliability Centred Maintenance
ROV	Remotely Operated Underwater Vehicle

ROW	Right of Way. During the Construction Phase, the ROW is the construction working strip. During the Operation Phase, the ROW is the Pipeline Protection Strip.
SAC	Special Area of Conservation
SCADA	Supervisory control and data acquisition
SDF	Standard Data Form
SPA	Special Protection Area
SSS	Side Scan Sonar system
SPT	System Pressure Test
SSCO	Site Specific Conservation Objective
TUC	Towed Underwater Camera
UV	Ultra Violet

1 INTRODUCTION

1.1 Legal Framework for Conducting the Appropriate Assessment for the SAC "VoreioanatolikoAkroKritis: Dionysades, Elasa Kai ChersonisosSidero (AkraMavro Mouri – Vai – AkraPlakas) Kai ThalassiaZoni", GR4320006

According to Greek national legislation Law 4014/2011, an Environmental Social Impact Assessment (ESIA) is required for technical projects belonging to category A1. If they interfere with Natura 2000 sites a specialised Appropriate Assessment (AA) must be conducted concerning the entire Natura 2000 site, which becomes an integral part of the projects' ESIA.

The EastMed pipeline has offshore and onshore section and is natural gas pipeline, directly connecting east Mediterranean resources to mainland Greece via Cyprus and Crete. The Project is being developed by IGI Poseidon Project Owner), a company based in Athens and equally owned (50-50%) by the Greek company DEPA International Projects S.A. and the Italian company Edison S.p.A. The ESIA has been prepared on behalf of the Project Owner by the company ERM Italia SpA and the Engineering company ASPROFOS Engineering S.A. (member of the HELPE Group of Companies) and in collaboration with renowned, experienced and specialised consultants, in accordance with applicable environmental legislation. The AAs of the Project have been carried out by Nature Conservation Consultants Ltd (NCC), subcontractor of ASPROFOS Engineering S.A.

The present AA concerns the Special Area of Conservation "Voreioanatoliko Akro Kritis: Dionysades, Elasa Kai Chersonisos Sidero (Akra Mavro Mouri – Vai – AkraPlakas) Kai Thalassia Zoni", GR4320006, focusing mainly on the portion directly crossed by the Offshore section of the pipeline (Figure 2-1).

Category of Appropriate Assessment Study for the site, based on the Annexes of Ministerial Decision 170225/2014

The Greek MD 170225/2014 sets two possible categories of AA described in Annexes 3.2.1 and Annex 3.2.2. In particular:

- An AA falls under the requirements of Annex 3.2.1, when existing biodiversity data for the Natura 2000 site, where the project or portion of the project is proposed to be implemented, are not recent and/or sufficient, and a detailed biodiversity field survey lasting at least 20 days (for projects of category A1) is required for the collection of biodiversity information.

- An AA falls under the requirements of Annex 3.2.2, when existing biodiversity data for the Natura 2000 site, where the project or portion of the project is proposed to be implemented, are recent, reliable and sufficient and are available from official/public sources, such as the Natura 2000 sites national biodiversity monitoring network and no field survey is required.

The present AA for the Special Area of Conservation (SAC) "Voreioanatoliko Akro Kritis: Dionysades, Elasa Kai Chersonisos Sidero (Akra Mavro Mouri – Vai – Akra Plakas) Kai Thalassia Zoni", GR4320006, falls under the category set in Annex 3.2.1, since existing data for the sites are not sufficiently detailed to fulfil the requirements of Annex 3.2.2. Thus, a field survey of at least 20 days has to be performed addressing the requirements of Greek legislation to gather sufficient biodiversity information for this AA.

The field survey was carried out for an overall period of 20 days between June 2021 and September 2021, including the following activities:

- Collection of field data on fauna species of interest present in the section of the Natura 2000 site near the pipeline routing and at the pelagic area outside the site by fauna experts;
- Collection of additional field data on avifauna species of interest present in the section of the Natura 2000 site near the pipeline routing by ornithologists;

Field survey results are presented alongside desktop data and clear reference to the data source is made throughout the AA.

1.2 Assumptions, Limitations and Exclusions

A number of assumptions have been made in preparing the AA:

- The assessment was based on Project design data available to date. Reliable assumptions on the following key elements have been made, on the base of existing bibliography on pipeline construction: (a) total duration, (b) specifications concerning the Project;
- The AA is in alignment with the ESIA;
- The present AA focused solely on the normal operative conditions of the Project. Consequently, emergency and non-routine events that could potentially affect biodiversity were not taken into consideration in this AA and will be assessed in the ESIA; and
- The decommissioning phase of the Project was not taken into account in this AA, since it is expected to take place in 3-5 decades from today, when all biodiversity parameters will have to be re-evaluated. Therefore, a new AA will be required for the decommissioning phase after the Project end of life.

1.3 Analysis of Institutional / Legal Framework

1.3.1 Plans and Projects within Natura 2000 Sites

The Natura 2000 network is an EU network of protected areas, whose main objective is the protection of vulnerable and endangered species of animals, plants and habitat types in the EU, and it constitutes the widest biodiversity conservation network worldwide. Based on the Birds and Habitats Directives (2009/147/EC and 92/43/EEC), every member of the Union declares Special Protection Areas (SPA) and Special Areas of Conservation (SAC), in order to protect the endangered biodiversity of Europe.

The connection between human activities and the protection framework of Natura 2000 sites is clarified in Article 6 of the Habitats Directive. More specifically, for every project or plan that is expected to significantly affect an area, it is noted that:

"*Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public*".

"*If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted*".

The two Directives have been transposed into Greek legislation with the following decrees: JMD 37338/1807/2010, JMD 8353/276/2012, JMD 33318/3028/1998, MD 14849/853/2008.

Concerning Article 6 of Directive 92/43/EEC, L. 4014/2011 and MD 170225/2014 define in detail implementation of respective provisions. National legislation also includes Law 3937/11 "Conservation of biodiversity and other provisions".

Based on the above legal framework, the following are noted:

- The consequences of every project must be examined separately and in accordance with other existing projects or plans at the site,

- The criteria must be based on preserving the integrity of the site, along with keeping in mind the conservation objectives,
- If the construction of the project is necessary for overriding public interest, all necessary compensatory measures will be taken.

1.3.2 Natura 2000 Network in Greece

The national Natura 2000 network has been updated and extended with JMD 50743/2017, while the Management Bodies for all the Natura 2000 sites are set by Laws 4519/2018 and 4685/2020. According to Law 4685/2020 the Organisation of Natural Environment and Climate Change (OFYPEKA) was established and operates as the successor of the National Centre for Environment and Sustainable Development (EKPAA). Among other things, the purpose of OFYPEKA is implementation of the policy set by the Ministry of Environment and Energy for management of Natura 2000 protected areas in Greece.

1.3.3 Environmental Authorisation of Activities and Projects

According to Law 4014/2011, the environmental authorization procedure of project and activities that may affect Natura 2000 sites, the preparation of an Appropriate Assessment is foreseen, constituting an integral part of the Environmental and Social Impact Assessment.

According to Greek MD 1958/2012 and its subsequent amendments (Greek Decrees MD 20741/2012, MD 65150/1780, MD 173829/2014 and MD 37674/2016), projects are classified in two categories: Category A, when they potentially may cause very significant/significant environmental impacts, or Category B, when they may cause environmental impacts only locally or of no significance.

The content of the Appropriate Assessment was specified by MD 170225/2014 which includes

- Detailed record of natural environment data with emphasis to the protected elements of the Natura 2000 sites and those likely to be affected by the project or activity;
- Appropriate assessment and impact assessment;
- Mitigation measures for the potential impacts;
- Compensatory measures (if needed);
- Monitoring program;
- Conclusions summary;
- Bibliography sources; and
- Study team.

1.3.4 Classification of the Project Based on National Legislation

The project classification according to national legislation (as amended and in force) is provided in Table 1-1.

Table 1-1 Classification of EastMed According to MD 170225/2014

Legislation	Category	Project Categorisation
MD 1958/2011	Group	11 - Transport of energy, fuels and chemical compounds
	No.	1 – Pipelines of national importance or included in European or international networks and associated/ supporting facilities
	Category	A1 – Project and activities that may have very significant impacts on the environment
	Comment	-
STAKOD 08/ NACE Rev.2*	Section	D – Electricity, gas, steam and air conditioning supply
	Division	35 – Electricity, gas, steam and air conditioning supply
	Group	35.2 – Manufacture of gas; distribution of gaseous fuels through mains
	Class	35.23
	Description	Trade of gas through mains
JMD 3137/191/Φ.15/2012*	Group	n/a
	Sub-group	n/a
	No.	n/a
	Disturbance class	n/a

** The classification presents the activity most relevant to the Project. The applicable provisions concern also the compressor stations..*
It is noted that the compressor stations, having a total capacity >50 MW, fall under the provisions of JMD 36060/1155/E.103 regarding "Establishing a framework of rules, measures and procedures for the integrated prevention and control of environmental pollution from industrial activities, in compliance with the provisions of Directive 2010/75 / EU "On Industrial Emissions (Integrated Pollution Prevention and Control)" of the European Parliament and of the Council of 24 November 2010".

Prepared by: (ASPROFOS, 2021)

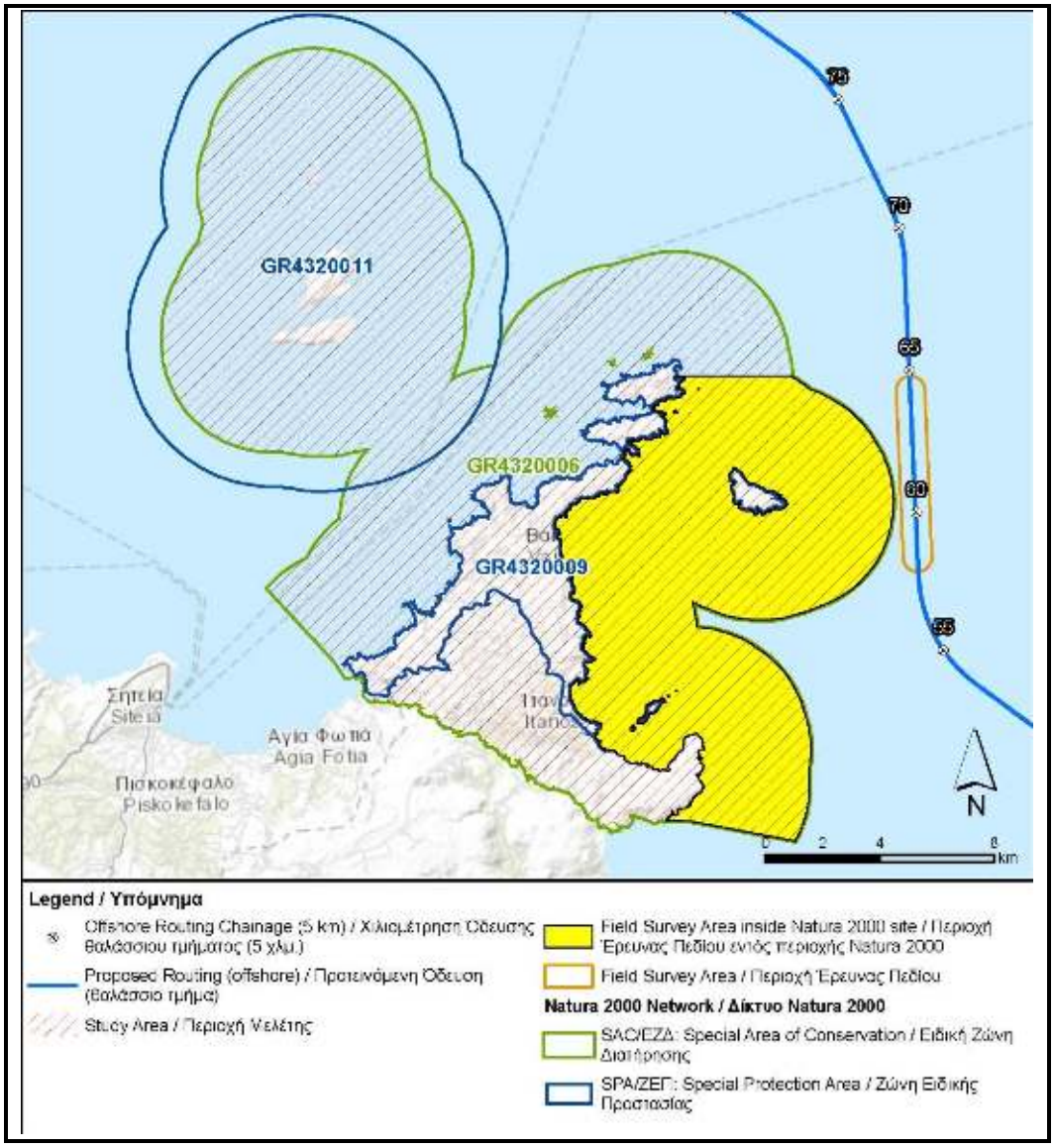
2 STUDY AREA – FIELD SURVEY AREA

According to AA specifications (MD 170225/2014), the whole Natura 2000 site, crossed or affected by the Project should be defined as a Study Area; hence the Study Area for this AA is the SAC "Voreioanatoliko Akro Kritis: Dionysades, Elasa Kai Chersonisos Sidero (Akra Mavro Mouri – Vai – Akra Plakas) Kai Thalassia Zoni", GR4320006. As shown in Figure 2-1 ,the routing of the Offshore pipeline approaches its eastern part, but does not cross it.

According to national regulatory specifications (MD 170225/2014), the Field Survey Area (FSA) for linear projects (such as the pipeline) is defined as a buffer zone of at least 500 m either side of the linear infrastructure falling within the Study Area. Although the Project does not cross the Study Area, it is in close proximity to it (about 800 m) and therefore impacts during Project construction are considered.

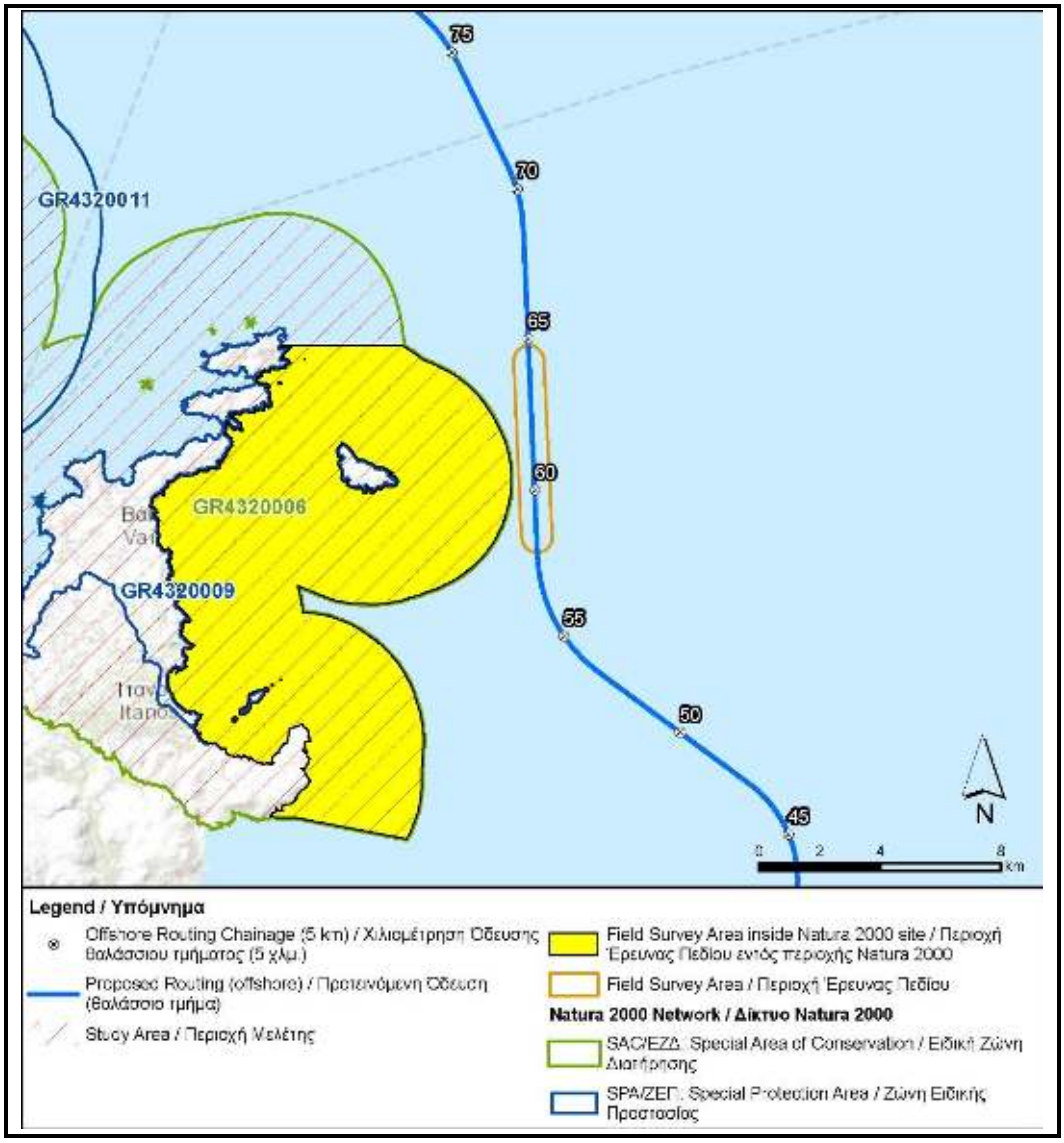
Provided the routing of the Project, the FSA has considered a 500 m buffer zone of the pipeline routing (outside the Natura site), as well as the eastern part of the site, including the coastal areas of eastern Crete and of Elasa islet, which are the most approximate to the pipeline areas of the Natura 2000 site (Figure 2-2).

Maps of the Study Area and the Field Survey Area are provided in ANNEX F, in Maps 2 and 4 respectively.



Prepared by: (NCC, 2021)

Figure 2-1 Study Area and Field Survey Area



Prepared by: (NCC, 2021)

Figure 2-2 Field Survey Area (in yellow the FSA part within the SAC). Pipeline routing in blue

3 CURRENT STATUS OF THE NATURAL ENVIRONMENT

According to the specifications of MD 170225/2014, the characterisation of the current status of the natural environment should include the description, recording and analysis of elements of the natural environment of the Study Area, as well as its conservation status.

This section focuses on the entire SAC ecosystem, providing data on existing baseline conditions of the site. Information on the FSA is provided based on data collected during fieldwork.

3.1 Description, Recording and Analysis of the Study Area Natural Environment

The analysis of the current status of the natural environment in the Study Area has been based on data derived from literature, enriched by the findings of the dedicated field surveys.

In particular, for the purpose of this document, a literature review of published references and a desktop review of data available from existing databases were carried out for the Study Area.

The main literature sources of information used include:

- The Standard Data Form of SPA Area GR4320006 (2020); and
- The most recent reports on the implementation of Directives 92/43/EEC and 2009/147/EC, including habitat mapping.

In addition, the results of the following studies have been considered:

- Action Plans for species at National and European levels;
- The most recent Red Data Books (National, European, International);
- Important Bird Areas in Greece: Priority Areas for Biodiversity Conservation (Portolou et al., 2009); and
- Important Areas for Seabirds in Greece. (Fric et al., 2012).

3.1.1 Short Description of the Study Area

The Study Area is the Special Area of Conservation “Voreioanatoliko Akro Kritis: Dionysades, Elasa Kai Chersonisos Sidero (Akra Mavro Mouri – Vai – Akra Plakas) Kai Thalassia Zoni”, GR4320006, which is located within the administrative limits of the Region of Crete covering an area of 39,415.76 hectares. The area is managed by the Management Body of the Protected Areas of Central and Eastern Crete. The Study Area includes the Wildlife Reserves "Plai Marazaki Dimou Itanou", "Vai Dimou Itanou" and

"Dionysades nisoi Dimou Siteias", while it also partially overlaps with Special Protection Area GR4320011 "Dionysades Nisoi".

The site, the north-eastern part of Crete, includes the easternmost area of the island, the peninsula of Sidero, and the nearby islets, Dionysades and Elasa. The vegetation is mainly phrygana. There are a lot of valleys with maquis, some of them degrading. The palm forest (*Phoenix theophrastii*) of Vai, unique in Europe, is situated in a coastal valley on the easternmost coast of Crete. This part of Crete is one of the driest parts of Greece. Almost all streams dry up during summer; they are surrounded by typical vegetation of oleanders, etc. There are few villages in the area. There are plantations of bananas in greenhouses while land near the villages is cultivated. The eastern coast has many sand dunes, mainly in the area between the palm forest and the sea and east of Palaikastro at Grantes Gulf. On the west side of the Sidero peninsula, *Posidonia* beds occur and pods of *Tursiops truncatus* have been observed. A military base is located on the tip of the Sidero peninsula. The nearby islets are uninhabited. The Dionysades islets group consists of Permian limestone, while Elasa islet consists of dolomites and limestones of the upper Cretaceous. The main vegetation on the islets is phrygana, while near the sea halophilous plants dominate. On the larger islet of Dionysades group, as well as on the opposite coast of Crete, the coastline is characterised by sea cliffs. The marine habitats of interest include *Posidonia* meadows, reefs and sandbanks slightly covered by sea water.

The site extends 2 nm off the Cretan and surrounding islet coasts including important and vulnerable habitats of the circalittoral and deep zones, including biodiversity-rich facies of coralligenous assemblages, and extensive detritic and rhodolith beds at depths over -40 m. Several islets, reefs and shoals add to the geographic and topographic complexity of the site.

The whole area is very important for its flora and fauna, both marine and terrestrial. The palm forest is one of the most important characteristics of the area, where it occupies a surface of 20 ha. The forest has already been characterised as an aesthetic forest. Most of the terrestrial plants of interest are endemic. Concerning fauna, there are a lot of terrestrial invertebrate endemic species and some vertebrate endemic subspecies. It can be said that the presence of reptiles is quite important. On Crete the reptiles are found in isolated small populations while on the islets there are endemic subspecies. Many species of land snails are endemic of the site or of Crete. The Dionysades group of islands is important for Eleonora's Falcon, seabirds and migratory birds, while the mainland Crete part of the site is important for migratory birds and species of steep rocky shores. The sea fauna and flora are quite interesting. Among those species are Mediterranean Monk Seal (*Monachus monachus*) and Bottlenose Dolphin *(Tursiops truncates)* that are present in the area, as well as the rare for Crete marine plant species *Ruppia cirrhosa*.

Various facies of coralligenous assemblages (deep counterpart of habitat type 1170) occur along the steep rocky coasts and reefs of the site, mostly at depths below ~40 m. Extensive detritic and

rhodolith beds (important deep subtypes for habitat type 1110) dominate the circalittoral sedimentary bottoms of the area at depths between -50 - -150 m. The uninhabited islet complex of Dionysades presents littoral biogenic rims of *Lithophyllum tortuosum* and *Titanoderma trochanter*, and support some otherwise rare for this area marine invertebrates (i.e. *Corynactis viridis, Leptopsammia pruvoti, Charonia variegata*).

The map of the Study Area is provided in ANNEX F, in Map 2.

3.1.2 Detailed Description of the Study Area

3.1.2.1 Habitats types and Flora

The Natura 2000 site hosts 24 habitat types of Annex I of Directive 92/43/EEC with habitats 1120, 1150, 6220, 7210, 9370 being priority habitats, while 3290 of national priority.

A large part of the site is marine and most of the area is characterised by sandbanks, large shallow inlets and bays and reefs, while the terrestrial area is characterised mainly by the presence of phrygana and cultivated land mostly olive groves. Table 3-1 provides the spatial extension of each habitat identified in the Study Area, as well as their percentage with respect to the whole area of the site, as provided by the habitat map of the site (Ministry of Environment, 2018).

The available spatial information concerns only terrestrial habitats and the information on marine habitats is only qualitative as no official habitat mapping is available.

It should be noted that three (3) terrestrial plant species of Directive 92/43/EEC, *Crepis pusilla, Phoenix theophrasti,* and *Silene holzmannii* have been recorded, the second of which is recorded at sandy coastal areas.

Table 3-1 Habitat Types Found at the Site

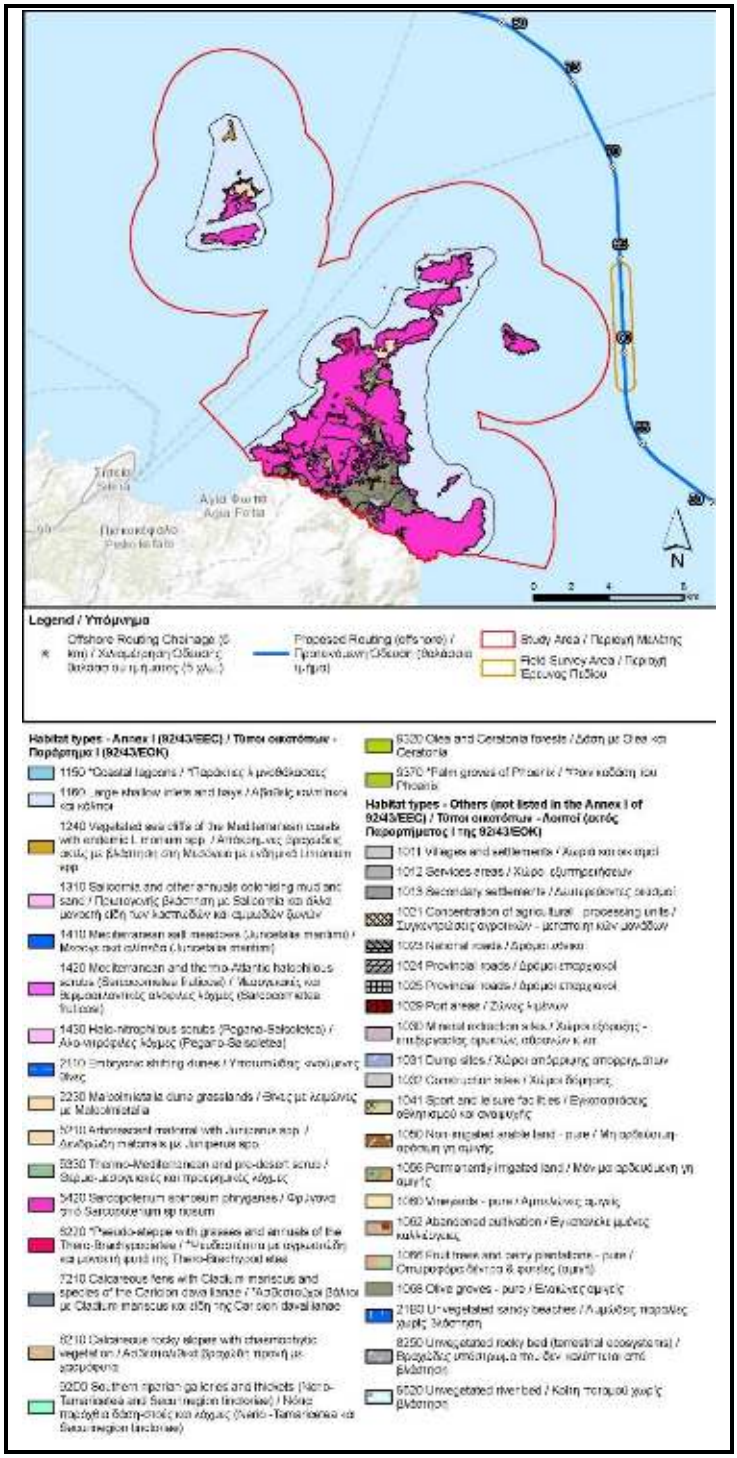
Code	Description of habitat type	Area (ha)	Percentage (%)	Classification
Habitat types as included in the SDF				
Marine habitat types				
1110	Sandbanks which are slightly covered by sea water all the time	23,605.00		HD: Annex I
1120*	*Posidonia* beds (*Posidonion oceanicae*)	142.00		HD: Annex I
1150*	Coastal lagoons	1.53		HD: Annex I
1170	Reefs	2,818.00		HD: Annex I
8330	Submerged or partially submerged sea caves	0.00		HD: Annex I

1160	Large shallow inlets and bays	5,693.24	14.44%	HD: Annex I
Terrestrial habitat types				
5420	Sarcopoterium spinosum phryganas	5,397.46	13.69%	HD: Annex I
1240	Vegetated sea cliffs of the Mediterranean coasts with endemic *Limonium* spp.	364.86	0.93%	HD: Annex I
5210	*Juniperus drupacea* arborescent matorral	135.74	0.34%	HD: Annex I
9320	Olea and Ceratonia forests	64.76	0.16%	HD: Annex I
6220*	Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea	39.77	0.10%	HD: Annex I
9370*	Palm groves of Phoenix	19.08	0.05%	HD: Annex I
5330	Thermo-Mediterranean and pre-desert scrub	11.88	0.03%	HD: Annex I
1420	Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)	5.15	0.01%	HD: Annex I
2230	Malcolmietalia dune grasslands	1.47	0.00%	HD: Annex I
1410	Mediterranean salt meadows (*Juncetalia maritimi*)	1.13	0.00%	HD: Annex I
2110	Embryonic shifting dunes	1.11	0.00%	HD: Annex I
92D0	Southern riparian galleries and thickets (Nerio-Tamaricetea and *Securinegion tinctoriae*)	0.96	0.00%	HD: Annex I
1430	Halo-nitrophilous scrubs (Pegano-Salsoletea)	0.74	0.00%	HD: Annex I
1310	Salicornia and other annuals colonizing mud and sand	0.61	0.00%	HD: Annex I
7210*	Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*	0.38	0.00%	HD: Annex I
8210	Calcareous rocky slopes with chasmophytic vegetation	0.20	0.00%	HD: Annex I
3290	Intermittently flowing Mediterranean rivers of the Paspalo-Agrostidion	0.00	0.00%	HD: Annex I

Other habitat types				
1068	Olive groves - pure	933.79	2.37%	
1062	Abandoned cultivation	114.36	0.29%	
1050	Non-irrigated arable land - pure	89.06	0.23%	
1056	Permanently irrigated land	87.81	0.22%	
1011	Villages and settlements	38.01	0.10%	
1023	National roads	33.37	0.08%	
9620	Unvegetated river bed	29.31	0.07%	
1060	Vineyards - pure	27.15	0.07%	
1024	Provincial roads	20.08	0.05%	
1066	Fruit trees and berry plantations - pure	18.20	0.05%	
1013	Secondary settlements	17.59	0.04%	
21B0	Unvegetated sandy beaches	8.65	0.02%	
1041	Sport and leisure facilities	6.03	0.02%	
1032	Construction sites	5.84	0.01%	
1021	Concentration of agricultural/processing units	5.66	0.01%	
1025	Provincial roads	2.59	0.01%	
1031	Dump sites	2.48	0.01%	
1012	Services areas	2.22	0.01%	
1030	Mineral extraction sites	1.57	0.00%	
1029	Port areas	1.35	0.00%	
8250	Unvegetated rocky bed (terrestrial ecosystems)	0.11	0.00%	

Prepared by: (NCC, 2021)

In Map 3 in ANNEX F the habitat type coverage at the Study Area is presented for the terrestrial section.



Prepared by: (NCC, 2021)

Figure 3-1 Habitat Type Coverage at the Study Area

3.1.2.2 Fauna

The Natura 2000 site is important for marine and terrestrial fauna. There are 3 species for which the site has been designated, namely 2 marine mammals (*Monachus monachus, Tursiops truncatus*) and 1 reptile species (*Caretta caretta*), also marine. These species are residents and present in the site, except *Tursiops truncatus*, for which the presence status is unknown. ANNEX A of this AA presents the species included in the SDF of the site, as well as their presence in the site, population and conservation assessment.

Of the species included in the SDF, all are protected under the Habitats Directive and are included in Annexes II and IV. Two of them have been characterised as Endangered or Vulnerable worldwide, while at the national level 3 are characterised as Critically Endangered, Endangered or Vulnerable. ANNEX B of this AA provides information concerning the threat status of the species included in the SDF of the Study Area based on the most up to date literature sources.

ANNEX A of this AA also provides information concerning other species of interest included in the SDF.

The marine part of the site is also used by the seabird species *Phalacrocorax aristorelis, Larus audouinni, Calonectris diomedea and Puffinus yelkouan* with the first two nesting along the coast and on uninhabited islets in the site.

3.2 Other Projects – Potential Cumulative Impacts

The following broad categories of types of third-party projects that, if occurring, would be likely to have direct or indirect synergy with the EastMed Pipeline Project:(a) other linear projects, namely pipelines, roads, power lines, (b) other energy projects and (c) other major projects. The existence or planning of third-party projects that may act cumulatively with the current project was investigated within the Natura 2000 site.

The terrestrial part of the site has some significant existing and planned projects and infrastructure besides four planned wind park projects under permission. Regarding the marine part of the SAC, no other existing or planned projects and infrastructure have been identified during this study.

3.3 Description, Recording and Analysis of Elements of Natural Environment in the Field Survey Area

3.3.1 Field Survey Methodology

According to MD 170225/2014 for Category A1 projects implemented within SACs, falling under the category set in Annex 3.2.1, field work *"[...] will have to cover the ecological requirements of an annual cycle for each species and habitat type (depending on the seasonal presence of the habitat types listed in Annex I and of the species listed in Annex II of the Directive 92/43/EC […])"*, unless otherwise stated. Fieldwork should last at least 20 days.

In light of the above, a total of 20 days of field work have been conducted (timing provided in Table 3-2); more specifically:

- 15 days of field work were conducted during June 2021 (summer survey); and
- 5 days of field work were conducted during October 2021 (autumn survey).

The field work included the following activities:

- Field data collection by marine biodiversity experts for marine mammals and reptiles in the FSA ; and
- Field data collection was also carried out for other elements of biodiversity in the Natura 2000 site, such as seabirds.

Table 3-2 Timetable of the Field Work Days

Group	Date	No. of Field Work Person-Days
General site assessment	15/06/2021	1
Marine Mammals	15-18/06/2021 13-14/09/2021	7
Marine Turtles	15-18/06/2021 13-14/09/2021	6
Seabirds	15-18/06/2021 13-14/09/2021	6
	Total	20

Prepared by: (NCC, 2021)

The field work methodological approach aimed at:

- Recording all fauna species within the FSA in all the main and secondary habitats of the site;
- Focusing the study on the sensitive species listed in the Annexes (92/43/EEC); and

- Focusing on colonies, breeding and resting sites, rendezvous points etc. of important fauna species for the SAC.

A series of factors were considered in organizing the field work for optimal recording of species of interest and include:

- The adequacy of existing data from literature;
- The knowledge and experience of experts concerning the area;
- The size, relief and accessibility of the area; and
- The homogeneity, extent and diversity of the types of vegetation.

3.3.1.1 Field Survey Methodology for Fauna

Regarding seabirds, the European Seabirds at Sea (ESAS) methodology was followed. ESAS is a standardised boat-based method which has been widely used in Europe since the 1980s to record seabirds and other marine fauna at-sea, e.g. seals, cetaceans and sea turtles, and is based on the methodologies outlined by Tasker et al. (1984) and Camphuysen and Garthe (2004). Using this method, seabirds are recorded continuously within the 300-meter band on one or both sides of the observation vessel along a series of line-transects travelled by vessel.

Furthermore, boat-based line transect surveys along the coastline of the mainland and islets have been used to record seabirds in the coastal marine areas. Line transects follow the coastline at a distance of 50-200 m from the shore and are therefore not straight lines as in the conceptually similar ESAS method. This method was originally designed and successfully applied for recording Eleonora's falcon distribution in Greece and has been adapted for surveys of those seabird species which mainly use coastal waters. The method was used to record seabirds that are associated with the coastal areas, namely Mediterranean Shags, Audouin's Gulls and Yellow-legged Gulls.

Coastal counts from predefined vantage points were also carried out to record the number of individuals and the geographical extent of the area used by seabirds, as well as to record abundance and distribution of seabirds in marine areas, adjacent to the coast.

Information on use of the area by *Calonectris Diomedea* individuals was also utilised. The individuals are nesting on Dionysades islets and their movements are tracked through GPS data loggers mounted on them by the project team in the frame of other projects. The GPS data loggers collect information on the location of the individuals and their activity.

Regarding marine mammals, the same ESAS methodology was followed at sea.

Regarding *Monachus monachus*, evaluation of habitat availability and suitability was carried out by circumnavigating the coastline at a distance of about 50 m from the shoreline to locate all potentially suitable coastal caves for resting and/or pupping. Once a cave was located, it was approached and its suitability evaluated based on a set of physical and environmental features (Dendrinos et al., 2007). The ESAS methodology was followed at sea while along coastline boat-based line transects.

Regarding sea turtles, the ESAS method was followed at sea while along coastline boat-based line transects.

Reference: (NCC)

Figure 3-2 Evaluation of Suitability of Sea Cave for *Monachus monachus*

3.3.2 Detailed Description of the Field Survey Area

3.3.2.1 Habitats

The area crossed by the pipeline is open sea of depths between 350 and 750 m. The area within the Natura 2000 site is characterised by pelagic and coastal habitats, including *Posidonia* beds, coastal lagoons, sandbanks which are slightly covered by sea water all the time, reefs and submerged or partially submerged sea caves. No information is available on their location and distribution within the site. Furthermore, the FSA hosts several islets with the largest being Elasa. The coasts of Crete and the islets have vegetated sea cliffs of the Mediterranean coasts with endemic *Limonium* spp.

Various facies of coralligenous assemblages occur along the steep rocky coasts and reefs of the site, mostly at depths below -40 m. Extensive detritic and rhodolith beds dominate the circalittoral sedimentary bottoms of the area at depths between 50 - 150 m.

According to Topouzelis et al. (2018), the *Posidonia* beds are present in coastal areas that are located at a minimum distance of 7 km from the pipeline alignment.

Along the pipeline routing, according to Lighthouse (2021), north of the FSA, outside the Study Area, an area of pockmark is located, while no information is available for the FSA itself that could be used to relate the seabed structure with possible habitat types present in the area.

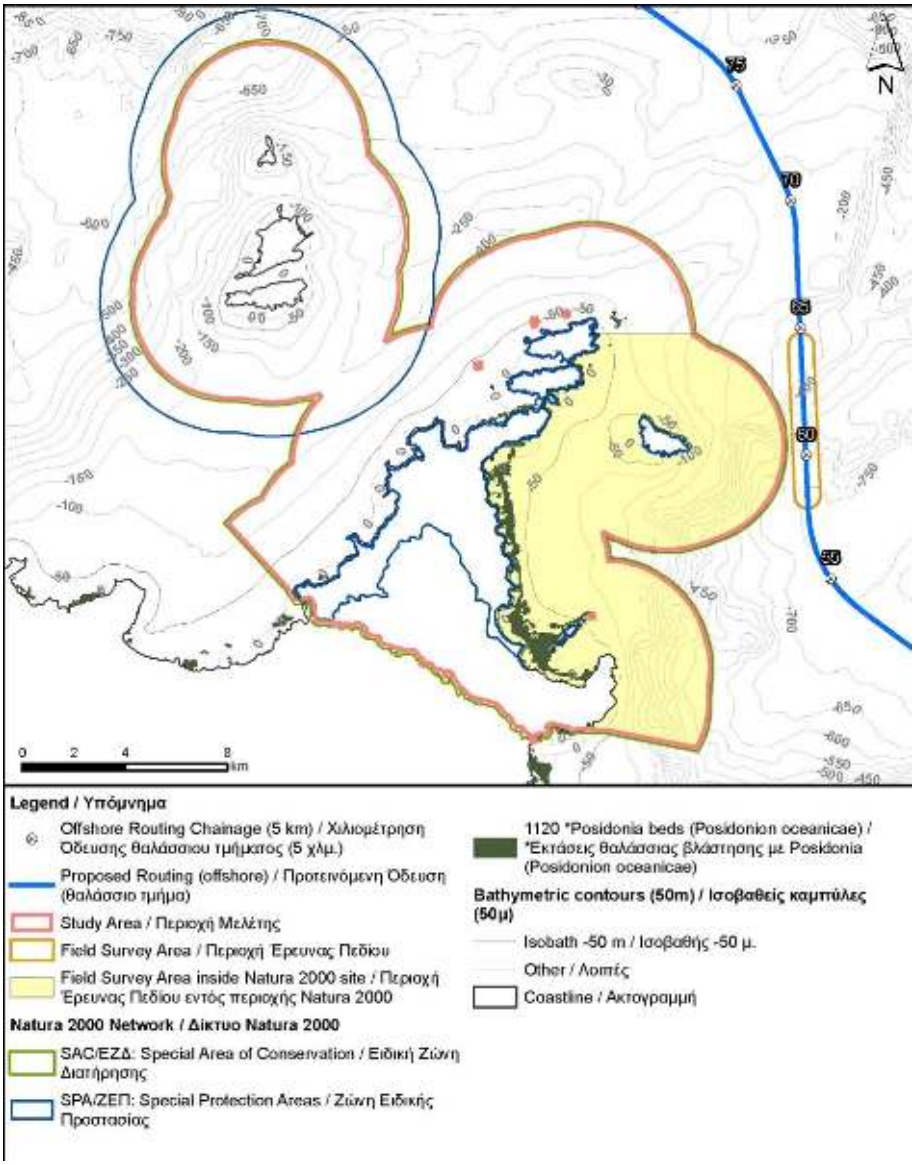


Figure 3-3 Bathymetry and *Posidonia* Beds Distribution According to Topouzelis et al. (2018)

3.3.2.2 Fauna

3.3.2.2.1 Seabirds

Four (4) seabird species were recorded during the survey. They are not included in the SDF, but were taken into consideration in terms of Natura 2000 network coherence.

Larus audouinii was recorded within the FSA. A colony has been recorded on Grandes islet complex (south-west of Elasa islet) in the SPA Natura 2000 site GR4320009 "Voreioanatoliko Akro Kritis" (Figure 2-1). A total of 8 adult individuals have been recorded, therefore the colony size is at least 4 breeding pairs.

Phalacrocorax aristotelis desmarestii was also recorded within the FSA, while the largest concentration was found outside the FSA at the Koufonisi islet, which is a SAC (GR4320008) and an SPA (GR4320017) located about 2.5 nm south of the LF2 location. The species is considered to be breeding in the FSA, but no nesting sites have been located given that surveys have been conducted during species post-breeding period.

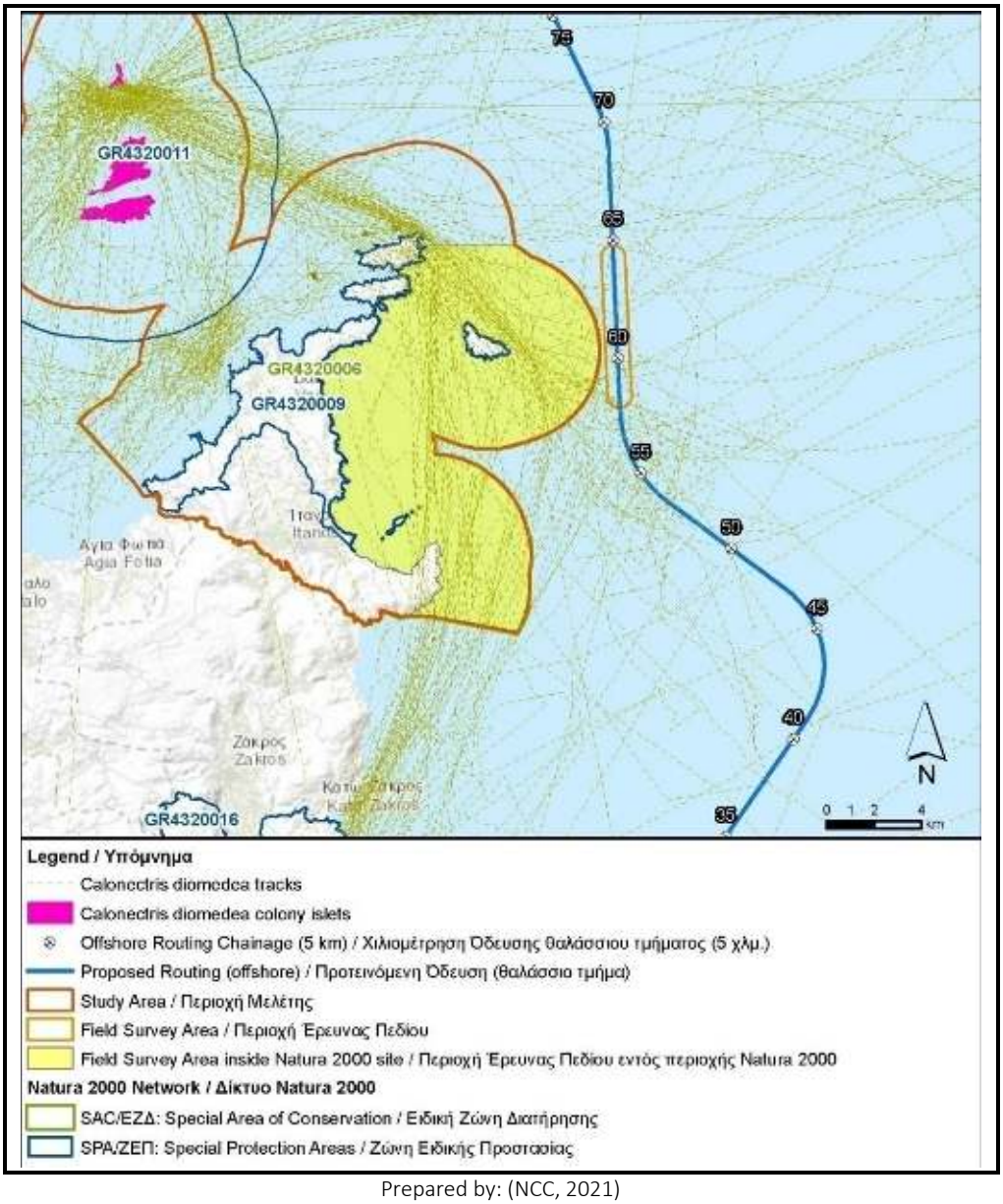
Calonectris diomedea and *Puffinus yelkouan* were located outside the FSA at their breeding colonies at Koufonisi islet (SPA GR4320017), while *Calonectris diomedea* was also located at its breeding colonies at Dionysades islets (GR4320011), at a distance of about 11 nm from the pipeline routing. At Koufonisi, several tens of individuals of each species have been recorded at the colony islets, but the estimation of the species' colony sizes was not feasible due to the incubation breeding stage of the two species, as well as a waxing moon during the survey period, resulting in the reduced numbers of individuals visiting the colonies. At Dionysades islets, a large *Calonectris diomedea* colony has been recorded. Based on the sampling the species active nests' occupancy, the breeding population size seems stable, therefore the 2012 population size estimate of 710 - 1,010 breeding pairs is retained. Due to the large breeding population and species extended foraging range (the individuals from the colony tagged with GPS tracking devices have been recorded to forage as far as Libya, Egypt and Syria) and newer data retrieved from tracked individuals, it was confirmed that individuals from the colony forage on a regular basis within the Study Area and the FSA; the same may apply for the individuals of the breeding colony at Koufonisi.

Table 3-3 Species Expected or Observed within the FSA

Group	Code	Species	Observed during Fieldwork	Annex of Birds Directives / IUCN / Greek Red List
B	A392	*Phalacrocorax aristotelis desmarestii*	X	I|LC|NT
B	A181	*Larus audouinii*	X	I|LC|VU

Group	Code	Species	Observed during Fieldwork	Annex of Birds Directives / IUCN / Greek Red List
B	A464	*Puffinus yelkouan*	X*	I|VU|NT
B	A850	*Calonectris diomedea s. str.*	X*	I|LC|LC

Note: *: outside the FSA. Prepared by: (NCC, 2021).



Prepared by: (NCC, 2021)

Figure 3-4 Use of the Study Area by *Calonectris diomedea* Individuals Nesting on Dionysades Islets.

3.3.2.2.2 Marine Mammals

During the field survey a local fishermen indicated the presence of *Monachus monachus,* however the species was not recorded nor signs of its presence identified. On Elasa islet one resting cave (Figure 3-6) of the species was recorded. The species' marine habitat are areas with depths down to 200 m. No other marine mammals were recorded.

Tursiops truncatus is also a species that is present in the area and has been included in its SDF. In general, the species is expected at depths that do not exceed 100 m and prefers coastal areas to pelagic ones. The species was not observed in the FSA during field work.

Information on use of the FSA by mammal species is scarce. As shown by Giannoudaki et al. (2017), the north-eastern edge of Crete is estimated to be preferential for *Tursiops truncatus*, based on habitats characteristics, although no sightings are available for the area.

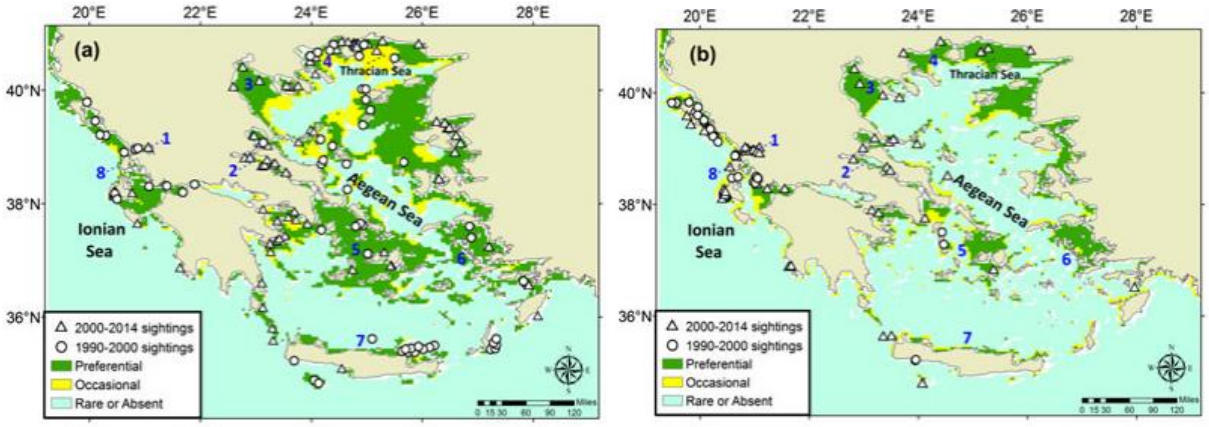
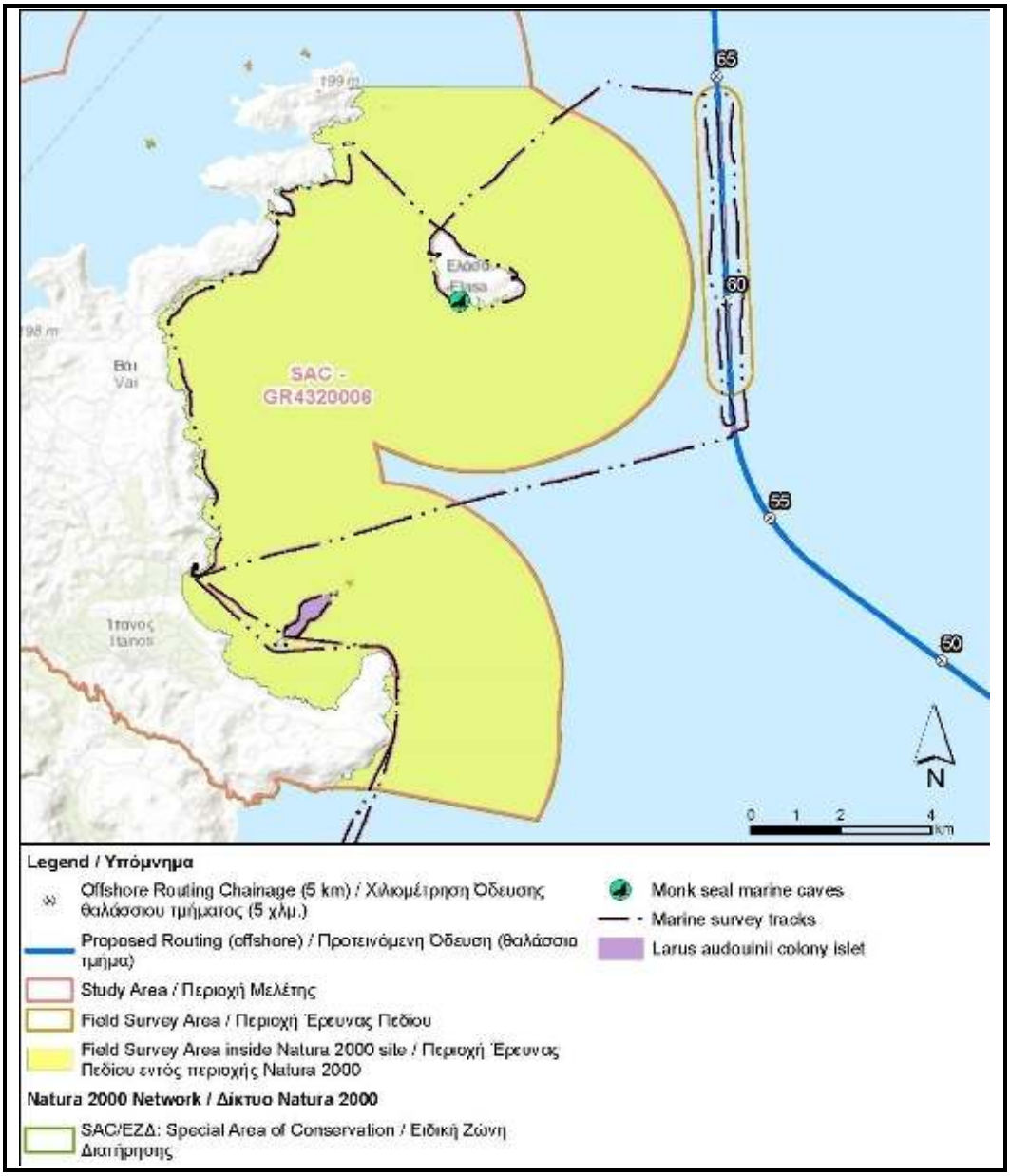


Figure 3-5 Bottlenose Dolphin (*Tursiops truncatus*): Habitat Allocation Maps for (a) Early and (b) Late Summer in the Period 2004–2008. Sightings for the Periods 1990–2000 and 2000–2014 are also Shown (Giannoudaki et al., 2017).

3.3.2.2.1 Sea turtles

No sea turtle individuals were observed during field surveys. According to SWOT (2019), the FSA has a medium to high count of individuals' locations.



Prepared by: (NCC, 2021)

Figure 3-6 (a) Field Survey Locations for the Survey of Fauna Groups of Annex II and IV (Directive 92/43/EEC) Demonstrated within the FSA and (b) Sensitive Areas for Species of Interest

3.3.3 Key Findings

The area of the Study Area that is in close proximity to the pipeline routing is regularly used by seabirds that use open waters and especially *Calonectris diomedea*, for which the area seems to be a foraging ground. During field work no marine mammals or sea turtles were observed in the FSA,

though they can be present. The coastal zones of the Study Area are used by *Larus audouinii*, *Phalacrocorax aristotelis desmarestii* and *Monachus monachus*.

3.4 Status of Natural Environment

3.4.1 Conservation Objectives of Habitats/Species

The conservation objectives have been specified through the project "Assessment of the conservation status of species and habitat types in Greece". The overall conservation objectives proposed for each habitat type of Annex I of Directive 92/43/EEC and for each species of Annex II of Directive 92/43/EEC are directly relevant to the assessment of the Degree of Conservation at the Natura 2000 site as impressed in the Natura 2000 descriptive database of the country. Therefore:

- For each Habitat type listed in Annex I of Directive 92/43/EEC (with a significant presence in the Natura 2000 site) for which the Degree of Conservation has been assessed as A, the Overall Conservation Objective is proposed to be the maintenance of the Degree of Conservation A;
- Similarly, for each species of fauna and flora of Annex II of Directive 92/43/EEC for which the Degree of Conservation has been assessed as A, the Overall Conservation Objective is proposed to be the assurance of Degree of Conservation A;
- For each Habitat type of Annex I of Directive 92/43/EEC (with a significant presence in the Natura 2000 site) for which the Degree of Conservation has been evaluated as B, the Overall Conservation Objective is proposed to be the maintenance of Degree of Conservation B in the short term, in 2 six-year periods, and the achievement of Degree of Conservation A in the long term, i.e. 4 six-year periods (in line with EU standards for "long-term"/"short-term" concepts of the national reference reports of Article 17 of the Habitats Directive);
- Similarly, for each species of fauna and flora of Annex II of Directive 92/43/EEC for which the Degree of Conservation has been evaluated as B, the Overall Conservation Objective is proposed to be the maintenance of Degree of Conservation B in the short term and the achievement of Degree of Conservation A in the long term;
- For each habitat type of Annex I of Directive 92/43/EEC (with a significant presence in the Natura 2000 site) for which the Degree of Conservation has been assessed as C, the Overall Conservation Objective is proposed to be the achievement of Conservation Status B in the short term; and
- Similarly, for each species of fauna and flora in Annex II of Directive 92/43/EEC for which the Degree of Conservation has been assessed as C, the Overall Conservation Objective is proposed to be the achievement of Degree of Conservation B in the short term.

For the Habitat types of Annex I of Directive 92/43/EEC, for species listed in Annex II of Directive 92/43/EEC for which the Degree of Conservation has been identified as unknown, a prerequisite for setting conservation objectives is to collect more data through research and monitoring programs.

The specific Conservation Objectives are provided in ANNEX C.

3.4.2 Conservation Status of Habitats, Flora and Fauna Species

According to the SDF of the SAC, the area hosts a high percentage (15-100%) of the total national area covered by habitat type 9370, as well as significant percentage (2-15%) of habitat types 1240, 2230 and 5420. The representativity of the natural habitats in the site is significant to excellent. Their conservation status varies from excellent to average or reduced, while for most of the habitats the status is good. The overall value of the site for the conservation of the habitats is indicated as good, excluding 9320 and 1170 for which it is significant.

Concerning the species included in the SDF, the SAC hosts a high percentage (15-100%) of the national population of *Phoenix theophrasti* and *Silene holzmannii*, while their conservation status is excellent. All the species populations are not isolated. The overall value of the site for the conservation of the species *Phoenix theophrasti* and *Silene holzmannii* is assessed as excellent. The site hosts a non-significant population of *Monachus monachus*, while the Degree of Conservation is average or reduced. No information is available for *Caretta caretta* and *Tursiops truncatus*.

Detailed information is provided in ANNEX A.

3.4.3 Threats/Pressures

According to the SDF of the SAC, the main threats are of high, medium and low magnitude. Threats of high magnitude within the site include grazing in the terrestrial area and removal of forest undergrowth, hunting and introduction of invasive non-native species, as well as reduction of specific habitat features, habitat shifting and alteration and decline of species. At the marine area, threats of great magnitude are intensive fish farming, professional and leisure fishing, including spear fishing, and pollution of surface waters by point sources. Furthermore, conservation measures are missing or wrongly directed.

Of medium magnitude threats at the terrestrial area include mainly landslides, disposal of household or recreational facility waste, pollution of surface waters, and poaching, while at the marine area they include construction on the coast, fishing including trawling, accidental capture and illegal taking of marine fauna, as well as the use of dynamite, disturbance of marine species through recreational

cave visits and motorised nautical sports, shallow surface mechanical damage to the seabed surface or disturbance below surface of the seabed. Furthermore, pollution is a threat for the site, including oil spills and marine macro-pollution

Of low magnitude are diffuse pollution to surface waters due to agricultural activities and fires.

3.4.4 Ecological Functions

The Natura 2000 site forms an important terrestrial and marine ecosystem in Crete and Southern Greece. It holds a significant ecological value as it supports several types of marine and terrestrial ecosystems with different life sustaining, important habitats. This means the site functions as a very important area for flora and fauna, both marine and terrestrial. Most of the terrestrial plant species of interest found in the site are endemic, while there are some plants that their presence in the area is the only (or one of the few) European presence of the species. The site hosts the palm forest which is one of the most important characteristics of the area.

The Study Area also holds a diversity of habitats which support significant species of fauna. It supports many endemic invertebrate species and some endemic vertebrate subspecies, as well as reptile species found in isolated small populations, while there are endemic subspecies on the islets. Dionysades group of the site also functions as an important bird area, especially for birds that live at cliffs as they provide suitable habitats for their needs.

The area also functions as an important marine ecosystem based on the presence of various facies of coralligenous assemblages (deep counterpart of habitat Type 1170) which occur along the steep rocky coasts and reefs of the site. Extensive detritic and rhodolith beds dominate the circalittoral sedimentary bottoms of the area at depths between 50 - 150m.

3.4.5 Site Development Trends

Site development trends refer to the evolution trends of the site's natural environmental elements which are present and recorded within the Study Area, under the assumption that no construction for the Project would take place in the region.

The natural environmental elements and human activities of SAC GR4320006 have shaped current development trends, which mainly involve tourism development, since the site is one of great natural beauty and cultural heritage for visiting. However, the site is strongly influenced by those human activities performed in the area, e.g. human exploitation, tourism development, etc., as increased nutrient and organic pollution detected at fish farming and hatching activities in the wider Antikiari

bay were found to exert a significant pollution effect on the shallow rocks and *Posidonia* beds. As a result, the site's development trend is highly dependent on projects to be implemented within the boundaries of the protected site.

4 PROJECT OVERVIEW

4.1 Introduction

This section provides an overview of the proposed project and its associated components, as well as it further outlines the project's constructional and operational requirements.

Apart from this general project description, Section 4.5 provides a more detailed description of the project interfaces with the specific Natura 2000 site.

The EastMed Pipeline Project aims to transport gas directly from the eastern Mediterranean fields to the European Natural Gas System via Greece.

EastMed consists of a Southern Line and a Northern Line to deliver gas from Israeli and Cypriot sources, respectively, through Peloponnese and Western Greece, to the Poseidon Pipeline Project in north-west Greece. Upstream of Crete these two lines are designed to work complementarily as well as independently, foreseeing infrastructure in Cyprus dedicated to each line. Thanks to this, the system is highly flexible, contributing to security of supply. The EastMed Pipeline Project comprises the following main components:

A. Southern Line of EastMed (Israel → Cyprus/Crete → SE Peloponnese):

- Transports gas from Israeli sources directly from the EastMed Compression Platform (ECP) in Israeli waters to a compression and metering station in Crete (CS2/MS2) and from there to the mainland Greece and the Poseidon Pipeline Project,
- Delivers gas to Cyprus for domestic consumption through a subsea Inline Tee Assembly (ITA) and a branch pipeline from the subsea ITA to Cyprus (OSS1 comes from Israeli platform to ITA, OSS1a from ITA to a Metering and Pressure Reduction Station (MS1a/PRS) in Cyprus and OSS2 from ITA to Crete);

B. Northern Line of EastMed (Cyprus → Crete → SE Peloponnese):

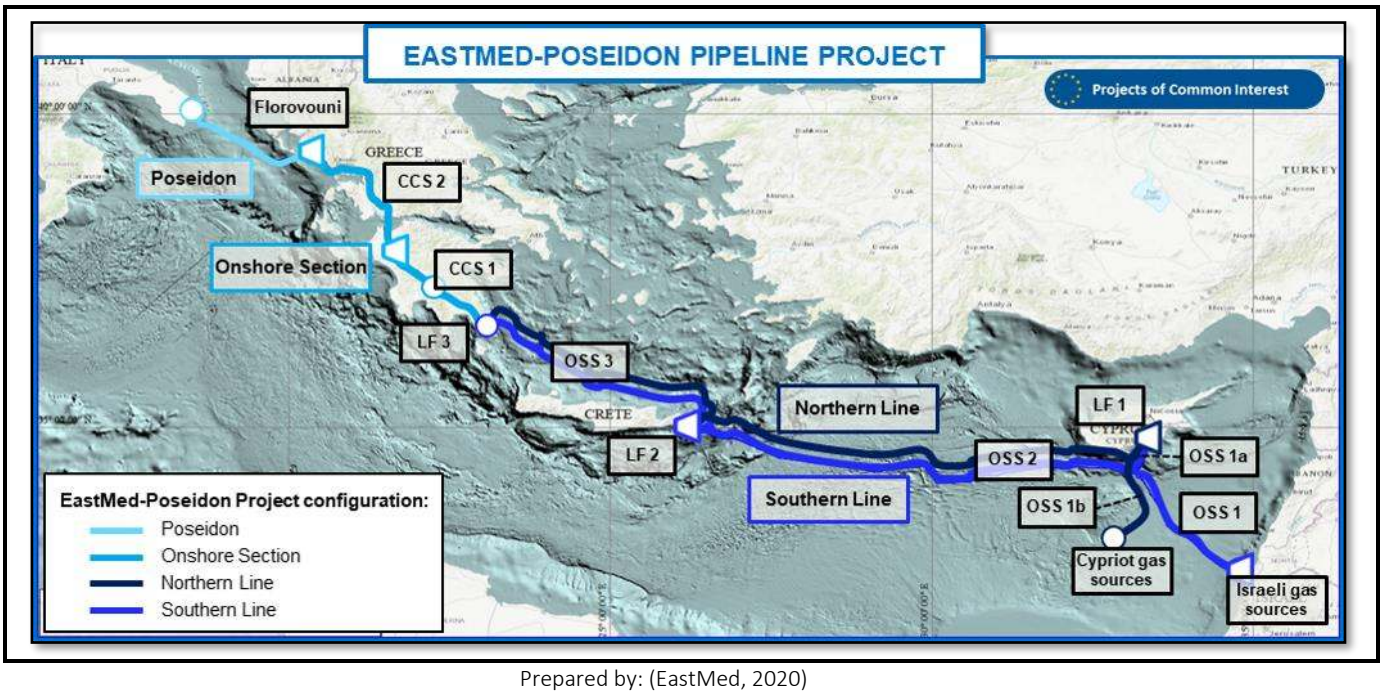
- Delivers dry gas originating from one or more of the Cypriot offshore gas discoveries to the compression and metering stations in Cyprus (CS1/MS1) first, through OSS1b and then in Crete (CS2/MS2N), through OSS2N and from there to the mainland Greece and Poseidon Pipeline Project, as referred in the next paragraph;

C. Combined System of EastMed (Crete & mainland Greece → Poseidon Pipeline Project):

- At LF3 the gas flow streams from two pipelines will be combined into a single large-diameter pipeline (CCS1-OSS4-CCS2) for transportation to the Poseidon Pipeline Project Compressor Station at Florovouni[1] in north-west Greece,
- Combination of the Southern and Northern flow streams will require additional compression along the CCS1 section in Peloponnese (CS3).

The 'Northern and Southern Lines' are shown in Figure 4-1 where the 'Southern Line' and 'Northern Line' are indicated in blue and dark blue, respectively. The onshore single large diameter pipeline of the 'Combined System' (i.e., CCS1 and CCS2) is shown in light blue[2].

A more comprehensive visualization of the crossing with the Natura 2000 sites is provided in Map 1 of ANNEX F.



Prepared by: (EastMed, 2020)

Figure 4-1 EastMed Onshore and Offshore Sections - Overview

The **EastMed Onshore Section in Greece** includes the following:

[1]Compressor Station of the Poseidon Pipeline Project system at Florovouni in north-west Greece belongs to another project with the same owner and has received environmental permitting through a separate procedure (ETA: ΥΠΕΝ/ΔΙΠΑ/35872/2373/07-06-2019, ΑΔΑ: ΩΠΝ34653Π8-4Ι9)

[2] Light blue line also includes the small offshore section of the Combined System that crosses Patraikos Gulf, i.e., OSS4.

- The Compressor and Metering Stations in Crete (CS2/MS2 and CS2/MS2N) together with the relevant small onshore sections to and from landfall site LF2;
- The onshore section of the 48" pipeline that crosses Peloponnese (CCS1) from landfall site LF3 (SE of R.U. Laconia) to landfall site LF4 (NW of R.U. Achaia on the south coast of the Patraikos Gulf);
- The Megalopoli's Branch line that is foreseen to connect CCS1 with the National System at Megalopoli's area (Perivolia area). The pipeline will have a diameter of 16";
- LF4 (Landfall site in the NW of R.U. of Achaia, close to Lakopetra beach, NW Peloponnese area)
- The offshore section of the 46'' pipeline that crosses the Patraikos Gulf (OSS4) from landfall site LF4 to landfall site LF5 (SW of R.U. Etoloakarnania);
- LF5 (Landfall site in the SW of R.U. of Elotoakarnania, close to Evinochori settlement, SW Sterea Ellada)
- The onshore section of the 48" pipeline that crosses Western Greece (CCS2) from landfall site LF5 (south-west of R.U. Etoloakarnania) to the installation site of the Poseidon Pipeline Project compressor station at Florovouni , in R.U. Thesprotia;
- The Metering and Pressure Reduction Station (MS4/PRS4) in Megalopoli (start of Megalopoli's Branch);
- The Heating Station in Megalopoli in the same plot as MS4/PRS4;
- The compressor station CS3 at R.U. Achaia in Peloponnese; and
- The Dispatching and Operation and Maintenance Centre (O&M) in the R.U. of Achaia.

Along the onshore section, Scraper Stations – SS (in total seven[3]) and Block Valve Stations - BVS (fifteen in total) will be installed as per the current Project design. BVSs will be placed at distances of approximately 30 km. A Landfall Station (LS) (four in total) will be installed near each landfall site.

For the section starting at landfall site LF3 in south-east Peloponnese to the Poseidon Pipeline Project's compressor station at Florovouni (sections CCS1, OSS4 and CCS2), the design pressure of the Project is 100 barg while the maximum operating pressure (MOP) is considered equal to 95 barg. For the Megalopoli's Branch line, the design pressure is 80 barg while the MOP is equal to 75 barg.

[3] It is clarified that 1 Scraper station will be located within the MS4/PRS4 and Heating Station at Megalopoli area, 1 Scraper station will be located within the future CS3, in the R.U. of Achaia, and 4 Scraper Stations will be located within the same plot as the Landfall Stations, bundling permanent facilities of the project as much as possible. The seventh SS concerns the Megalopoli's Branch.

The **EastMed Offshore Section in Greece**, includes the following:

- OSS2 and OSS2N (the part of the Offshore Section from Cyprus to Crete under Greek jurisdiction): Subsea trunk lines from the start of the Greek Offshore Section to Crete;
- LF2 (Landfall site in Crete): the nearshore and coastal crossing section in the area of Crete;
- OSS3 and OSS3N (Crete to Peloponnese): Subsea trunk lines from Crete to Peloponnese; and
- LF3 (Landfall site in Peloponnese): the nearshore and coastal crossing section in the area of Peloponnese.

The Greek Offshore Section of the Project includes two (i.e., twin) pipelines at an average distance of approximately 100 m. Near the landfall site, the two pipelines approach each other to enter the same shore crossing cofferdam. Up to the landfall site, pipelines will be simply laid on the seabed with the pipelines gradually buried only near the coast.

In more detail:

- OSS2 (in Greece) will have an approximate length of 390 km, a diameter of 26''and a transfer capacity of 11 BSCM/yr;
- OSS2N (in Greece) will have an approximate length of 390 km, a diameter of 26'' and a transfer capacity of 10 BSCM/yr; and
- OSS3 and OSS3N will have a diameter of 28'' and transfer capacity of 10.5 BSCM/yr each, along an approximate length of 430 km.

Once both lines become operational, the EastMed project will transport a combined total flow rate of 21 BSCM/yr to the EastMed Onshore Section.

The design pressure of the OSS2 and OSS2N sections is 363 barg, while the MOP is considered equal to 345 barg. The design pressure of the OSS3 and OSS3N sections is 231 barg, while the MOP is equal to 220 barg. From a technical point of view, the two pipelines (Southern and Northern) are independent but also parts of a unique project system, and from an environmental point of view, they should be considered as one for most environmental and social parameters. Therefore, unless a clear distinction is necessary, the term "**Line OSS2/OSS2N**" is introduced to describe pipelines OSS2 and OSS2N as one integrated pipeline system across the south Cretan Sea (from the middle of the sea straits between Greece and Cyprus to the designated landfall in Crete); similarly, the term "**Line OSS3/OSS3N**" is used for the OSS3 and OSS3N pipelines across the South Aegean Sea from the landfall in Crete (LF2) to the designated landfall in SE Peloponnese (LF3).

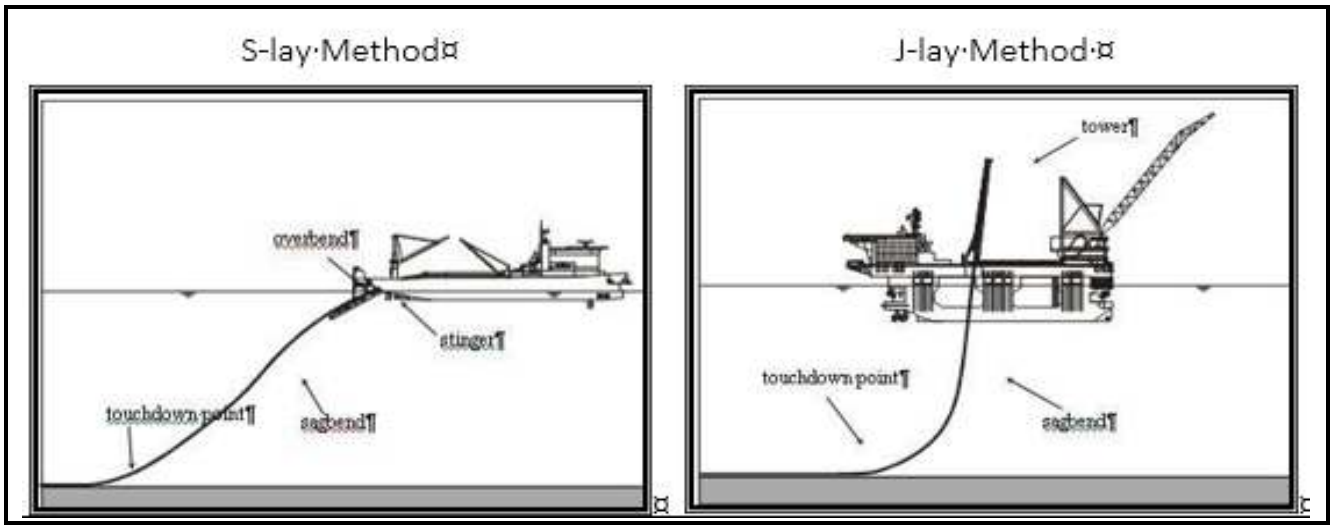
4.2 Pipeline Construction and Pre-commissioning

4.2.1 Construction Overview

4.2.1.1 Offshore Section Installation Method

The different pipeline installation methods can be recognised by the general shape of the pipeline during installation.

The most common offshore pipeline installation method is the "S-lay", where the pipe is spanning from the vessel to the seabed in an S-like shape whilst the "J-lay" installation method is recognized by the absence of the stinger and the high departure angle (Figure 4-2). The S-Lay method is the chosen installation technique for all offshore pipelines of the EastMed Pipeline Project. Nonetheless, J-Lay cannot be excluded as an option in developing the FEED for installation scope.



Reference:(EastMed Feasibility Study - Preliminary Design Report – Offshore)

Figure 4-2 Offshore Pipeline Installation Methods

In principle, the pipeline is simply placed at the bottom of the sea. No excavation or any other construction activity is carried out.

For installation of the total offshore EastMed pipeline system, the following three types of S-lay pipelay vessels are distinguished:

a) High-Capacity S-lay vessel: This is a semi-submersible or ship shaped vessel with a high-tension capacity capable of laying pipe in ultra-deep and deep water. These vessels are dynamically positioned.

b) Medium Capacity S-lay vessel: This is a semi-submersible or ship shaped vessel with a medium tension capacity, capable of working in a water depth range starting at 20 m to 30 m and continuing to intermediate to deep water, where the maximum water depth affects the pipeline configuration and specific vessel capabilities. These vessels may be either anchored or dynamically positioned.

c) Shallow Water ("Lower Capacity") S-lay vessel: This is a relatively small, flat-bottom lay vessel with low tension capacity capable of working in a water depth range of 5 m to at least 30 m. These barges typically use anchors for positioning / propulsion.

The pipeline sections will be installed sequentially. A single installation vessel will be used for the deepwater sections. Installation in shallow water may be conducted in parallel to activities in deeper waters. It is assumed that installation in shallow water will be much slower than installation in deep water; hence shallow water installation is assumed as not critical for defining the need for pipe supply vessels. The deepwater installation vessel will install up to 3 km of line pipe per day. Combining single joints into multi-joints will not be done at the marshalling yard. If necessary, such activities can be performed, for example, on board the installation vessel. It is noted that no subsea tie-ins are expected in the Greek part of the EastMed Pipeline Project Water depth limitations usually define the transition point between one vessel and the next.

Multi vessel operation can operate simultaneously providing flexibility in contracting and planning.

4.2.1.1.1 Indicative Schedule

Typical pipelay rates are on the order of 3 km per day.

4.2.2 Pressure Testing during Construction (Hydrotesting)

The condition of the pipeline at the start of pre-commissioning is determined by performing a system pressure test (SPT). SPT options include:

- Conventional SPT using water (e.g., hydrotesting); and
- Replacement of the SPT with other means that ensure that the overall safety level of the pipeline system for which the test is to be replaced is equal to or better than that of an equivalent system that implements the SPT- this option is applicable only to the offshore pipeline sections and under specific conditions.

The above ground facilities of the project (e.g., compressor, metering, pressure regulating, heating stations) are not subject to this procedure since these facilities include equipment that has been pre-tested during its manufacturing.

4.2.2.1 Hydrotest Concept

Hydrotesting (or hydrostatic testing) is the most common method for testing pipeline integrity and checking for any potential leaks prior to commissioning. The test involves placing water inside the pipeline at a certain pressure for a certain time to confirm pipeline strength and tightness.

The activities to be carried out before and after the hydrotest are repeated here:

- Before hydrotest:
  - Flooding and cleaning,
  - Gauging;
- During hydrotest:
  - Leak detection;
- After hydrotest:
  - Dewatering,
  - Drying,
  - Purging.

Pressurisation is achieved during a hydrotest by pumping water into the pipeline section being tested. According to DNV-OS-F101, the system pressure test should be 1.15 times the design pressure with a hold period of 24 hrs. Pressurisation is then carried out with a high pressure pump.

After the pipeline has been filled and pressurised, and all the necessary parameters have been measured, the pipeline is dewatered and dried.

- Flooding, Cleaning and Gauging. After the pipeline is initially flooded, it will be cleaned and gauged. Typically, cleaning and gauging are performed as a single operation together with flooding. Cleaning involves sending a series of pigs through the pipe section to remove any debris (typically weld slag and pipe mill scale, where the latter is expected only in a very limited amount due to the internal coating) from inside the pipeline. One pig bounds the air and water, and another series of pigs can be used to clean the internal pipe-wall. Clean water is pumped in front of the pig train to moisten the debris. Pipeline internal gauging is used to ensure the inner diameter of the pipeline is free from obstructions and excessive ovality. A gauging pig is equipped

with a device to determine its location in case it does not reach the pig receiver. If a gauging pig becomes stuck in the pipeline it is freed, the pipe defect is located and eliminated, and the gauging operation is repeated. An alternative gauging method could be used that will pinpoint any defect. Gauging can be performed with an electronic calliper tool for this purpose, optionally combined with a geometry pig to confirm the pipeline geometry as built. The gauging and geometry pigs may be run in the same train as the flooding and flushing pigs; pig speed for this operation should be between 0.3 m/s and 1 m/s. The pipeline system configuration should be designed to allow for pigging in forward or reverse direction. This is achieved by barred tees, lock-open check valves, eliminating non-piggable wye pieces, and designing the pig receivers so that they can also be used as launchers. This philosophy provides benefits during pre-commissioning and possible future repair scenarios;

- Dewatering. The recommended method for dewatering is to use compressed air. This method uses compressed air to drive a pig train through the pipeline while displacing the hydrotest water. The pig train consists of multiple compartments separated by pigs. Some are filled with fresh water to flush the salt from the pipe wall, and some are filled with air. The air is oil free and dry with a dewpoint of at least -65°C at atmospheric pressure and an oil content no greater than 0.01 ppmW;
- Drying and Purging. The dewatering pig train leaves a small film of water, approximately 0.05 mm thick, in the pipe. The absence of water in the pipeline is necessary in order to prevent the possible formation of methane hydrate. The drying method is air drying which usually employs swabbing pigs to help spread out the water so that it has a larger surface area in order to be more easily collected; and
- Discharge/Disposal Options. Following successful testing, the used water is discharged back into a receiving water body after having passed a sedimentation pool, through which the water will flow very slowly. These pools are sized to provide a retention time of 5 minutes, which is considered enough time to allow the solid particles to be cleaned out of the pipe, to settle and remain in the bottom of the pond. The discharge rate after finalisation of hydrotests will follow the same rules as applicable for abstraction. Hence the same water bodies will be taken into consideration for discharge. Environmental effects are expected to be minimal or negligible when discharge rates are under 10% of the receiving river flow. Discharged water will be free of any chemicals, or, if it is necessary to add any chemical substances (especially at the offshore sections), they will be from the PLONOR list. The contractor for hydrotesting will obtain written approvals from the local authorities and landowner(s) where the hydrotest water will be discharged; water will not be returned to any watercourse without permission of the appropriate local authorities.

4.2.2.2 Pre-Commissioning with SPT Replacement (only applicable to offshore sections under specific conditions)

The aim of the REPLACE methodology is to provide a robust basis for replacing the SPT with other means that ensure that the overall safety level of the pipeline system for which the test is to be replaced is equal to or better than that of an equivalent system that implements the SPT.

Consideration of SPT replacement starts early in the design timeline and continues through the offshore pipeline installation phase. The methodology describes the REPLACE activities to be undertaken in each phase of the project.

The REPLACE plan describes the actions required to ensure that all prerequisites, requisites and additional safeguards identified in the FMECA are implemented and documented to demonstrate compliance to stakeholders and authorities. The REPLACE plan is maintained throughout the Project lifecycle and is updated as the technical definition and execution plans develop.

Should the SPT be replaced (i.e., from REPLACE option), the pre-commissioning procedure changes. Certain steps can be omitted, and additional safeguards will be taken on board. In that case, the typical pre-commissioning procedure consists of the following (sequential) activities:

- Pressurising. The pipeline will be pressurised using dry air to create back pressure ahead of the cleaning and gauging pig train, which will be introduced in the system in the next step. Back pressure is necessary to ensure the pig-train speed can be controlled on steep slopes. The required back pressure will be assessed in detailed design. The size of the compressor spread determines the time needed for the pressurisation phase. Upon completion of the pressurising step, the pipeline is filled with dry air at elevated pressure;
- Cleaning and gauging. Cleaning and gauging activities are, ideally, conducted using a single pig run—a second run may be necessary if too much debris is found in the pig train's last slug after the first run. The pig train will consist of a series of pigs with clearing and gauging (CG) functionalities. The series of pigs will be separated by slugs of monoethylene glycol (MEG), not by slugs of water. MEG is hygroscopic and will absorb condensed water in the pipeline. For this reason, MEG inhibits against hydrates and is a so-called "hydrate-control fluid". The pig train will be propelled by a large slug of nitrogen (with a high purity of, for instance, 95%) of several tens of kilometres followed by ultra-dry air. Now the pipeline is chemically conditioned and a drying step is no longer needed. Upon completion of the pig run, the system is filled with dry air at elevated pressure;
- Depressurisation. After successful receipt of all pigs (see the above CG step), the pipeline system will be depressurised by venting to atmospheric pressure from both ends of the pipeline. Upon completion of the depressurisation, the system is filled with dry air at ambient pressure; and

- **Nitrogen purging.** Next, the system will be purged with a nitrogen-rich gas mixture of very high purity (e.g., 98%) to avoid an explosive gas–air interface. The mixture is pumped into the pipeline at low pressure to displace the air contents. Once the oxygen level measured at the outlet is sufficiently low, nitrogen purging is halted. Upon completion of nitrogen purging, the pipeline system is filled with inert gas, slightly above ambient pressure. This means that pre-commissioning has been completed and the system is ready to receive hydrocarbon gas.

This REPLACE Methodology was successfully used in TurkStream and Nord Stream 2 Pipeline projects, removes the need for seawater and the risk associated with lateral buckling concerning the conventional method. This procedure can be amended if necessary, depending on specific project requirements.

4.2.2.2.1 REPLACE plan

The REPLACE plan describes the actions required to ensure that all prerequisites, requisites and additional safeguards identified in the FMECA are implemented and documented to demonstrate compliance to stakeholders and authorities. The REPLACE plan is maintained throughout the Project lifecycle and is updated as the technical definition and execution plans develop.

Should the SPT be replaced (i.e., from REPLACE option), the pre-commissioning procedure changes. Certain steps can be omitted, and additional safeguards will be taken on board. In that case, the typical pre-commissioning procedure consists of the following (sequential) activities:

- **Pressurising**. The pipeline will be pressurised using dry air to create back pressure ahead of the cleaning and gauging pig train, which will be introduced in the system in the next step. Back pressure is necessary to ensure the pig-train speed can be controlled on steep slopes. The required back pressure will be assessed in detailed design. The size of the compressor spread determines the time needed for the pressurisation phase. Upon completion of the pressurising step, the pipeline is filled with dry air at elevated pressure;
- **Cleaning and gauging.** Cleaning and gauging activities are, ideally, conducted using a single pig run—a second run may be necessary if too much debris is found in the pig train's last slug after the first run. The pig train will consist of a series of pigs with clearing and gauging (CG) functionalities. The series of pigs will be separated by slugs of monoethylene glycol (MEG), not by slugs of water. MEG is hygroscopic and will absorb condensed water in the pipeline. For this reason, MEG inhibits against hydrates and is a so-called "hydrate-control fluid". The pig train will be propelled by a large slug of nitrogen (with a high purity of, for instance, 95%) of several tens of kilometres followed by ultra-dry air. Now the pipeline is chemically conditioned and a drying

step is no longer needed. Upon completion of the pig run, the system is filled with dry air at elevated pressure;

- Depressurisation. After successful receipt of all pigs (see the above CG step), the pipeline system will be depressurised by venting to atmospheric pressure from both ends of the pipeline. Upon completion of the depressurisation, the system is filled with dry air at ambient pressure; and
- Nitrogen purging. Next, the system will be purged with a nitrogen-rich gas mixture of very high purity (e.g., 98%) to avoid an explosive gas–air interface. The mixture is pumped into the pipeline at low pressure to displace the air contents. Once the oxygen level measured at the outlet is sufficiently low, nitrogen purging is halted. Upon completion of nitrogen purging, the pipeline system is filled with inert gas, slightly above ambient pressure. This means that pre-commissioning has been completed and the system is ready to receive hydrocarbon gas.

This REPLACE Methodology was successfully used in TurkStream and Nord Stream 2 Pipeline projects, removes the need for seawater and the risk associated with lateral buckling concerning the conventional method. This procedure can be amended if necessary, depending on specific project requirements.

4.2.2.3 EastMed System Pressure Test Response

Each offshore pipeline, the pig train in Step 2 was propelled segments comprising the Greek section of the EastMed Pipeline Project has been assessed individually in accordance with the REPLACE methodology.

Based on the System Pressure Test Replacement Study (E780-00225-Ev32A-TDR-00055, Rev.02), it has been concluded that, for OSS2, OSS2N, OSS3 and OSS3N project components, it is beneficial not to pressure test the system applying the conventional hydrotesting SPT because of the risk associated with lateral buckling. For the remaining Project components, conventional SPT is applied.

Hydrotest sections will have a length varying between up to to 9 km each. It is estimated that approximately 50 hydrotests will be carried out for CCS1, 38 for CCS2 and 2 for Megalopoli Branch.

Each hydrotest will be completed in 7-10 days.

Pre-commissioning of the offshore OSS4 section is expected to require a total of 11 days. Similarly, the pre-commissioning of the other offshore project components is expected to require a total of 57 to 84 days. Pre-commissioning will be finished before commissioning activities.

4.2.2.4 Water Abstraction Sources

As far as the onshore pipeline segment, inland water sources with larger amounts of water flow have been considered for water abstraction and discharge. Water reservoirs will not be used as a source for testing water. For the offshore and nearshore segments, the most likely option is the use of sea water.

Table 4-1 shows the potential water sources identified along the pipeline route and the volumes required for hydrotesting for each main section.

The timing for hydrostatic testing activities will consider the seasonal changes of river flows and the reduced flows during the summer months.

The quantity of water used for hydrotest, considering the complete onshore section, is approximately 600,490 m3. This volume of water is the maximum that could be used. However, it is best international practice to transfer water between hydraulic test sections and re-use it as much as possible so the final volume is expected to be much smaller.

The contractor for the hydrotest will obtain written approvals from local authorities and landowner(s) or users regarding hydrotest water abstraction and disposal.

Table 4-1 Water Requirements for Hydrotest Sections

Pipeline Spread		Water Source	Approx. Volume Required (m^3)	Pipeline Section
From KP	To KP			
				Short Onshore Section at Crete
0	50	Evrotas	54,900	CCS1
50	100	Evrotas	54,900	CCS1
100	130	Evrotas	32,940	CCS1
130	150	Alfeios	21,960	CCS1
150	200	Alfeios	54,900	CCS1
200	250	Pineiakos Ladonas	54,900	CCS1
250	300	Pineiakos Ladonas - Pineios	50,500	CCS1
			18,451	OSS4
0	35	Evinos	38,430	CCS2

Pipeline Spread		Water Source	Approx. Volume Required (m^3)	Pipeline Section
From KP	To KP			
35	55	Water Canal of Trichonida	21,960	CCS2
55	70	Acheloos	16,470	CCS2
70	135	Arachthos & Louros	71,370	CCS2
135	200	Louros	71,370	CCS2
200	233	Louros & Acherontas	36,234	CCS2
0	4	Alfeios	492	Megalopolis Branch
4	9.8	Alfeios	713.4	Megalopolis Branch

Source: (IGI Poseidon, 2021)

As the conventional SPT approach involves the use of water (either inland or sea), it should be noted that inland water providing the compliance of its physicochemical characteristics with what was described earlier does not pose any risk to pipeline integrity. The water used needs to be free of contaminants and not aggressive (pH between 5 and 8), and no additives, corrosion inhibitors or chemicals are envisaged to be used.

This is not the case with sea water due to its corrosive behavior. The following options exist regarding seawater composition for hydrotesting purposes:

Filtered seawater (50 micron) + UV sterilisation. Use of chemicals is not envisaged considering that the water residence time should be fewer than 30 days. If the use of chemicals or other additives is deemed unavoidable, these substances will be included in the PLONOR list. The PLONOR list is a list of substances that are deemed to pose little or NO risk (PLONOR) to the environment. The list has been developed by the OSPAR committee (known as Oslo – Paris committee) for protection of the marine environment. All chemicals or mixtures on the PLONOR list are allowed to be discharged into the sea in accordance with international industry standards.

4.2.2.4.1 Discharge and Disposal of SPT Mediums

Conventional SPT includes discharge and disposal of large quantities of hydrotesting water.

Water for the onshore sections will be discharged back into a receiving water body after having passed a sedimentation pool, through which the water will flow very slowly. These pools are sized to provide a retention time of 5 minutes, which is considered enough time to allow cleaning the solid particles out of the pipe to settle and remain in the bottom of the pond. The discharge rate after finalisation of hydrotests follow the same rules as applicable for abstraction. Hence the same water bodies will be taken into consideration for discharge. Environmental effects are expected to be minimal or negligible when discharge rates are under 10% of the receiving river flow. Discharged water will be free of any chemicals.

Regarding the offshore section (OSS4), filtered seawater used for flooding, gauging and testing is treated. The water is headed to a tank, filtered, checked according to applicable statutory limits and then discharged. Hydrotest water should be free of biocides and oxygen prior of discharge. If any additives have to be used, they will be included in the PLONOR list. The surface area of the tank is calculated to be approximately 600 m². If this area is not available near the coast, the equipment can be placed on a barge which is tied up close to the coast.

In any case:

- The discharge is performed in a controlled manner according to local environmental approvals. An assessment of the likely dispersion rate and extent should be evaluated as part of the pre-commissioning design activities during the EPIC stage of the project; and
- Prior to discharging the hydrotest fluids, samples are collected and analysed on-site to ensure compliance with permits and other regulations before being discharged to the open sea.

The discharge point will be selected based on:

- Results of dispersion analysis;
- Application of diffuser; and
- Assurance of efficient dispersion into environment.

Continuous discharge is considered possible by developing a discharge plan taking into account the spread capacity of the entire discharge system.

4.3 Operation and Maintenance

Detailed operating procedures for the pipeline system will be developed. These procedures will precede the operation of the pipeline. A system for collecting information from third party activities will be operational.

The pipeline is monitored and controlled from the control room. The monitoring system is SCADA (System Control and Data Acquisition). During operation, leak detection is performed through continuous measurements of pressure and flow rate at the inlet and outlet of the stations and the pipeline. If a leak is detected, the deactivation system is activated. In order to be able to carry out an internal inspection, scrapper stations will be installed.

4.3.1 Maintenance

4.3.1.1 Pipeline Maintenance

The pipeline system will be monitored and maintained to ensure that it shall remain adequate and operational as designed, constructed and tested throughout its life-time and also in order to minimize environmental and human hazards. In general, pipeline monitoring, operational inspections and monitoring of operating conditions shall be performed in order to address any problems and to enable their repair in a short period of time. Maintenance planning shall be performed through a combination of modern management techniques, information systems and innovative technical analyzes in order to minimize any risk associated with the operation of the installation and equipment in the long run. The integration of scheduled maintenance will be a major component of the project development and will be implemented throughout the operation of the pipeline system.

Pipeline inspection and maintenance work during operation include the following parameters:

- Pipeline monitoring
- Supervision of the alignment possibly with road vehicles
- Inspections of special intersections
- Monitoring the population and activities of third parties adjacent to the pipeline
- Installation of the cathodic protection system
- Control and monitoring investigations
- Functional inspections and accreditation of the installation and equipment
- Maintenance of installation and equipment at predetermined intervals

The pipeline will be cleaned on a regular basis to confirm the geometry of the pipeline as well as after possible damage or after seismic phenomena.

4.3.1.2 Maintenance of Compressor Stations and Metering Stations

The maintenance strategy is based on the preventive maintenance, the program defined in the Maintenance Plan and the inspection / testing program. In the subsequent operation, the

maintenance program follows the Reliability Centered Maintenance (RCM) principle where maintenance activities are based on the recorded reliability and fault database of the plant equipment.

No significant gas leaks occur during the maintenance of the metering stations.

4.4 Decommissioning of the Project

The expected service lifetime of the two pipeline systems is 50 years. It may be possible that life expectancy of the Project is increased as technology further develops during its operation. Nevertheless, it is expected that at some point the pipelines and the facilities will be decommissioned.

Any decommissioning activities will be subject to permitting requirements applicable at that time and subject to consultation with affected owners and stakeholders of affected properties and structures. A plan covering all relevant items will be prepared and approved before any decommissioning works. The plan will also include an assessment of the environmental impacts of the proposed decommissioning technique and proper mitigation measures.

The Project is designed for a lifetime up to 50 years. Project components may be modified and upgraded over the years, and various measures may be taken to increase the life expectancy of the Project. However, at some time in the future the maintenance of the project will become economically unfavourable and the technology obsolete; consequently, the Project will be demobilised.

The plant and equipment will be dismantled or cut into manageable sections, wiring and electronic boxes removed and handled in accordance with national legislation. Steel sections will be carted away for reuse or reprocessing. Building structures, including pits and culverts, and paved surfaces on the site are demolished, and the used building materials are transported to an approved waste disposal site if they cannot be recycled.

Finally, the area is reinstated by contouring the site to its original slope and undulation, and any scrub and vegetation are planted. The reinstatement will be planned and drafted in co-operation with the relevant authorities, whose approval shall be in hand prior to commencement of any fieldwork. A few years thereafter, the site should appear to be mingling in with the general landscape, and any traces from Project operations would not be detectable.

More specifically, a detailed plan for the decommissioning phase will be submitted to competent authorities for approval in advance of the planned date of end of operation activities, providing

details of all necessary activities, in compliance with international best available dismantling practices and technologies available at the time of the execution of the plan.

The current approach foresees that the decommissioning procedure will consist of removal of the pipeline. In specific sections where the removal operation would not be technically feasible or would cause a more adverse impact on the natural or socioeconomic environment than the abandonment underground, the pipeline will be left buried (e.g., OSS4 or other sections of the onshore components of the Project). Nevertheless, regarding the offshore sections, it is expected that at some point the offshore pipeline should be decommissioned. At that point activities will be undertaken in accordance with prevailing legislation, in liaison with the relevant regulatory authorities and taking into account international best practices. This can be expected, for instance, in trenchless crossing sections. In these cases, the section will be made inert by filling up the pipe with appropriate concrete conglomerates or benthonic mixtures (in order to prevent collapse of empty pipeline), provided that the section is welded with caps.

Pipeline decommissioning, like the commissioning of a new pipeline, will be performed through a number of sequential phases that will allow occupation of limited areas at a time, progressively forwarding through the route. The impacts are expected to be similar to the ones evaluated for the construction phase (in a reverse chronological order).

In line with the principles concerning the permanent above-ground facilities, the decommissioning procedure will consist of removal of the structures and reinstatement of the area in a reasonable time frame in order to the return to the previous conditions of the area where this is possible. Of course, the first priority is to reuse materials; some components, though, cannot be reused and they are recycled to the extent possible. Other components are managed as excavation, demolition, construction waste.

4.5 Description of the Project Overlap with the Natura 2000 Site

The current Appropriate Assessment concerns the part of the project that is located in close proximity to the Study Area (Natura 2000 site: GR4320006), namely the section KP 0058-0065. The pipeline will be lying on the seabed at a distance greater than 800 m from the sites' boundaries.

A single installation vessel will be used for this deepwater section, capable of laying pipe in ultra-deep and deep water. It will be dynamically positioned. The deepwater installation vessel will install up to 3 km of line pipe per day.

During construction

- It is estimated that the pipeline construction will be completed in the area within approximately 1 week;
- Blasting is not expected to be used;
- Subsea tie-ins are not expected to be used; and
- Activities are expected to take place both at daytime and at night time.

5 APPROPRIATE ASSESSMENT

According to the requirements of Article 6 of Directive 92/43/EEC, the guidelines of the European Commission for the Appropriate Assessment and MD 170225/2014, a series of procedural and substantive safeguards are set out, that must be applied to plans and projects that are likely to significantly affect a Natura 2000 site. In this framework the procedure of the AA is designed to:

- Fully assess the impacts of plans and projects that are likely to have a significant effect on a Natura 2000 site.
- Ascertain whether an adverse effect on the integrity of the site can be ruled out. If such is not the case, the plan or project can only be approved if mitigation measures or planning conditions can be introduced that remove or minimise the adverse effects on the site so that its integrity is not affected.
- Provide a mechanism for approving (in exceptional circumstances) plans or projects for which it cannot be ascertained that they will not adversely affect a Natura 2000 site even after the introduction of mitigation measures, when these plans of projects in the absence of alternative solutions are judged to be of overriding public interest.

5.1 Appropriate Assessment Methodology

This section describes the appropriate assessment methodology that will be applied so as to assess in an appropriate manner the potential significant impacts that may be determined by the Project to the qualifying features and integrity of Natura 2000 sites. With this aim the methodology was based on the provisions and criteria of MD 170225/2014 with slight modifications so as to fulfill the purpose of the assessment and be in line with the directions derived from the methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.

The significance of the potential impacts has been assessed considering the following characteristics:

- Duration;
- Spatial extent of the impact;
- Frequency of occurrence or timing with significant ecological periods;
- Intensity of the expected impact on ecological functions of habitats, species and ecosystems; and
- Reversibility, either naturally or through implementation of measures to prevent and mitigate impacts.

Furthermore, the vulnerability/sensitivity of the habitat or species (receptor) to changes caused by the Project and its capability to recover are taken into account, always considering how tolerant and

fragile the habitat or species is and the value, in terms of environmental conservation and ecology, of the receptor affected including species, populations, communities, habitats and ecosystems.

The significance of the impact was assessed in two steps: (a) taking into consideration the value and sensitivity of habitats and species and the intensity of the impact on them; and (b) incorporating the frequency of occurrence or timing with important ecological periods.

In cases where a site supports habitats or species for which the potential impact differs, the scoring system uses a "weakest link" approach. This means that scores are based on the "worst" case.

Table 5-1 Assessment of Impact Intensity towards the Recipient of Habitats/Species of Interest

Impact Intensity	Recipient: Habitats/Species of interest
High	• The project (either alone or in combination with other projects) may adversely affect the integrity of a habitat, by substantially changing its ecological features, structures and functions in the long term across all or most of the area, that enables it to sustain the habitat, complex of habitats and/or the population levels of species that makes it important. • Affects an entire population or species in sufficient magnitude to cause a decline in abundance and/or change in distribution beyond which natural recruitment (reproduction, immigration from unaffected areas) will not return that population or species, or any other population or species depending on it, to its former level within several generations*. A large magnitude impact affecting the species may also adversely affect the integrity of the site, habitat or ecosystem. A secondary impact of large magnitude may also affect a subsistence or commercial resource use (e.g. fisheries) to the degree that the well-being of the user is affected over a long term.
Medium	• The habitat's integrity will not be adversely affected in the long term, but the effect is likely to be significant in the short or medium term to some, if not all, of its ecological features, structures and functions. The habitat may be able to recover, through natural regeneration and restoration, to its state at the time of the baseline study. • Affects a portion of a population and may bring about a change in abundance and / or distribution over one or more generations*, but does not threaten the integrity of that population or any population dependent on it. A medium magnitude impact may also affect the ecological functioning of a site, habitat or ecosystem but without adversely affecting its overall integrity. The size of the consequence is also important. A medium magnitude impact multiplied over a wide area will be regarded as large. A short term effect upon the well-being of resource users may also constitute a secondary medium impact.
Low	• Neither of the above applies, although some minor impacts of limited extent, or to some elements of the habitat, are predicted but the habitat will readily recover through natural regeneration. • Affects a specific group of localized individuals within a population over a short time period (one generation* or less), but does not affect other trophic levels or the population itself.

*Note: Generations of the animal/plant species under consideration.

Prepared by: (NCC, 2021)

Table 5-2 Assessment of Impact Intensity towards Value and Sensitivity of Resource/Receptor, Frequency of Occurrence and Reversibility

Impact Intensity	Value and Sensitivity of Resource/Receptor	Frequency	Reversibility
High	The receptor has little capacity to balance the changes without substantially altering its current state or is important at national or international level. For the classification the value of the species habitat affected is also taken into consideration.	The activity is continuous and/or takes place during critical life-stages or seasons for wildlife, e.g. bird nesting season.	The implementation of mitigation measures will reverse the effect by 100%.
Medium	The receptor has moderate ability to balance changes without significantly altering its current state or is of high importance. For the classification the value of the species habitat affected is also taken into consideration.	The activity is expected to be carried out for long periods of time during construction and will continue during operation and/or takes place during early or late breeding stages.	The implementation of mitigation measures will reverse the effect only partially and over 50%.
Low	The receptor is tolerant to change without harming its features, is of low or local importance. For the classification the value of the species habitat affected is also taken into consideration.	The activity will occur sporadically at irregular intervals and/or outside critical life-stages or seasons for wildlife.	The implementation of mitigation measures will reverse the effect only partially and up to 50%.
Negligible		The activity will occur once and outside critical life-stages or seasons for wildlife.	
Irreversible			There is no reasonable chance of action being taken to reverse it.

Prepared by: (NCC, 2021)

Table 5-3 Assessment of the Impact's Magnitude towards the Value of the Resource and the Intensity of the Impact

Magnitude of Impact		Intensity		
		Low	Medium	High
Value/ sensitivity of receptor	Low	Negligible	Low	Medium
	Medium	Low	Medium	High
	High	Medium	High	High

Prepared by: (NCC, 2021)

Table 5-4 Assessment of the Overall Significance of the Impact, with the Frequency Taken into Account

Overall significance of impact		Impact's Magnitude with Regard to the Value of the Receptor and Intensity			
		Negligible	Low	Medium	High
Frequency	Negligible	Negligible	Negligible	Negligible	Low
	Low	Negligible	Negligible	Low	Medium
	Medium	Low	Low	Medium	High
	High	Low	Low	High	High

Prepared by: (NCC, 2021)

An assessment of the residual impact (impact that cannot be mitigated and thus irreversible) has also taken into account the reversibility that may arise from implementing measures to prevent or mitigate the impacts of the Project on habitats and species.

Table 5-5 Assessment of the Residual Impact, with the Reversibility of the Impact Taken into Account

Residual impact		Overall Significance of Impact			
		Negligible	Low	Medium	High
Reversibility	High	Negligible	Negligible	Low	Low
	Medium	Negligible	Negligible	Low	Medium
	Low	Negligible	Low	Medium	High
	Irreversible	Negligible	Medium	High	Critical

Prepared by: (NCC, 2021)

Table 5-6 Impact Significance Definitions

Significance	Definition
Critical	Unacceptable. It is not subject to mitigation, Alternatives should be identified.
High	Significant. Impacts with a "High" significance are likely to disrupt the function and value of the resource/receptor and may have broader systemic

Significance	Definition
	consequences (e.g. ecosystem or social well-being). These impacts are a priority for mitigation in order to avoid or reduce the significance of the impact.
Medium	Significant. Impacts with a "Moderate" significance are likely to be noticeable and result in lasting changes to baseline conditions, which may cause hardship to or degradation of the resource or receptor, although the overall function and value of the resource or receptor is not disrupted. These impacts are a priority for mitigation in order to avoid or reduce the significance of the impact.
Low	Detectable but not significant. Impacts with a "Low" significance are expected to be noticeable changes to baseline conditions, beyond natural variation, but are not expected to cause hardship, degradation, or impair the function and value of the resource or receptor. However, these impacts warrant the attention of decision-makers, and should be avoided or mitigated where practicable.
Negligible	Not Significant. Any impacts are expected to be indistinguishable from the baseline or within the natural level of variation. These impacts do not require mitigation and are not a concern of the decision-making process.

Prepared by: (NCC, 2021)

5.2 Assessment of Impacts

This impact assessment evaluated impacts, taking into consideration the implementation of adequate mitigation measures and environmental planning aimed at reducing and where possible preventing environmental impacts as presented in Section 6. Final residual impact is also estimated. A typical example of a mitigation measure is the selection of a trenchless underground passage of the pipeline at some Natura 2000 sites in order to minimise impact on sensitive habitats and species. Mitigations measures are therefore presented alongside the assessment and presented in detail in Section 6.

In this framework, the potential impacts concerning the construction and operation of the Project were assessed with regards to technical characteristics, special natural characteristics and current environmental conditions of the site, with emphasis on protected elements, ecological integrity of the Study Area and overall consistency of the Natura 2000 network.

For the section of the Project under assessment, given the characterisation of the area of interest as SAC for the Natura 2000 network, the following evaluation indicators were used:

(a) loss and fragmentation of habitat type coverage,

(b) loss and fragmentation of species of interest habitat,

(c) disturbance/displacement of species of interest, as well as

(d) direct loss of species of interest.

The examination of those indicators can provide information on the impact of the project and on whether it may:

- Cause delay or disrupt the progress in meeting the conservation objectives of the Natura area concerned;
- Reduce the size of the species population or affect the conservation status of their habitats or fragment them or affect the balance between species or affect their degree of isolation;
- Cause changes to vital parameters within the Natura 2000 site; and
- Interact with anticipated or expected physical changes.

as required by the MD 170225/2014.

The chapter includes an initial screening of species and habitat types, followed by the estimation of Project impacts on the selected species related to (a) pipeline construction and pre-commissioning, (b) pipeline operation, (c) cumulative impacts, while possible impacts to other important species are also presented. Finally, the alternative scenarios are examined.

5.2.1 Species / Habitat Type Screening

In regard to habitat types, no habitats of interest are expected in the area that the pipeline crosses, as it is characterised by great depth.

In regard to the fauna species, a screening was carried out concerning the species included in Table 3.2 of the SDF that could be potentially be affected by the Project, based on field observations and literature data. Species were selected for which the Natura 2000 site has been designated and could potentially be affected by the Project. The rest of the species are terrestrial and are not expected in the FSA.

Their ecological requirements are presented in ANNEX D.

Table 5-7 Species of Interest Expected or Observed within the FSA

Group	Code	Species	Presence	Observed during Fieldwork	Annex of Habitats Directive/ IUCN / Greek Red List
Annex II (92/43/EEC) species of the Study Area - Reported in chapter 3.2 of the site's SDF					

M	1366	*Monachus monachus*	p		II;IV|EN|CR
M	1349	*Tursiops truncatus*			II;IV|LC|VU
R	1224	*Caretta caretta*	p		II;IV|VU|EN

Note: p: permanent (Source: SDF), II, IV: Annexes of Habitats Directive, LC: Least Concern, VU: Vulnerable, EN: Endangered, CR: Critically Endangered

Prepared by: (NCC, 2021)

Furthermore, the sensitivities of other species of concern, that are not among the species included in the SDF, but were considered to probably be present in the area or were observed during fieldwork, are taken into consideration for the proposal of good practices and for their protection and are presented in Table 5-8.

Table 5-8 Other Species Expected or Observed within the FSA

Group	Code	Species	Presence	Observed during Fieldwork	Annex of Birds Directives / IUCN / Greek Red List
Other important Annex I of Birds Directive of the Study Area not included in the site's SDF					
B	A464	*Puffinus yelkouan*		X	I|VU|NT
B	A850	*Calonectris diomedea* s. str.		X	I|LC|LC
B	A181	*Larus audouinii*		X	I|LC|VU
B	A392	*Phalacrocorax aristotelis desmarestii*		X	I|LC|NT

Note: I: Annex of Birds Directive, LC: Least Concern, VU: Vulnerable, NT: Near Threatened

Prepared by: (NCC, 2021)

5.2.2 Pipeline Construction and Pre-Commissioning

The Project will not cross the Natura 2000 site, as the proposed route runs at more than 800 m to the east, where depths are between 350 and 750 m. The construction is expected not to exceed 1 week approximately and will imply the presence of one Dynamic Positioning installation vessel laying the pipeline as the vessel advances.

Habitat type coverage loss, deterioration, fragmentation: Not applicable

The pipeline will not cross the Natura 2000 site. The area where the pipeline will be located can be divided into two main ecosystems. The pelagic, that is the water column, is not expected to be affected beyond the temporary presence of the vessels and the existence of potential routine

discharges from them, all in compliance with MARPOL and local regulations. The benthic ecosystem in the pipeline corridor is located at depths greater than 300 m (between 350 and 750 m) and no data is available concerning potential presence of habitat types of importance. Furthermore, as the species of interest in the area use the water column and not the deep seabed of the area, no impact on their habitat is expected.

No impact is expected on the General Conservation Objectives and the Site Specific Conservation Objectives concerning the quality of the habitat types and the species habitat quality.

Loss of Individuals: **Negligible**

The loss of individuals concerns mainly potential collision of sea turtles or marine mammals with vessels at sea. The physical presence and risk of boat strike from anchored or slow-moving vessels is not expected to impact adult sea turtles significantly as the pipelay vessel will be laying the pipe at only 3 km per day (1.62 nm/day). In fact, fast moving supply vessels constitute a greater risk of boat strike (Hazel et al. 2007) for sea turtles, and the same applies for marine mammals including cetaceans and *Monachus monachus*.

With regards to impacts from underwater noise, according to the Annex 9.8 of the ESIA, the distance of Permanent Threshold Shift, which leads to permanent change in the auditory threshold and permanent hearing loss, is estimated to be less than 100m from the noise source for *Tursiops truncatus, Monachus monachus* and sea turtles.

The site specific conservation objectives for *Monachus monachus* are the same as the national ones. The species breeding population has to reach 500 individuals.

Table 5-9 General Impact Characteristics for Loss of Individuals

Receptor	Nature	Extent	Duration
Caretta caretta Marine mammals	Negative. Loss of individuals.	Local	Short-term. The impact is limited to the construction period.

Prepared by: (NCC, 2021)

The value of the receptor is high as it concerns an Annex II species of the Habitats Directive. The intensity of the impact applies if this unlikely impact occurs; very few individuals may be affected, while the frequency is estimated to be low. As a result, the overall impact is low.

As appropriate mitigation measures can be applied (Section 6), the reversibility of the impact is medium and the residual impact negligible.

No SSCOs have been defined for other species populations. Thus, no conclusion on any impact on them can be defined, although the impact is generally negligible.

Disturbance: **Negligible**

As mentioned above, the speed of laying pipeline is 1.62 nm/day, and a vessel is expected to operate in the area also during night with the necessary use of light. Disturbance can affect mainly marine mammals and sea turtles. The distance for behavioural reactions for *Tursiops truncatus, Monachus monachus* and sea turtles is estimated to be 11 km at offshore areas for marine mammals. Sea turtles are expected to have high behavioural reactions within tens of metres of the pipe laying activities, but moderate and low reactions further away from the source. The distance of the pipeline routing from the island of Elasa, where a marine cave suitable for resting of *Monachus monachus* is located, is about 5 km, thus a temporal disturbance is expected for the duration of pipeline laying in the area. Hatchling orientation has been shown to be disrupted by light produced at distances of up to 18 km from the nesting beach (Hodge et al. 2007).

Table 5-10 General Impact Characteristics for Disturbance - Fauna

Receptor	Nature	Extent	Duration
Caretta caretta *Monachus monachus*	Negative. Animals may be disturbed.	Local, at the broader area of the working strip.	Short-term. The impact is expected only during the construction period.

Prepared by: (NCC, 2021)

The value of the receptor is high, as it concerns species included in Annex II of the Habitats Directive. The intensity of the impact is low, as it could potentially affect only localised individuals within a population over a short time period and the frequency is also low, as the construction period will last a few weeks. Based on the above the impact is estimated to be low.

As appropriate mitigation measures can be applied in order to prevent disturbance, mainly during night, the reversibility of the impact is medium and the residual impact negligible.

No SSCOs have been defined for species distribution. Thus, no conclusion on the impact on them can be reached, although the impact is generally negligible.

Changes in the general ecosystem of the Study Area: **Not applicable**

It is expected that the Project will not cause changes to the vital defining aspects that determine how the site functions as a habitat or ecosystem.

In combination with the negligible impact to species and habitats, the above leads to the estimation that no changes are expected in the dynamics of the relationships that define the structure and/or function of the site. Furthermore, the Project does not interfere with predicted or expected natural changes to the site.

The Project is not expected to change the balance between key species or reduce the diversity of the site.

5.2.3 Operation and Maintenance

During operation and maintenance, the pipeline will not be maintained on site and operation will not include any regular human or vessel presence.

Habitat type loss, deterioration, fragmentation: Not applicable.

No loss, deterioration, fragmentation of habitat type is expected during operation.

Species habitat loss, deterioration, fragmentation: Not applicable.

No loss, deterioration, fragmentation of species habitat is expected during operation.

Loss of Individuals: Not applicable.

No loss of individuals is expected during operation.

Disturbance: Not applicable.

No disturbance is expected during operation.

Table 5-11 Assessment of Impacts

Phase	Threat	Receptor	Nature	Extend	Duration	Intensity	Value of the Receptor	Frequency	Overall Importance	Reversibility	Residual Impact
Construction	Habitat loss etc.	Habitat types	Negative	*No impact expected*							
	Habitat loss etc.	Fauna	Negative	*No impact expected*							
	Loss of individuals	Marine mammals Sea turtles	Negative	Local	Short term	Low	High	Negligible	Low	Medium	Negligible
	Disturbance	Marine mammals Sea turtles	Negative	Local	Short term	Low	High	Negligible	Low	Medium	Negligible
Operation	Habitat loss	Habitat	Negative	*No impact expected*							
		Fauna	Negative	*No impact expected*							
	Loss of individuals	Fauna	Negative	*No impact expected*							
	Disturbance	Fauna	Negative	*No impact expected*							

Prepared by: (NCC, 2021)

5.2.4 Sensitivities of Other Species

Pelagic seabird species are observed in the area, and according to available data the species *Calonectris diomedea* is regularly using the area for foraging. They are not expected to be affected by the Project during construction and operation, apart from a low disturbance related to the presence of the vessel and pipeline laying activities in the area.

5.2.5 Cumulative Impacts

It is well established that pipelines, power lines and roads can form a linear intrusion in natural areas leading to habitat loss, fragmentation, and to the creation of barriers to movement of terrestrial species. As mentioned in previous sections, the terrestrial part of the site has some significant existing and planned projects including four wind park projects currently in the permitting phase. However, given that the pipeline Project route does not cross the terrestrial part of the Natura 2000 site, no cumulative effects on the site habitats or species are expected from the interaction of these wind park projects and pipeline construction. The main potential cumulative impact would be related to birds, though the absence of effects on seabirds from EastMed activities in the area, as stated in section 5.2.4, can confirm that the combination of the activities referred to will not result in cumulative impacts to these species.

Regarding the marine part of the SAC, no other existing or planned projects and infrastructure have been identified during this study. No cumulative impacts are expected for the marine area of the site.

5.2.6 Alternative Scenarios

Detailed description of alternative scenarios is provided in the relevant chapters of the ESIA. Concerning the assessment of alternative Project routings to avoid the specific SAC site, this cannot be a viable scenario due to the fact that the pipeline is already not traversing the site and just crosses in close proximity to it (more than 800 m). This routing is practically the optimum ecological scenario for pipeline routing, and therefore the study team decided not to examine alternative routing scenarios except for the current routing and the do-nothing scenario.

Scenario 1: Current routing.

Construction works for the current routing are estimated to have no impact on the qualifying features of the SAC. By respecting the construction time-constraints and by taking appropriate pre-

construction mitigation measures such as marine fauna surveys, the impact is expected to be negligible.

Scenario 2: Do-nothing Scenario.

In the case of the do-nothing scenario, there would be no pipeline construction, which would have the effect of negligible effects for all types of impacts. However, the implementation of the project would result in a number of significant positive impacts, namely: enhancement of competition in the energy market and of EU security of supply, broadening of the Southern Gas Corridor, developing of natural gas resources within the EU or close border sources, ensurance of supply of natural gas to areas of Greece that do not have access to the National Network, support of the transitory phase to renewable sources.

5.3 Conclusions of Impact Assessment on Conservation Objectives and Ecological Integrity of the Natura 2000 Site

Taking into consideration the above assessment and the current status of the ecological characteristics of the Study Area and the construction and functional requirements of the Project, it is concluded that the implementation of the proposed Project is not expected to:

- Cause delay or disrupt the progress in meeting the conservation objectives of the Natura 2000 area concerned;
- Reduce the size of the population of protected species or affect the conservation status of their habitats or fragment or affect the balance between species or affect their degree of isolation;
- Cause changes to vital parameters (e.g. terrain, water surface network) that contribute to the function of the Natura 2000 site;
- Interact with anticipated or expected physical changes; and
- Affect connectivity with nearby Natura 2000 sites, also an important parameter of the network.

Given the above and considering the implementation of the aforementioned management and mitigation measures to prevent/reduce potential impacts, it is concluded that the implementation and operation of the proposed Project will not induce any impacts on the protected species, on the ecological functions they perform regarding the ecological integrity of the Study Area and on its role towards the coherence of the Natura 2000 network.

6 MITIGATION MEASURES OF POTENTIAL IMPACTS

Mitigation measures are proposed as a precaution for avoiding or reducing undesired impacts. In this context the aim is to prevent, minimise and neutralise any negative impacts of the Project and they are an integral part of its implementation specifications.

In this context the most vulnerable points and sections of the pipeline routing were highlighted and the areas where measures should be implemented to prevent/minimise impacts are presented in the following Table (Table 6-1).

It is noted that the impact assessment presented in the above section assessed residual impacts after the implementation of the management and mitigation measures listed below.

Table 6-1 Impact, Mitigation Measures Proposed and Significance of Residual Impact

Mitigation Commitments to Address the Impact / Risk	Efficiency				KP	Significance of Residual Impact / Risk
	Prevention/ Avoidance	Reduction of Intensity	Reduction of Extent	Restoration		
Construction Phase						
Loss of individuals						
Develop a Marine Traffic Management Plan, including maximum speed per marine area, notification procedures, anchoring and berthing areas, guidelines for employees, etc.	X	X	X		50-80	Negligible
Litter and other waste material must be stored and disposed of appropriately. Any environmentally hazardous material used during construction works must be carefully stored in accordance with applicable legislation.	X					
Collection of injured marine wildlife individuals and transfer to wildlife rehabilitation centres, (if possible). At all events get into contact with the nearest Port Police authority to report the incident.		X				
Disturbance						
Minimum usage of lights, only for safety and operational reasons, and directional lighting.	X		X		50-80	Negligible
All impacts						

Training on ecological aspects/behaviours will be made available for all workers.	X	X	X		50-80	Negligible
All project vessels shall operate under international standards (MARPOL)	X	X	X			
Implementation of Spill Prevention and Response Plan.	X					
On the ship(s) for the offshore pipeline laying, there will be a Marine Mammals Observer(s) (MMOs), using Passive Acoustic Monitoring (PAM) system and visual observations, so as to inform immediately the ship(s) commander(s) for risks of mammals collisions.	X					
On the ship(s) for the shore crossing construction works, there will be a Marine Visual Observer so as to inform immediately the ship(s) commander(s) for risks of marine reptile collisions.	X					
Works can be performed during times of good visibility (e.g., daylight, clear weather conditions) when marine wildlife individuals presence can be sufficiently monitored. Otherwise, they can be performed provided that monitoring takes place through other means (e.g. sonars).	X					
Before beginning any noise producing action there should be a dedicated watch to ensure no animals are within a 200 m zone close to the vessels.	X					
Temporary pause of all activities, except for safety related ones, if a marine mammal is detected within a 100 m zone from the construction activities vessels.	X					
Temporary pause of activities if a marine reptile is detected within a 50 m zone from the construction activities vessels.	X					

Prepared by: (NCC, 2021)

Information concerning monitoring of the efficiency of the mitigation measures is provided in Section 8.

7 COMPENSATORY MEASURES

Compensatory measures, as described in Article 6 (4) of the EU Habitats Directive and incorporated into Greek Law 4014/2011, are the "last resort" and are only used when a decision has been taken to proceed with a project or plan that could have negative impacts on the integrity of Natura 2000 because there are no alternatives and the project has been judged to be of overriding public interest.

Based on the guidelines for interpretation of European Directive 92/43/EEC, compensatory measures have to be considered only when a significant negative impact on the integrity of a Natura 2000 site is found.

Since no significant negative impact on the integrity and conservation objectives of the GR4320006 Natura 2000 site, as assessed in this Appropriate Assessment, no compensatory measures are proposed.

8 MONITORING PROGRAM

The implementation of a monitoring program is considered particularly important during both (a) the construction phase of the pipeline, as well as (b) the operation and maintenance phase. The monitoring program is in alignment with Chapter 11 of the ESIA.

8.1 General Monitoring Criteria

During construction and just before the construction

During construction, a "pre-construction" team composed by specialized field experts-scientists will monitor/survey before construction initiation. Main goal for the team is to survey potential presence of important species.

Main goal of monitoring activities

The main aim of monitoring, is to be able during construction with a pre-construction preceding team, to record the actual stage and status of fauna species, in-situ, in real-time during the construction process, impact and effect of mitigation measures, and natural environment elements' status.

8.2 Monitoring Program for the Study Area

The implementation and monitoring of the mitigation measures proposed will be foreseen and included in the Environmental Management System of the Project and their details will be defined by the Environmental Management Plan. An Environmental Monitoring Plan has to be prepared, while a Biodiversity Management Plan will be included as an integral part of it. The Environmental Monitoring Plan shall be submitted to the competent authorities that will monitor its implementation by the contractor.

The monitoring will focus on (a) the presence of the species in the area and its use during construction in order to estimate the actual impact of the activities to the species in terms of loss of habitat, loss of individuals and disturbance and the efficiency of the mitigation measures in order to provide information for the assessment of the need for modifications in the construction timing or finetuning of mitigation measures etc. and (b) the presence of the species and the use of the area after the construction in order to estimate the long-term impacts of the project to the Natura 2000 site.

Furthermore, the monitoring will also focus on the collection of all necessary information on (a) the confirmation of the mitigation measures' implementation and (b) the effectiveness of the mitigation. A series of indicators representative of the effectiveness of the mitigation measures (Key Performance Indicators - KPIs) will be defined and monitored. The effectiveness of the one-off measures will be measured once, i.e. after their implementation.

Species on which monitoring should focus both during construction and in post-construction surveys.

Based on the site's recorded fauna, attention during monitoring should be focused on species that are qualifying features, Directive 92/43/EEC Annex II, IV and V species, as well as rare and important species that may be affected by the construction and operation of the Project, as presented in this AA, namely *Monachus monachus, Caretta caretta* and *Tursiops truncatus*.

Monitoring during construction period

During construction, monitor of presence of sensitive fauna in deep waters (marine mammals, reptiles) will take place.

It is estimated that monitoring should take place for (a) sea turtles and (b) marine mammals. European Seabirds at Sea (ESAS) should be carried out. ESAS is a standardized boat-based method, which has been widely used in Europe since the 1980s to record seabirds and other marine fauna at-sea e.g. seals, cetaceans and sea turtles and is based on the methodologies outlines by Tasker et al. (1984) and Camphuysen and Garthe (2004). Using this method, seabirds are recorded continuously within the 300-meter band, on one or both sides of the observation vessel, along a series of line-transects travelled by vessel. The presence of the species during construction should be monitored, in order to avoid interactions/collisions.

9 CONCLUSIONS

The present Appropriate Assessment concerns the onshore section of the EastMed pipeline, which crosses the Special Area of Conservation (SAC) "Voreioanatoliko Akro Kritis: Dionysades, Elasa Kai Chersonisos Sidero (Akra Mavro Mouri – Vai – Akra Plakas) Kai Thalassia Zoni", GR4320006. It has been prepared as a necessary and integral part of the Environmental and Social Impact Assessment of the Project.

The present AA followed the specifications described in Annex 3.2.1 of MD 170225/2014, concerning the AA of projects and activities located within Natura 2000 sites that are not subject to specific conditions. Bibliographical data were collected and field surveys of a total duration of 20 days were carried out in 2021. Although the Project will cross the Study Area at a distance of about 800 m to the east, an Appropriate Assessment was carried out.

The present AA provided an ecological description of the Study Area with special emphasis on the Field Survey Area, which was defined as a strip of 500 m either side of the proposed routing in close proximity to the Study Area and the eastern part of the Study Area. In particular, the AA assessed the potential impacts of the Project on the populations and distribution of protected species and the ecological functions of the site, and where required, identified suitable mitigation measures to ensure that the proposed Project will not harm the ecological integrity of the site and connectivity of the Natura 2000 network.

The expected impact on ecosystems and species of the Study Area, and therefore on the conservation objectives and integrity of the Natura 2000 site, are estimated as negligible, as appropriate mitigation measures have been foreseen.

Concerning cumulative impacts, no other projects in the marine environment are present and no such impacts apply. The scenario of the current routing is estimated as the optimal one.

This AA also provided guidelines on the monitoring program to be carried out during construction alongside the execution of construction works.

Provided that the precautions described above are taken into consideration, it is well beyond doubt that the impacts of the Project crossing on the ecological integrity of the Special Area of Conservation (SAC) "Voreioanatoliko Akro Kritis: Dionysades, Elasa Kai Chersonisos Sidero (Akra Mavro Mouri – Vai – Akra Plakas) Kai Thalassia Zoni", GR4320006, of the Natura 2000 network, will be negligible.

10 STUDY TEAM

Name		Role
Tasos Dimalexis	Dr. Biologist	Project Coordinator Site assessment Marine field survey
Margarita Tzali	Environmental Engineer, MSc	Project Manager AA compilation
Alexandra Kontou	Environmentalist, MSc	AA compilation
Vassilis Goritsas	Environmentalist, MSc	Data management/Map production
Jakob Fric	Physicist	Development of databases / Data management Seabird expert Marine field survey
Apostolis Christopoulos	Environmentalist MSc, PhD candidate in Biology	Avifauna expert Marine field survey
Kimonas Koemtzopoulos	Biologist MSc	Marine mammal expert Marine field survey

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ANNEX A SDF DATA

Table ANNEX-1Habitat Types Present on the Site and Assessment for them

Code	Population		Assessment			
	Cover (ha)	Data quality	Repres.	Rel.surf.	Cons.	Global
1240	364.861	G	B	B	B	B
1310	0.614	G	B	C	B	B
1410	1.127	G	B	C	B	B
1420	5.153	G	B	C	B	B
1430	0.741	G	B	C	A	B
2110	1.106	G	B	C	B	B
2230	1.473	G	B	B	B	B
5210	135.738	G	B	C	B	B
5330	11.884	G	A	C	A	B
5420	5397.461	G	B	B	B	B
8210	0.201	G	A	C	A	B
92D0	0.960	G	B	C	B	B
9320	64.762	G	C	C	C	C
1150	1.526			C		
6220	39.774	G	A	C	A	B
7210	0.376	G	C	C	C	B
9370	19.079	G	B	A	B	B
3290		G				
1120	142	M	A		B	B
1170	2818	G	A		C	C
8330		G	A		B	B
1110	23605	G	A	C	B	B

Prepared by: (NCC, 2021)

Definition:

Data quality: G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor'

Degree of representativity of the natural habitat type on the site (Representativity): A= ‘excellent representativity’, B= ‘good representativity, C= ‘significant representativity’, D= ‘non-significant presence’

Area of the site covered by the natural habitat type in relation to the total area covered by that natural habitat type within the national territory (Relative surface): A=15%-100%, B=2%-15%, C=0%-2%.

Degree of conservation of the structure and functions of the natural habitat type concerned and restoration possibilities (Conservation Status): This criterion comprises three sub-criteria: i) degree of conservation of the structure, ii) degree of conservation of the functions, iii) restoration possibility / A = 'excellent conservation' (= excellent structure, independent of the grading of the other two sub-criteria, = structure well conserved and excellent prospects independent of the grading of the third criterion), B = 'good conservation' (= structure well conserved and good prospects independent of the grading of the third sub-criterion, = structure well conserved and average/maybe unfavourable prospects and restoration easy or possible with average effort, = average structure/partially degraded, excellent prospects and restoration easy or possible with average effort, = average structure/partially degraded, good prospects and restoration easy), C = 'average or reduced conservation' (= all other combinations)

Global assessment of the value of the site for conservation of the natural habitat type concerned (Global assessment): A = 'excellent value', B =' good value', C = 'significant value'

Table ANNEX 2 Species Referred to in Article 4 of Directive 2009/147/EC and Listed in Annex II of Directive 92/43/EEC and Site Evaluation for them

Group	Code	Species Name	Population						Assessment			
			Type	Min	Max	Unit	Abund.	Data Quality	Pop.	Cons.	Isol.	Global
M	1366	*Monachus monachus*	p			i	P	M	D	C	C	C
M	1349	*Tursiops truncatus*										
P	4082	*Crepis pusilla*	p	0	0	grids1x1	P	G	C	C	C	B
P	1896	*Phoenix theophrasti*	p	5728	6728	i	R	G	A	A	C	A
P	1459	*Silene holzmannii*	p	5723	5732	i	R	G	A	A	C	A
R	1224	*Caretta caretta*	p	4	4	subadults	P	DD				

Prepared by: (NCC, 2021)

Definitions:

Group: A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles

Type: p = permanent, r = reproducing, c = concentration, w = wintering

Unit: i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)

Abundance categories (Cat.): C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information

Data quality: G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor'

Size and density of the population of the species present on the site in relation to the populations present within national territory (Population): the ratio of the population in the site / population in the national territory: A: 15%-100%, B=2%-15%, C=0%-2%, D=non-significant population

Degree of conservation of the features of the habitat which are important for the species concerned and possibilities for restoration (Conservation): This criterion comprises two sub-criteria: i) degree of conservation of the features of the habitat important for the species, ii) restoration possibilities. A = conservation excellent (= elements in an excellent condition, independent of the grading of the possibility of restoration), B = good conservation (= elements well conserved independent of the grading of the possibility of restoration), C = average or reduced conservation (= all other combinations)

Degree of isolation of the population present on the site in relation to the natural range of the species (Isolation). A: population (almost) isolated, B: population not-isolated, but on margins of area of distribution, C: population not-isolated within extended distribution range

Global assessment of the value of the site for conservation of the species concerned: A: excellent value, B: good value, C: significant value.

Other species

There are also 81 other species of importance for the area included in the SDF, 6 of which are fish, 17 invertebrates and 58 plants, 7 of which included in the National Red Data Lists, 23 in International Conventions, while 1 is listed in Annex IV of the Habitats Directive and 1 in Annex V, and 29 are listed for other reasons. 33 species are endemic. For further detail please refer to the SDF.

ANNEX B THREAT STATUS

Table ANNEX-3 Threat and Protection Status of Species Referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC

Group	Code	Species Name	IUCN (2020)	Greek Red Data Book (2008)	Endemic - Greek Red Data Book (2008)	Habitats Directive Annex II	Habitats Directive Annex IV	Bern Convention	Bonn Convention	CITES	Observed during Field Work
R	1224	*Caretta caretta*	VU	EN		Y	Y	II	I; II	I	
P	4082	*Crepis pusilla*				Y	Y				
M	1366	*Monachus monachus*	EN	CR		Y	Y	II	I; II	I	
P	1896	*Phoenix theophrasti*	NT	VU		Y	Y	I			
P	1459	*Silene holzmannii*	EN	EN		Y	Y	I			
M	1349	*Tursiops truncatus*	LC	VU		Y	Y	II	II	II	

Prepared by: (NCC, 2021)

Definitions:

Group: A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles

Threat categories according to IUCN's Red List of Threatened Species (2020.1) (http://www.iucnredlist.org/): EX: Extinct, CR: Critically Endangered, EN: Endangered, VU: Vulnerable, NT: Near Threatened, LC: Least Concern, DD: Data Deficient, NE: Not Evaluated

Red Data Book of Rare and Threatened Plants of Greece (2009): EX: Extinct, CR: Critically Endangered, EN: Endangered, VU: Vulnerable, NT: Near Threatened, LC: Least Concern, DD: Data Deficient, NE: Not Evaluated, (): temporary category

Threat categories according to the Red Data Book for Endangered Animals of Greece (2009): EX: Extinct, CR: Critically Endangered, EN: Endangered, VU: Vulnerable, NT: Near Threatened, LC: Least Concern, DD: Data Deficient, NE: Not Evaluated

Habitats Directive (92/43/EC) Annex II: core areas of their habitat must be protected under the Natura 2000 Network and the sites managed in accordance with the ecological requirements of the species. Annex IV: strict protection regime must be applied across their entire natural range within the EU, both within and outside Natura 2000 sites.

Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention). I: Appendix I – Strictly Protected Flora Species, II: Appendix II - Strictly Protected Fauna Species, III: Appendix III – Protected Fauna Species

Convention on the conservation of migratory species of wild animals (CMS, Bonn Convention). I: Appendix I – Endangered migratory species, II: Appendix II – Migratory species conserved through Agreements

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). I: Appendix I - endangered species of animals and plants, which CITES generally prohibits international trade of their specimens, II: Appendix II - species of animals and plants which are not directly threatened with extinction, but may be listed in Annex I if their trade is not controlled.

ANNEX C SITE SPECIFIC CONSERVATION OBJECTIVES

Specific conservation objectives

1210, 1240, 1310, 1420, 1430, 2110, 2120, 2230, 3290, 5210, 5330, 5420, 6220, 7210, 8130, 8210, 8310, 8330, 9320, 9370, 92D0:

The General Conservation Objectives apply to these habitat types.

1120:

Distribution range dynamically stable taking into consideration the natural processes. Extent: Conservation at least the current area. Conservation or Extension of the Lower Limit of Distribution (Meadow) (LLD) deeper than 28 m. Conservation of Type LLD as "Stable (presence of lateral plants)". Increase of % Coverage at a value >80%. Conservation of the Conservation Index (CI) at a value of ≥ 0.7. Increase Density at a value> 450 shoot/m^2. Increase of % Side Rhizomes at a value > 30%.

1170:

Conservation of the distribution and extent at least at current levels. Conservation of the value of the Structure and Coverage of Macroalgae EEI indicator > 0.48. Raising lower Fucales distribution limit >0.5 m.

1410:

Restoration of structures and functions (including typical species) to tend towards a Conservation Degree A. Change of the type and magnitude of pressures and threats from medium - high with medium or high effect/impact to low - medium magnitude with small - medium effect/impact, and therefore contribution to the upgrading of the future prospects of the structure and functions of the habitat type from Poor (P) to Good (G).

Crepis pusilla:

Species distribution greater than the Favourable Reference Value (FRV) or at least equal to it, i.e. ≥ 1 cell 10x10 km. Species population greater than or equal to the Favourable Reference Value (FRV), i.e. ≥ 2 cells 1x1.

Phoenix theophrasti:

Species distribution greater than the Favourable Reference Value (FRV) or at least equal to it, i.e. ≥ 3 cells 2x2 km. Species population greater than the Favourable Reference Value (FRV) or at least equal to it, i.e. ≥ 5,728-6,728 individuals.

Silene holzmanii:

Species distribution to be greater than the Favourable Reference Value (FRV) or at least equal to it, i.e. ≥ 1 cell 1x1 km. Population of the species to be greater than the Favourable Reference Value (FRV) or at least equal to it, i.e. ≥ 1,500 individuals.

ANNEX D ECOLOGICAL REQUIREMENTS

Table ANNEX-4 Ecological Requirements, Threats and State in Greece and the Study Area of Species Assessed by the AA ([1]: SDF)

Code	Species Name	Habitat		Threats	Presence Status in Greece	Significant Presence Status in the Study Area[1]
		Reproduction	Foraging			
Annex II (92/43/EEC) species of the Study Area - Reported in chapter 3.2 of the site's SDF						
1366	*Monachus monachus*	Well-protected sea caves, located in remote or inaccessible coastal or island locations with one or more entrances above or below the water surface and end up on a beach	Continental shelf, sea meadows and open sea.	Habitat deterioration and loss by human coastal development, deliberate killing and accidental entanglement in fishing gear, decreased food availability due to overfishing, marine pollution and stochastic events, such as disease outbreaks	Widely distributed throughout coastal and insular Greece. Min population estimate: 179 adult individuals	D
1349	*Tursiops truncatus*	Continental shelf, sea meadows and open sea. It is found mainly in coastal areas and to a depth of -250 m and up to 6 km from the coast.	Continental shelf, sea meadows and open sea. It is found mainly in coastal areas and to a depth of -250 m and up to 6 km from the coast.	Intentional killing, by-catch, reduced food availability due to overfishing, illegal fishing and habitat degradation chemical pollution, resulting in reproductive dysfunction and attenuation immune system and noise pollution at local level.	All coastal areas, straits and gulfs of Greece, as well as around and between islands in the Ionian Sea and from the Thracian to the Libyan Sea. An isolated population exists in the Amvrakikos Gulf.	
1224	*Caretta caretta*	sandy shores	coastal and open sea	Degradation of nesting beaches and the nearby sea area due to the development of coastal areas, light pollution, nuisance and intensive tourist use of	Greek seas, nesting colonies in the Ionian (Zakynthos, Kyparissia Gulf, etc.)	

				beaches, entanglement in fishing gear, intentional killing, ingestion of plastic waste, climate change		

Prepared by: (NCC, 2021)

ANNEX E PHOTOGRAPHIC DOCUMENTATION

Study Area

Photographs	
	
	
	

Prepared by: (NCC, 2021)

Field Survey Area

Photograph	Filename / Date
	T_20210612_150156_Σημείο_79_20210617_122012.jpg
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Prepared by: (NCC, 2021)

ANNEX F MAPS

REFERENCE DOCUMENTS / DRAWINGS
ΣΧΕΤΙΚΑ ΕΓΓΡΑΦΑ / ΣΧΕΔΙΑ

DOCUMENT / ΑΡ. ΕΓΓΡΑΦΟΥ	

LEGEND/ ΥΠΟΜΝΗΜΑ

Project Components / Στοιχεία του Έργου

- Proposed Routing / Προτεινόμενη Όδευση
- Proposed Routing (offshore) / Προτεινόμενη Όδευση (θαλάσσιο τμήμα)
- Study Area / Περιοχή Μελέτης

Rev. Αναθ.	Date Ημερομ.	Description Περιγραφή	Drawn Σχεδίαση	Checked Έλεγχος	Approved Έγκριση
0A	9/1/2022	ISSUED FOR REVIEW	NCC Ltd	PiM	Client

Contract No: / Αρ. Συμβολαίου: project code

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Projection: Mercator Auxiliary Sphere
Datum: WGS 1984
WKID: 3857 Authority: EPSG

COMPANY / ΕΤΑΙΡΕΙΑ: IGI Poseidon

ENGINEER/CONSULTANT ΜΗΧΑΝΙΚΟΣ/ ΜΕΛΕΤΗΤΗΣ: Asprofos engineering, ERM

PROJECT TITLE - ΤΙΤΛΟΣ ΕΡΓΟΥ

EASTMED PIPELINE PROJECT - GREEK SECTION/
ΕΡΓΟ ΑΓΩΓΟΥ ΦΥΣΙΚΟΥ ΑΕΡΙΟΥ EASTMED - ΕΛΛΗΝΙΚΟ ΤΜΗΜΑ

DOCUMENT TITLE - ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ

APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE "SAC - GR4320006" /
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 "ΕΖΔ - GR4320006"

Map n°:	
M1-F1 S01	*STUDY AREA: NATURA 2000 SITES CROSSED BY ONSHORE EASTMED PIPELINE / ΠΕΡΙΟΧΗ ΜΕΛΕΤΗΣ: ΠΕΡΙΟΧΕΣ NATURA 2000 ΠΟΥ ΤΕΜΝΕΙ Ο ΑΓΩΓΟΣ EASTMED*

Scale/ Κλίμακα	Project DWG No./ Αρ. Σχ. Έργου:	Rev/ Αναθ
1:2.500.000		0A

Size/ Μέγεθος	Company's DWG No/ Αρ. Σχ. Εταιρείας:	Engineer's DWG No/ Αρ. Σχ. Μελετητή:	Sheet/ Φύλλο
A3	-	AUT-11727500-STU-XXX/ Section 11.1.1	

Document Name: Map1_PROJECT_ver3.1_2022.01.09

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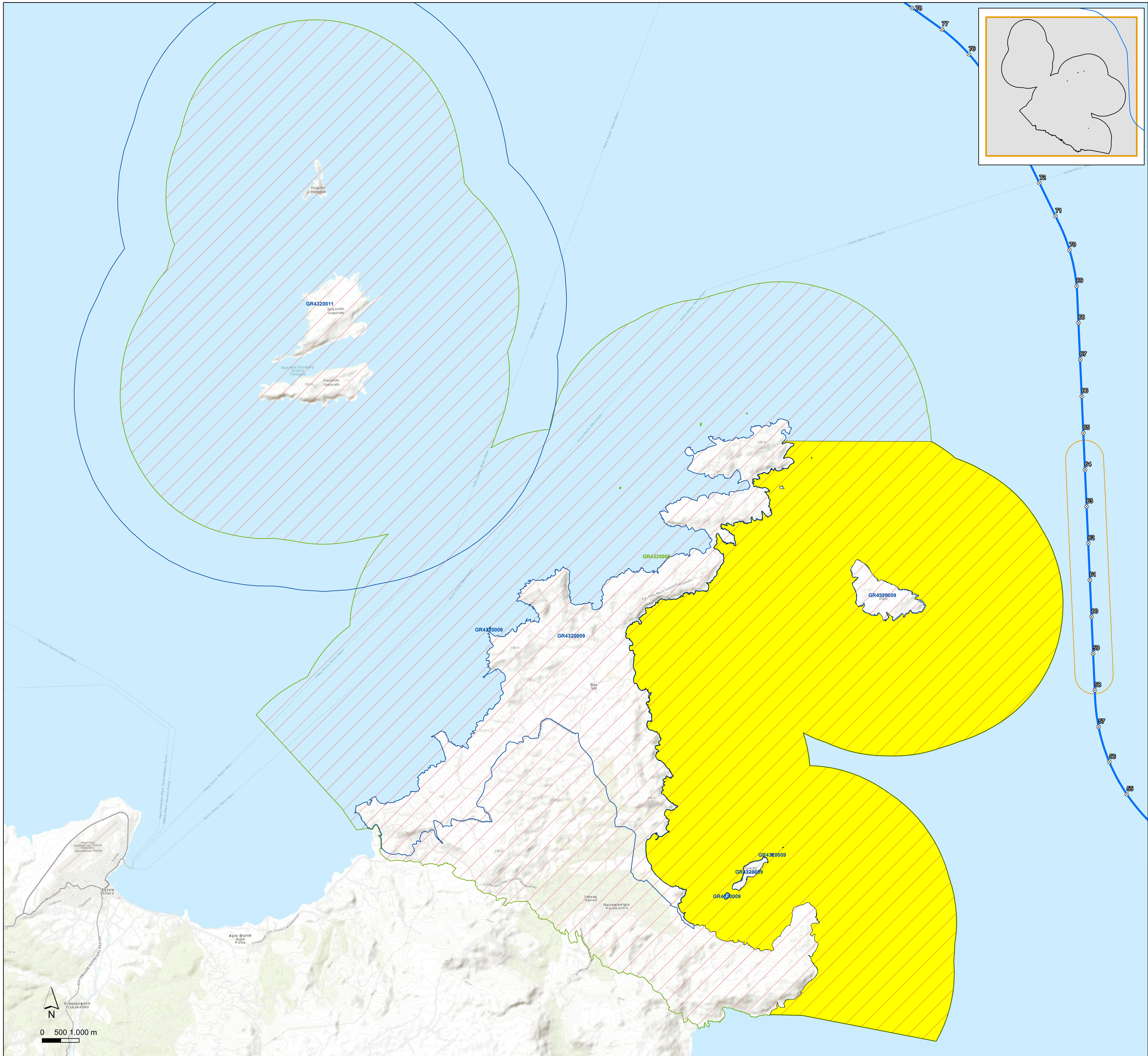


REFERENCE DOCUMENTS / DRAWINGS
ΣΧΕΤΙΚΑ ΕΓΓΡΑΦΑ / ΣΧΕΔΙΑ

DOCUMENT / ΑΡ. ΕΓΓΡΑΦΟΥ	DOCUMENT TITLE / ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ
M2-F01 S01A01	APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE "SAC GR4320006" FOR THE OFFSHORE SECTION OF EASTMED PIPELINE PROJECT ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 "SAC GR4320006" ΓΙΑ ΤΟ ΘΑΛΑΣΣΙΟ ΤΜΗΜΑ ΤΟΥ ΔΙΑΣΥΝΔΕΤΗΡΙΟΥ ΑΓΩΓΟΥ ΦΥΣΙΚΟΥ ΑΕΡΙΟΥ EASTMED

LEGEND/ ΥΠΟΜΝΗΜΑ

Project Components / Στοιχεία του Έργου

- Offshore Routing Chainage (1 km) / Χιλιομέτρηση Όδευσης θαλάσσιου τμήματος (1 χλμ.)
- Routing Chainage (5km) / Χιλιομέτρηση Όδευσης (5 χλμ.)
- Proposed Routing (offshore) / Προτεινόμενη Όδευση (θαλάσσιο τμήμα)
- Proposed Routing (onshore) / Προτεινόμενη Όδευση (χερσαίο τμήμα)
- Study Area / Περιοχή Μελέτης
- Field Survey Area inside Natura 2000 site / Περιοχή Έρευνας Πεδίου εντός περιοχής Natura 2000
- Field Survey Area / Περιοχή Έρευνας Πεδίου

Natura 2000 Network / Δίκτυο Natura 2000

- SAC/ΕΖΔ: Special Area of Conservation / Ειδική Ζώνη Διατήρησης
- SPA/ΖΕΠ: Special Protection Areas / Ζώνη Ειδικής Προστασίας

NOTES/ ΣΗΜΕΙΩΣΕΙΣ

Rev. Αναθ.	Date Ημερομ.	Description Περιγραφή	Drawn Σχεδίαση	Checked Έλεγχος	Approved Έγκριση
0A	23/2/2022	ISSUED FOR REVIEW	NCC Ltd	PjM	Client

Contract No:
Αρ. Συμβολαίου:

Coord. Syst.: Greek Grid
Projection: Transverse Mercator
Datum: GGRS 1987
WKID: 2100 Authority: EPSG

COMPANY / ΕΤΑΙΡΕΙΑ: IGI Poseidon

ENGINEER/ CONSULTANT: Asprofos engineering, ERM

PROJECT TITLE - ΤΙΤΛΟΣ ΕΡΓΟΥ

EASTMED PIPELINE PROJECT - GREEK SECTION/
ΕΡΓΟ ΑΓΩΓΟΥ ΦΥΣΙΚΟΥ ΑΕΡΙΟΥ EASTMED - ΕΛΛΗΝΙΚΟ ΤΜΗΜΑ

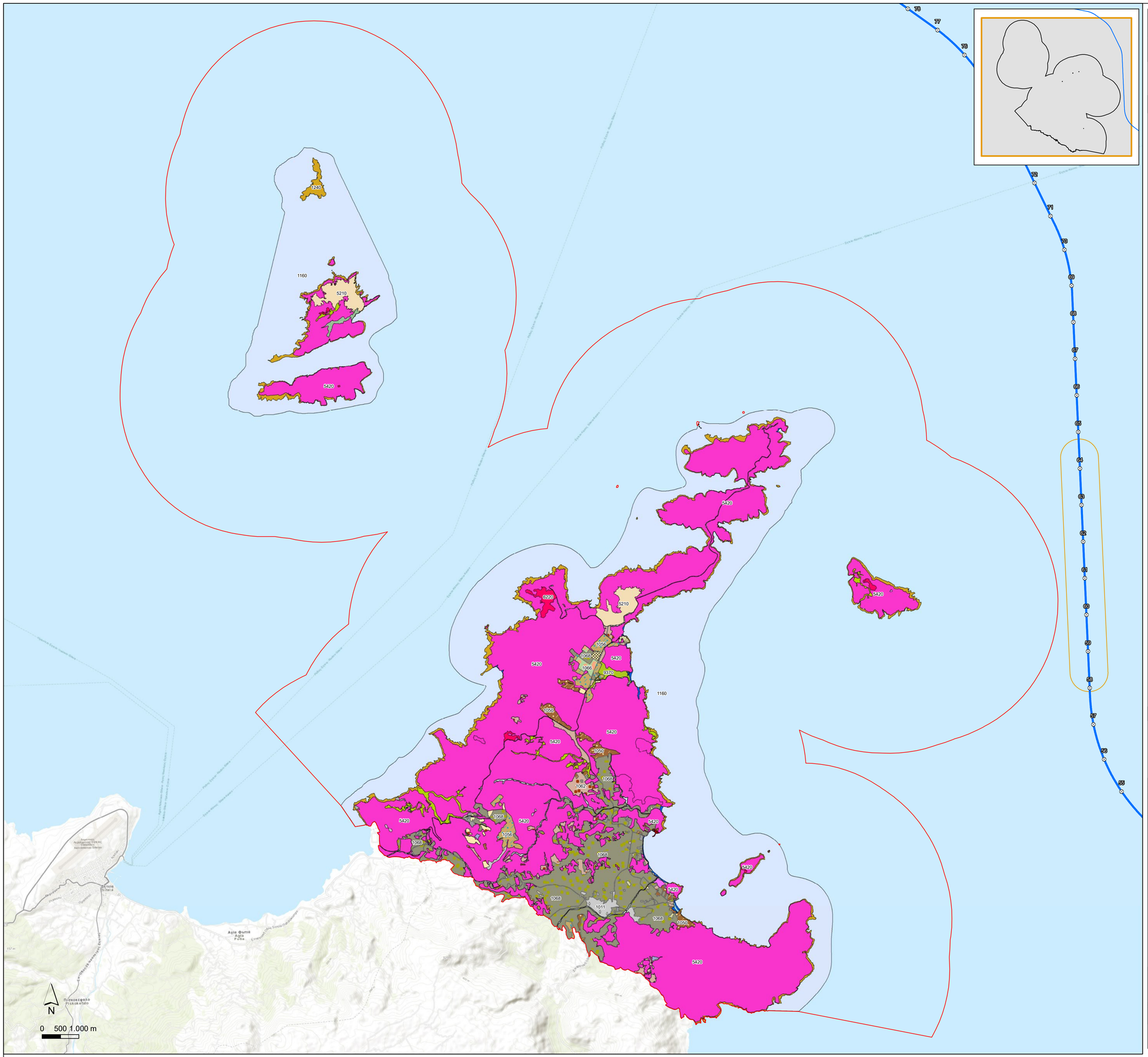
DOCUMENT TITLE - ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ

APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE "SAC - GR4320006" /
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 "ΕΖΔ - GR4320006"

Map n°: M2-F01 S01A01 — *STUDY AREA / ΠΕΡΙΟΧΗ ΜΕΛΕΤΗΣ*

Scale/Κλίμακα	Project DWG No./ Αρ. Σχ. Έργου:		Rev/Αναθ
1:50.000			0A
Size/Μέγεθος A1	Company's DWG No/ Αρ. Σχ. Εταιρείας: -	Engineer's DWG No/ Αρ. Σχ. Μελετητή: AUT-11727500-STU-XXX/ Section 11.1.1	Sheet/Φύλλο 1 of 1

Document Name: Map2_STUDY_AREA_ver3.1_2022.01.09_A1_offshore



REFERENCE DOCUMENTS / DRAWINGS
ΣΧΕΤΙΚΑ ΕΓΓΡΑΦΑ / ΣΧΕΔΙΑ

DOCUMENT / ΑΡ. ΕΓΓΡΑΦΟΥ	DOCUMENT TITLE / ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ
M3-F01 S01A01	APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE "SAC GR4320006" FOR THE OFFSHORE SECTION OF EASTMED PIPELINE PROJECT ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 "SAC GR4320006" ΓΙΑ ΤΟ ΘΑΛΑΣΣΙΟ ΤΜΗΜΑ ΤΟΥ ΔΙΑΣΥΝΔΕΤΗΡΙΟΥ ΑΓΩΓΟΥ ΦΥΣΙΚΟΥ ΑΕΡΙΟΥ EASTMED

LEGEND/ ΥΠΟΜΝΗΜΑ

Project Components / Στοιχεία του Έργου

- Offshore Routing Chainage (1 km) / Χιλιομέτρηση Όδευσης θαλάσσιου τμήματος (1 χλμ.)
- Proposed Routing (offshore) / Προτεινόμενη Όδευση (θαλάσσιο τμήμα)
- Study Area / Περιοχή Μελέτης
- Field Survey Area / Περιοχή Έρευνας Πεδίου

Habitat types - Annex I (92/43/EEC) / Τύποι οικοτόπων - Παράρτημα I (92/43/ΕΟΚ)

- 1150 *Coastal lagoons / *Παράκτιες λιμνοθάλασσες
- 1160 Large shallow inlets and bays / Αβαθείς κολπίσκοι και κόλποι
- 1240 Vegetated sea cliffs of the Mediterranean coasts with endemic Limonium spp. / Απόκρημνες βραχώδεις ακτές με βλάστηση στη Μεσόγειο με ενδημικά Limonium spp.
- 1310 Salicornia and other annuals colonising mud and sand / Πρωτογενής βλάστηση με Salicornia και άλλα μονοετή είδη των λασπωδών και αμμωδών ζωνών
- 1410 Mediterranean salt meadows (Juncetalia maritimi) / Μεσογειακά αλίπεδα (Juncetalia maritimi)
- 1420 Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi) / Μεσογειακές και θερμοατλαντικές αλόφιλες λόχμες (Sarcocornietea fruticosi)
- 1430 Halo-nitrophilous scrubs (Pegano-Salsoletea) / Αλο-νιτρόφιλες λόχμες (Pegano-Salsoletea)
- 2110 Embryonic shifting dunes / Υποτυπώδεις κινούμενες θίνες
- 2230 Malcolmietalia dune grasslands / Θίνες με λειμώνες με Malcolmietalia
- 5210 Arborescent matorral with Juniperus spp. / Δενδρώδη matorrals με Juniperus spp.
- 5330 Thermo-Mediterranean and pre-desert scrub / Θερμο-μεσογειακές και προερημικές λόχμες
- 5420 Sarcopoterium spinosum phryganas / Φρύγανα από Sarcopoterium spinosum
- 6220 *Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea / *Ψευδοστέππα με αγρωστώδη και μονοετή φυτά της Thero-Brachypodietea
- 7210 Calcareous fens with Cladium mariscus and species of the Caricion davallianae / *Ασβεστούχοι βάλτοι με Cladium mariscus και είδη της Caricion davallianae
- 8210 Calcareous rocky slopes with chasmophytic vegetation / Ασβεστολιθικά βραχώδη πρανή με χασμόφυτα
- 92D0 Southern riparian galleries and thickets (Nerio-Tamaricetea and Securinegion tinctoriae) / Νότια παρόχθια δάση-στοές και λόχμες (Nerio -Tamaricetea και Securinegion tinctoriae)
- 9320 Olea and Ceratonia forests / Δάση με Olea και Ceratonia
- 9370 *Palm groves of Phoenix / *Φοινικοδάση του Phoenix

Habitat types - Others (not listed in the Annex I of 92/43/EEC) / Τύποι οικοτόπων - Λοιποί (εκτός Παραρτήματος Ι της 92/43/ΕΟΚ)

- 1011 Villages and settlements / Χωριά και οικισμοί
- 1012 Services areas / Χώροι εξυπηρετήσεων
- 1013 Secondary settlements / Δευτερεύοντες οικισμοί
- 1021 Concentration of agricultural - processing units / Συγκεντρώσεις αγροτικών - μεταποιητικών μονάδων
- 1023 National roads / Δρόμοι εθνικοί
- 1024 Provincial roads / Δρόμοι επαρχιακοί
- 1025 Provincial roads / Δρόμοι επαρχιακοί
- 1029 Port areas / Ζώνες λιμένων
- 1030 Mineral extraction sites / Χώροι εξόρυξης - επεξεργασίας ορυκτών, αδρανών κ.λπ.
- 1031 Dump sites / Χώροι απόρριψης απορριμμάτων
- 1032 Construction sites / Χώροι δόμησης
- 1041 Sport and leisure facilities / Εγκαταστάσεις αθλητισμού και αναψυχής
- 1050 Non-irrigated arable land - pure / Μη αρδευόμενη-ξηρή γη αμιγής
- 1056 Permanently irrigated land / Μόνιμα αρδευόμενη γη αμιγής
- 1060 Vineyards - pure / Αμπελώνες αμιγείς
- 1062 Abandoned cultivation / Εγκαταλελειμμένες καλλιέργειες
- 1066 Fruit trees and berry plantations - pure / Οπωροφόρα δέντρα & φυτείες (αμιγή)
- 1068 Olive groves - pure / Ελαιώνες αμιγείς
- 21B0 Unvegetated sandy beaches / Αμμώδεις παραλίες χωρίς βλάστηση
- 8250 Unvegetated rocky bed (terrestrial ecosystems) / Βραχώδες υπόστρωμα που δεν καλύπτεται από βλάστηση
- 9620 Unvegetated river bed / Κοίτη ποταμού χωρίς βλάστηση

NOTES/ ΣΗΜΕΙΩΣΕΙΣ

Rev. Αναθ.	Date Ημερομ.	Description Περιγραφή	Drawn Σχεδίαση	Checked Έλεγχος	Approved Έγκριση
0A	24/2/2022	ISSUED FOR REVIEW	NCC Ltd	PJM	Client

Contract No:
Αρ. Συμβολαίου: project code

Coord. Syst.: Greek Grid
Projection: Transverse Mercator
Datum: GGRS 1987
WKID: 2100 Authority: EPSG

COMPANY / ΕΤΑΙΡΕΙΑ: IGI Poseidon

ENGINEER/ CONSULTANT: Asprofos engineering, ERM

PROJECT TITLE - ΤΙΤΛΟΣ ΕΡΓΟΥ

EASTMED PIPELINE PROJECT - GREEK SECTION/
ΕΡΓΟ ΑΓΩΓΟΥ ΦΥΣΙΚΟΥ ΑΕΡΙΟΥ EASTMED - ΕΛΛΗΝΙΚΟ ΤΜΗΜΑ

DOCUMENT TITLE - ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ

APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE "SAC - GR4320006" /
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 " - GR4320006"

Map n°:	
M3-F01 S01A01	*HABITAT TYPES - ECOLOGICAL SPATIAL UNITS INSIDE STUDY AREA /* *ΤΥΠΟΙ ΟΙΚΟΤΟΠΩΝ - ΟΙΚΟΛΟΓΙΚΕΣ ΧΩΡΙΚΕΣ ΕΝΟΤΗΤΕΣ* *ΣΤΗΝ ΠΕΡΙΟΧΗ ΜΕΛΕΤΗΣ*

Scale/Κλίμακα	Project DWG No./ Αρ. Σχ. Έργου:		Rev./Αναθ
1:50.000			0A
Size/Μέγεθος A1	Company's DWG No/ Αρ. Σχ. Εταιρείας -	Engineer's DWG No/ Αρ. Σχ. Μελετητή: AUT-11727500-STU-XXX/ Section 11.1.1	Sheet/Φύλλο 1 of 1

Document Name: Map3_HABITATS-OXE_ver3.1_2022.02.14_A1_offhore

REFERENCE DOCUMENTS / DRAWINGS
ΣΧΕΤΙΚΑ ΕΓΓΡΑΦΑ / ΣΧΕΔΙΑ

DOCUMENT TITLE / ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ

APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE " GR4320006"
FOR THE ONSHORE SECTION OF EASTMED PIPELINE PROJECT
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 " GR4320006"
ΓΙΑ ΤΟ ΘΑΛΑΣΣΙΟ ΤΜΗΜΑ ΤΟΥ ΔΙΑΣΥΝΔΕΤΗΡΙΟΥ ΑΓΩΓΟΥ ΦΥΣΙΚΟΥ ΑΕΡΙΟΥ EASTMED

LEGEND/ ΥΠΟΜΝΗΜΑ

Project Components / Στοιχεία του Έργου

- Offshore Routing Chainage (1 km) / Χιλιομέτρηση Όδευσης θαλάσσιου τμήματος (1 χλμ.)
- Proposed Routing (offshore) / Προτεινόμενη Όδευση (θαλάσσιο τμήμα)
- Study Area / Περιοχή Μελέτης
- Field Survey Area inside Natura 2000 site / Περιοχή Έρευνας Πεδίου εντός περιοχής Natura 2000
- Field Survey Area / Περιοχή Έρευνας Πεδίου

Natura 2000 Network / Δίκτυο Natura 2000

- SAC/ΕΖΔ: Special Area of Conservation / Ειδική Ζώνη Διατήρησης
- SPA/ΖΕΠ: Special Protection Area / Ζώνη Ειδικής Προστασίας

NOTES/ ΣΗΜΕΙΩΣΕΙΣ

Rev. Αναθ.	Date Ημερομ.	Description Περιγραφή	Drawn Σχεδίαση	Checked Έλεγχος	Approved Έγκριση
0A	28/2/2022	ISSUED FOR REVIEW	NCC Ltd	PiM	Client

Contract No:
Αρ. Συμβολαίου:

Coordinate System: Greek Grid
Projection: Transverse Mercator
Datum: GGRS 1987
WKID: 3857 Authority: EPSG

COMPANY / ΕΤΑΙΡΕΙΑ
IGI Poseidon

ENGINEER/CONSULTANT
ΜΗΧΑΝΙΚΟΣ/ ΜΕΛΕΤΗΤΗΣ
Asprofos engineering
ERM

PROJECT TITLE - ΤΙΤΛΟΣ ΕΡΓΟΥ

EASTMED PIPELINE PROJECT - GREEK SECTION/
ΕΡΓΟ ΑΓΩΓΟΥ ΦΥΣΙΚΟΥ ΑΕΡΙΟΥ EASTMED - ΕΛΛΗΝΙΚΟ ΤΜΗΜΑ

DOCUMENT TITLE - ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ

APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE " - GR4320006" /
ΕΙΔΙΚΗ ΟΙΚΟΛΟΠΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 " - GR4320006"

Map n°: M4-F01 S01A01	*FIELD SURVEY AREA / ΠΕΡΙΟΧΗ ΕΡΕΥΝΑΣ ΠΕΔΙΟΥ*	
Scale/ Κλίμακα 1:70.000	Project DWG No./ Αρ. Σχ. Έργου:	Rev/ Αναθ 0A
Size/ Μέγεθος A3	Company's DWG No/ Αρ. Σχ. Εταιρείας: -	Engineer's DWG No/ Αρ. Σχ. Μελετητή: AUT-11727500-STU-XXX/ Section 11.1.1
		Sheet/ Φύλλο 1 of 1

Document Name: Map4_PEP_ver3.2_2022.02.28_A3_offshore

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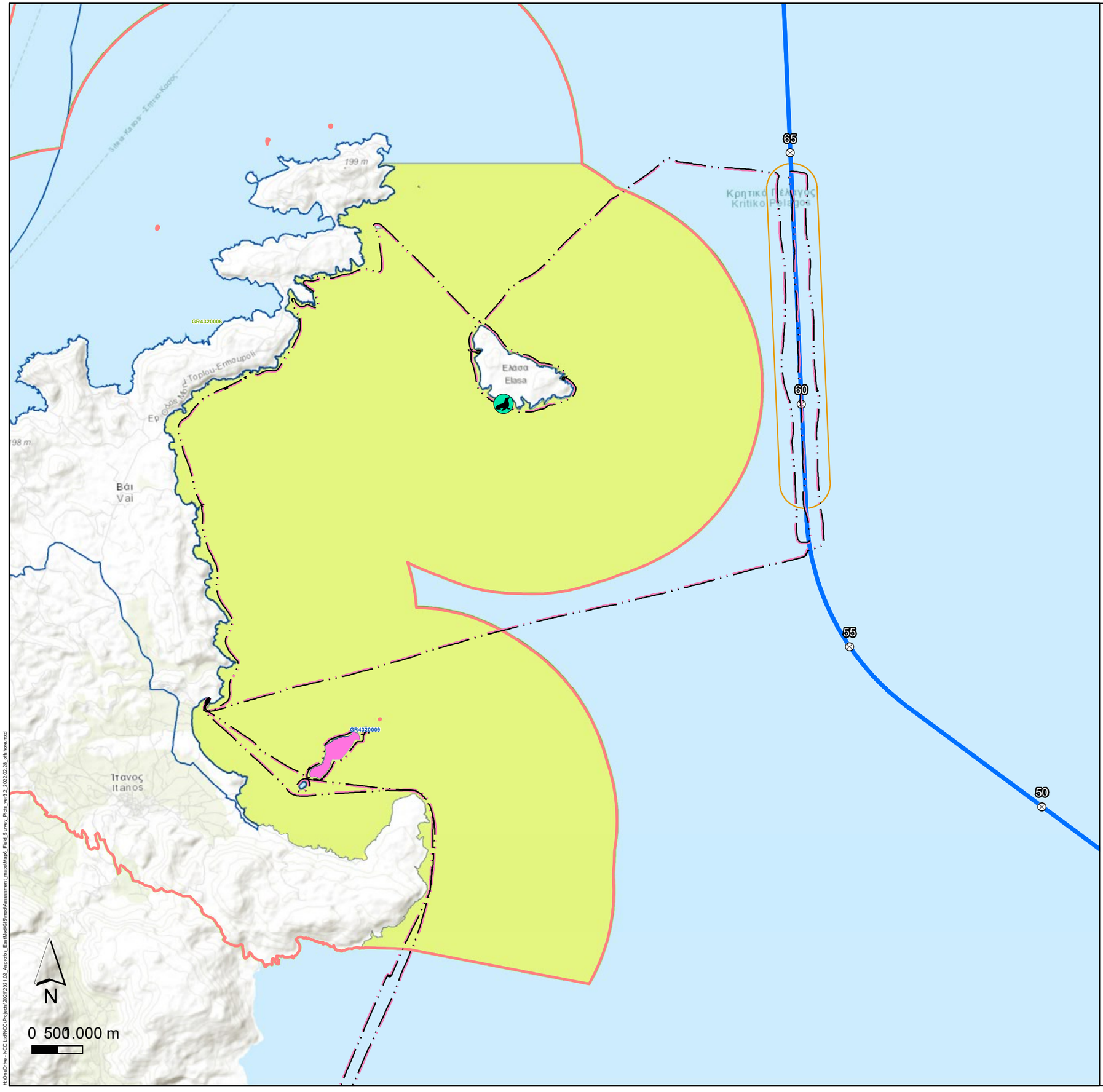

REFERENCE DOCUMENTS / DRAWINGS
ΣΧΕΤΙΚΑ ΕΓΓΡΑΦΑ / ΣΧΕΔΙΑ

DOCUMENT TITLE / ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ

APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE " GR4320006"
FOR THE ONSHORE SECTION OF EASTMED PIPELINE PROJECT
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 " GR4320006"
ΓΙΑ ΤΟ ΘΑΛΑΣΣΙΟ ΤΜΗΜΑ ΤΟΥ ΔΙΑΣΥΝΔΕΤΗΡΙΟΥ ΑΓΩΓΟΥ ΦΥΣΙΚΟΥ ΑΕΡΙΟΥ EASTMED

LEGEND/ ΥΠΟΜΝΗΜΑ

Project Components / Στοιχεία του Έργου

- Offshore Routing Chainage (5 km) / Χιλιομέτρηση Όδευσης θαλάσσιου τμήματος (5 χλμ.)
- Proposed Routing (offshore) / Προτεινόμενη Όδευση (θαλάσσιο τμήμα)
- Study Area / Περιοχή Μελέτης
- Field Survey Area / Περιοχή Έρευνας Πεδίου
- Field Survey Area inside Natura 2000 site / Περιοχή Έρευνας Πεδίου εντός περιοχής Natura 2000
- Monk seal marine caves
- Marine survey tracks
- Larus audouinii colony islet

Natura 2000 Network / Δίκτυο Natura 2000

- SAC/ΕΖΔ: Special Area of Conservation / Ειδική Ζώνη Διατήρησης
- SPA/ΖΕΠ: Special Protection Areas / Ζώνη Ειδικής Προστασίας

NOTES/ ΣΗΜΕΙΩΣΕΙΣ

Rev. Αναθ.	Date Ημερομ.	Description Περιγραφή	Drawn Σχεδίαση	Checked Έλεγχος	Approved Έγκριση
0A	28/2/2022	ISSUED FOR REVIEW	NCC Ltd	PiM	Client

Contract No:
Αρ. Συμβολαίου:

Coordinate System: Greek Grid
Projection: Transverse Mercator
Datum: GGRS 1987
WKID: 3857 Authority: EPSG

COMPANY / ΕΤΑΙΡΕΙΑ: IGI Poseidon

ENGINEER/CONSULTANT ΜΗΧΑΝΙΚΟΣ/ ΜΕΛΕΤΗΤΗΣ: Asprofos engineering, ERM

PROJECT TITLE - ΤΙΤΛΟΣ ΕΡΓΟΥ

EASTMED PIPELINE PROJECT - GREEK SECTION/
ΕΡΓΟ ΑΓΩΓΟΥ ΦΥΣΙΚΟΥ ΑΕΡΙΟΥ EASTMED - ΕΛΛΗΝΙΚΟ ΤΜΗΜΑ

DOCUMENT TITLE - ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ

APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE " - GR4320006" /
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 " - GR4320006"

Map n°:	*FIELD SURVEY PLOTS / ΣΗΜΕΙΑ ΔΕΙΓΜΑΤΟΛΗΨΙΑΣ*	
M6-F01 S01A01		
Scale/ Κλίμακα: 1:75.000	Project DWG No./ Αρ. Σχ. Έργου:	Rev/ Αναθ: 0A
Size/ Μέγεθος: A3	Company's DWG No/Αρ. Σχ. Εταιρείας: -	Engineer's DWG No/ Αρ. Σχ. Μελετητή: AUT-11727500-STU-XXX/ Section 11.1.1
		Sheet/ Φύλλο: 1 of 1

Document Name: Map6_Field_Survey_Plots_ver3.2_2022.02.28_offshore

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