




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 shall be awarded. Currently, it is not defined the manner of awarding or the number of engaged contractors.
EC	European Commission
ECP	EastMed Compression Platform
EIA	Environmental Impact Assessment
EKPAA	National Center for Environment and Sustainable Development
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



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Abbreviation	Description
km	Kilometers
LFi	Landfall
m	meters
MD	Ministerial Decision
MEE	Ministry of Environment & Energy
NCC	Nature Conservation Consultants Ltd.
O&M	Dispatching and Operation & Maintenance Building
OFYPEKA	Organization of Natural Environment and Climate Change
Onshore Stations	<ul style="list-style-type: none"> <li>Compressor and Metering Stations at Crete,</li> <li>Compressor Station at Achaia,</li> <li>Metering/ Pressure Regulating and Heating Station at Megalopoli.</li> </ul>
PGM	Permanent Ground Markers
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 Company equally owned (50-50%) by DEPA International Projects and Edison, incorporated under Greek law
RCM	Reliability Centered Maintenance
SAC	Special Area of Conservation
SDF	Standard Data Form
SPA	Special Protection Area
SPT	System Pressure Test
WS	Working Strip

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## 1 INTRODUCTION

### 1.1 Legal framework for the conduction of Appropriate Assessment for the SPA/SAC “Oropedio Foliois”, GR2330002

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

The EastMed Pipeline Project has offshore and onshore sections and is 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 Protection Area/Special Area of Conservation “Oropedio Foliois”, GR2330002**, focusing mainly on the portion directly crossed by the Onshore section of the pipeline (Figure 2-1).

In the framework of the present AA, NCC established an official communication with the Management Body of Kotychi-Strofylia wetlands and Kyparissiakos Gulf, the responsible Body for the management and protection of the site and requested the most up to date information on habitats, flora, avifauna and fauna monitoring in the site available from its' biodiversity data-bank.

#### 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

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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 Protection Area/Special Area of Conservation (SPA/SAC) “Oropedio Folois”, GR2330002, **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 the present AA.

The field survey was carried out for an overall period of 26 days between March 2021 and December 2021, including the following activities:




- Collection of field data on avifauna and other fauna species of interest present in the section of the Natura 2000 site directly crossed by the pipeline by ornithologists and fauna experts;
- Collection of field data on habitats and flora by habitat expert at the same section;

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

For the preparation of the AA a number of assumptions have been made:

- The assessment was based on Project design data available to date. Reliable assumptions on the following key elements on the base of existing bibliography on pipeline construction: (a) total duration, (b) specifications concerning the project within the Study Area have been made.
- The AA is in alignment with the ESIA.
- The present AA focused solely on the normal operative conditions of the project operation phase . 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.
- The decommissioning phase of the project was not taken into account in the present 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.

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## 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, respectively), 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 the 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, the L. 4014/2011 and the MD 170225/2014 are defining in detail the implementation of respective provisions. The national legislation includes also the Law 3937/11 “Conservation of biodiversity and other provisions”.

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

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- The consequences of every project must be examined separately and in accordance with other existing projects or plans in the site,
- The criteria must be based on preserving the integrity of the site, along with keeping in mind the conservation objectives,
- In the case 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 the JMD 50743/2017, while the Management Bodies for all the Natura 2000 sites are set by the Laws 4519/2018 and 4685/2020. According to Law 4685/2020 the Organization of Natural Environment and Climate Change (OFYPEKA) was established and operates as the successor of the National Center for Environment and Sustainable Development (EKPAΑ). Among other things, the purpose of OFYPEKA is the implementation of the policy set by the Ministry of Environment and Energy for the management of Natura 2000 protected areas in Greece.




### **1.3.3 Environmental authorization of activities and projects**

According to Law 4014/2011, the environmental authorisation 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 the Greek MD 1958/2012 and its subsequent amendments (Greek Decrees MD 20741/2012, MD 65150/1780, MD 173829/2014 and MD 37674/2016), the Projects are classified in two categories: Category A, when they potentially may cause very significant/significant environmental impacts, or in Category B, when they may cause only locally or of no significance environmental impacts.

The content of the Appropriate Assessment was specified by the 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,

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- 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 Categorization
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
<p>* The classification presents the activity most relevant to the Project. The applicable provisions concern also the compressor stations.</p> <p><i>It is noted that the compressor stations, having a total capacity &gt;50 MW, fall into 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"</i></p>		

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## 2 STUDY AREA – FIELD SURVEY AREA

According to the AA specifications (MD 170225/2014) the whole Natura 2000 site, crossed or affected by the project should be defined as Study Area; hence the Study Area for the present AA is the SPA/SAC “Oropedio Folois”, GR2330002. As shown in Figure 2-1 the routing of the Onshore pipeline crosses for 10.2 km its central to southern part.




According to the National regulatory specifications, the Field Survey Area (FSA) for linear projects (such as the pipeline) is defined as a buffer zone of at least 500m either side of the linear infrastructure falling within the Study Area. Consequently, the FSA for the present AA is an area of 1km in width and of 10.2km in length within the Natura 2000 site, strictly considering the intersection between the pipeline and the site. However, given that:

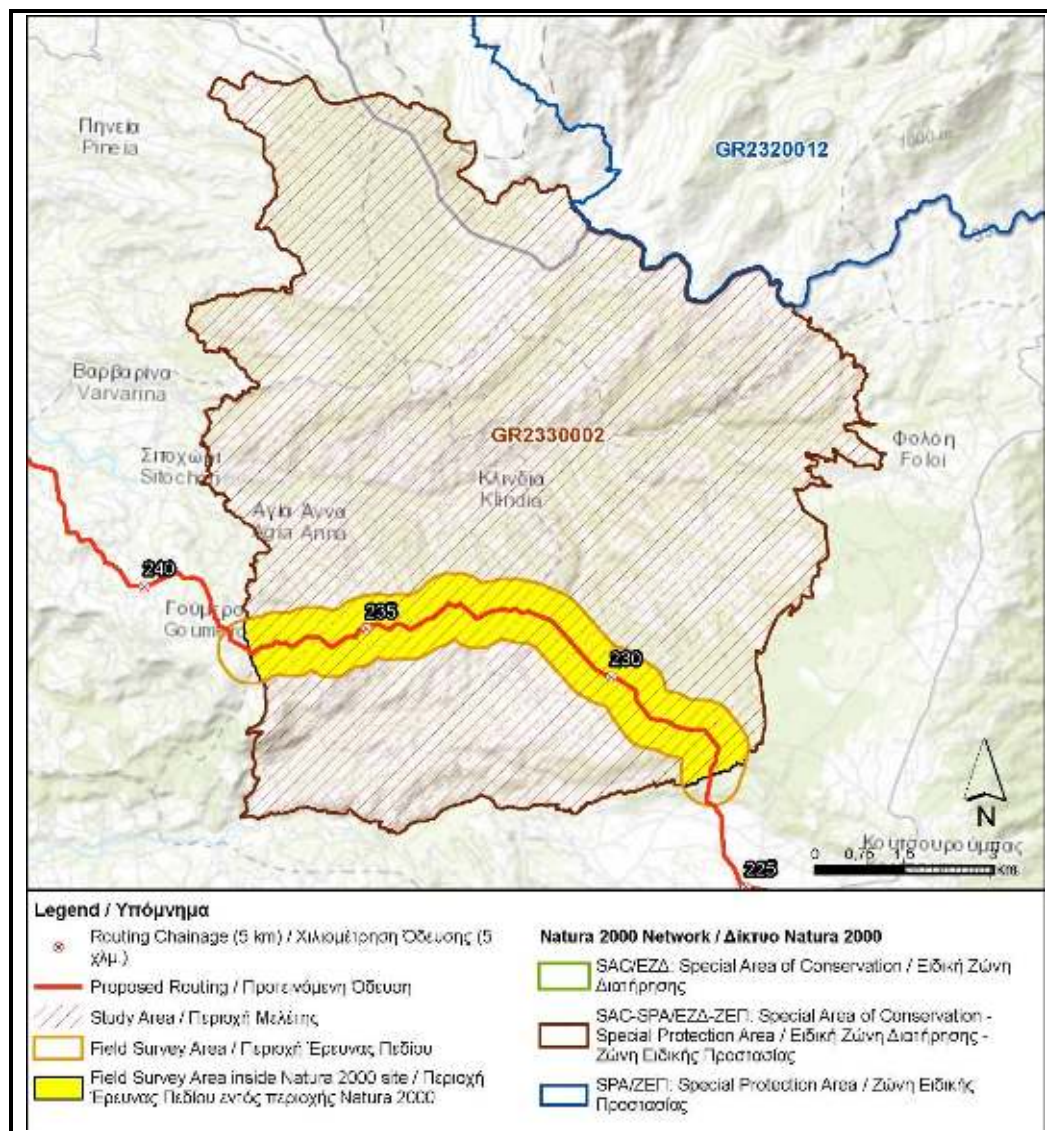
- the routing of the project extends also outside the Natura 2000 site and at its immediate vicinity; and
- the construction of the project outside the Natura 2000 site may affect the defined buffer zone within the site;

a slightly larger FSA area was considered, covering a total surface area of 1,068ha, of which 985ha overlaps with the Natura 2000 site (10.1% of the site’s area) (Figure 2-2).

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






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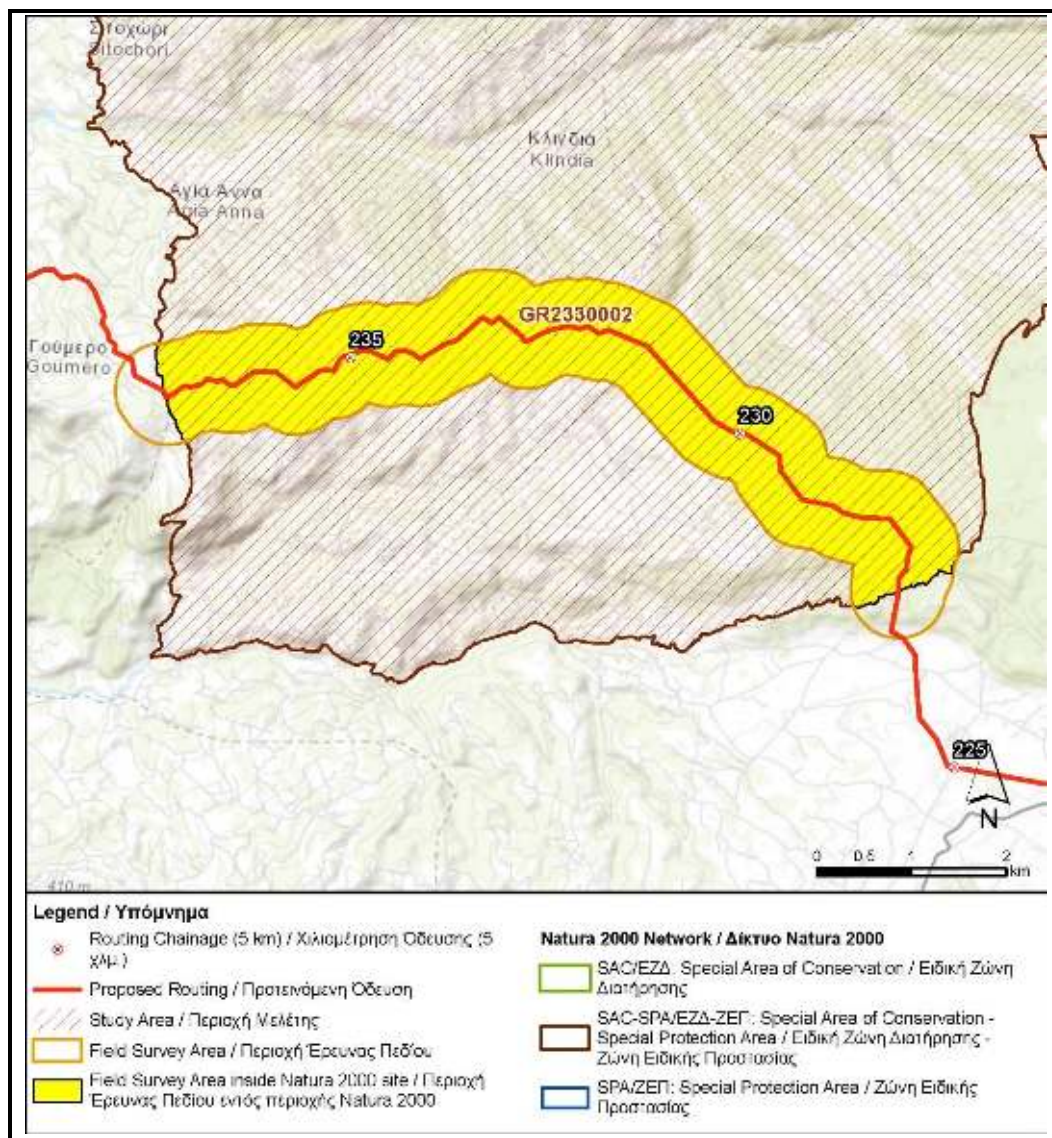


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**Figure 2-1 Study Area (red hatch) and Field Survey Area (orange). Pipeline routing in red**






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

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### 3 CURRENT STATUS OF NATURAL ENVIRONMENT

According to the specifications of MD 170225/ 2014, the characterization 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.

The present section focuses on the whole SPA/SAC ecosystem providing data on existing baseline conditions of the site. Information on the FSA is provided based on fieldwork collected data.

#### 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 the literature, enriched by the findings of the dedicated field surveys performed for the development of this AA.

In particular, for the purpose of the present 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 bibliographic sources of information used include:




- The Standard Data Form of SPA/SAC Area GR2330002 (2020).
- 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:

- Determination of compatible activities in relation to the avifauna trigger species of the Special Protection Areas. (Dimalexis et al., 2009).
- Action Plans for species at National and European level.
- The most recent Red Data Books (national, European, international).
- Important Bird Areas in Greece: Priority Areas for Biodiversity Conservation (Portolou et al., 2009)

##### 3.1.1 Short description of the Study Area

The Study Area is the Special Area of Conservation and Special Protection Area “Oropedio Foliois”, GR2330002, which is located within the administrative limits of the Region of Western Greece covering an area of 9,748.58 hectares. The area is managed by the Management Body of Kotychi-Strofylia wetlands and Kyparissiakos Gulf.

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The site is characterized by forests of *Quercus frainetto*. On the westerly exposed sites, *Quercus frainetto* is found mixed with *Pinus halepensis* while at the edge of the forest it is mixed with evergreen broad-leaved species, which also represent its understorey. The absence of natural regeneration is quite characteristic together with illegal tree-felling and the presence of a mosaic of cultivated and grazed land. The woodlands of the site also contain a seed producing population of *Pinus nigra* species. The *Pinus halepensis* woods cover lower altitudes up to 700m and are used by farmers for resin collection. Their understorey is composed of evergreen broad-leaved species. In the lower altitudes some parts of the formations, which had previously experienced fires, are now at the stage of natural regeneration. The presence of maquis vegetation is uniform in a small limestone area and occurs as an understorey of *Pinus halepensis* and in the lower part of *Quercus frainetto* formations. The area around the human settlements is occupied by phrygana, abandoned fields and wooded areas. Cultivated land covers areas around the buildings but also occurs in the forests of *Quercus frainetto* originating from fires, transgression and tree-felling.

It is an important site for species characteristic of a mosaic of forest, pasture and olive-groves. At the site the clusters of saplings prevent soil erosion and positively affect the ecology of the area. The forests of the site are within the catchment basin of Erymanthos and Pineios rivers and help to protect the soil and the cultivated areas. Species of concern include *Dendrocopos medius* and *Emberiza caesia*.

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 Habitat types and Flora

According to the official habitat mapping, the Study Area hosts 3 habitat types of Annex I of the Directive 92/43/EEC. Most of the area is covered by forests, mainly by oaks. The rest of the area is covered by maqui, garrigues, phrygana etc. 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).

It should be noted that no priority habitat types of Annex I of Directive 92/43/EEC was recorded in the area.

**Table 3-1 Habitats types found at the site (source: SDF and official habitat mapping)**

Code	Description of habitat type	Area (ha)	Percentage (%)	Classification
Habitat types included in the SDF				

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Code	Description of habitat type	Area (ha)	Percentage (%)	Classification
91M0	Pannonian-Balkan turkey oak – sessile oak forests	4,889.13	50.15%	Annex I
9540	Mediterranean pine forests with endemic Mesogean pines	1,474.46	15.12%	Annex I
9340	<i>Quercus ilex</i> and <i>Quercus rotundifolia</i> forests	120.81	1.24%	Annex I
Other habitat types				
1051	Non-irrigated arable land - mixed	1,316.70	13.51%	
1050	Non-irrigated arable land - pure	928.70	9.53%	
1069	Olive groves - mixed	642.86	6.59%	
1068	Olive groves - pure	100.64	1.03%	
1062	Abandoned cultivation	95.66	0.98%	
1011	Villages and settlements	75.35	0.77%	
5340	Eastern Garrigues	68.40	0.70%	Of national importance
1024	Provincial roads	13.41	0.14%	
1025	Provincial roads	7.79	0.08%	
1013	Secondary settlements	6.09	0.06%	
1023	National roads	3.49	0.04%	
934A	Greek Kermes oak forests	2.74	0.03%	Of national importance
1012	Services areas	1.32	0.01%	
1061	Vineyards - mixed	0.90	0.01%	
1032	Construction sites	0.13	0.00%	

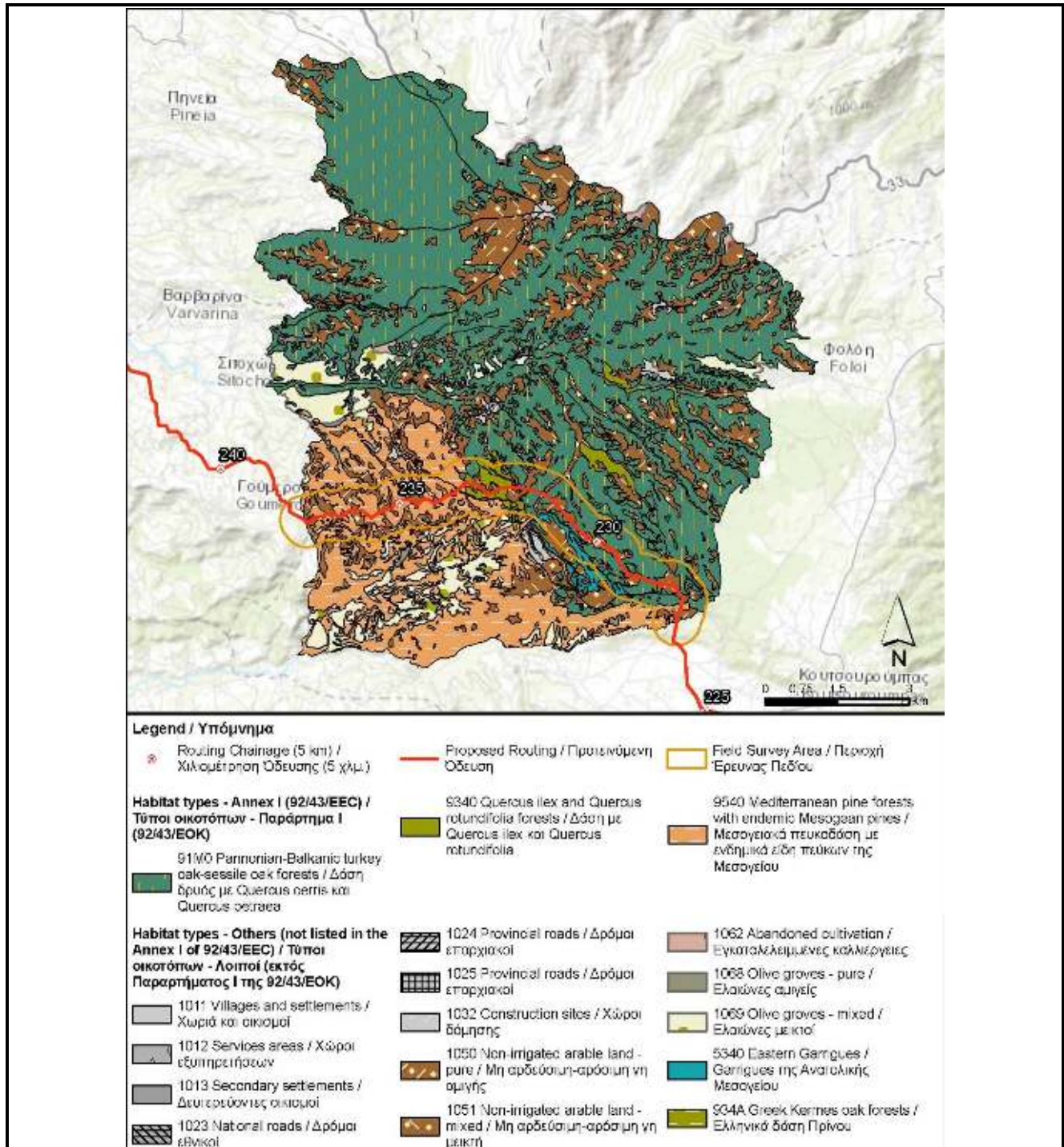
Note: HD: Habitats Directive (source: SDF and official habitat mapping)

Prepared by: (NCC, 2021)

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






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**Figure 3-1 Habitat type coverage at the Study Area**

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### 3.1.2.2 Fauna

It is an important site for species characteristic of a mosaic of forest, pasture and olive-groves. The species for which the site has been designated are 10, namely 7 mammal (*Barbastella barbastellus*, *Lutra lutra*, *Miniopterus schreibersii*, *Myotis bechsteinii*, *Myotis blythii*, *Rhinolophus ferrumequinum*, *Rhinolophus hipposideros*), 2 reptile (*Elaphe quatuorlineata*, *Testudo hermanni*) and 1 fish species (*Telestes pleurobipunctatus*). All are residents in the site and are present or common. Furthermore, ANNEX A of the present AA presents the species included in the SDF of the site, as well as their presence in the site, population and conservation assessment.

In total 6 of the above species have been characterized as Near Threatened worldwide, namely *Barbastella barbastellus*, *Elaphe quatuorlineata*, *Lutra lutra*, *Miniopterus schreibersii*, *Myotis bechsteinii*, *Testudo hermanni* (IUCN), while at national level 4 have been characterized as Near Threatened, Vulnerable or Endangered and 1 is endemic. ANNEX B of the present AA provides information concerning the threat status of the species included in the SDF of the Study Area based on the most up to data bibliographic sources.

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




### 3.1.2.3 Avifauna

It is an important site for species characteristic of a mosaic of forest, pasture and olive-groves. The trigger species of the area are *Leipicus medius* and *Emberiza caesia*.

31 species have been recorded in the Study Area and included in its Standard Data Form (SDF), of which 21 species are listed in Annex I of the Birds Directive. ANNEX A of the present AA presents the trigger species, the Annex I species of the Birds Directive and the migratory species with regular presence, included in the SDF of the SPA. Their presence in the SPA, population and conservation assessment, are also presented in ANNEX A.

Of the species included in the SDF, 7 are residents, 21 are breeding in the area, 1 overwinters in the area, 8 use it as a stopover site, during their annual migratory movements. 2 species have been characterized as rare visitors of the area. ANNEX A of the present AA also provides information concerning other species of interest included in the SDF.

One (1) species has been characterized as Near Threatened (*Alectoris graeca*) and one as Vulnerable (*Streptopelia turtur*) worldwide (IUCN), while at national level species 1 species has been characterized as Endangered (*Aquila chrysaetos*), 4 as Near Threatened (*Circaetus gallicus*, *Dendrocopos leucotos*, *Hippolais olivetorum*, *Sylvia rueppelli*) and 2 as Vulnerable (*Alectoris graeca*,

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*Hieraaetus fasciatus (Aquila fasciata)*). ANNEX B of the present AA provides information concerning the threat status of the species included in the SDF of the SPA, based on the most up to date bibliographic sources.




### 3.2 Other projects – potential cumulative impacts

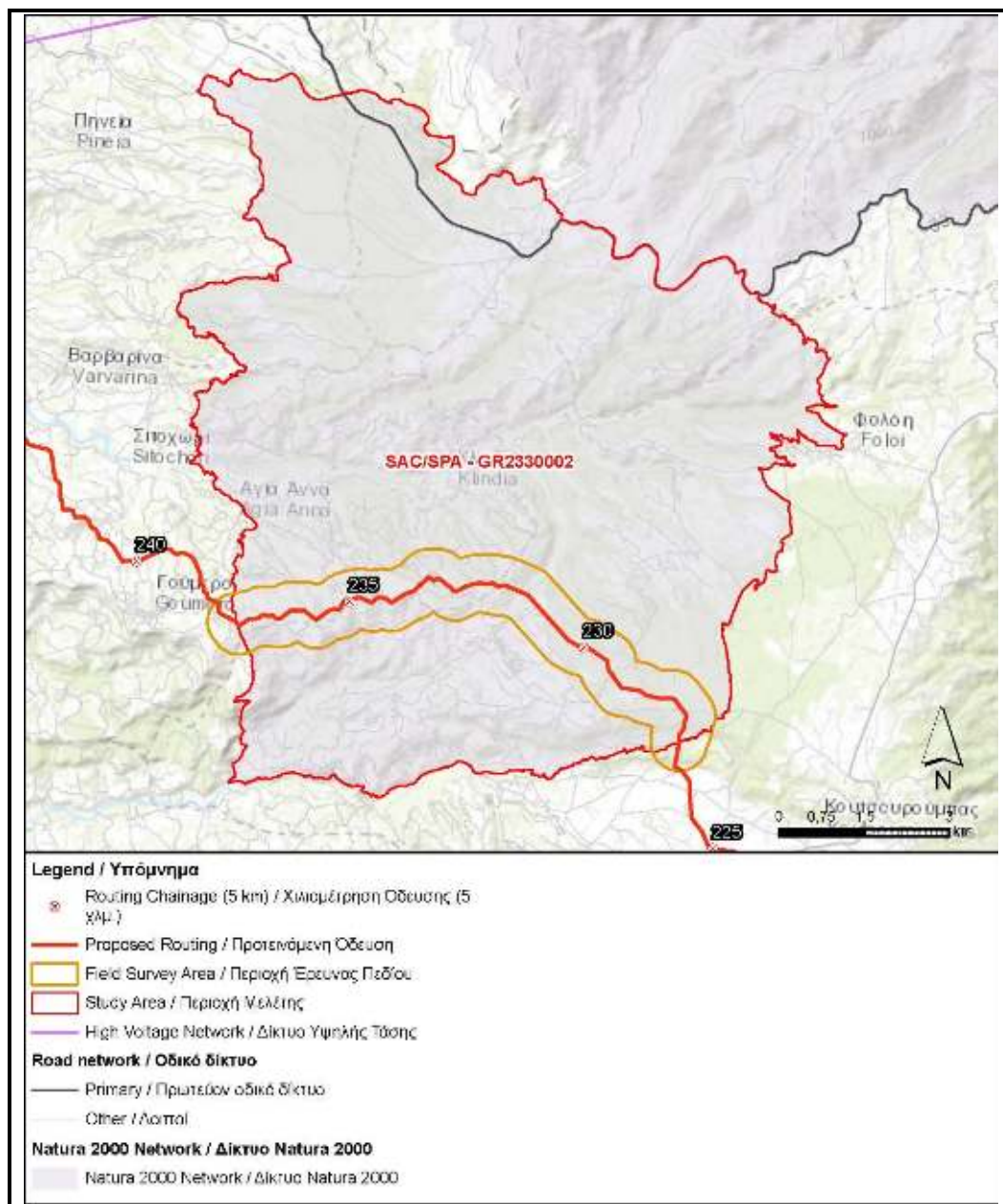
The following broad categories of types of third-party projects that is likely to have direct or indirect synergy with EastMed Pipeline Project: (a) other linear projects, namely pipelines, roads, power lines, (b) other energy projects and (c) other major projects.

The existence or planning of third-party projects that may act cumulatively with the current project was investigated within the Study Area.

The site has not other significant existing or planned projects and infrastructures, such as Power lines, energy and other major projects; except for the local road network.






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**Figure 3-2 Main other project at the Study Area**



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

#### 3.3.1 Field survey methodology

According to the MD 170225/2014 for Category A1 projects implemented within SACs or outside but potentially affecting them, 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 [...])” and within SPAs field work, falling under the category set in Annex 3.2.1, “[...] will have to cover the ecological requirements of an annual cycle of avifauna, depending on the seasonal presence of the species in the area and should include observations during (a) the breeding season, (b) the migratory period and (c) the wintering period [...]”, unless otherwise stated. Field work should last at least 20 days.




In light of the above 26 days of field work have been conducted (timing provided in Table 3-2); more specifically:

- 8 days of field work were conducted during March – April 2021 (spring survey – migration for avifauna)
- 16 days of field work were conducted during May 2021 (summer survey - breeding)
- 2 days of field work were conducted during December 2021 (winter survey – wintering for avifauna)

and included the following activities:

- Field data collection for avifauna in the part of the Natura 2000 site which is crossed by the pipeline and suitable areas in close proximity to the site, by ornithologists.
- Field data collection for mammals, such as *Canis aureus* and bats in the part of the Natura 2000 site which is crossed by the pipeline and suitable areas in close proximity to the site, by mammal experts. It was estimated that the potential use of the FSA by other important species not included in the SDF should also be investigated.
- Field data collection for reptiles and amphibians in the part of the Natura 2000 site which is crossed by the pipeline, by a herpetofauna expert.
- Field data collection for habitats and flora with a focus on important habitats and habitats that are suitable for the identified fauna species, by habitat expert.

The main focus of the field work carried out was during spring and summer period.

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**Table 3-2 Timetable of the Field work days**

Group	Date	No of field work person-days
General site assessment	18-19/04/2021	2
Habitats, Flora	06/03/2021	1
Jackal	20-22/05/2021	5
Bat species	20-22/05/2021	5
Reptiles – Amphibians	18-19/04/2021 21/05/2021	3
Avifauna	06/03/2021 18-19/04/2021 20-21/05/2021 22/12/2021	9
Invertebrates	21/05/2021	1
Total		26

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The field work methodological approach aimed at:




- Recording of all habitat types within the FSA and location of important flora species.
- Recording all fauna species within the FSA in all the main and secondary habitats of the site.
- Focusing on the study to the trigger species.
- Focusing the study on the sensitive species listed in the Annexes (92/43/EEC).
- Focusing on colonies, breeding and resting sites, rendezvous points etc. of important fauna species for the SAC and the SPA.

For the organization of the field work, a series of factors were considered for optimal recording of species of interest and include:

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

#### *3.3.1.1 Field survey methodology for Habitats/flora*

The purpose of the survey on habitat types is to locate important habitat types, identify important flora species by mapping their habitats in order to describe their coverage and population

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respectively. The research techniques used are the interpretation of satellite images and on site-landscape verification. The existing habitat mapping (Ministry of Environment, 2018) for the site was utilized as baseline.

Verification in the field refers to the survey of the Study Area with the systematic visit and recording of all the environmental resources encountered by the field researcher. By this process:

- (a) the existing mapping of habitat types is confirmed, necessary modifications are being made and details are recorded which are not visible in the satellite images or aerial photographs, and
- (b) important flora species are being identified and their habitat is investigated to assess their spread and population.




Specifically, for the habitat types and flora, an on-the-spot investigation was carried out (Figure 3-16) to check all possible microenvironments and taking into account the Braun-Blanquet method (1964), which is based on the distinction between vegetation types and then habitat types.

The existing mapping was considered as sufficient and no changes were made for the FSA.

### 3.3.1.2 Field survey methodology for Fauna

Regarding mammals, according to standardized national and international protocols, although a variety of different monitoring techniques is available, Foot Line Transects were carried out at the FSA, both during day and night. The main goal is to record direct and indirect observations that denote species' presence in the area. Direct observation refers to visual contact with an individual, which is an immediate index of the species' presence within the FSA. Indirect observation refers to recording of surrogate parameters which denote nonetheless, the species' presence in the area, such as prey left-overs, nests, scats, footprints, hair, acoustic verifications, howls, and more (Sutherland 2006). More specifically, the methodology for some species is detailed in the following paragraphs:

Regarding *Canis aureus*, point inspections and random transects were carried out (Figure 3-16), in search of signs of the species presence or reproduction within the FSA. Furthermore, other areas of possible interest/sensitivity in proximity were also inspected. The surveys were conducted both during day and night. During the day the signs of presence expected to be found were tracks and scats, whereas during the night hours, the surveys focused mainly in direct observation of the animals or hearing them vocalize as the species is usually more active during night hours. Due to the poor road network in the area, the segment of interest was impossible to approach, so the point inspections were carried out as close as possible to the FSA. Random transects were carried out to approach the pipeline routing, or in adjacent areas of interest where wolf presence was expected,

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due to habitat suitability. In total, inspections were carried out at six (6) points and transects along six (6) routes.

Along the route, interviews to local inhabitants, shepherds, and hunters were conducted, in order to collect data about jackal and wolf presence in the area of concern (recent sightings, hearings, road-kill sightings or confirmed damage to livestock). Due to complications in relation with the spread of the pandemic (Covid-19) in Greece in the period when the visits were held, interviews were difficult to achieve and thus the sample was small.

Regarding bat species, passive acoustic bat recording was conducted (Figure 3-16) stationary, in May 2021, stationary for 2 full nights (from 30 min before sunset to sunrise) at 8 sites within the FSA. Additionally, 3 recordings on transect lines were done for about 30-40 min after the sunset covering larger area than the stationary recordings. One transect was conducted by car (driving with low speed) and the others on foot. For the recordings, SM4BAT-FS bat recorders were used with UU2 microphones on a 3m pole (for the stationary) or 2m pole (for the transects) (Figure 3-3).

The recorded sound files were organized and scanned for bat calls with the software bcAdmin (Version 3.6.24) and the found bat calls were identified automatically with the batIdent (Version 1.5) that is specifically trained for European bat species (both software from EcoObs GmHH, Nuremberg, Germany). BatIdent identifies each sequence on a species or group level with a probability of correctness. Since automatic species identification has always a risk of misidentification (e.g. Russo & Voigt, 2016), the dubious in identification recordings were also checked manually using bcAnalyse 3 Pro Standalone (EcoObs GmHH, Nuremberg, Germany) to assist the correct identification to species or species group. Manual identification was based on the Greek Bat Call Library, developed by Papadatou (Papadatou 2006; Papadatou et al. 2008), Georgiakakis (Georgiakakis 2009) and Kafkaletou-Diez (2017) and maintained in the Natural History Museum of Crete, University of Crete, Greece.

Apart from the above-mentioned fieldwork, information on bat roosts and bat presence in the area was collected from the Greek Bat Database held on Natural Museum of Crete, University of Crete, Greece and contacting local people and speleologists. Settlements such as old buildings, churches (Fig. 4) that were spotted along the pipeline routing, were visited –when possible– and checked for bats.

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Reference: (NCC, 2021)

Figure 3-3      The microphone on the 3m pole that is connected with the SM4BAT-FS recorder at the Foloi.






Reference: (NCC, 2021)

Figure 3-4      The microphone on the 3m pole that is connected with the SM4BAT-FS recorder at the Foloi.



Reference: (NCC, 2021)

Figure 3-5      Church in Foloi area that was checked externally for signs of bats.

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Regarding amphibians and reptiles, three different methods have been used (Figure 3-16); line transects have been selected in order to have visually contact with amphibians and reptiles, refugia and habitat searching was also used. These methods are the mostly used for the detection and record of amphibians and reptiles during both day and night. As extra data, frequent traffic roads were been checked within the study area in order to locate roadkills.

Regarding invertebrates, non-invasive techniques were applied (Figure 3-16) especially concerning flying insect taxa, such as Lepidoptera and Odonata. Therefore, the needed observations were carried out on the field, based on photographic material, using a high shutter-speed camera (*Combes et al., 2013*) and real-time stereoscopic observation, with hand lenses. In order to perform close inspections, the use of an entomological net was essential and for night-time observation, in the case of nocturnal moths, a white sheet and a lamp was used (*Hsiao, 1973*).




#### 3.3.1.3 Field survey methodology for Avifauna

Field work has been carried out using the following methods:

- *Look and see*, to identify species in suitable habitats.
- *Point counts*, which is an adequate method for monitoring birds in areas with shrub or tree vegetation.
- Vantage Points for location of presence, flights and nests of birds of prey in suitable habitats.
- Line transects.

The fieldwork has been carried out (Figure 3-16) by 2 experienced ornithologists, using binoculars, spotting scopes and zoom cameras to record birds and their habitats in FSA. Field experts searched on a wider area than the FSA for species of interest, identified possible or confirmed breeding of birds within the FSA and recorded individuals of various species singing, defending breeding territories or simply passing over the area.



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Reference: (NCC, 2021)

**Figure 3-6 Recording of avifauna.**

### 3.3.2 Detailed description of the Field Survey Area




#### 3.3.2.1 Habitats

Based on field work observations at the FSA, apart from crops, settlements and reforestations (codes 1024, 1050, 1051, 1062, 1068 and 1069), one natural Greek habitat type of national importance was recorded, the garrigues of east Mediterranean (code 5340) representing evergreen shrublands dominated by *Quercus coccifera*. The habitat types included in Habitats' Directive Annex I Pannonian-Balkan turkey oak- sessile oak forests (code 91M0), *Quercus ilex* and *Quercus rotundifolia* forests (code 9340) and Mediterranean pine forests with endemic Mesogean pines (code 9540) were identified (Table 3-3).

In the FSA habitat types of mixed evergreen shrublands, pine and oak forests appear in spots. In addition, the *Platanus orientalis* and *Liquidambar orientalis* woods (*Plantation orientalis*) (code 92C0) habitat type was found in a very small stand that was not mapped.

**Table 3-3 Area (in ha) and Percentage (%) of the habitat types per Area of Interest**

Code	Habitat type	Study Area	FSA	FSA%	WS	WS%	PPS	PPS%
Habitat types included in the SDF								
91M0 <sup>1</sup>	Pannonian-Balkan turkey oak –sessile oak forests	4,889.13	278.44	5.70%	2.33	0.05%	0.80	0.02%
9540 <sup>1</sup>	Mediterranean pine forests with endemic Mesogean pines	1,474.46	275.43	18.68%	6.05	0.41%	1.90	0.13%
9340 <sup>1</sup>	<i>Quercus ilex</i> and <i>Quercus rotundifolia</i> forests	120.81	56.76	46.98%	1.37	1.14%	0.48	0.40%

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Code	Habitat type	Study Area	FSA	FSA%	WS	WS%	PPS	PPS%
Other habitat types								
1051	Non-irrigated arable land - mixed	1316.7	136.20	10.34%	4.41	0.34%	1.21	0.09%
1050	Non-irrigated arable land - pure	928.7	193.52	20.84%	15.00	1.61%	3.79	0.41%
1069	Olive groves - mixed	642.86	2.23	0.35%				
1068	Olive groves - pure	100.64	3.08	3.06%				
1062	Abandoned cultivation	95.66	2.35	2.45%				
5340 <sup>2</sup>	Eastern Garrigues	68.4	34.33	50.19%				
1024	Provincial roads	13.41	2.69	20.04%	0.05	0.34%	0.01	0.08%

Notes: FSA: Field Survey Area, WS: the Working Strip as planned by the project, PPS: the Pipeline Protection Strip (4 m on each side of the pipeline axis). Percentages refer to cover compared to the total area of the habitat types in the Study Area. <sup>1</sup>: habitats listed in Annex I of Directive 92/43/EEC, <sup>2</sup>: habitats of national importance

Prepared by: (NCC, 2021)

The WS and the PPS are crossing the habitat type 9540 and the affected area is expected to be 6.05ha (0.41% of this habitat within the site) and 1.90ha (0.13%), respectively, as well as the habitat type 9340 with the affected area expected to be 1.37ha (1.14%) and 0.48ha (0.40%), respectively. It also crosses agricultural areas as shown above.




The main habitat types present within the FSA are presented briefly below.

#### Pannonian-Balkan turkey oak- sessile oak forests (code 91M0)

The habitat type 91M0 includes all the oak forests (the dominant species are *Quercus frainetto*, *Q. cerris*, *Q. pubescens* and *Q. petraea*) of the Balkan Peninsula.

In the FSA, the 91M0 habitat type has a limited extent, dominated by *Quercus frainetto*. The habitat type is mainly at risk from inappropriate forest management and regeneration probably due to grazing.



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Reference: (S.Profitis)

**Figure 3-7 Pannonian-Balkan turkey oak- sessile oak forests (code 91M0)**

*Quercus ilex* and *Quercus rotundifolia* forests (code 9340)

Habitat type 9340 includes tall shrubs or *Quercus ilex* forests.

In the FSA, the habitat type 9340 has limited spread. There are typical evergreen shrublands, where *Quercus ilex* and *Phyllirea latifolia* dominate. The habitat type is relatively common in Greece and does not seem to face any particular threats, except from wildfires.

*Platanus orientalis* and *Liquidambar orientalis* woods (Plantanion orientalis) (code 92C0)




The habitat type 92C0 includes the, usually riparian, forests of *Platanus orientalis* and of *Liquidambar orientalis* occur in southeastern Europe.

Habitat type 92C0 is found in the FSA in a small spot, where *Platanus orientalis* dominate. The habitat type is mainly at risk from the stability of the hydrological cycle, and its structure can be altered by tree loggings.

Mediterranean pine forests with endemic Mesogean pines (code 9540)

Habitat type 9540 includes the pine forests of the Mediterranean region.

This habitat type, in the FSA includes *Pinus halepensis* forest patches. These forests are often the succession of oak forests in areas after fires. Fires mainly threaten the habitat type.

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Reference: (NCC, 2021)




**Figure 3-8      Panoramic view of the FSA at IP 1033**

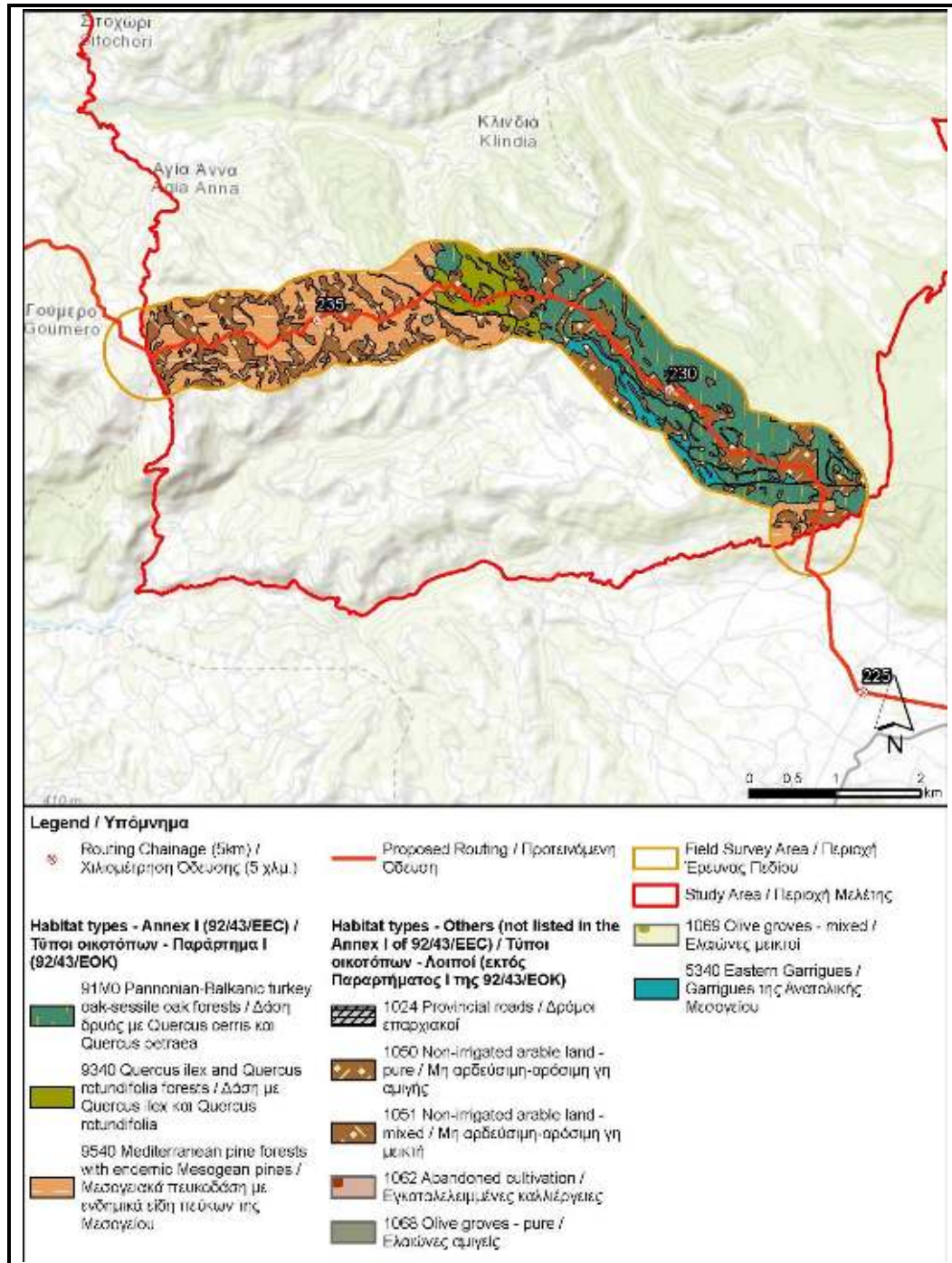


Reference: (NCC, 2021)

**Figure 3-9      Panoramic view of the FSA at IP 1022 -1025**




The mapping of habitats for the FSA has been carried out by the habitat expert and is provided in Figure 3-10.

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Prepared by: (NCC, 2021)

**Figure 3-10 Habitat type coverage at the Field Survey Area**

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### 3.3.2.2 Flora

No important species of Directive 92/43/EEC were found in the area, however the species *Platanus orientalis* was found, which is protected by the Presidential Decree 67/81. Table 3-4 presents a detailed list of flora species identified in the FSA during field work.

**Table 3-4 Flora species of the FSA**

Family	Taxon
Anacardiaceae	<i>Pistacia lentiscus</i> L.
Araliaceae	<i>Hedera helix</i> L.
Cistaceae	<i>Cistus creticus</i> L.
Convolvulaceae	<i>Convolvulus althaeoides</i> L.
Dennstaedtiaceae	<i>Pteridium aquilinum</i> (L.) Kuhn
Ericaceae	<i>Arbutus unedo</i> L.
	<i>Erica arborea</i> L.
Fabaceae	<i>Spartium junceum</i> L.
	<i>Cercis siliquastrum</i> L.
Fagaceae	<i>Quercus coccifera</i> L.
	<i>Quercus ilex</i> L.
	<i>Quercus frainetto</i> Ten.
	<i>Quercus cerris</i> L.
Oleaceae	<i>Phillyrea latifolia</i> L.
Pinaceae	<i>Pinus halepensis</i> Mill.
	<i>Pinus pinaster</i> Aiton
Platanaceae	<i>Platanus orientalis</i> L.
Rosaceae	<i>Rubus sanctus</i> Schreb.




Prepared by: (NCC, 2021)

### 3.3.2.3 Fauna

#### 3.3.2.3.1 Birds

The species observed in the area were mainly passerines, typical of forested and agricultural areas. The species of interest that were observed were *Leipicus medius*, observed at oak forests and mixed deciduous with pine forests, as well as the observation of *Falco peregrinus*, *Streptopelia turtur* and *Lanius collurio* at the later habitat.



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### 3.3.2.3.2 Mammals – Bats

Based on available information of previous studies (Greek Bat Database of the Natural History Museum of Crete) on bat species, presence of 14 species has been reported in the area of Foloï.

At least 11 bat taxa (Table 3-5) were recorded during the recordings in May 2021 within the FSA. Due to the high overlap of the call parameters between several species, it was not possible to identify the *Myotis* calls in species level. Considering former information for the bats of the region of Foloï (Greek Bat Database of the Natural History Museum of Crete), the recorded *Myotis* calls could be possibly attributed to two or more of the following species: *Myotis aurascens*, *M. nattereri*, *M. bechsteinii* and *M. blythii*. *Myotis bechsteinii* has specialised habitat requirements and in Europe, it tends to prefer mature deciduous woodland of beech and oak with a high proportion of old trees, while *Myotis nattereri* forages over a variety of habitats (Dietz et al. 2009).

The priority species *Barbastella barbastellus* was also recorded. It forages in mature woodland and woodland edges, feeding mostly on large moths and in summer, roosting sites occur mainly mature woodlands. The main vegetation type of Oropedio Foloï is forests of *Quercus* forests (9340), Mediterranean pine forests with endemic Mesogean pines (9540) and Pannonian-Balkani turkey oak-sessile oak forests (91M0) which is partly present also in the FSA. Forests can host *Myotis* species but also *Barbastella barbastellus*. The Study Area also includes more Chiroptera species of high conservation status, such as *Miniopterus schreibersii*. It is known to forage mainly in deciduous woodlands and mature orchards but also along hedgerows separating pastures (IUCN 2021). *Rhinolophus ferrumequinum* and *R. hipposideros* are also present in the area. The first forages in pastures, deciduous temperate woodland, Mediterranean and sub-mediterranean shrubland and woodland while the latter forages close to ground within and along the edges of broadleaf deciduous woodland, which represents its primary foraging habitat, but also in riparian vegetation, Mediterranean and sub-mediterranean shrubland (Dietz et al. 2009).

Among the rest of the species that were recorded, there are some with status of least concern (e.g. *Hypsugo savii*, *Tadarida teniotis*) but also other for which data are deficient (e.g. *Pipistrellus* species). Due to the high overlap in call parameters, it was impossible to distinguish with safety *Pipistrellus nathusii* from *P. kuhlii* therefore the last two species are grouped. Also, there are probably more than one species of the group Nyctaloid (*Nyctalus* and *Eptesicus*), but their identification only from their calls is ambiguous. The fieldwork for the current project revealed the presence of 2 new species in the area, in specific *Pipistrellus pipistrellus* and *Tadarida teniotis*. The latter one was found at most of the recording sites. The same is true for *Pipistrellus pygmaeus* that was one of the most common

species and was contributing the highest percentage (>64%) in the total bat calls at some of the recording sites.

No specific roosts have been identified within the FSA, as far as it was possible to search.

**Table 3-5 Bat species that were recorded at the FSA during field surveys and species found in previous surveys (SDF and Greek Bat Database of the Natural History Museum of Crete)**




Code	Species	Observed during fieldwork	Previous studies
1308	<i>Barbastella barbastellus</i>	X	X
1327	<i>Eptesicus serotinus</i>		X
5365	<i>Hypsugo savii</i>	X	X
1310	<i>Miniopterus schreibersii</i>	?	X
	<i>Myotis spp.</i>		
5004	<i>Myotis aurascens</i>	?	X
1323	<i>Myotis bechstenii</i>	?	X
1307	<i>Myotis blythii</i>	?	X
1322	<i>Myotis nattereri</i>	?	X
1331	<i>Nyctalus leisleri</i>		X
	<i>Nyctalus sp.</i>	X	
2016	<i>Pipistrellus kuhlii</i>		X
	<i>Pipistrellus kuhlii</i> / <i>P. nathusii</i>	X	
1317	<i>Pipistrellus nathusii</i>		X
1309	<i>Pipistrellus pipistrellus</i>	X	
5009	<i>Pipistrellus pygmaeus</i>	X	X
1304	<i>Rhinolophus ferrumequinum</i>	X	X
1303	<i>Rhinolophus hipposideros</i>	X	X
1333	<i>Tadarida teniotis</i>	X	

Note: X: confirmed presence, ?: possible presence in the area, *Nyctaloid*: *Nyctalus* spp. or *Eptesicus* spp.

Prepared by: (NCC, 2021)

### 3.3.2.3.3 Mammals – *Canis aureus*

*Canis aureus* presence in the area both on North-West side of the Study Area (Giannatos, 2009), as well as on the East side (Migli & Galinos, 2010) is confirmed. The population size or trend is unknown though, as well as its distribution and habitat use in the FSA. *Canis aureus* presence was confirmed

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directly (animal observation) in the FSA during the field survey, while through interviews the permanent presence of the species was affirmed.




At the FSA, the alternation between more forested/dense areas and open meadows/agricultural land in combination with relatively low altitudes (~600-750m) makes this area an extremely suitable habitat for *Canis aureus* both for foraging as for denning/resting. Some more characteristics of the area that increase its fitness as a habitat for the species are: a) Plenty of food sources (small rodents, reptiles, livestock) b) Abundance of water supplies, natural and artificial (due to livestock presence) c) Low disturbance from vehicles or human activities.

Due to habitat suitability of the FSA (based on field observations) the proximity to confirmed *Canis aureus* presence (from interviews) and according to available data about the area, it is assumed that the species has constant presence in the FSA.



Reference: (NCC, 2021)

**Figure 3-11** Grain fields and *Quercus frainetto* stands, Dry ravine close to observation point, Dry ravine along which transect has been carried out.

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Reference: (NCC, 2021)




**Figure 3-12** Pasture with fern growths, Mixed vegetation with pastures sparse olive trees and ever-green broad leaved species, Meadow, olive grove, ever-green broad leaved species and presence of small stream.

#### 3.3.2.3.4 Amphibians and Reptiles

During the field survey one reptile species of interest for which the site has been designated was observed, *Testudo hermanni*. The species uses forested, agricultural and shrubby areas with openings and clearings.

The species which are included in the Annexes II and IV of the Habitats Directive and were observed within the FSA are three lizard species: *Algyroides moreoticus*, *Podarcis peloponnesiaca*, *Podarcis muralis* and one snake species: *Zamenis longissimus*. Other species observed were: *Malpolon insignitus*, *Anguis cephallonica*.



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Reference: (A.Christopoulos)

**Figure 3-13**    **Area of fieldwork at Foloi**






Reference: (A.Christopoulos)

**Figure 3-14**    *Testudo hermanni* and *Podarcis ionicus*

#### 3.3.2.3.1 Invertebrates

A total of 10 insect species were recorded and sufficiently identified during the point samplings, one of which, namely *Morimus funereus*, is included in Annex II of Habitats Directive. Oak trees of the genus *Quercus sp.* are very important throughout many stages of their life cycle.

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Reference: (A.Dakari)

**Figure 3-15** (a) *Morimus funereus* mating, (b) male *M. funereus* individual

### 3.3.3 Key findings

The main findings of interest are summarized as follows:

- **Habitat types**: At the FSA four habitat types of Annex I were identified, namely 9340, 9540, 92C0 and 91M0.
- **Plant species**: *Platanus orientalis*, a species of national importance is found within the FSA.
- **Bird species**: The bird species observed in the area are mainly common species of the habitats found in the area, while of special interest is the *Leiopicus medius*.
- **Mammal species**: *Canis aureus* is estimated to have permanent presence in the area which is an extremely suitable habitat both for foraging as for denning/resting. Several bat species were recorded in the area, while no specific roosts have been identified within the FSA, as far as it was possible to search. All the FSA has a high bat diversity, especially the oak forest at IP 1019-1024 and the area near IP 1030-1033. Of special interest is the species *Barbastella barbastellus* which may forage in old (oak and other) trees. The whole area seems to be an important site for this species.
- **Reptile/amphibian species**: *Testudo hermanni*, which is included in the site's SDF was found within the FSA, while several other species of the Habitats Directive were also observed.
- **Invertebrate species**: One invertebrate species of interest was found, namely *Morimus funereus*, which is included in Annex II of Habitats Directive. Oak trees of the genus *Quercus sp.* are very important throughout many stages of their life cycle.

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**Table 3-6 Species of interest recorded during fieldwork**

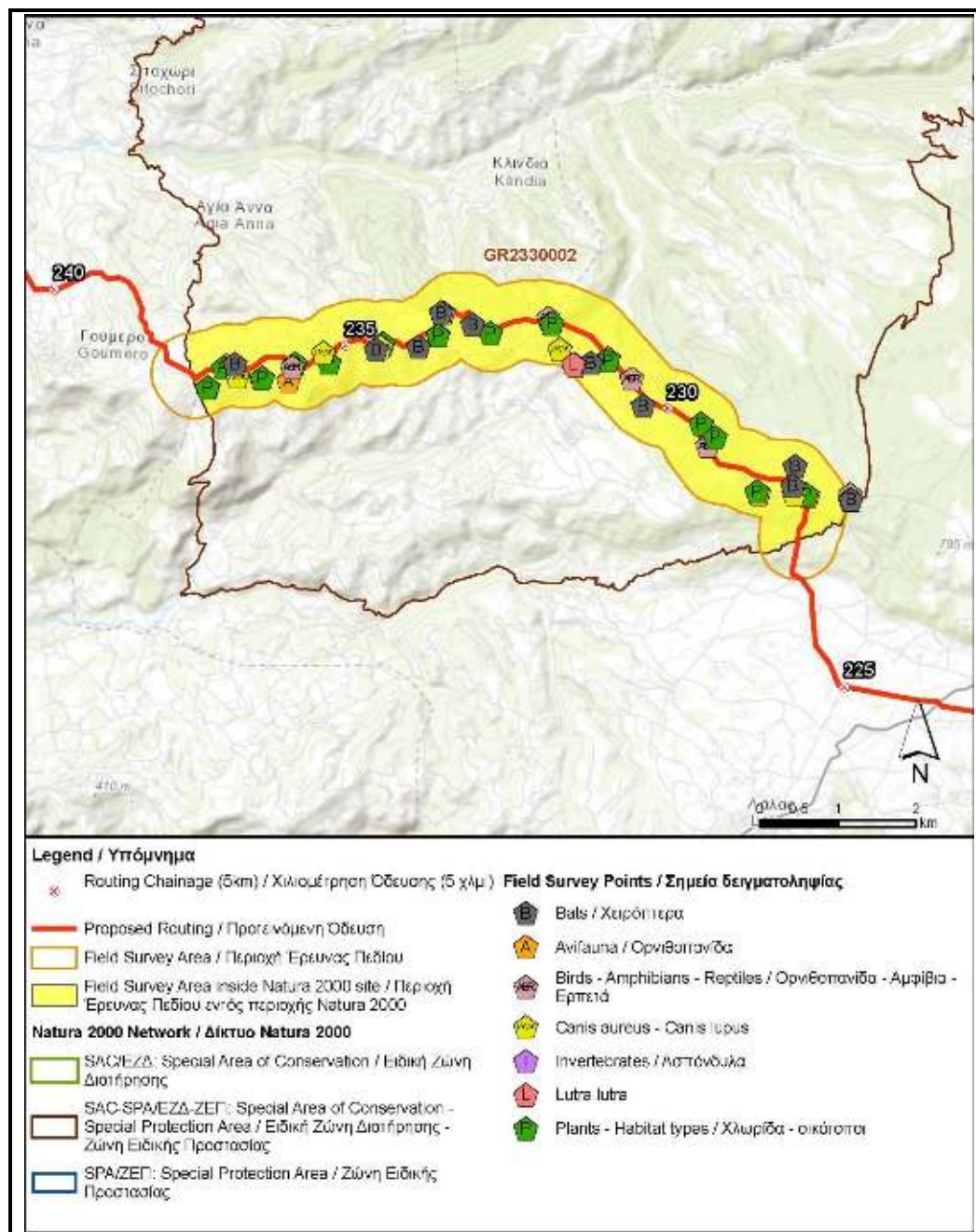
IP	Species of interest
1021	<i>Leiopicus medius</i> , <i>Buteo buteo</i> , <i>Hirundo rustica</i> <i>Testudo hermanni</i> , <i>Podarcis taurica</i> , <i>Ablepharus kitaibelii</i> , <i>Podarcis muralis</i> , <i>Algyroides moreoticus</i> <i>Barbastella barbastellus</i> , <i>Pipistrellus pygmaeus</i> , <i>Rhinolophus hipposideros</i>
1022	<i>Barbastella barbastellus</i> , <i>Myotis spp.</i> , <i>Nyctalus noctula</i> , <i>Pipistrellus pygmaeus</i> , <i>Tadarida teniotis</i>
1025-1026	<i>Barbastella barbastellus</i> , <i>Myotis spp.</i> , <i>Nyctalus noctula</i> , <i>Pipistrellus pipistrellus</i> , <i>Pipistrellus pygmaeus</i> , <i>Tadarida teniotis</i>
1026-1027	<i>Canis aureus</i>
1031-1032	<i>Falco peregrinus</i> , <i>Leiopicus medius</i> , <i>Lanius collurio</i> <i>Barbastella barbastellus</i> , <i>Myotis spp.</i> , <i>Pipistrellus pygmaeus</i>
1032	<i>Falco peregrinus</i> , <i>Leiopicus medius</i> , <i>Streptopelia turtur</i> , <i>Apus apus</i> , <i>Hirundo rustica</i> , <i>Lanius collurio</i> <i>Testudo hermanni</i> , <i>Podarcis peloponnesiaca</i>
1032-1033	<i>Canis aureus</i> (interview info)
1045-1046	<i>Barbastella barbastellus</i> , <i>Hypsugo savii</i> , <i>Myotis spp.</i> , <i>Rhinolophus hipposideros</i> , <i>Rhinolophus ferrumequinum</i> , <i>Tadarida teniotis</i>
1047-1048	<i>Barbastella barbastellus</i> , <i>Hypsugo savii</i> , <i>Myotis spp.</i> , <i>Tadarida teniotis</i>
1052	<i>Barbastella barbastellus</i> , <i>Myotis spp.</i> , <i>Pipistrellus pipistrellus</i> , <i>Tadarida teniotis</i>
1059-1060	<i>Platanus orientalis</i>
1061-1062	<i>Lullula arborea</i> , <i>Lanius collurio</i>
1067	<i>Hypsugo savii</i> , <i>Myotis spp.</i> , <i>Nyctalus noctula</i> , <i>Pipistrellus pipistrellus</i> , <i>Pipistrellus pygmaeus</i> , <i>Tadarida teniotis</i>

Note: \*: outside the FSA

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**Figure 3-16** Field Survey locations for the survey of habitats, fauna groups of Annex II and IV (Directive 92/43/EEC) and bird species (Directive 2009/147/EC), carried out within the FSA

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### 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 the 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, ie 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.
- 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.

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### 3.4.2 Conservation status of habitats, flora and fauna species

According to the SDF of the SPA/SAC, the area hosts significant percentage (2-15%) of the total national area covered by the habitat type 91M0. The representativity of the habitat types 91M0 and 9340 in the site is excellent, as well as their conservation status. The overall value of the site for the conservation of the habitat types is indicated as good, except for the habitat 9540 which is indicated as significant.




Concerning the species included in the SDF, the SPA/SAC hosts significant percentage (2-15%) of the total national population of *Telestes pleurobipunctatus*. The conservation status of the species is excellent to average or reduced with that of *Testudo hermanni*, as well as of several bird species such as *Bubo bubo*, *Buteo buteo*, *Caprimulgus europaeus*, *Pernis apivorus*, *Streptopelia turtur*, being excellent. The only species on their margins of distribution are *Myotis bechsteinii*, *Dendrocopos leucotos*, *Falco eleonora*, *Sylvia rueppelli*. The overall value of the site for the conservation of the species is assessed as good for the species and significant for other groups, for *Testudo hermanni* good, while there are also several species that have been not assessed.

Detailed information is provided in ANNEX A.

### 3.4.3 Threats/Pressures

According to the SDF of the site the main threats are mostly of high or medium magnitude. Threats of high magnitude in the area include intensive annual crops for food production and the use of biocides, hormones and chemicals, as well as cultivation, the removal of dead and dying trees and thinning of tree layer in and around the area. Of medium magnitude are grazing, forestry clearance and the forest exploitation without replanting or natural regrowth in the area. Furthermore, of medium magnitude are the demolition of buildings and human structures, the reconstruction and renovation of buildings, hunting and the reduction or loss of specific habitat features in the area. Moreover, of medium magnitude are grazing in forests or woodland, wind energy production, trapping, poisoning and poaching and fire and fire suppression in and around the area. Of low magnitude are the use of motorized vehicles, vandalism, the construction and operation of roads, paths and railroads, the discontinuous urbanization and the action of erosion in the area.



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#### 3.4.4 Ecological functions

The Study Area consists an important ecosystem in Western Greece. It holds a significant ecological value as it supports a mosaic type of ecosystems with life sustaining different habitats. The clusters of saplings prevent soil erosion and further provide the ecological function of the area. The forests of the site are located within the basin of the Erymanthos and Pineios rivers and function towards the protection of the soil, the cultivated areas and the archaeological site of the SAC.

The mosaic type of ecosystems within the site further functions as an important site for species characteristic of a mosaic of forest, pasture and olive-groves i.e. *Dendrocopos medius*, *Emberiza caesia*, as well as other vertebrate taxa , and flora species.

#### 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 site is merely influenced by human activities performed in the area e.g. agricultural use, forestry, grazing and hunting which further interact with natural elements of the site both biotic and abiotic. As a result, the site's development trend can be dependent on projects to be implemented within the Study Area.

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## 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;

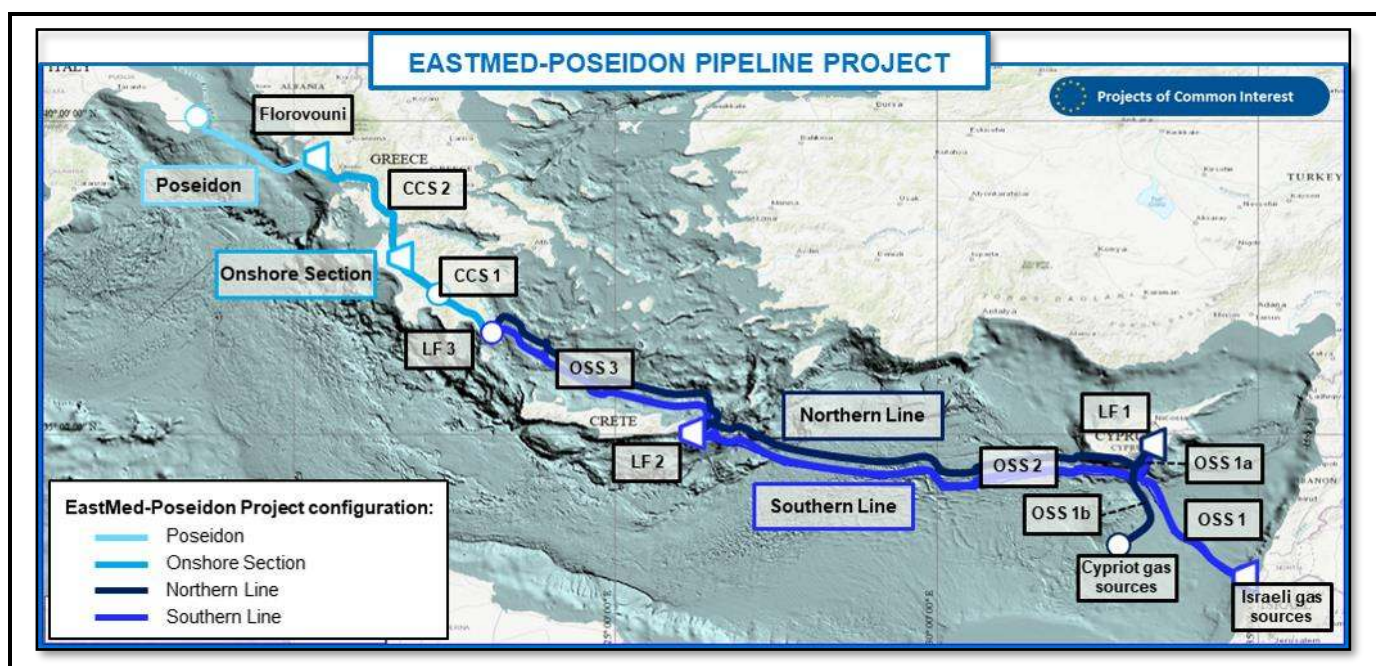
#### C. Combined System of EastMed (Crete & mainland Greece → Poseidon Pipeline Project):

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- 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<sup>1</sup> 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<sup>2</sup>.

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**

<sup>1</sup>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: ΩΠΝ34653Π8-419)

<sup>2</sup> Light blue line also includes the small offshore section of the Combined System that crosses Patraikos Gulf, i.e., OSS4.

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




- 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 Etoloakarnania, 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<sup>3</sup>) 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

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<sup>3</sup> 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.

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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.

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).



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## 4.2 Pipeline Construction and Pre-commissioning

### 4.2.1 Construction Overview

The basic method of constructing gas onshore pipelines is generally known as the spread technique, which is an “open cut” method and is widely used throughout the world. A typical sequence for onshore pipeline construction is illustrated in Figure 4-2.






Prepared by: (ASPROFOS, 2021)

**Figure 4-2 Typical Pipeline Construction Sequence**

This method can be broken down into several phases:

- Route survey and layout;
- Working strip preparation (clearing, grading, topsoil stripping);
- Trench excavation;
- Pipeline handling, Hauling and stringing;
- Pipeline bending;
- Pipeline welding and weld testing, applying field joint coating;
- Pipeline laying;
- Backfilling;
- Hydrotest and



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- Reinstatement.

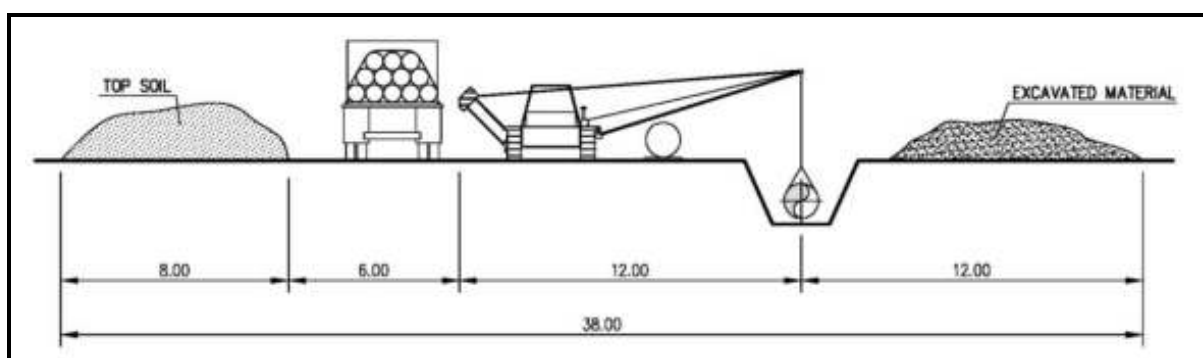
A survey control system in the form of permanent ground markers (PGM) will be installed. A subcontractor will tie all survey works into this control system and confirm the accuracy of the PGM control system.

The work includes removal of all trees, bushes, hedges and other obstacles from the construction working strip. A restricted working strip shall apply where there are physical constraints or where contractor chooses to reduce the working strip to benefit particular operations. A larger working strip may be necessary where a particular operation may benefit from additional space. The working strip should be set up before work commences.

## 4.2.2 Onshore Construction Methods

### 4.2.2.1 Marking and Clearance of Working Strip




The working strip is the temporary corridor along the pipeline where construction takes place. It must be wide enough to allow all activities to be carried out safely whilst providing sufficient room to store topsoil and trench material separately and keeping crop loss to the farmer to a minimum. The width of the working strip is proportional to the diameter of the pipeline to be installed. It follows that the greater the pipe diameter, the greater the extracted trench material that has to be stored. The width of the working strip is also determined by the size of the heavy machinery needed to safely lift and lower pipe into the trench and dig the trench. The width of the working strip in open country for pipelines with nominal diameter (ND) 48" and 46" will be 38 m.

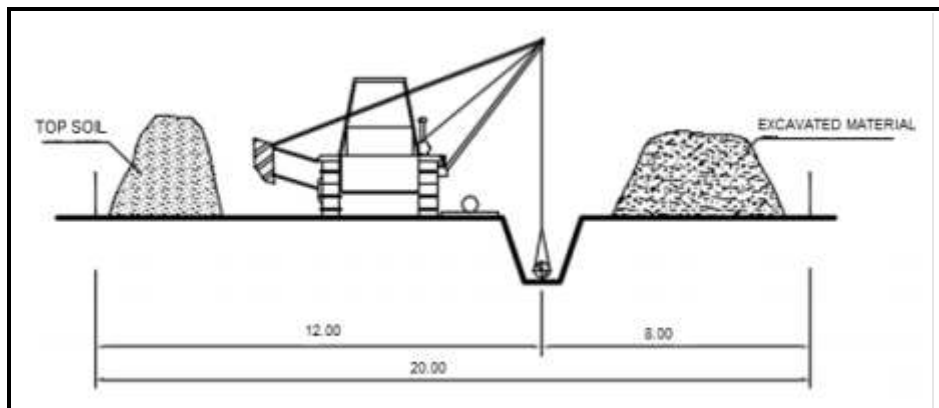


Source: (Design Basis Memorandum – Pipeline and Facilities)

**Figure 4-3 Regular Working Strip in Open Country for Pipeline ND 48" and 46"**

The width of the working strip in open country for pipeline of ND 16" will be 20 m.

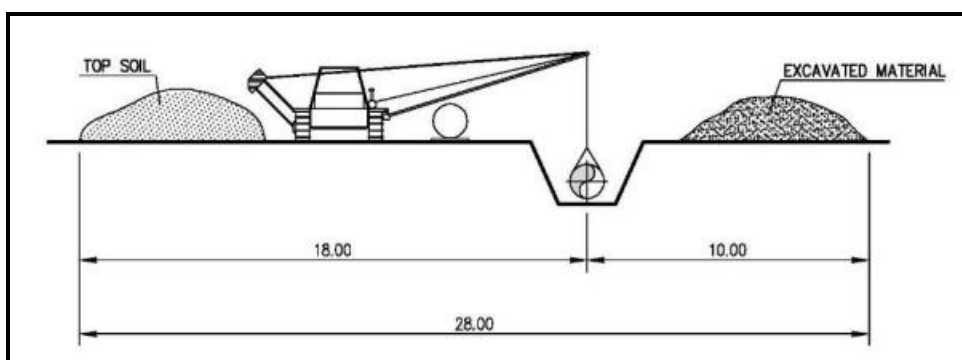
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Source: (Design Basis Memorandum – Pipeline and Facilities)




**Figure 4-4 Regular Working Strip in Open Country for Pipeline ND 16"**

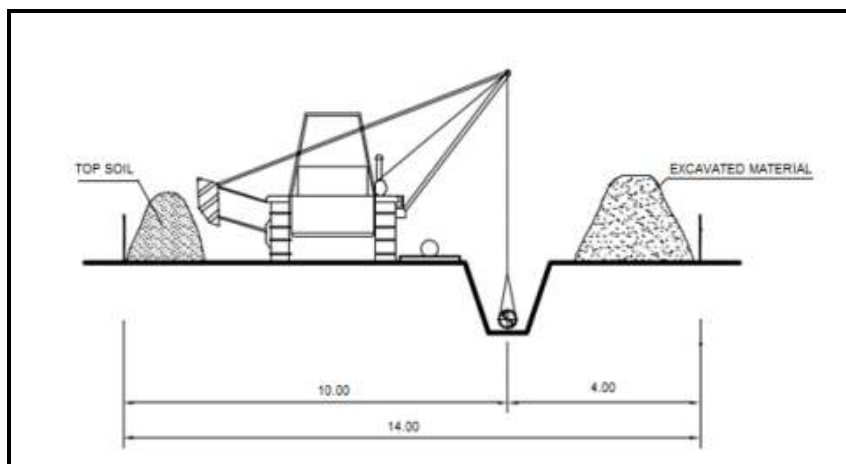
The width of the spread zone along areas planted with permanent crops (e.g., vineyards, olive trees, etc.) for pipeline with ND 48" and 46" will be reduced to 28 m and for pipeline with ND 16" will be reduced to 14 m in order to minimise impacts on the plantations.



Source: (Design Basis Memorandum – Pipeline and Facilities)

**Figure 4-5 Reduced Working Strip (with Topsoil Stripping) for Pipeline ND 48" and 46"**

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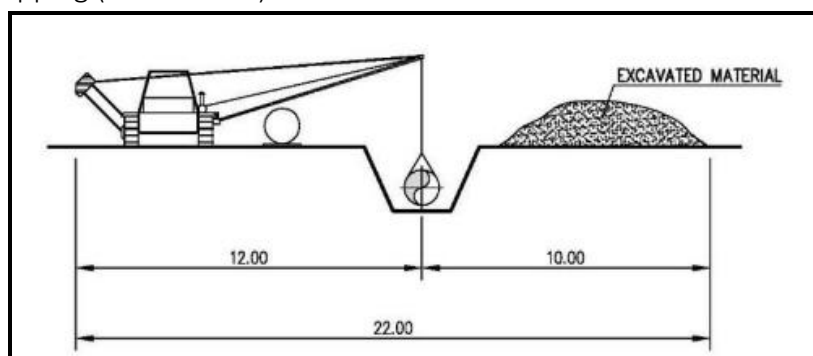


Source: (Design Basis Memorandum – Pipeline and Facilities)

**Figure 4-6 Reduced Working Strip (with Topsoil Stripping) for Pipeline ND 16"**

The width of the working strip for construction of pipelines with ND 48" and 46" inches can be reduced to 22 m in forest and mountainous areas where there is usually no need for top soil storage and to 28 m in areas with permanent plantations (with topsoil stripping).




For pipelines with ND 16" the regular working strip (in open country and agricultural areas planted with annual crops) is 20 m which is reduced to 14 m in areas planted by permanent plantations and without topsoil stripping (forest areas).



Source: (Design Basis Memorandum – Pipeline and Facilities)

**Figure 4-7 Reduced Working Strip (without Topsoil Stripping) for Pipeline ND 48" and 46"**

The areas where this reduced working strip will be applied will be carefully defined in order to reduce the impacts of the pipeline construction along these areas as much as possible, as well as to minimise impacts on the construction progress (e.g., delays) and to ensure that all activities along the reduced zone will be safely executed.

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Furthermore, the width of the working strip will be increased when a trenchless construction method is applied at crossings of major infrastructure or rivers in order to accommodate relevant equipment for construction works (e.g., horizontal directional drilling (HDD), direct pipe, microtunnel, boring method).

**Table 4-1 Summary of Working Strip width**

Diameter of the pipelines (inches)	Regular Working Strip (m)	Reduced Working Strip (m)	Reduced Working Strip without Topsoil Stripping (m)	Boring methods (Area Required) (m <sup>2</sup> )	HDD (Area Required) (m <sup>2</sup> )
48 and 46	38	28	22	45 x 50 and 45 x 30 (each side)	100 x 100
16	20	14	14	40 x 40 and 40 x 20 (each side)	100 x 100

Source: IGI Poseidon, 2021

#### 4.2.2.2 Topsoil Stripping




Topsoil will be removed by means of suitable earth moving equipment (such as excavators and loaders) from the entire surface of the area, with the only exception being the areas designated for topsoil storage. The average depth of the topsoil strip to be removed is 0.2 m but this will be adapted to local soil conditions. The topsoil removed will be stockpiled within the area for temporary storage until site reinstatement.

#### 4.2.2.3 Grading

As described above the working strip must provide sufficient working space for pipeline fabrication and for simultaneous vehicle movements. Therefore, the delineated strip will be graded by specified equipment such as bulldozers and graders to the required width.

#### 4.2.2.4 Trenching

The pipeline will be buried underground within a trench for its entire length and protected against corrosion by a cathodic protection system. The required trenching works will be mainly undertaken by excavators or jack-hammers. The standard soil covers of the buried onshore pipeline (measured from top of pipe) shall be at least 1 m.

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#### 4.2.2.5 Blasting

The use of explosives might be considered necessary at the following Natura 2000 areas. They could speed up the construction, decreasing construction duration and consequently nuisance to sensitive receptors.

**Table 4-2 Indicative locations where explosives might be used during construction within protected areas**

Pipeline Segment	From KP	To KP	Length (m)	Engaged Natura 2000 site
CCS1	21.348	21.845	497	SPA - GR2540007
CCS2	211.308	213.142	1,834	SPA – GR2120006

Prepared by: (ASPROFOS, 2021). Based on ESIA baseline soil classification

#### 4.2.2.6 Backfill

The assembling of the pipeline will be carried out in a standard way with a construction spread that moves along the pipeline corridor. Most of the excavated soil will be used to backfill the pipeline trench. Excess soil will likely be spread out and contoured along the route in agreement with competent authorities and landowners/ users and according to further engineering studies.

#### 4.2.2.7 Clean Up and Restoration




The clean up and restoration will be carried out in a specified way with a construction spread that moves along the pipeline corridor.

The removed topsoil will be placed back on the working strip so as the area to be restored as closely as possible to its original condition. Land will be stabilized where necessary and progressively restored with native vegetation, where possible. All machinery, equipment, tools, etc will be removed.

#### 4.2.2.8 Indicative Schedule

The estimated total duration of the Onshore pipeline construction activities is 36 months.

On top of that, duration of the construction depends on the difficulties imposed by the baseline conditions, e.g., morphology, geotechnical issues, land uses, etc. Based on experience from other

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similar projects in dimensions constructed in Greece (i.e., with similar baseline conditions) the indicative construction rates (in terms of project progress, per construction activity) are:

- 400 m/day, in agricultural areas (in plain areas, 600 m/ day may be achieved)
- 200 m/day, in hilly or intense relief areas, of tree crops or natural vegetation
- 100 m/day, in mountainous areas, more often than not covered with natural vegetation (in rocky areas, 75 m/day or even smaller may be constructed).

#### 4.2.3 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.




##### 4.2.3.1 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;



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- 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;

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- **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.




#### 4.2.3.2 *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.

##### 4.2.3.2.1 *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.

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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.

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#### 4.2.3.3 *EastMed System Pressure Test Response*

Each offshore pipeline, 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 up 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.

#### 4.2.3.4 *Water Abstraction Sources for Conventional SPT*




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 4-3 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 m<sup>3</sup>. 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.

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**Table 4-3 Water Requirements for Hydrotest Sections**

Pipeline Spread		Water Source	Approx. Volume Required (m³)	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
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.



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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.

#### 4.2.3.4.1 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.

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.

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### 4.3 Operation 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.

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#### 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.

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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 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 interferences with the Natura 2000 site

The current Appropriate Assessment concerns the part of the project that overlaps with the Study Area (Natura 2000 site: GR2330002). The total length of the project crossing the Study Area is 10.2km at the section IP 1017-1073 (KP: 227.131 - 237.383).

##### During construction

- The working strip will be of 22m to 38m width covering an area of 29.2ha.
- It is estimated that a few weeks will be required for the completion of the work in the area.

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- Blasting is not expected to be used.
- Regarding precommissioning activities, for the System Pressure Test no water abstraction and discharge will take place in the specific Natura 2000 site.
- It should be noted that no construction activities will take place during night.

#### During operation/maintenance




- An 8m wide pipeline protection strip will be maintained along the pipeline of 8.2 ha.

**Table 4-4 Pipeline Working Strips**

Project phase	Working Strip	Width (m)
Construction and pre-commissioning	General working strip	38
	Working strip with construction/environmental constraints	28
Operation and maintenance	Pipeline protection strip	8

Reference: (ESIA Project Description)



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## 5 APPROPRIATE ASSESSMENT

According to the requirements of Article 6 of the Directive 92/43/EEC, the guidelines of the European Commission for the Appropriate Assessment and the 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 minimize 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 or 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. To 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,
- 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

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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	<ul style="list-style-type: none"> <li>The project (either alone or in combination with other projects) may adversely affect the integrity of a habitat, by substantially changing in the long term its ecological features, structures and functions, across all or most of the area, that enable it to sustain the habitat, complex of habitats and/or the population levels of species that makes it important.</li> <li>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.</li> </ul>
Medium	<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> </ul>
Low	<ul style="list-style-type: none"> <li>Neither of the above applies, but some minor impacts of limited extent, or to some elements of the habitat, are predicted but the habitat will readily recover through natural regeneration.</li> <li>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.</li> </ul>

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




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**Table 5-2 Assessment of impact Intensity towards value and sensitivity of resource/recipient, frequency of occurrence and reversibility.**

Impact Intensity	Value and sensitivity of resource/recipient	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 or/and 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 or/and 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 or/and 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.

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**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

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**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




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An assessment of the residual impact (impact that can not be mitigated and thus irreversible) has also taken into account the reversibility that may arise from the implementation of 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

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**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 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.

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## 5.2 Assessment of Impacts




The present 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 is the selection of the trenchless underground passage of the pipeline at some sites, in order to minimize 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 the technical characteristics, the special natural characteristics and the current environmental conditions of the Study Area, with emphasis on the protected elements, the ecological integrity of the Study Area and the overall consistency of the Natura 2000 network.

For the section of the project under assessment, given the characterization of the area of interest as SPA/SAC for the Natura 2000 network, the following evaluation indicators were used:

(a) loss and fragmentation of habitat type coverage,



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- (b) loss and fragmentation of habitat areas of bird and other fauna and flora species,
- (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;
- 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 the impacts of the project on the selected species related to (a) the pipeline construction and pre-commissioning, (b) the 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 types screening




In respect to habitat types, the habitats that were taken into consideration for the appropriate assessment are those included in the FSA and are presented in Table 5-7. The rest of the EU habitats within the Study Area are not taken into consideration, as due to the nature of the project activities and its location they are not expected to be at risk of affection, direct or indirect.

**Table 5-7 Habitat types of interest in FSA**

Code	Habitat type
Habitat types included in the SDF	
91M0	Pannonian-Balkan turkey oak –sessile oak forests
9540	Mediterranean pine forests with endemic Mesogean pines
9340	<i>Quercus ilex</i> and <i>Quercus rotundifolia</i> forests

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In respect 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

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bibliographic data. The species for which the site has been designated as a Natura 2000 site and could potentially be affected by the project were selected. The rest of the species are aquatic species and are not expected in the FSA, as no rivers, streams or wetlands were located within the FSA. The rest of the avifauna species was decided to be grouped in main bird groups and assessed based on the ecological requirements of their group (see below).

Their ecological requirements are presented in ANNEX D.




**Table 5-8 Species of interest expected or observed within the FSA**

Group	Code	Species	Presence	Observed during fieldwork	Annex of Birds & Habitats Directives / IUCN / Greek Red List
Annex II (92/43/EEC) species of the Study Area - Reported in chapter 3.2 of the site's SDF					
B	A868	<i>Leipicus medius</i>	p		I LC LC
B	A447	<i>Emberiza caesia</i>	p		I LC LC
M	1308	<i>Barbastella barbastellus</i>	p	X	II;IV NT EN
M	1310	<i>Miniopterus schreibersii</i>	p		II;IV NT NT
M	1323	<i>Myotis bechsteinii</i>	p		II;IV NT NT
M	1307	<i>Myotis blythii</i>	p		II;IV LC LC
M	1304	<i>Rhinolophus ferrumequinum</i>	p	X	II;IV LC LC
M	1303	<i>Rhinolophus hipposideros</i>	p	X	II;IV LC LC
R	1279	<i>Elaphe quatuorlineata</i>	p		II;IV NT LC
R	1217	<i>Testudo hermanni</i>	p	X	II;IV NT VU
Groups of other species included in the site's SDF					
Passerines of agricultural areas					
Passerines of forests					
Passerines of wetlands					
Raptors					

Note: p: permanent (Source: SDF), II, IV: Annexes of Habitats Directive, I: Annex of Birds Directive, LC: Least Concern, VU: Vulnerable, NT: Near Threatened, EN: Endangered

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Passerines of agricultural areas: *Alectoris graeca* all others, *Anthus campestris*, *Tachymarptis melba*, *Apus apus*, *Caprimulgus europaeus*, *Crex crex*, *Delichon urbicum* (urbica), *Emberiza hortulana*, *Ficedula albicollis*, *Hippolais olivetorum*, *Hirundo rustica*, *Lanius collurio*, *Lullula arborea*, *Merops apiaster*, *Motacilla flava*, *Oriolus oriolus*, *Passer hispaniolensis*, *Streptopelia turtur*, *Sylvia rueppelli*

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Passerines of forests: *Dendrocopos leucotos*

Passerines of wetlands: *Alcedo atthis*

Raptors: *Aquila chrysaetos*, *Bubo bubo*, *Buteo buteo*, *Circaetus gallicus*, *Falco eleonora*, *Falco peregrinus*, *Hieraaetus fasciatus* (*Aquila fasciata*), *Pernis apivorus*

Furthermore, the sensitivities of the species of concern, namely species of the Annexes II and IV of the Habitats Directive that are not among the trigger species for the site, 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 also for their protection and are presented in Table 5-9.

**Table 5-9 Other species expected or observed within the FSA**

Group	Code	Species	Presence	Observed during fieldwork	Annex of Habitats Directives / IUCN / Greek Red List
Other important Annex IV (92/43/EEC) species of the Study Area - Reported in chapter 3.3 of the site's SDF					
M	1353	<i>Canis aureus</i>			- LC EN
M	5365	<i>Hypsugo savii</i>		X	IV LC LC
M	5009	<i>Pipistrellus pygmaeus</i>		X	IV LC DD
R	1248	<i>Podarcis taurica</i>	p	X	IV LC LC
Other important Annex II and IV species of the Study Area not included in the site's SDF					
M	1309	<i>Pipistrellus pipistrellus</i>		X	IV LC DD
M	1333	<i>Tadarida teniotis</i>		X	IV LC LC
R	1258	<i>Algyroides moreoticus</i>	p	X	IV NT NT
R	1254	<i>Podarcis peloponnesiaca</i>	p	X	IV LC LC
R	1256	<i>Podarcis muralis</i>	p	X	IV LC LC
R	1281	<i>Zamenis longissimus</i>	p	X	IV LC LC
I	1089	<i>Morimus funereus</i>	p	X	II VU -




Note: p: permanent, II, IV: Annexes of Habitats Directive, LC: Least Concern, VU: Vulnerable, NT: Near Threatened, EN: Endangered,

DD: Data Deficient

Prepared by: (NCC, 2021)

### 5.2.2 Pipeline Construction and Pre-commissioning

The project will cross the Study Area. The construction is expected not to exceed a few months.

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During the preliminary design phase special care was taken in order:

- to minimize the overlap of the project with forested areas in an attempt to minimize impacts of the project to the specific habitat.
- to prevent or minimize any potential impact during project construction. More specifically, a series of measures have been taken in order to minimize the potential impact to biodiversity, including (a) no use of blasting within the site, (b) minimization of construction works during night and (c) application of reduced working strip when environmental constraints apply.

The potential impacts have been assessed taking into consideration measures adopted during preliminary design phase and the pre-condition that the construction works within and in the vicinity of the Study Area will take place outside the breeding period March-July, following the provisions of the EU Habitats Directive and of national legislation.

Habitat type coverage loss, deterioration, fragmentation: **Low**

During planning of the pipeline routing, special attention has been given in order to maximize the avoidance of natural habitats and crossing through agricultural areas. At the FSA four habitat types of Annex I were identified, namely 9340, 9540, 92C0 and 91M0. Of them the ones expected to be affected, as the working strip crosses them, are 91M0, 9540 and 9340. The area of each habitat type expected to be lost due to construction is 2.33 (0.05%), 6.05 (0.41%) and 1.37 (1.14%) ha for 91M0, 9540 and 9340 respectively.

The habitats of the broader area may be affected by any potential discharge or deposition of garbage or aggregates.




**Table 5-10 General impact characteristics for habitats and flora**

Receptor	Nature	Extent	Duration
91M0 9540 9340	Negative. Loss of habitat type.	Local	Permanent/Long term. The impact is expected to be permanent for the PPS and long term for the rest of the working strip.

Prepared by: (NCC, 2021)

The value of the receptor is high as it concerns three habitat types listed in Annex I of the Habitats Directive. The intensity is medium, while the frequency is medium and as a result the overall impact high.

As appropriate mitigation measures can be applied in order to restore those impacts, the reversibility of the impact is medium and the residual impact low. More specifically, almost 70% of the destructed habitat can be restored and regain its former form and characteristics.

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For the habitat types assessed the general Conservation Objectives apply, as no Site Specific Conservation Objectives (SSCOs) have been defined. Thus, the Conservation Objective for 91M0 and 9540 is to maintain the Degree of Conservation A, while for the 9340 is to achieve the Degree of Conservation B in the short term. The Degree of Conservation is directly related to the conservation of the habitat type's structure and functions, as well as its restoration possibility. Both, structure and function of the above mentioned habitats are expected to be affected in a small extend, while the restoration possibility of the habitat types is expected to be high. The Conservation Status and the Conservation Objectives of the three habitat types present in the area are expected to be affected in a small extent.

Habitat loss, deterioration, fragmentation: **Low**

The project is crossing an area that is characterized mainly by the presence of forests and agricultural habitats. The forested areas are main habitat for some species of interest, including *Leipicus medius* and bat species. Felling of old trees may lead to the destruction of roosting sites of bat species and nesting sites of bird species.

For the species of agricultural areas the impact on their habitat is expected to be of less extent, as it is expected to regain its former use and form.

**Table 5-11 General impact characteristics for habitat loss/deterioration – fauna**




Receptor	Nature	Extent	Duration
<i>Leipicus medius</i> Passerines of forests Bat species	Negative. Habitat loss and fragmentation	Local, at the broader area of the working strip and the surrounding area	Long-term/Permanent. The impact is expected to continue after the construction period.
Passerines of agricultural areas Raptors <i>Testudo hermanni</i> <i>Elaphe quatuorlineata</i>	Negative. Habitat loss	Local	Short-term

Prepared by: (NCC, 2021)

The value of the receptor is high as it concerns species, listed in Annex II of the Habitats Directive and Annex I of the Birds Directive. The intensity of the impact is low, as it could potentially affect specific group of localized individuals within the population. The frequency is medium. Based on the above the impact is estimated to be medium.

The reversibility will be medium for the parts of the forested areas as the fragmentation will not be reversed, while for the parts that are grasslands/agricultural areas the reversibility is high.



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Furthermore, the implementation of mitigation measures could not reverse significantly the impact. As a result, the residual impact is low. More specifically, old trees can be avoided through micro-siting while large part of the destroyed habitats can be restored.

For the species habitats' quality, the general Conservation Objectives apply for all species, as no SSCOs have been defined. Thus, the Conservation Objective for species with Degree of Conservation A is to maintain it, for those with Degree of Conservation B is to maintain it in the short term, while for those with Degree of Conservation C, to achieve B. The Degree of Conservation is directly related to the conservation of the features of the habitat important for the species, as well as the restoration possibility of the species. Based on the above, as the important for the species features of the habitat are affected in a small extent, the Conservation Status and the Conservation Objective for the species is expected to be affected.

Furthermore, the suitable habitat should be >50% of the 36 cells and 83 cells of 1x1km in the site for *Elaphe quatuorlineata* and *Testudo hermanni*, respectively. For the bat species the suitable feeding habitat should cover a significant part of the area of the 10x10 cells of the species distribution within the site (>50%) for *Miniopterus schreibersii*, *Myotis bechsteinii*, *Myotis blythii*, *Rhinolophus hipposideros* and the same applies for suitable habitat for *Barbastella barbastellus*. Those SSCOs are not expected to be affected.

#### Loss of Individuals: Negligible

No streams are present and as a result, no species related to aquatic habitats are expected in the FSA.




During construction, increase of vehicle traffic is expected in the area and as a result individuals of reptile and mammal species that are moving in the area may become victims of accidental roadkill. The increase in traffic is estimated to be about 200 vehicle movements per day.

Reptiles are active specific period of the year, which in its main part coincides with the breeding period that was set as precondition. Furthermore, they may hibernate underground at locations inside the FSA.

Concerning reptiles, species that potentially hibernate at the working strip may be accidentally killed during construction works. Open trenches may act as traps mainly for reptiles and amphibians.

**Table 5-12 General impact characteristics for loss of individuals - fauna**

Receptor	Nature	Extent	Duration
<i>Testudo hermanni</i> Other reptile species	Negative. Potential loss of individuals	Local, at the broader area of the working strip	Short-term. The impact is expected only during

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Receptor	Nature	Extent	Duration
		and the surrounding area	the construction period (few months).

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

As appropriate mitigation measures can be applied in order to prevent accidental roadkills and unintentional killing, the reversibility of the impact is medium and the residual impact negligible.




The Conservation Status and the Conservation Objectives, concerning the population density and distribution, for the terrestrial and freshwater reptile species included in the SDF are not expected to be affected.

Loss of individuals of avifauna is envisaged only in the case of destruction of active nests due to felling of trees. As construction works will take place outside the breeding season, loss of juveniles or nestlings is not expected.

The overall residual impact is estimated to be negligible.

The SSCOs for *Testudo hermanni* and *Miniopterus schreibersii* are an average density population in areas with suitable habitat to be greater or equal to 4 ind./ha and 1 ind./ha, respectively. Furthermore, *Testudo hermanni* and *Elaphe quatuorlineata* to be recorded in 50 1x1km cells, within the Natura 2000 site. The SSCOs for the species *Barbastella barbastellus* and *Miniopterus schreibersii* are permanent presence in at least 1 and 3 5x5km cell within the Natura 2000 site, respectively, while for the species *Myotis blythii*, *Rhinolophus ferrumequinum*, *Rhinolophus hipposideros*, in at least 4. Finally, *Myotis bechsteinii*, *Myotis blythii*, *Rhinolophus ferrumequinum*, *Rhinolophus hipposideros* should be present in each cell of 10x10 species distribution within Natura 2000 site. For *Leiopicus medius* SSCOs are no significant reduction in breeding population and distribution range below FRV and FRVr values. It is estimated that the project will not affect the objectives, as necessary mitigation measures will be taken in order to avoid loss of individuals, while the species have broad distribution in the area.

Disturbance: Low

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Disturbance is mainly related to mammal and bird species, which may be affected by increased human presence, vehicle movement and construction work carried out.

As bats are nocturnal and feed during dawn, dusk and night, light pollution at the working strip may induce to some species disturbance.

**Table 5-13      General impact characteristics for disturbance - fauna**

Receptor	Nature	Extent	Duration
Bat species Bird species	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 (few months).

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The value of the receptor is high as it concerns species included in Annexes II and IV of the Habitats Directive. The intensity of the impact is medium, as it could potentially affect portion of the population and may change abundance over one or more. The frequency is low, as the construction, according to the construction speed rate will be a few weeks, which is a short period of time, while it will take place outside the breeding season. Based on the above the impact is estimated to be medium.

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 low. More specifically, no construction activities will take place during the sensitive breeding period and during night.




The SSCOs of the species concerning their distribution, as presented above, are not expected to be affected.

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

The project is crossing the Study Area at its southern part and special care has been taken to maximize the avoidance of natural habitat. As a result, 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.

The above in combination with the low impact to species and habitats leads to the estimation that no change to the dynamics of the relationships that define the structure and/or function of the site are expected. 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.

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### 5.2.3 Operation and Maintenance

During operation and maintenance the PPS will be maintained free of wood vegetation and operation will not include any regular human or vehicle presence.

Habitat type loss, deterioration, fragmentation: **Low**

The maintenance of the PPS at the forested areas will not allow the regeneration of the forest at those locations. Areas of habitat types expected to be permanently lost are areas of 91M0, 9540 and 9340, namely 0.8ha (0.02%), 1.9ha (0.13%) and 0.48ha (0.4%), respectively.

As the PPS is even smaller than the working strip the impact is estimated to be low.

Species habitat loss, deterioration, fragmentation: **Low**

Applies the same as for the habitat type loss.

Loss of Individuals: **Not applicable**.

*(No loss of individuals is expected during operation.)*

Disturbance: **Not applicable**.

*(No disturbance is expected during operation.)*




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Table 5-14 Assessment of impacts

Phase	Threat	Receptor	Nature	Extend	Duration	Intensity	Value of the receptor	Frequency	Overall importance	Reversibility	Residual impact
Construction	Habitat type loss, deterioration, fragmentation	Habitat types	Negative	Local	Long term	Low	High	Medium	Medium	Medium	Low
	Species habitat loss, deterioration, fragmentation	Fauna	Negative	Local	Long term	Low	High	Medium	Medium	Medium	Low
	Loss of individuals	Fauna	Negative	Local	Short term	Low	High	Low	Low	Medium	Negligible
	Disturbance	Fauna	Negative	Local	Short term	Medium	High	Low	Medium	Medium	Low
Operation	Habitat type loss, deterioration, fragmentation	Habitat	Negative	Local	Long term	Negligible	High	Medium	Low	-	Low
		Fauna	Negative	Local	Long term	Negligible	High	Medium	Low	-	Low
	Loss of individuals	Fauna	Negative	No impact expected							
	Disturbance	Fauna	Negative	No impact expected							

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#### 5.2.4 Sensitivities of other species

As presented in Table 5-9, other species included in the Annex II and IV of the Habitats Directive were also observed in the FSA.

The presence of *Canis aureus* was not recorded previously, specifically in the segment of concern. If *Canis aureus* have newly colonized the area through natural dispersal, the population will be of small size, sensitive to newly introduced disturbance and easily prone to leave the area. In the worst-case scenario, the species could potentially be temporarily displaced from the area, abandon a previously highly suitable area even if the disturbance ceases. If time constraints are not met and *Canis aureus* get disturbed during sensitive periods (mid-March to July) they may abandon their litters/denning sites or try to move them elsewhere, risking injury and death of the pups. *Canis aureus* may also be attracted by the presence of garbage and food remains, increasing habituation of the species to humans, which may lead to increase of conflict.

As *Canis aureus* and bats are nocturnal and feed during dawn, dusk and night, light pollution at the working strip will probably induce disturbance.

The forested areas are main habitat for *Morimus funereus*, which is sensitive in reduction of its habitat.




At the FSA, stands of *Platanus orientalis* were found and in case any individuals are inside the working strip, felling is expected.

The other bat and reptile species are also sensitive, as presented above, for the species included in the SDF included in the same ecological group.

#### 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 above, the site has not significant other existing or planned projects and infrastructures, such as Pipelines, Power lines, energy and other major projects; except for the local road network.

The routing of the EastMed pipeline traverses the southern part of the site, in areas where no other projects exist, just the local road network. The fact that the project crosses the SAC/SPA in such areas leads to the decrease of any possible cumulative impact, as it does not increase the habitat fragmentation within the site and the increase of noise and human presence during construction,

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which will take place in an area that is not sensitive for the bird species. In addition, no other planned projects or plans are known to be proposed within the Natura 2000 site and therefore no cumulative impacts are expected.

### 5.2.6 *Alternative scenarios*

Concerning the assessment of alternative routings of the project, to avoid the specific SAC/SPA site, detailed description of alternative scenarios is given in the relevant chapter (Chapter 7) of the ESIA. However, it is noted that a different routing in a different terrain, would need to address significant geotechnical challenges, require higher constructional effort and time, and therefore higher potential impacts towards biodiversity, increased proximity to Ancient Olympia cultural heritage site, etc.

#### **Scenario 1: Current routing.**




The construction works for the current routing are estimated to have no impacts on the qualifying features of the SAC/SPA. By respecting the construction time-constraints and by taking appropriate pre-construction mitigation measures such as ornithological and fauna surveys for spotting nesting trees and tree stands or other appropriate nesting sports, to avoid the destruction of nest sites or important flora species through micro-siting, the impact is expected to be low.

#### **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 objects and ecological integrity of 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:

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- 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.

Given the above and considering the implementation of the aforementioned management and mitigation measures preventing/reducing potential impacts, it is concluded that the implementation and operation of the proposed project will induce low impact 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, as well as low impact on the integrity of the site.

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## 6 MITIGATION MEASURES OF POTENTIAL IMPACTS




Mitigation measures are proposed as precaution for the avoidance or reduction of potential adverse impacts. In this context the aim is to prevent, minimize and neutralize 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/minimize impacts are presented in the following Table (Table 6-1).




It is noted 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**

Table 6-1 Impact, mitigation measures proposed and significance of residual impact						
Mitigation Commitments to Address the Impact / Risk	Efficiency				IP	Significance of Residual Impact / Risk
	Prevention/avoidance	Reduction of intensity	Reduction of extent	Restoration		
Construction Phase						
Implement time-constraints and undertake construction works outside the breeding period between 1 <sup>st</sup> March and the 31 <sup>st</sup> July.	X				1017-1073	Low
Appropriate micro-siting before construction to avoid, important for the species tree stands and mature trees within the working strip.	X					
Habitat types loss / Species habitat loss, degradation or fragmentation						
<u>Already foreseen by the project:</u> The topsoil will be carefully stored and no construction materials will be taken from the surrounding environment unless approved by the responsible authority.	X				1017-1073	Low
<u>Already foreseen by the project:</u> Establishment and marking of working strip and use of existing infrastructure and roads.	X					
Restoration of habitat by seeding/planting. The planting material (seeds and stems) should be preferably collected before the construction from the area.				X		




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Mitigation Commitments to Address the Impact / Risk	Efficiency				IP	Significance of Residual Impact / Risk
	Prevention/avoidance	Reduction of intensity	Reduction of extent	Restoration		
Decrease of working strip from 38m to 28m (or 22m).			X			
Loss of individuals						
Limiting of vehicle speed (limits will be established at the Traffic Management Plan)	X	X	X			
At trenches, plugs will be incorporated every 100 m and daily fauna retrieval will be conducted if required. Where appropriate, temporary or permanent provisions for fauna to cross the working strip/ roads using underpasses, tunnels or other measures should be installed.	X					
Work to retain passage for species as long as possible across the corridor and following works to reinstate passage to be conducted immediately upon pipe section completion				X		
Litter and other waste material have to be stored and disposed of appropriately. Any environmentally hazardous material used during construction works have to be carefully stored and in accordance with the applicable legislation.	X				1017-1073	Negligible
Scanning of the working strip, prior to vegetation clearance, to identify protected and endemic tree species and micro-siting for avoidance.	X					
Pre-construction survey at the working strip prior to construction initiation by a herpetologist, for the relocation of tortoises or other reptiles to nearby locations.	X					
Collection of injured individuals and transfer to wildlife rehabilitation centres.		X				
Pre-construction survey along the route for potential presence of important hibernating species or colonies and nests.	X					

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Mitigation Commitments to Address the Impact / Risk	Efficiency				IP	Significance of Residual Impact / Risk
	Prevention/avoidance	Reduction of intensity	Reduction of extent	Restoration		
Fauna species should not be caught or killed during construction.	X					
Scanning of the working strip, prior to vegetation clearance, to identify protected and endemic tree species and micro-siting for avoidance. (Concerns mainly <i>Platanus orientalis</i> and old trees)	X					
Disturbance						
Avoidance of dusk-dawn work.		X				
Usage of lights to minimum, for safety reasons, and directional lighting.	X		X			
No upgrade of existing forest roads should take place.		X	X		1017-1073	Low
Access to the works area will only be allowed to site staff.		X	X			
All impacts						
Ecological awareness/behaviour training should be provided to all personnel.	X	X	X			
Establishment of a Fire Risk Prevention Plan	X					
Construction work must be supervised by fauna and habitat experts and monitoring of fauna will take place immediately before and during construction period, to carry out preventive conservation measures by the pipeline environmental team when/if required. The Management Body will be timely informed for the specific ecological work.	X				1017-1073	Low
A Biodiversity Action Plan (BAP) will be implemented for the Natura 2000 site. The BAP should foresee direct collaboration with the local Management Body of the protected site.	X	X	X			
Operation Phase						
A Biodiversity Action Plan (BAP) will be implemented for the Natura 2000 site. The BAP				X	1017-1073	Low






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Mitigation Commitments to Address the Impact / Risk	Efficiency				IP	Significance of Residual Impact / Risk
	Prevention/ avoidance	Reduction of intensity	Reduction of extent	Restoration		
ensure a close collaboration of the ecological monitoring team with the management Body of the protected area.						

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The majority of the aforementioned mitigation measures are expected to benefit also the other species observed in the area.

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




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## 7 COMPENSATORY MEASURES

Compensatory measures, as described in Article 6 (4) of the EU Habitats Directive and incorporated into the 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 the interpretation of the 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 of the investigated Natura 2000 site is assessed in the present Appropriate Assessment, no compensatory measures are proposed.

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## 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. It consists of two parts (a) monitoring the state of the species and habitats of interest and (b) monitoring the implementation of the mitigation measures.

### 8.1 General Monitoring Criteria

#### During construction

During construction phase, a “pre-construction” team composed by specialized field experts-scientists will monitor/survey (walkover) before construction initiation. Main goal for the team is to survey potential presence of important species, features and parameters that may need specific handlings (e.g. breeding species, important species, injured individuals, young individuals, important sites, etc.). This will ensure that any site-specific issues will be highlighted before construction and appropriate measures will be taken before construction activities initiation.

#### Post construction




After construction has been finalized, a monitoring program during the operation of the project must be conducted for at least 3 years. Given the scale of the project, it is necessary to implement such monitoring follow-up in order to establish the effectiveness of the applied mitigation measures and record any possible changes/impacts to the natural environment and its components due to the project function. During the operation phase, monitoring actually has an ancillary role to observe the follow-up situation, and record some meta-status that may need attention.

#### Main goal of monitoring activities

The main aim of these two monitoring stages, is to be able to record the actual stage and status of fauna species, in-situ, with a pre-construction preceding team, then in real-time during the construction process, and eventually once the construction is over to record the post-construction situation, impact and effect of mitigation measures, and natural environment elements’ status in the recovery phase.

#### Basic axis for monitoring implementation

There are four basic axes upon which the monitoring will be designed and carried out: (a) Important species of concern that must be studied in each respective protected area, (b) Period (season-month and time of the day) of the monitoring implementation, (c) Guidelines for monitoring implementation

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depending on each biological group which is studied, and (d) Biological and environmental parameters recorded during monitoring process.

All four axes are analytically described in the paragraphs below.

## 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.

All above information will feed the procedure of the periodic adjustment of the mitigation program, while annual reports of the monitoring program should be submitted to central, regional and local authorities responsible for environmental supervision.

### Species for which monitoring should focus on, during construction and in post-construction surveys.

Based on the site's recorded fauna, attention during monitoring should be given in trigger, 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 the present AA, namely (a) mammals, including *Canis aureus* and bats, (b) reptiles and amphibians and (c) birds.

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### Monitoring during construction




In the case of mammals. For bat species passive acoustic bat recording should be used.

During construction it is advisable to have both a monitoring process 3-4 days before construction reaches at the surveyed, whereas experts should also follow the working crews in-situ during construction. Permanent line transects should be applied. In case of direct observation of animals on the project area, evaluation of the situation should take place on the case by case basis.

In the case of reptiles, foot line transects again is one of the most common, simple and low-cost technique to monitor them as well that can cover many species' survey, and is only applied during the day due to the species biological traits for reptiles and during day and night for amphibians. One of the main techniques of herpetofauna monitoring, apart the foot survey, is the turnover of all material possible to give shelter to reptiles, stones, cupboards, wood debris, trunks, etc. High attention should be given to possible encounter with venomous snakes, and only specialists should undertake handling. During night the survey is also (and probably mainly) acoustic, recording and identifying individuals from their sound.

During construction, it is advisable to have both a monitoring process 3-4 days before construction reaches at the surveyed, whereas experts should also follow the working crews in-situ during construction. In case of direct observation of animals inside the working strip, evaluation of the situation should take place as well on a case by case basis, possible relocation should be considered, and first aid help if an animal is injured.

In the case of eagles and falcons, Road-Foot-survey Line Transects will be used. Monitoring will be mainly performed with binoculars preferably 10x42, and an additional spotting scope 20x60. The team will be following specific line transects. Foot line transects can be realized in parallel by the avian experts field crew, and recording may take place preferably early in the morning (1 hour after dawn) but may last even until late in the afternoon. Nonetheless, the best time of the day for monitoring is between 8.00-9.00 up to 14.00-15.00. Each member of the avian survey team, should have along a hand-gps loaded with the transect lines that will be followed, and the project routing. Before direct observation and monitoring will take place, the field team must have already complete basic parameters within specific protocols such as name of surveyor, temperature, date, local geographical names, percentage of cloud-cover, wind direction, wind power on Beaufort scale. Whenever eagle, vultures and falcon species are observed, or else raptors in general, the following parameters will be recorded: Latin name of the species, number of individuals, age of individuals, sex of individual, description of habitat at site of observation, direction flight, distance of flight from the project, and the following eight ethological parameters must also be recorded based on raptors'

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behavior: flying-gliding, roosting, prey foraging – feeding, territory marking & defending, courtship, nest construction, egg-laying and incubation, feeding nestlings.

In the case of passerines – songbirds - small birds, a group which actually includes Passeriformes, Coraciiformes, Piciformes, Apodiformes, Cuculiformes, Columbiformes, Road-Foot-survey Line Transects will be realized. Monitoring will be mainly realized with binoculars preferably 10x42, whereas the additional spotting scope 20x60 will be much less needed, since due to high activity of the species, quick reflexes require an easy spotting tool such as hand binoculars. The team will be following specific line transects. Foot line transects can be realized in parallel by the avian experts field crew, and recording may take place preferably very early in the morning (1 hour before dawn) and must not be realized after 11.00-12.00. Each member of the avian survey team, should have along a hand-gps loaded with the transect lines that will be followed, and the project routing. Before direct observation and monitoring will take place, the field team must have already complete basic parameters within specific protocols such as name of surveyor, temperature, date, local geographical names, percentage of cloud-cover, wind direction, wind power on Beaufort scale. Whenever representative species of the group will be located (it must be noted that more than half of this group's observations are realized through acoustic identification and not visual contact), the following parameters will be recorded: Latin name of the species, number of individuals, age of individuals, sex of individual, description of habitat at site of observation, direction flight, distance of flight from project, and the following eight ethological parameters must also be recorded based on species' behavior: flying-gliding, roosting, prey foraging – feeding, territory marking & defending, courtship, nest construction, egg-laying and incubation, feeding nestlings. Furthermore, for this group we record mainly species which are within the vicinity of 100m around us, and in case the species fly above the site as passing by visitors, it is noted in the protocols as “fly over flight”, which does not relate the individuals with the site.

#### Monitoring during operation and maintenance phase

After the construction is finalized, the monitoring phase of the “post-construction” period will be conducted for a total of 3 years, except if during monitoring and assessment it is estimated that a shorter period can be sufficient. The main axis of its implementation is the same as presented in the above section of construction monitoring phase.



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## 9 CONCLUSIONS

The present Appropriate Assessment concerns onshore section of the EastMed pipeline, which crosses the Special Protected Area and Special Area of Conservation (SPA/SAC) "Oropedio Folois", GR2330002. 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 the 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 26 days were carried out in 2021, to cover all the annual cycle.

The present AA provided a detailed ecological description of the Study Area with special emphasis in the Field Survey Area (a strip of 500 m either side of the proposed routing). In particular, the AA assessed the potential impacts of the project to the populations and distribution of protected species and the ecological functions of the site, and identified suitable mitigation measures to ensure that the proposed project will not harm the ecological integrity of the site and the connectivity of the Natura 2000 network.

The project will cross the Study Area. The construction is expected not to exceed a few months. The expected residual impacts to habitats and species of the Study Area are estimated as low and concern mainly (a) habitat type coverage loss of 91M0 and 9340, (b) habitat loss for species mainly through potential felling of old trees used as roosting sites of bat species and nesting sites of bird species (i.e. *Leiopicus medius*) and maintenance of the PPS and (c) for disturbance of mammals and birds, due to noise and light pollution, while the impact related to loss of individuals is estimated as negligible. During the operation and maintenance phase of the project impacts related to species habitat fragmentation were estimated as low.




The present AA proposes a key measure for mitigation of the impacts on the local biodiversity, in order to minimize project impacts to the site: The construction works within the site and its vicinity will take place outside the main breeding period, March-July, following the provisions of the EU Habitat Directive and of the national legislation. By applying this measure and other mitigation measures proposed in the relevant chapter of the AA, the impacts of the project to the ecological integrity of the SAC/SPA site are assessed to be low.

Concerning cumulative impacts, the site has not significant other existing or planned projects and infrastructures that could be expected to act cumulatively. The scenario of the current routing is estimated as the optimal one.

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The present AA also provided guidelines on the monitoring program to be carried out during construction alongside the executions of construction works and during the pipeline operation for at least three years.

Provided that the described above precautions are taken into consideration, it is well beyond doubt that the impacts of the crossing of the project to the ecological integrity of the Special Protected Area and Special Area of Conservation (SPA/SAC) "Oropedio Foliois", GR2330002, of the Natura 2000 network, will be low.

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## 10 STUDY TEAM

Name		Role
Tasos Dimalexis	Dr. Biologist	Project Coordinator Site assessment
Margarita Tzali	Environmental Engineer, MSc	Project Management AA compilation
Alexandra Kontou	Environmentalist, MSc	AA compilation
Vassilis Goritsas	Environmentalist, MSc	Data management/Map production
Jakob Fric	Physicist	Development of databases / Data management
Giorgos Fotiadis	Dr. Forester	Habitat expert Field survey, Preparation of texts, Mapping
Apostolos Christopoulos	Environmentalist MSc, Phd candidate in Biology	Herpetofauna/Avifauna expert Field survey, Preparation of texts
Irini Antoniadi	Biologist, MSc	Wolf/Jackal expert Field survey, Preparation of texts
Ioanna Salvarina	Dr. Biologist	Bat/Otter expert Field survey, Preparation of texts
Aliki Dakari	Biologist	Invertebrate expert Field survey, Preparation of texts
Stefanos Profitis	Forester	Field worker: Habitat field survey
Nikos Probonas	Field worker	Field worker: Avifauna field survey
Thanos Kastritis	Dr. Oceanographer	Field worker: Mammal/Bird field survey

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## ANNEX A SDF DATA

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**Table ANNEX-11-1 Habitat types present on the site and assessment for them**

Code	Cover (ha)	Data quality	Assessment			
			Repres.	Rel.surf.	Cons.	Global
91M0	4889.13	G	A	B	A	B
9340	120.81	G	A	C	A	B
9540	1474.46	G	C	C	C	C

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-11-2 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
F	5334	<i>Telestes pleurobipunctatus</i>	p				P	DD	B	C	C	C

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Group	Code	Species Name	Population						Assessment			
			Type	Min	Max	Unit	Abund.	Data Quality	Pop.	Cons.	Isol.	Global
M	1308	<i>Barbastella barbastellus</i>	p				P	P	C	B	C	
M	1355	<i>Lutra lutra</i>	p				P	M	C	B	C	C
M	1310	<i>Miniopterus schreibersii</i>	p				P	P	C	B	C	
M	1323	<i>Myotis bechsteinii</i>	p				P	P	C	B	B	
M	1307	<i>Myotis blythii</i>	p				P	P	C	B	C	
M	1304	<i>Rhinolophus ferrumequinum</i>	p				P	P	C	B	C	
M	1303	<i>Rhinolophus hipposideros</i>	p				P	P	C	B	C	
R	1279	<i>Elaphe quatuorlineata</i>	p				C	DD	C	B	C	C
R	1217	<i>Testudo hermanni</i>	p	1001	10000	i		M	C	A	C	B
Trigger bird species												
B	A868	<i>Leiopicus medius</i>	p				P	DD	C	B	C	B
B	A447	<i>Emberiza caesia</i>	r				P	DD	C	C	C	B
Bird Directive   Annex I species												
B	A229	<i>Alcedo atthis</i>	r				P	DD	C	B	C	B
B	A878	<i>Alectoris graeca all others</i>	p				C	DD	C	B	C	B
B	A255	<i>Anthus campestris</i>	r				P	DD	C	C	C	B
B	A091	<i>Aquila chrysaetos</i>	p				P	DD	C	B	C	B
B	A215	<i>Bubo bubo</i>	p	2	2	i		M	C	A	C	B
B	A224	<i>Caprimulgus europaeus</i>	r				P	DD	C	A	C	B
B	A080	<i>Circaetus gallicus</i>	r				P	DD	C	B	C	B
B	A122	<i>Crex crex</i>	c				P	DD	C	B	C	B
B	A239	<i>Dendrocopos leucotos</i>	p				P	DD	C	A	B	B
B	A379	<i>Emberiza hortulana</i>	r				P	DD	C	B	C	B

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Group	Code	Species Name	Population						Assessment			
			Type	Min	Max	Unit	Abund.	Data Quality	Pop.	Cons.	Isol.	Global
B	A100	<i>Falco eleonora</i>	c				R	DD	C	B	B	B
B	A103	<i>Falco peregrinus</i>	p				P	DD	C	B	C	B
B	A321	<i>Ficedula albicollis</i>	c				P	DD	C	B	C	B
B	A707	<i>Hieraetus fasciatus</i> ( <i>Aquila fasciata</i> )	c				R	DD	C	B	C	B
B	A707	<i>Hieraetus fasciatus</i> ( <i>Aquila fasciata</i> )	r				P	DD	C	B	C	B
B	A439	<i>Hippolais olivetorum</i>	r				P	DD	C	B	C	B
B	A338	<i>Lanius collurio</i>	c				C	DD	C	B	C	B
B	A338	<i>Lanius collurio</i>	r				C	DD	C	B	C	B
B	A246	<i>Lullula arborea</i>	p				P	DD	C	B	C	B
B	A246	<i>Lullula arborea</i>	r				P	DD	C	B	C	B
B	A072	<i>Pernis apivorus</i>	c				C	DD	C	A	C	B
B	A072	<i>Pernis apivorus</i>	r				P	DD	C	A	C	B
B	A440	<i>Sylvia rueppelli</i>	r				P	DD	C	B	B	B
Migratory bird species with regular presence												
B	A228	<i>Tachymarptis melba</i>	r				P	DD	C	B	C	B
B	A226	<i>Apus apus</i>	r				P	DD	C	B	C	B
B	A087	<i>Buteo buteo</i>	r	3	3	p		M	C	A	C	B
B	A087	<i>Buteo buteo</i>	w	1	1	i		M	C	A	C	B
B	A738	<i>Delichon urbicum</i> ( <i>urbica</i> )	c				C	DD	C	A	C	B
B	A738	<i>Delichon urbicum</i> ( <i>urbica</i> )	r				C	DD	C	A	C	B
B	A251	<i>Hirundo rustica</i>	r				P	DD	C	A	C	B
B	A230	<i>Merops apiaster</i>	r				P	DD	C	A	C	B
B	A260	<i>Motacilla flava</i>	r				P	DD	C	B	C	B
B	A337	<i>Oriolus oriolus</i>	c				C	DD				
B	A355	<i>Passer hispaniolensis</i>	r				P	DD	C	B	C	B
B	A210	<i>Streptopelia turtur</i>	r	3	10	p		M	C	A	C	B

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### 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

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 23 other species of importance for the area included in the SDF, of which 2 are amphibians, 1 bird, 9 mammals and 11 reptiles, all of which included in the National Red Data Lists, 20 in International Conventions, while 18 are listed in Annex IV of the Habitats Directive and 1 in Annex V and 1 is listed for other reasons. 3 species are endemic. For further detail please refer to the SDF.






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## ANNEX B THREAT STATUS

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Table ANNEX-11-3 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)	Birds Directive Annex I	Habitats Directive Annex II	Habitats Directive Annex IV	Bern Convention	Bonn Convention	AEWA	CITES	Observed during field work
M	1308	<i>Barbastella barbastellus</i>	NT	EN			Y	Y	II	II			X
R	1279	<i>Elaphe quatuorlineata</i>	NT	LC			Y	Y	II				
M	1355	<i>Lutra lutra</i>	NT	EN			Y	Y	II			I	
M	1310	<i>Miniopterus schreibersii</i>	NT	NT			Y	Y	II	II			
M	1323	<i>Myotis bechsteinii</i>	NT	NT			Y	Y	II	II			
M	1307	<i>Myotis blythii</i>	LC	LC			Y	Y	II	II			
M	1304	<i>Rhinolophus ferrumequinum</i>	LC	LC			Y	Y	II	II			X
M	1303	<i>Rhinolophus hipposideros</i>	LC	LC			Y	Y	II	II			X
F	5334	<i>Telestes pleurobipunctatus</i>	LC	LC	(x)		Y-CTC						
R	1217	<i>Testudo hermanni</i>	NT	VU			Y	Y	II			II	X
Trigger bird species													
B	A868	<i>Leipicus medius</i>	LC			Y-CTC			II				X
B	A447	<i>Emberiza caesia</i>	LC			Y			II				
Bird Directive   Annex I species													
B	A229	<i>Alcedo atthis</i>	LC	DD		Y			II				
B	A878	<i>Alectoris graeca all others</i>	NT	VU		Y			III				

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Group	Code	Species Name	IUCN (2020)	Greek Red Data Book (2008)	Endemic - Greek Red Data Book (2008)	Birds Directive Annex I	Habitats Directive Annex II	Habitats Directive Annex IV	Bern Convention	Bonn Convention	AEWA	CITES	Observed during field work
B	A255	<i>Anthus campestris</i>	LC			Y			II				
B	A091	<i>Aquila chrysaetos</i>	LC	EN		Y			II	II			
B	A215	<i>Bubo bubo</i>	LC			Y			II				
B	A224	<i>Caprimulgus europaeus</i>	LC			Y			II				
B	A080	<i>Circaetus gallicus</i>	LC	NT		Y			II	II			
B	A122	<i>Crex crex</i>	LC	DD		Y			II	II	✓		
B	A239	<i>Dendrocopos leucotos</i>	LC	NT		Y			II				
B	A379	<i>Emberiza hortulana</i>	LC			Y			III				
B	A100	<i>Falco eleonora</i>	LC			Y			II	II			
B	A103	<i>Falco peregrinus</i>	LC			Y			II	II			X
B	A321	<i>Ficedula albicollis</i>	LC			Y			II	II			
B	A707	<i>Hieraaetus fasciatus (Aquila fasciata)</i>	LC	VU		Y			II	II			
B	A439	<i>Hippolais olivetorum</i>	LC	NT		Y			II	II			
B	A338	<i>Lanius collurio</i>	LC			Y			II				X
B	A246	<i>Lullula arborea</i>	LC			Y			III				
B	A072	<i>Pernis apivorus</i>	LC			Y			II	II			

Migratory bird species with regular presence

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Group	Code	Species Name	IUCN (2020)	Greek Red Data Book (2008)	Endemic - Greek Red Data Book (2008)	Birds Directive Annex I	Habitats Directive Annex II	Habitats Directive Annex IV	Bern Convention	Bonn Convention	AEWA	CITES	Observed during field work
B	A228	<i>Tachymarptis melba</i>	LC						II				
B	A226	<i>Apus apus</i>	LC						III				X
B	A087	<i>Buteo buteo</i>	LC						II	II		II	X
B	A738	<i>Delichon urbicum (urbica)</i>	LC						II				
B	A251	<i>Hirundo rustica</i>	LC						II				X
B	A230	<i>Merops apiaster</i>	LC						II	II			
B	A260	<i>Motacilla flava</i>	LC						II				
B	A337	<i>Oriolus oriolus</i>	LC						II				
B	A355	<i>Passer hispaniolensis</i>	LC						III				
B	A210	<i>Streptopelia turtur</i>	VU						III	II			X


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

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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

Birds Directive (2009/147/EC): I: Annex I - Species subject to special management measures for their biotope, II/1: Annex II/1 - Species that may be hunted in the geographical area where the Directive applies, II/2: Annex II/2 - Species that may be hunted only in the Member State in respect of which they are indicated, III/1: Annex III/1- Member States shall not prohibit their exploitation, III/ 2: Annex III/2 - Member States may prohibit the exploitation of these species




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




Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA, CMS).

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.

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## ANNEX C SITE SPECIFIC CONSERVATION OBJECTIVES



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### Site Specific Conservation Objectives

9340, 9540, 91M0:

The General Conservation Objectives apply to these habitat types.

#### *Elaphe quatuorlineata:*

Conservation of a suitable habitat at a percentage of >50% in 36 1x1km grid cells in the Natura 2000 site. Record the species presence in 50 1x1km grid cells in the Natura 2000 site. On the habitat quality, see general conservation objectives for the Natura 2000 site in relation to the species' habitat conservation degree.

#### *Testudo hermanni:*

Average population density in areas with suitable habitat greater than or equal to 4 ind./ha. Conservation of suitable habitat at a percentage of >50% in 83 cells of 1x1km grid in the Natura 2000 site. Recording of the species presence in 50 cells of 1x1km grid in the Natura 2000 site. On the habitat quality, see general conservation objectives for the Natura 2000 site in relation to the species' habitat conservation degree.

#### *Barbastella barbastellus:*




Presence recording in each cell 10x10km of its distribution within the Natura 2000 site. Permanent presence of the species in at least 1 5x5km cell within the Natura 2000 site. Suitable habitat covers a significant part of the area of 10x10 cells of its distribution within the Natura 2000 site (>50%). On the habitat quality, see general conservation objectives for the Natura 2000 site in relation to the species' habitat conservation degree. The species is found in mature forests and in forest and crop boundaries. It forms summer colonies in old trees of mature forests and - in northern Europe - in buildings (churches, etc.), or - in the south - and in rocky crevices. Wintering in trees and underground shelters.

#### *Lutra lutra*

Average density 1 ind./35km<sup>2</sup>. Presence of the species in each 5x5 cell of its distribution within the Natura 2000 site. Permanent presence of the species in at least 4 5x5km cells within the Natura 2000 site. The suitable habitat should cover a significant part of the area of the 10x10 cells of the species distribution within the Natura 2000 site (> 50%). On the habitat quality, see general conservation objectives for the Natura 2000 site in relation to the species' habitat conservation degree.

#### *Miniopterus schreibersii:*

Permanent species presence in at least 2 cells 5x5km within the Natura 2000 site. Average density 1 ind./4km<sup>2</sup>. Species presence in each cell of 10x10 species distribution within Natura 2000 site.

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Suitable feeding habitat covers significant part of the area of 10x10 cells of the species distribution range within Natura 2000 site (> 50%). On habitat quality, see general conservation objectives for the Natura 2000 site in relation to the species' habitat conservation degree.

*Myotis bechsteinii:*

Permanent species presence in at least 2 cells 5x5km within the Natura 2000 site. Species presence in each cell of 10x10 species distribution within Natura 2000 site. Suitable feeding habitat covers significant part of the area of 10x10 cells of the species distribution range within Natura 2000 site (> 50%). On habitat quality, see general conservation objectives for the Natura 2000 site in relation to the species' habitat conservation degree. The species in Greece has been found in rivers near riparian vegetation and in oak and beech forests. Forms small colonies on mature trees, occasionally and in buildings. It probably overwinters preferably in trees but has also been found in underground shelters. It depends on the existence of mature forests that have a diverse of structure.

*Myotis blythii:*

Permanent species presence in at least 4 cells 5x5km within the Natura 2000 site. Species presence in each cell of 10x10 species distribution within Natura 2000 site. Suitable feeding habitat covers significant part of the area of 10x10 cells of the species distribution range within Natura 2000 site (> 50%). On habitat quality, see general conservation objectives for the Natura 2000 site in relation to the species' habitat conservation degree.




*Rhinolophus ferrumequinum:*

Permanent species presence in at least 4 cells 5x5km within the Natura 2000 site. Species presence in each cell of 10x10 species distribution within Natura 2000 site. Suitable feeding habitat covers significant part of the area of 10x10 cells of the species distribution range within Natura 2000 site (> 50%). On habitat quality, see general conservation objectives for the Natura 2000 site in relation to the species' habitat conservation degree.

*Rhinolophus hipposideros:*

Permanent species presence in at least 4 cells 5x5km within the Natura 2000 site. Species presence in each cell of 10x10 species distribution within Natura 2000 site. Suitable feeding habitat covers significant part of the area of 10x10 cells of the species distribution range within Natura 2000 site (> 50%). On habitat quality, see general conservation objectives for the Natura 2000 site in relation to the species' habitat conservation degree. Objective is to conserve the colony in the old cheese factory near Pineiakos Ladonas, (Foloi Plateau, Ilia) in good condition.

*Telestes pleurobipunctatus:*

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On the species habitat, see general conservation objectives for the Natura 2000 site in relation to the species' habitat conservation degree. Positive records in a percentage of  $\geq 50\%$  of the location where the species was distributed.

*Leiopicus medius:*

No significant reduction in breeding population and distribution range ( $97\text{km}^2$ ) below the FRV and FRVr values, respectively. Avoidance of significant reduction of habitat area ( $97\text{km}^2$ ). Avoidance of significant reduction of available food. Non-adverse effect to the species population due to human activities.

*Emberiza caesia:*

Achieve FRV and FRVr values of breeding population density and distribution ( $97\text{km}^2$ ), respectively. Habitat growth/restoration in extent ( $50\text{km}^2$ ) and number of areas used by the species. Increase of available food. Non-adverse effect to the species population due to human activities.

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## ANNEX D ECOLOGICAL REQUIREMENTS

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**Table ANNEX-11-4 Ecological requirements, threats and state in Greece and the Study Area of Species assessed by the AA (<sup>1</sup>: Papamichael et al. 2015, Ioannidis et al. 2015, Dimalexis et al., 2009, BirdLife International, 2015, <sup>2</sup>: SDF)**

Code	Species Name	Habitat <sup>1</sup>		Threats <sup>1</sup>	Presence Status in Greece <sup>1</sup>	Significant Presence Status in the Study Area <sup>2</sup>
		Reproduction	Foraging			
Annex II (92/43/EEC) species of the Study Area - Reported in chapter 3.2 of the site’s SDF						
A868	<i>Leipicus medius</i>	Mature deciduous forests (mainly oak forests), riparian forests	Mature deciduous forests (mainly oak forests), riparian forests	degradation / destruction of species' critical habitats, collision at power lines	Resident (10,000-30,000 pairs)	C
A447	<i>Emberiza caesia</i>	phryganic areas or areas with low and sparse maquis vegetation, meadows	open rocky slopes with sparse vegetation (mainly phrygana or low maquis)	residential development, forests, overgrazing	summer visitor (5,000-20,000 pairs)	C
1308	<i>Barbastella barbastellus</i>	Wide range of forests, but also in gardens near forests. Roosts in neglected dense-growth areas, or at least in near-natural forests with high old trees and standing dead wood, such as behind loose bark of oak, beech and spruce trees, usually at heights of 8 – 10 m	Wide range of forests, but also in gardens near forests.	Intensive forest management, leaving scarce amounts of old and dead wood, pesticide use in forests, increasing habitat fragmentation		C
1310	<i>Miniopterus schreibersii</i>	Underground roosts		Cave recreation- closure- collapses, vandalism	Resident	C
1323	<i>Myotis bechsteinii</i>	oak forests and temperate beech forest zones, occurring in deciduous woodlands from lowlands up to high mountain	oak forests and temperate beech forest zones, occurring in deciduous woodlands from	roadkill	Resident, continental Greece	C

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Code	Species Name	Habitat <sup>1</sup>		Threats <sup>1</sup>	Presence Status in Greece <sup>1</sup>	Significant Presence Status in the Study Area <sup>2</sup>
		Reproduction	Foraging			
		ranges. Roosts in tree holes, trunk crevices.	lowlands up to high mountain ranges			
1307	<i>Myotis blythii</i>	Caves and tree holes	Semi-arid open vegetation	Cave recreation- closure- collapses, vandalism, agricultural intensification, hedge removal, pollution	Resident	C
1304	<i>Rhinolophus ferrumequinum</i>	Caves and buildings	Pastures, deciduous woodlands	Cave reconstruction-recreation- closure- collapses, vandalism	Resident	C
1303	<i>Rhinolophus hipposideros</i>	Caves and buildings	Forest edge, riparian zones	Cave recreation- closure- collapses, vandalism, building demolition, pollution	Resident	C
1279	<i>Elaphe quatuorlineata</i>	Wood edge and hedges	Wood edge and hedges	Cultivation, roads, pollution, collection	Resident	C
1217	<i>Testudo hermanni</i>	Areas with dense vegetation and hot summers	Areas with dense vegetation and hot summers	Agricultural intensification, hedge/grassland removal, pollution, roads, collection, fires	Resident, continental Greece	C
Groups of other bird species included in the site's SDF						
Passerines of agricultural areas		open areas that combine low Mediterranean vegetation (mainly macchia and phrygana), crops with scattered trees, hedges, etc.	open areas that combine low Mediterranean vegetation (mainly macchia and phrygana), crops with scattered trees, hedges, etc.	Use of fertilizers, pesticides, residential and tourist development	Resident species, summer visitors, winter visitors, passage visitors	






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Code	Species Name	Habitat <sup>1</sup>		Threats <sup>1</sup>	Presence Status in Greece <sup>1</sup>	Significant Presence Status in the Study Area <sup>2</sup>
		Reproduction	Foraging			
Passerines of forests		deciduous and coniferous forests	deciduous and coniferous forests	Improper forest management, deforestation	Resident species	
Raptors		inland or coastal vertical cliffs and slopes, as well as deciduous and coniferous forests	open areas with low vegetation	Residential and tourist development, disturbance from human activities, operation of wind farms	Resident species, summer visitors, winter visitors, passage visitors	

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## ANNEX E PHOTOGRAPHIC DOCUMENTATION




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## Study Area

Note: The photographs provide an overview of the Natura 2000 site and come from the photographic archive of NCC Ltd.




Photographs	
	
	
	

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## Field Survey Area




Note: Photographs of the FSA have been taken from the referred sampling plot corresponding to the IPs mentioned in the table and are illustrated in ANNEX F, Map 6.

IP	Photograph	Sampling Plot	Filename / Date
1033		Panoramic	
1022-1025		Panoramic	
1026-1027		ABR23	JPEG_20210521130837220.jpg






	<p style="text-align: center;"><b>EASTMED PIPELINE PROJECT</b></p> <p style="text-align: center;">EastMed Greek Section – Environmental and Social Impact Assessment</p>	<div style="display: flex; justify-content: space-between; align-items: center;">   </div> <p>DOC No: PERM-GREE-ESIA-A09_0017_0_Annex9E9</p> <p>REV. : 00</p> <p>PAGE : 124 OF 127</p>
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IP	Photograph	Sampling Plot	Filename / Date
1026-1027		ABR23	JPEG_20210521130851891.jpg
1032-1033		ABR24	JPEG_20210521145048708.jpg
1034-1035		ABR25	JPEG_20210418150023363.jpg

	<p style="text-align: center;"><b>EASTMED PIPELINE PROJECT</b></p> <p style="text-align: center;">EastMed Greek Section – Environmental and Social Impact Assessment</p>	<div style="display: flex; justify-content: space-between; align-items: center;">   </div> <p>DOC No: PERM-GREE-ESIA- A09_0017_0_Annex9E9</p> <p>REV. : 00</p> <p>PAGE : 125 OF 127</p>
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IP	Photograph	Sampling Plot	Filename / Date
1034-1035		ABR25	JPEG_2021 041815010 7880.jpg
1043-1045		ABR26	JPEG_2021 041815191 9847.jpg
1043-1045		ABR26	JPEG_2021 041815235 1948.jpg

Prepared by: (NCC, 2021)

	EASTMED PIPELINE PROJECT		 
	EastMed Greek Section – Environmental and Social Impact Assessment		DOC No: PERM-GREE-ESIA-A09_0017_0 Annex9E9
			REV. : 00
			PAGE : 126 OF 127

## ANNEX F MAPS



	EASTMED PIPELINE PROJECT		 
	EastMed Greek Section – Environmental and Social Impact Assessment		DOC No: PERM-GREE-ESIA-A09_0017_0 Annex 9E9
			REV. : 00
			PAGE : 127 OF 127

Map 1. EastMed pipeline and Natura 2000 sites it crosses

Map 2. Study Area

Map 3. Habitat types – Study Area

Map 4. Field Survey Area

Map 5. Habitat types – Field Survey Area

Map 6. Sampling plots – Field Survey Area



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

Tirana

ALBANIA

Thessaloniki

GREECE

Athens

Izmir

Antalya

Ban

Istanbul

Bursa

Ionian Sea

Sea of Crete

Mediterranean Sea

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

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

Asprofos engineering

ERM

ENGINEER/CONSULTANT  
ΜΗΧΑΝΙΚΟΣ/ ΜΕΛΕΤΗΤΗΣ

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/SPA - GR2330002" /  
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000  
"ΕΖΔ/ΖΕΠ - GR2330002"

Map n°:  
M1-N02  
S04

STUDY AREA: NATURA 2000 SITES  
CROSSED BY ONSHORE EASTMED PIPELINE /  
ΠΕΡΙΟΧΗ ΜΕΛΕΤΗΣ: ΠΕΡΙΟΧΕΣ NATURA 2000  
ΠΟΥ ΤΕΜΝΕΙ Ο ΑΓΩΓΟΣ EASTMED

Scale/  
Κλίμακα  
1:2.500.000

Project DWG No./ Αρ. Σχ. Έργου:

Rev/  
Αναθ  
0A

Size/  
Μέγεθος  
A3

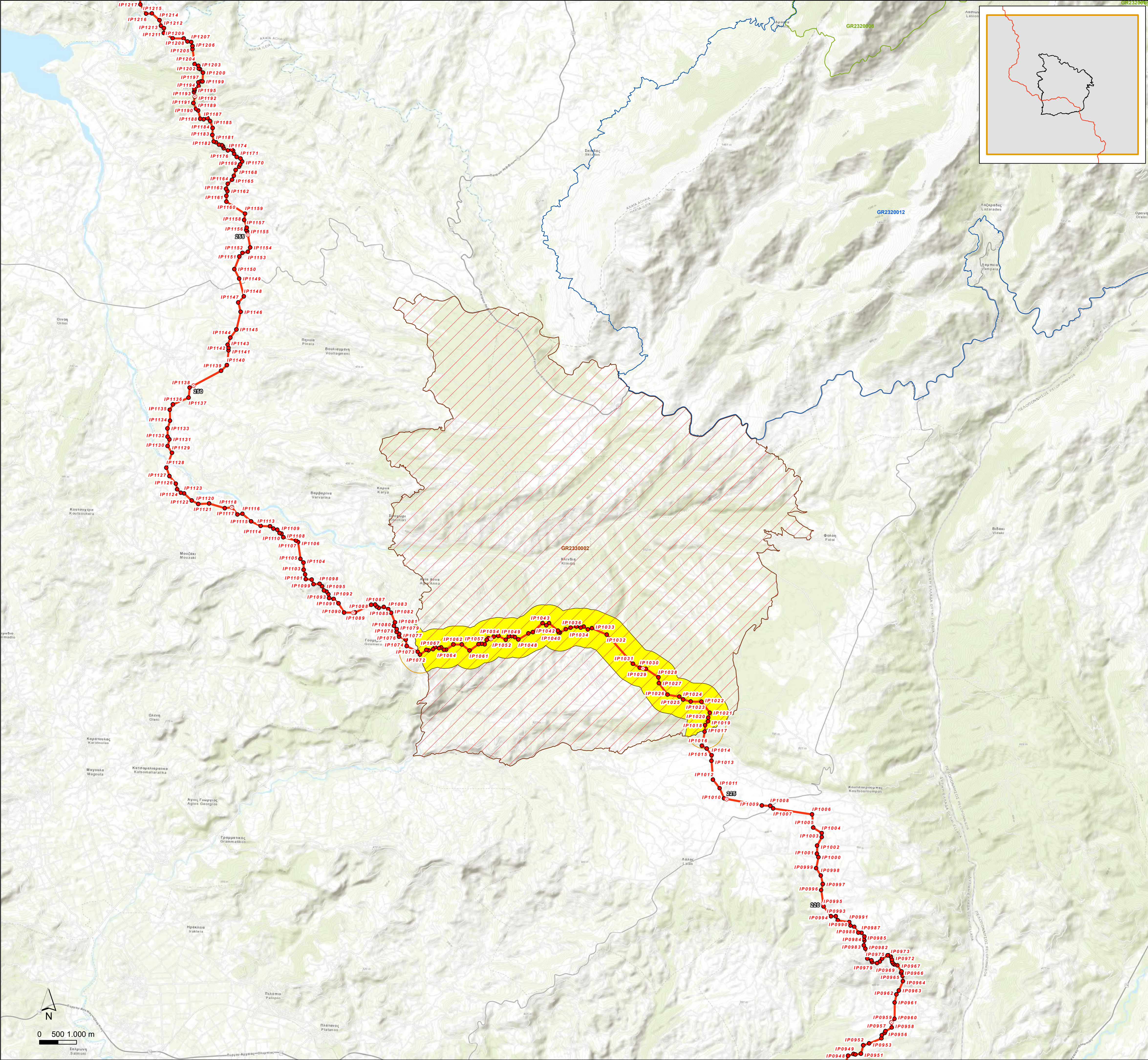
Company's DWG No/Αρ. Σχ.Εταιρείας:  
-

Engineer's DWG No/Αρ. Σχ.Μελετητή:  
AUT-11727500-STU-XXX/Section 11.1.1

Sheet/  
Φύλλο

Document Name: Map1\_PROJECT\_ver3.1\_2022.01.09





REFERENCE DOCUMENTS / DRAWINGS  
ΣΧΕΤΙΚΑ ΕΓΓΡΑΦΑ / ΣΧΕΔΙΑ

DOCUMENT / AP. ΕΓΓΡΑΦΟΥ

M2-N03  
S04A01

DOCUMENT TITLE / ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ

APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE "SAC/SPA GR2330002" FOR THE ONSHORE SECTION OF EASTMED PIPELINE PROJECT  
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 "SAC/SPA GR2330002" ΓΙΑ ΤΟ ΧΕΡΣΑΙΟ ΤΜΗΜΑ ΤΟΥ ΔΙΑΣΥΝΔΕΤΗΡΙΟΥ ΑΓΩΓΟΥ ΦΥΣΙΚΟΥ ΑΕΡΙΟΥ EASTMED

LEGEND/ ΥΠΟΜΝΗΜΑ

Project Components / Στοιχεία του Έργου

○ Routing Chainage (5km) / Χιλιόμετρηση Οδού (5 χλμ.)

● Route IP / Κορυφή Οδού

— Proposed Routing / Προτεινόμενη Οδός

— 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/EZΔ: Special Area of Conservation / Ειδική Ζώνη Διατήρησης

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

SPA/ΖΕΠ: Special Protection Areas / Ζώνη Ειδικής Προστασίας

NOTES/ ΣΗΜΕΙΩΣΕΙΣ

Rev.	Date	ISSUED FOR REVIEW Description Περιγραφή	NCC Ltd Drawn Σχεδίαση	PIM Checked Έλεγχος	Client Approved Έγκριση
Ανθ.	Ημερ.				

Contract No: Αρ. Συμβολαίου: project code

Coord. Syst.: Greek Grid  
Projection: Transverse Mercator  
Datum: GGRS 1967  
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/SPA - GR2330002" /  
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 "ΕΖΔ/ΖΕΠ - GR2330002"

Map n°:

M2-N03  
S04A01

STUDY AREA / ΠΕΡΙΟΧΗ ΜΕΛΕΤΗΣ

Scale/Κλίμακα

1:50.000

Project DWG No./ Αρ. Σχ. Έργου:

Rev/Αναθ

0A

Size/Μέγεθος

A1

Company's DWG No./Αρ. Σχ. Εταιρείας

-

Engineer's DWG No./Αρ. Σχ. Μελετητή

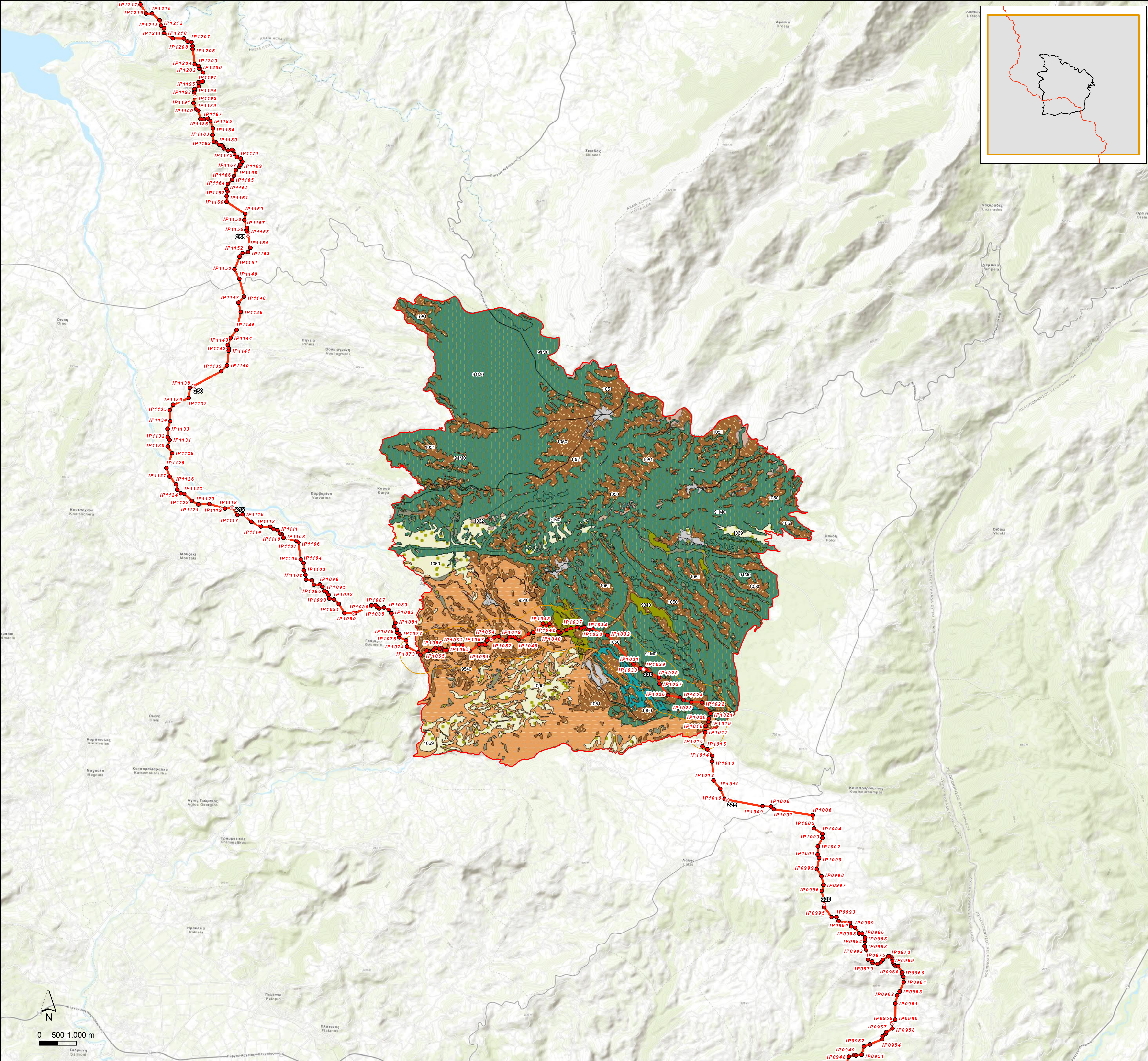
AUT-11727500-STU-XXX/Section 11.1.1

Sheet/Φύλλο

1 of 1

Document Name: Map2\_STUDY\_AREA\_ver3\_1\_2021.01.09\_A1\_onsore





REFERENCE DOCUMENTS / DRAWINGS  
ΣΧΕΤΙΚΑ ΕΓΓΡΑΦΑ / ΣΧΕΔΙΑ

DOCUMENT / AP. ΕΓΓΡΑΦΟΥ	DOCUMENT TITLE / ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ
M3-N03 S04A01	APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE "SAC/SPA GR2330002" FOR THE ONSHORE SECTION OF EASTMED PIPELINE PROJECT ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 "SAC/SPA GR2330002" ΓΙΑ ΤΟ ΧΕΡΣΑΙΟ ΤΜΗΜΑ ΤΟΥ ΔΙΑΣΥΝΔΕΤΗΡΙΟΥ ΑΓΩΓΟΥ ΦΥΣΙΚΟΥ ΑΕΡΙΟΥ EASTMED

LEGEND/ ΥΠΟΜΝΗΜΑ

**Project Components / Στοιχεία του Έργου**

- Routing Chainage (5km) / Χιλιομέτρηση Οδευσης (5 χλμ.)
- Route IP / Κορυφή Οδευσης
- Proposed Routing / Προτεινόμενη Οδευση
- Field Survey Area / Περιοχή Έρευνας Πεδίου
- Study Area / Περιοχή Μελέτης

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

- 91M0 Pannonian-Balkanic turkey oak-sessile oak forests / Δάση δρυός με Quercus ceris και Quercus petraea
- 9340 Quercus ilex and Quercus rotundifolia forests / Δάση με Quercus ilex και Quercus rotundifolia
- 9540 Mediterranean pine forests with endemic Mesogean pines / Μεσογειακά πευκοδάση με ενδημικά είδη πεύκων της Μεσογείου

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

- 1011 Villages and settlements / Χωριά και οικισμοί
- 1012 Services areas / Χώροι εξυπηρέτησεων
- 1013 Secondary settlements / Δευτερεύοντες οικισμοί
- 1023 National roads / Δρόμοι εθνικοί
- 1024 Provincial roads / Δρόμοι επαρχιακοί
- 1025 Provincial roads / Δρόμοι επαρχιακοί
- 1032 Construction sites / Χώροι δόμησης
- 1050 Non-irrigated arable land - pure / Μη αρδεύσιμη-αρόσιμη γη αμής
- 1051 Non-irrigated arable land - mixed / Μη αρδεύσιμη-αρόσιμη γη μεικτή
- 1062 Abandoned cultivation / Εγκαταλελειμμένες καλλιέργειες
- 1068 Olive groves - pure / Ελαιώνες αμής
- 1069 Olive groves - mixed / Ελαιώνες μεικτοί
- 5340 Eastern Garrigues / Garrigues της Ανατολικής Μεσογείου
- 934A Greek Kermes oak forests / Ελληνικά δάση Πρίνου

NOTES/ ΣΗΜΕΙΩΣΕΙΣ

Rev.	28/2/2022	ISSUED FOR REVIEW	NCC Ltd	PIM	Client
Δρ.	Ημερομ.	Description	Drawn	Checked	Approved
Αρ.		Περιγραφή	Σχεδίαση	Έλεγχος	Έγκριση

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

COMPANY / ΕΤΑΙΡΕΙΑ

IGI Poseidon

Asprofos engineering

ERM

ENGINEER/ CONSULTANT

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/SPA - GR2330002" /  
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 " - GR2330002"

Map n°:

M3-N03  
S04A01

HABITAT TYPES - ECOLOGICAL SPATIAL UNITS INSIDE STUDY AREA /  
ΤΥΠΟΙ ΟΙΚΟΤΟΠΩΝ - ΟΙΚΟΛΟΓΙΚΕΣ ΧΩΡΙΚΕΣ ΕΝΟΤΗΤΕΣ  
ΣΤΗΝ ΠΕΡΙΟΧΗ ΜΕΛΕΤΗΣ

Scale/Κλίμακα

1:50.000

Project DWG No./ Αρ. Σχ. Έργου:

Rev/Αναθ

0A

Size/Μέγεθος

A1

Company's DWG No./Αρ. Σχ. Εταιρείας

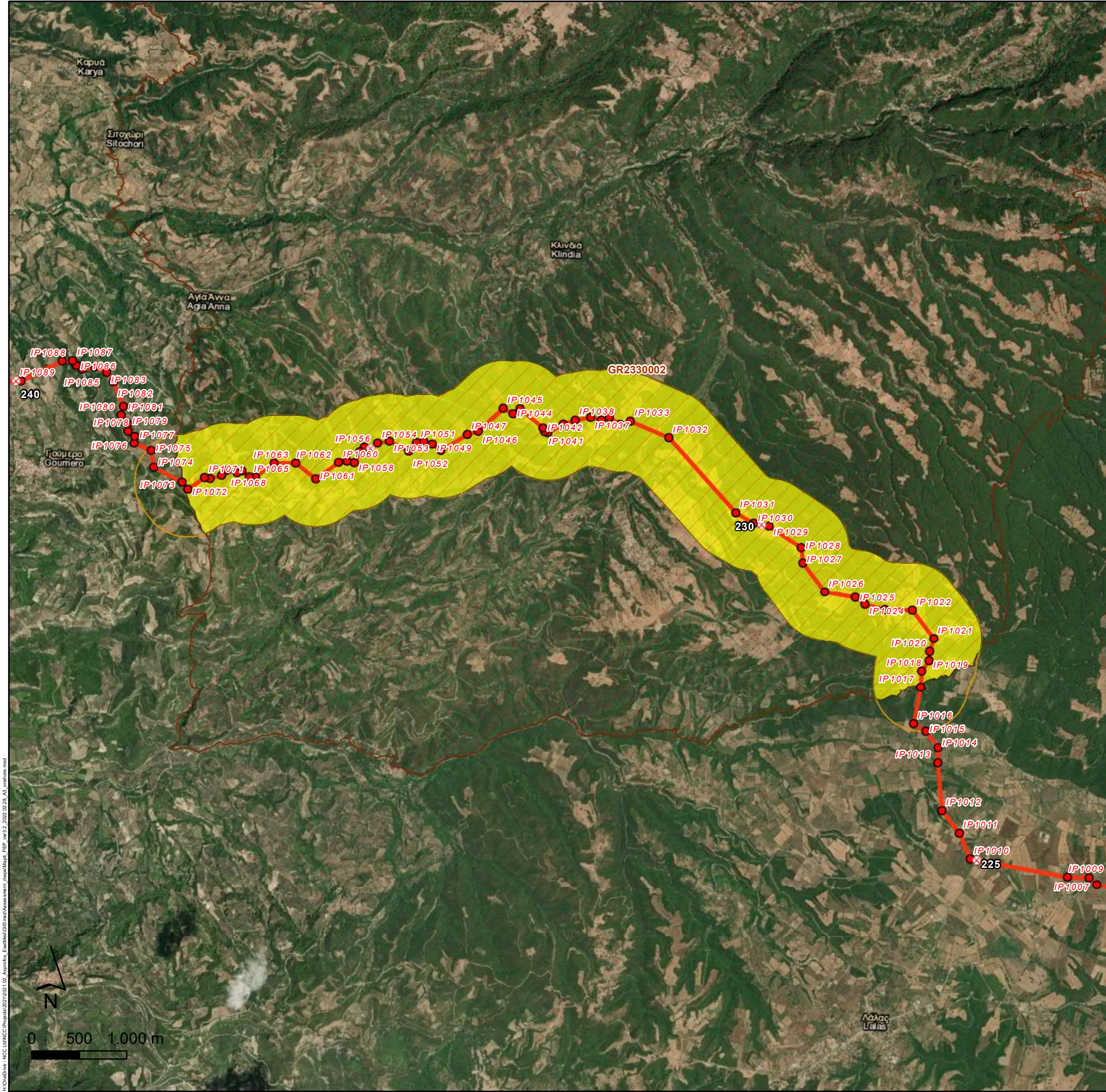
Engineer's DWG No./Αρ. Σχ. Μελετητή

Sheet/Φύλλο

1 of 1

Document Name: Map3\_HABITATS-OKE\_ver3\_1\_2022.02.14\_A1\_ortho





REFERENCE DOCUMENTS / DRAWINGS  
ΣΧΕΤΙΚΑ ΕΓΓΡΑΦΑ / ΣΧΕΔΙΑ

DOCUMENT TITLE / ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ

APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE " GR2330002"  
FOR THE ONSHORE SECTION OF EASTMED PIPELINE PROJECT  
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 " GR2330002"  
ΓΙΑ ΤΟ ΧΕΡΣΑΙΟ ΤΜΗΜΑ ΤΟΥ ΔΙΑΣΥΝΔΕΤΗΡΙΟΥ ΑΓΩΓΟΥ ΦΥΣΙΚΟΥ ΑΕΡΙΟΥ EASTMED

LEGEND/ ΥΠΟΜΝΗΜΑ

Project Components / Στοιχεία του Έργου

⊗

Routing Chainage (5km) / Χιλιόμετρηση Όδευσης (5 χλμ.)

●

Route IP / Κορυφή Όδευσης

—

Proposed Routing / Προτεινόμενη Όδευση

///

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/EZΔ: Special Area of Conservation / Ειδική Ζώνη Διατήρησης

□

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

□

SPA/ΖΕΠ: Special Protection Area / Ζώνη Ειδικής Προστασίας

NOTES/ ΣΗΜΕΙΩΣΕΙΣ

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

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

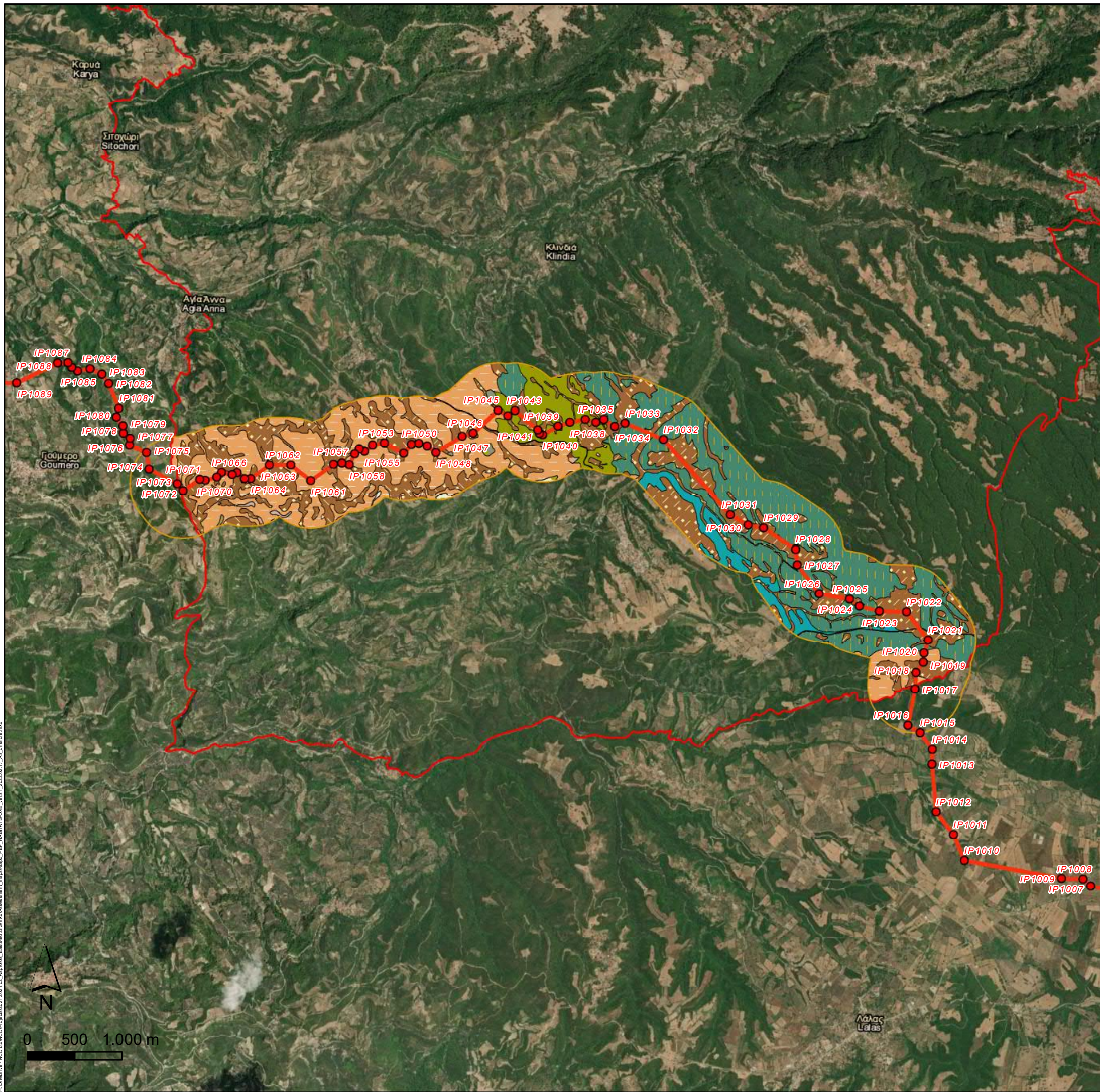
APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE " - GR2330002" /  
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 " - GR2330002"

Map n°: M4-N02 S04A01	FIELD SURVEY AREA / ΠΕΡΙΟΧΗ ΕΡΕΥΝΑΣ ΠΕΔΙΟΥ			
Scale/ Κλίμακα 1:40.000	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\_onsore



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REFERENCE DOCUMENTS / DRAWINGS

ΣΧΕΤΙΚΑ ΕΓΓΡΑΦΑ / ΣΧΕΔΙΑ

DOCUMENT TITLE / ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ

APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE "SAC/SPA GR2330002" FOR THE ONSHORE SECTION OF EASTMED PIPELINE PROJECT  
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 "SAC/SPA GR2330002" ΓΙΑ ΤΟ ΧΕΡΣΑΙΟ ΤΜΗΜΑ ΤΟΥ ΔΙΑΣΥΝΔΕΤΗΡΙΟΥ ΑΓΩΓΟΥ ΦΥΣΙΚΟΥ ΑΕΡΙΟΥ EASTMED

LEGEND/ ΥΠΟΜΝΗΜΑ

Project Components / Στοιχεία του Έργου

- Route IP / Κορυφή Όδεσης

Proposed Routing / Προτεινόμενη Όδεση
- Field Survey Area / Περιοχή Έρευνας Πεδίου

Study Area / Περιοχή Μελέτης
- 91M0 Pannonian-Balkan  
turkey oak-sessile oak  
forests / Δάση δρυός με  
Quercus cerris και Quercus  
petraea

9340 Quercus ilex and  
Quercus rotundifolia forests /  
Δάση με Quercus ilex και  
Quercus rotundifolia

9540 Mediterranean pine  
forests with endemic  
Mesogean pines /  
Μεσογειακά πευκοδάση με  
ενδημικά είδη πεύκων της  
Μεσογείου

1024 Provincial roads /  
Δρόμοι επαρχιακοί

1050 Non-irrigated arable  
land - pure / Μη αρδευσιμη-  
αρόσιμη γη αμιγής

1051 Non-irrigated arable  
land - mixed / Μη  
αρδευσιμη-αρόσιμη γη  
μεικτή

1062 Abandoned cultivation /  
Εγκαταλελειμμένες  
καλλιέργειες

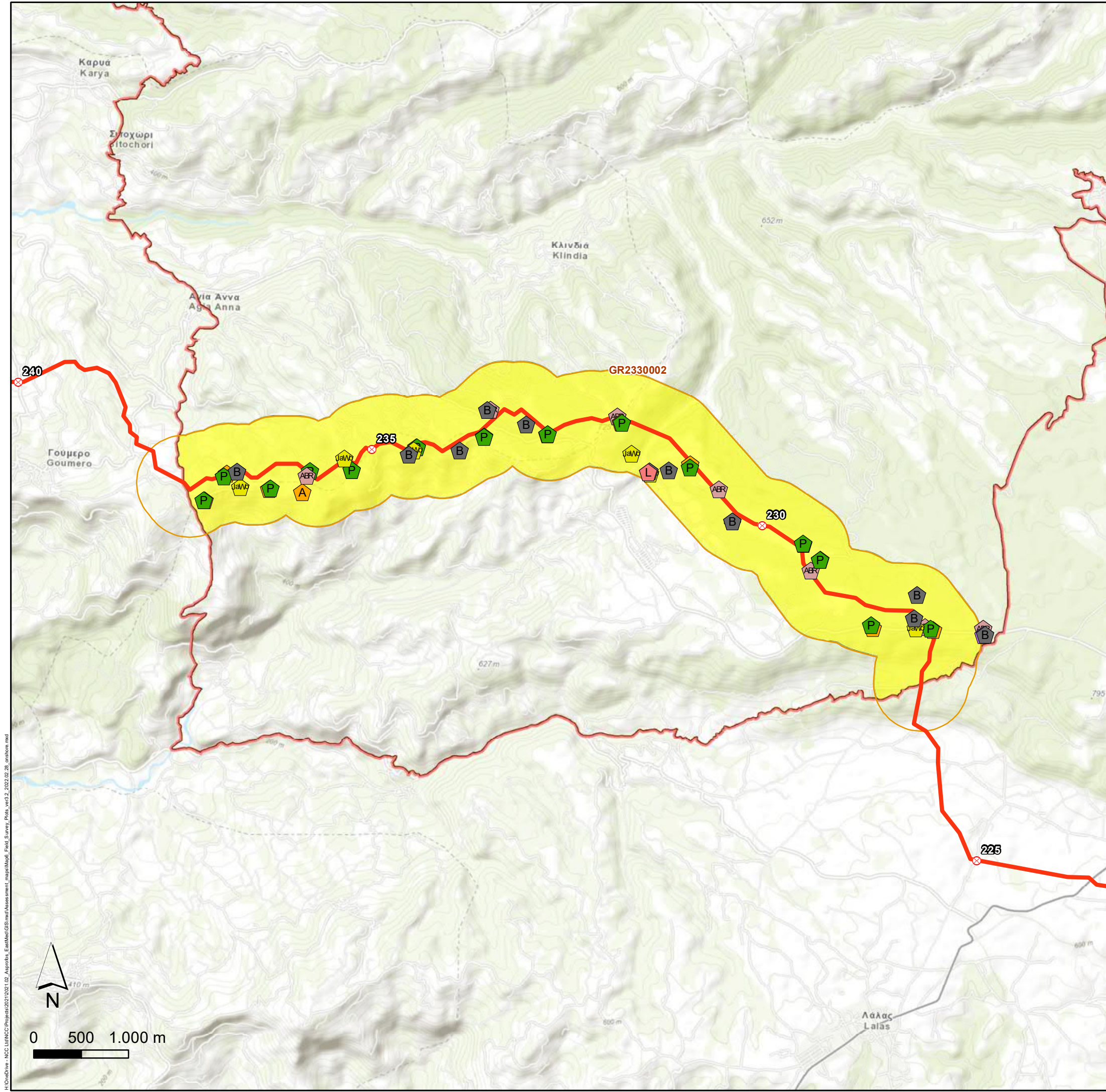
1068 Olive groves - pure /  
Ελαιώνες αμιγείς

1069 Olive groves - mixed /  
Ελαιώνες μεικτοί

5340 Eastern Garrigues /  
Garrigues της Ανατολικής  
Μεσογείου

0A	28/2/2022	ISSUED FOR REVIEW	NCC Ltd	PIM	Client			
Rev. Αναθ.	Date Ημερομ.	Description Περιγραφή	Drawn Σχεδίαση	Checked Έλεγχος	Approved Έγκριση			
Contract No: Αρ. Συμβολαίου:								
Coordinate System: Greek Grid Projection: Transverse Mercator Datum: GGRS 1987 WKID: 3857 Authority: EPSG								
COMPANY / ΕΤΑΙΡΕΙΑ			ENGINEER/CONSULTANT ΜΗΧΑΝΙΚΟΣ/ ΜΕΛΕΤΗΤΗΣ					
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/SPA - GR2330002" ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 " - GR2330002"								
Map n°: M5-N02 S04A01	HABITAT TYPES - ECOLOGICAL SPATIAL UNITS INSIDE FIELD SURVEY AREA / ΤΥΠΟΙ ΟΙΚΟΤΟΠΩΝ - ΟΙΚΟΛΟΓΙΚΕΣ ΧΩΡΙΚΕΣ ΕΝΟΤΗΤΕΣ ΣΤΗΝ ΠΕΡΙΟΧΗ ΕΡΕΥΝΑΣ ΠΕΔΙΟΥ							
Scale/ Κλίμακα 1:40.000	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: Map5_PEP_HABITATS-OXE_ver3.1_2022.02.17_A3_onshore								





REFERENCE DOCUMENTS / DRAWINGS  
ΣΧΕΤΙΚΑ ΕΓΓΡΑΦΑ / ΣΧΕΔΙΑ

DOCUMENT TITLE / ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ

APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE " GR2330002"  
FOR THE ONSHORE SECTION OF EASTMED PIPELINE PROJECT  
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 " GR2330002"  
ΓΙΑ ΤΟ ΧΕΡΣΑΙΟ ΤΜΗΜΑ ΤΟΥ ΔΙΑΣΥΝΔΕΤΗΡΙΟΥ ΑΓΩΓΟΥ ΦΥΣΙΚΟΥ ΑΕΡΙΟΥ EASTMED

LEGEND/ ΥΠΟΜΝΗΜΑ

Project Components / Στοιχεία του Έργου

⊗

Routing Chainage (5km) /  
Χιλιομέτρηση Οδού (5 χλμ.)

Proposed Routing /  
Προτεινόμενη Οδός

Field Survey Area / Περιοχή  
Έρευνας Πεδίου

Field Survey Area inside  
Natura 2000 site / Περιοχή  
Έρευνας Πεδίου εντός  
περιοχής Natura 2000

Study Area / Περιοχή  
Μελέτης

Natura 2000 Network / Δίκτυο Natura  
2000

SAC/EZΔ: Special Area of  
Conservation / Ειδική Ζώνη  
Διατήρησης

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

SPA/ΖΕΠ: Special Protection  
Area / Ζώνη Ειδικής  
Προστασίας

Field Survey Points / Σημεία  
δειγματοληψίας

B

Bats / Χειρόπτερα

A

Avifauna / Ορνιθοπανίδα

ABR

Birds - Amphibians - Reptiles  
/ Ορνιθοπανίδα - Αμφίβια -  
Ερπετά

JALN

Canis aureus - Canis lupus

I

Invertebrates / Ασπόνδυλα

L

Lutra lutra

P

Plants - Habitat types /  
Χλωρίδα - οικότοποι

NOTES/ ΣΗΜΕΙΩΣΕΙΣ

0A	28/2/2022	ISSUED FOR REVIEW	NCC Ltd	PIM	Client
Rev. Αναθ.	Date Ημερομ.	Description Περιγραφή	Drawn Σχεδίαση	Checked Έλεγχος	Approved Έγκριση
Contract No: Αρ. Συμβολαίου:					
Coordinate System: Greek Grid Projection: Transverse Mercator Datum: GGRS 1987 WKID: 3857 Authority: EPSG					
COMPANY / ΕΤΑΙΡΕΙΑ			ENGINEER/CONSULTANT ΜΗΧΑΝΙΚΟΣ/ ΜΕΛΕΤΗΤΗΣ		
IGI Poseidon			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 " - GR2330002" / ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 " - GR2330002"					
Map n°: M6-N02 S04A01	FIELD SURVEY POINTS / ΣΗΜΕΙΑ ΔΕΙΓΜΑΤΟΛΗΨΙΑΣ				
Scale/ Κλίμακα 1:40.000	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:	Sheet/ Φύλλο 1 of 1		

Document Name: Map6\_Field\_Survey\_Plots\_ver3.2\_2022.02.28\_onshore