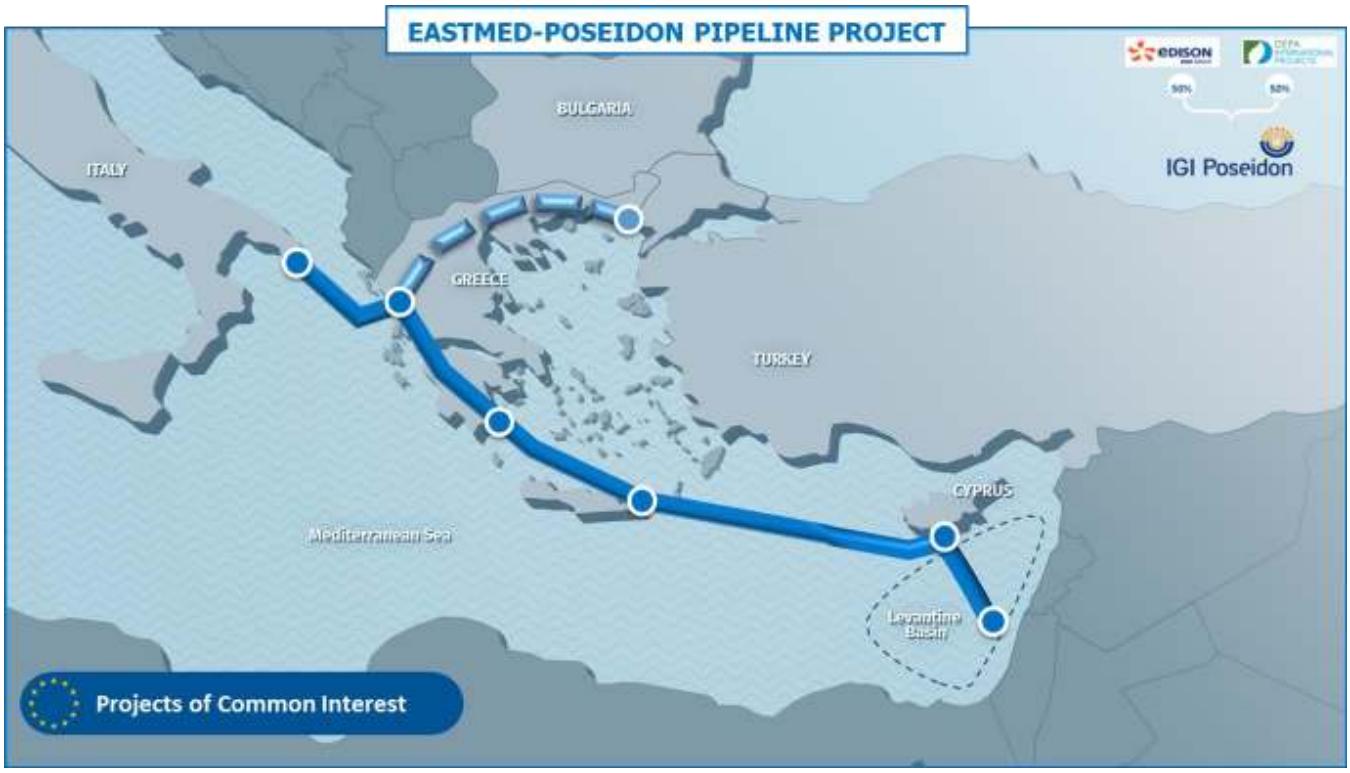
PROJECT:

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, the manner of awarding or the number of contractors engaged is not defined.
EC	European Commission
ECP	EastMed Compression Platform
EIA	Environmental Impact Assessment
EKPAA	National Centre for Environment and Sustainable Development
ESAS	European Seabird At Sea
ESIA	Environmental and Social Impact Assessment
ETA	Environmental Terms Approval
EU	European Union
FSA	Field Survey Area
ha	Hectares
HD	Habitat Directive
HDD	Horizontal Directional Drilling
IP	Interconnection Point
ITA	Inline Tee Assembly
IUCN	International Union for Conservation of Nature
JMD	Joint Ministerial Decision
kHz	kilohertz
km	Kilometres

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

Abbreviation	Description
SDF	Standard Data Form
SPA	Special Protection Area
SSS	Side Scan Sonar system
SPT	System Pressure Test
TUC	Towed Underwater Camera
UV	Ultra Violet

1 INTRODUCTION

1.1 Legal framework for Conducting an Appropriate Assessment for the SAC "Ori Gidovouni, Chionovouni, Gaidourovouni, Korakia, Kalogerovouni, Koulochera Kai Periochi Monemvasias Spilaio Solomou Trypa Kai Pyrgos Ag. Stefanou Kai Thalassia Zoni Eos Akrotirio Kamili", GR2540001

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

The EastMed pipeline has offshore and onshore sections and is directly connecting eastern Mediterranean resources to mainland Greece via Cyprus and Crete. The Project is being developed by IGI Poseidon (Project Owner), a company based in Athens and equally owned (50-50%) by the Greek company DEPA International Projects S.A. and the Italian company Edison S.p.A.

The ESIA has been prepared on behalf of the Project Owner by the company ERM Italia SpA and the engineering company ASPROFOS Engineering S.A. (member of the HELPE Group of Companies) and in collaboration with renowned, experienced and specialised consultants, in accordance with applicable environmental legislation. The AAs of the Project have been carried out by Nature Conservation Consultants Ltd (NCC), subcontractor of ASPROFOS Engineering S.A.

The present AA concerns the Special Area of Conservation "Ori Gidovouni, Chionovouni, Gaidourovouni, Korakia, Kalogerovouni, Koulochera Kai Periochi Monemvasias Spilaio Solomou Trypa Kai Pyrgos Ag. Stefanou Kai Thalassia Zoni Eos Akrotirio Kamili", GR2540001, focusing mainly on the portion directly crossed by the offshore section of the EastMed pipeline (Figure 2-1).

In the framework of this AA, NCC established an official communication with the Management Body of Parnonas, Moustos, Mainalo and Monemvasia, the body responsible for management and protection of the site and requested the most up to date information on habitat, flora 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 its Annexes 3.2.1 and Annex 3.2.2. In particular:

- An AA falls under the requirements of Annex 3.2.1 when existing biodiversity data for the Natura 2000 site, where the project or portion of the project is proposed to be implemented, are not recent and/or sufficient, and a detailed biodiversity field survey lasting at least 20 days (for projects of category A1) is required for the collection of biodiversity information; and
- 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 site national biodiversity monitoring network, and no field survey is required.

This AA for the Special Area of Conservation (SAC) "Ori Gidovouni, Chionovouni, Gaidourovouni, Korakia, Kalogerovouni, Koulochera Kai Periochi Monemvasias Spilaio Solomou Trypa Kai Pyrgos Ag. Stefanou Kai Thalassia Zoni Eos Akrotirio Kamili", GR2540001, falls under the category set in Annex 3.2.1, since existing data for the site 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 to address the requirements of Greek legislation and gather sufficient biodiversity information for the AA.

The field survey was carried out for an overall period of 24 days between June 2021 and September 2021 including the following activities:

- Collection of field data by fauna experts on fauna species of interest present in the section of the Natura 2000 site directly crossed by the pipeline;
- Collection of field data on seabed substrate and marine habitats by experts; and
- Collection of additional field data by ornithologists on avifauna species of interest present in the section of the Natura 2000 site directly crossed by the pipeline.

Field survey results are presented along with desktop datam and clear reference to the data sources is made throughout the AA.

1.2 Assumptions, Limitations and Exclusions

A number of assumptions were made for preparation of the AA:

- The assessment was based on Project design data available to date. Reliable assumptions were made based on existing bibliography on pipeline construction regarding the following key elements: (a) total duration, (b) specifications concerning the project within the Study Area;
- The AA is in alignment with the ESIA;

- The present AA focused solely on the normal operative conditions of the Project. Consequently, emergency and non-routine events that could potentially affect biodiversity were not taken into consideration in this AA and will be assessed in the ESIA; and
- The decommissioning phase of the Project was not taken into account in this AA, since it is expected to take place in 3-5 decades from today when all biodiversity parameters will have to be re-evaluated. Therefore, a new AA will be required for the decommissioning phase after the Project end of life.

1.3 Analysis of Institutional / Legal Framework

1.3.1 Plans and Projects within Natura 2000 Sites

The Natura 2000 network is an EU network of protected areas, the main objective of which is 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, L. 4014/2011 and MD 170225/2014 define the implementation of respective provisions in detail. National legislation also includes the L.3937/11 "Conservation of biodiversity and other provisions".

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

- The consequences of every project must be examined separately and in accordance with other existing projects or plans in the site;
- The criteria must be based on preserving the integrity of the site while keeping in mind the conservation objectives; and
- If the construction of the project is necessary for overriding public interest, all necessary compensatory measures will be taken.

1.3.2 Natura 2000 Network in Greece

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

1.3.3 Environmental Authorisation of Activities and Projects

According to Law 4014/2011, the environmental 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), 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 environmental impacts only local or of no significance.

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

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

1.3.4 Classification of the Project Based on National Legislation

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

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

Legislation	Category	Project 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

** The classification presents the activity most relevant to the Project. The applicable provisions concern also the compressor stations.*
It is noted that the compressor stations, having a total capacity >50 MW, fall 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"

Prepared by: (ASPROFOS, 2021)

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 this AA is the SAC "Ori Gidovouni, Chionovouni, Gaidourovouni, Korakia, Kalogerovouni, Koulochera Kai Periochi Monemvasias Spilaio Solomou Trypa Kai Pyrgos Ag. Stefanou Kai Thalassia Zoni Eos Akrotirio Kamili", GR2540001. As shown in Figure 2-1, routing of the Offshore pipeline crosses the site at its southern marine area.

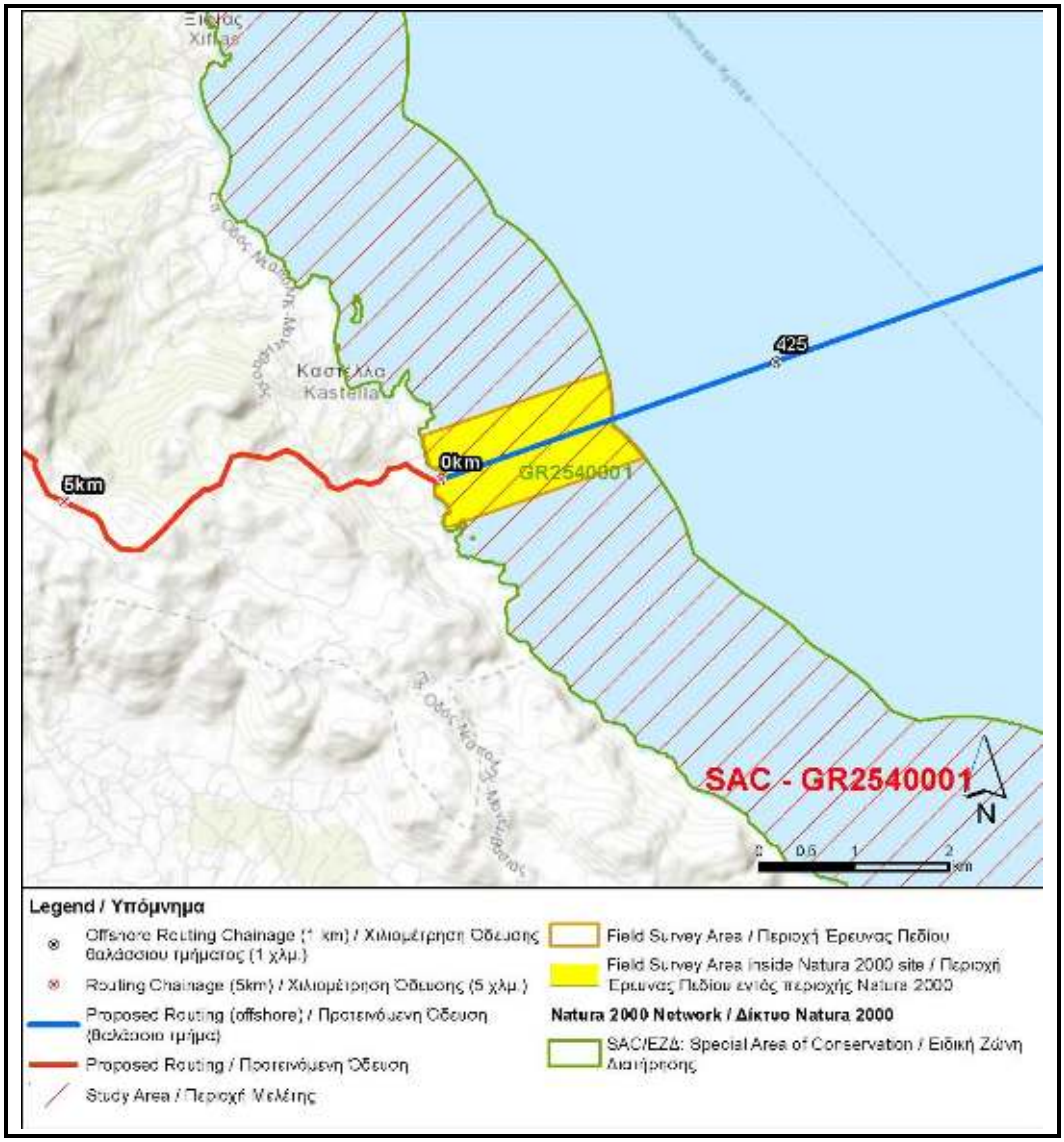
According to national regulatory specifications (MD 170225/2014), the Field Survey Area (FSA) for linear projects (such as the pipeline) is defined as a buffer zone of at least 500 m either side of the linear infrastructure falling within the Study Area. Consequently, the FSA for the present AA is an area of 1 km in width and 2 km in length within the Natura 2000 site, strictly considering the intersection between the pipeline and the site, covering a total surface area of 203 ha (0.5% of the site's area) (Figure 2-2). Furthermore, although the main objective of the surveys was the FSA, the whole coastline of the Study Area was surveyed in order to gain proper knowledge about the potential presence of important habitats for marine species, such as seabirds and *Monachus monachus*. The findings outside the FSA and along the coastline are also considered and presented.

Maps of the Study Area and the Field Survey Area are provided in ANNEX 6 in Maps 2 and 4 respectively.

Prepared by: (NCC, 2021)

Note: The chainage of the onshore section kilometre counting starts at the landfall, while the chainage of the offshore section kilometre counting starts at the landfall at Crete

Figure 2-1 Study Area and Field Survey Area



Prepared by: (NCC, 2021)

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

3 CURRENT STATUS OF NATURAL ENVIRONMENT

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

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

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

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

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

The main bibliographic sources of information used include:

- The Standard Data Form of SAC Area GR2540001 (2020); and
- The most recent reports on the implementation of Directives 92/43/EEC and 2009/147/EC, including habitat mapping.

In addition, the results of the following studies were considered:

- 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); and
- Important Areas for Seabirds in Greece (Fric et al., 2009).

3.1.1 Short Description of the Study Area

The Study Area is the Special Area of Conservation "Ori Gidovouni, Chionovouni, Gaidourovouni, Korakia, Kalogerovouni, Koulochera Kai Periochi Monemvasias Spilaio Solomou Trypa Kai Pyrgos Ag. Stefanou Kai Thalassia Zoni Eos Akrotirio Kamili", GR2540001, which is located within the administrative limits of the Region of Peloponnese covering an area of 39,051.66 hectares. The area

is managed by the Management Body of Parnonas, Moustos, Mainalo and Monemvasia. The Study Area partially overlaps with the Special Protected Area GR2540007 "Ori Anatolikis Lakonias" and includes the Wildlife Reserve "Gaidourovouni Dimotikon Diamerismaton Kremastis - Lampokampou Dimon Niaton - Zaraka".

The site consists of bare or sparsely forested mountains and scrub in many places. The coastline often ends with steep sea-cliffs and rocky shores. At higher altitudes the vegetation consists of coniferous forests with *Abies cephallonica* and *Pinus nigra* ssp. *pallasiana*. At lower altitudes *Juniperus phoenicea* arborescent matorals, while Thermo-Mediterranean brush vegetation, thickets and heath-garrigues mixed with *Sarcopoterium spinosum* phrygana predominate in the area. Scattered spots of *Platanus orientalis, Nerium oleander* and *Tamarix* galleries are also present while some thickets of *Castanea sativa* exist. The site has an extensive marine part that extends ~45 km along the coastline and 1 nm off, including several reefs and islets (e.g. Daskaleio), while the coastal area is characterised by the presence of well-developed *Posidonia oceanica* meadows that cover the largest part of the infralittoral sediments at depths between 5 - 30 m. The shallower and deeper zones are dominated by sands and detritic sands. *Cymodocea nodosa* beds are also common. Biodiversity-rich rocky shores and reefs are also common and extensive, hosting important and well-preserved stands of both shallow and deep *Cystoseira* and *Sargassum* canopies. The loggerhead turtle (*Caretta caretta*) is a common encounter in the area.

The site hosts the important cave of Solomou Tripa, where a parent colony with about 1,500 individuals of the bats *Myotis blythii, Miniopterus schreibersii* and *Rhinolophus euryale* has been recorded, while the Tower of Aghios Stefanos also hosts parent colonies of *Rhinolophus hipposideros, Rhinolophus ferrumequinum* and *Myotis emarginatus* and *Rhinolophus* sp.

The whole site provides a great variety of ecological niches and forms an interesting area for resting and nesting of migratory birds. The unique rocky landscape of Monemvasia occurs at the southernmost limits of the site. This landscape hosts some very rare floral elements, such as *Euphorbia dendroides* formations and very rare and local endemic plant taxa like *Stachys spreitzenhoferi* ssp. *virella* and *Campanula andrewsii* ssp. *hirsutula*. The fauna of the site is very diverse. The site hosts important parent colonies of bat species. The site is of great importance due to well-developed Posidonia meadows.

The map of the Study Area is provided in ANNEX 6, in Map 2.

3.1.2 Detailed Description of the Study Area

3.1.2.1 Habitat Types and Flora

According to official habitat mapping, the Study Area hosts 16 habitat types of Annex I of Directive 92/43/EEC with the Posidonia beds (1120*) being a priority habitat. Most of the area is covered by garrigues, as well as forests dominated by olive trees.

Table 3-1 provides the spatial coverage of each habitat type 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). At sea the main habitat types are sandbanks, *Posidonia* beds and reefs.

It should be noted that the available spatial information concerns only terrestrial habitats (namely 28,917.43 ha – 74% of the site) and the information on marine habitats is only qualitative and no official habitat mapping has been carried out. Although no official mapping of *Posidonia* beds (1120*) exists, according to the mapping carried out by Topouzelis et al. (2018), the area has seagrass meadows along almost all its coastline. Furthermore, the area near Platori village that was recently added to the Natura 2000 site during the last reporting period has not been officially mapped for its habitat types.

Table 3-1 Habitat Types Found at the Site

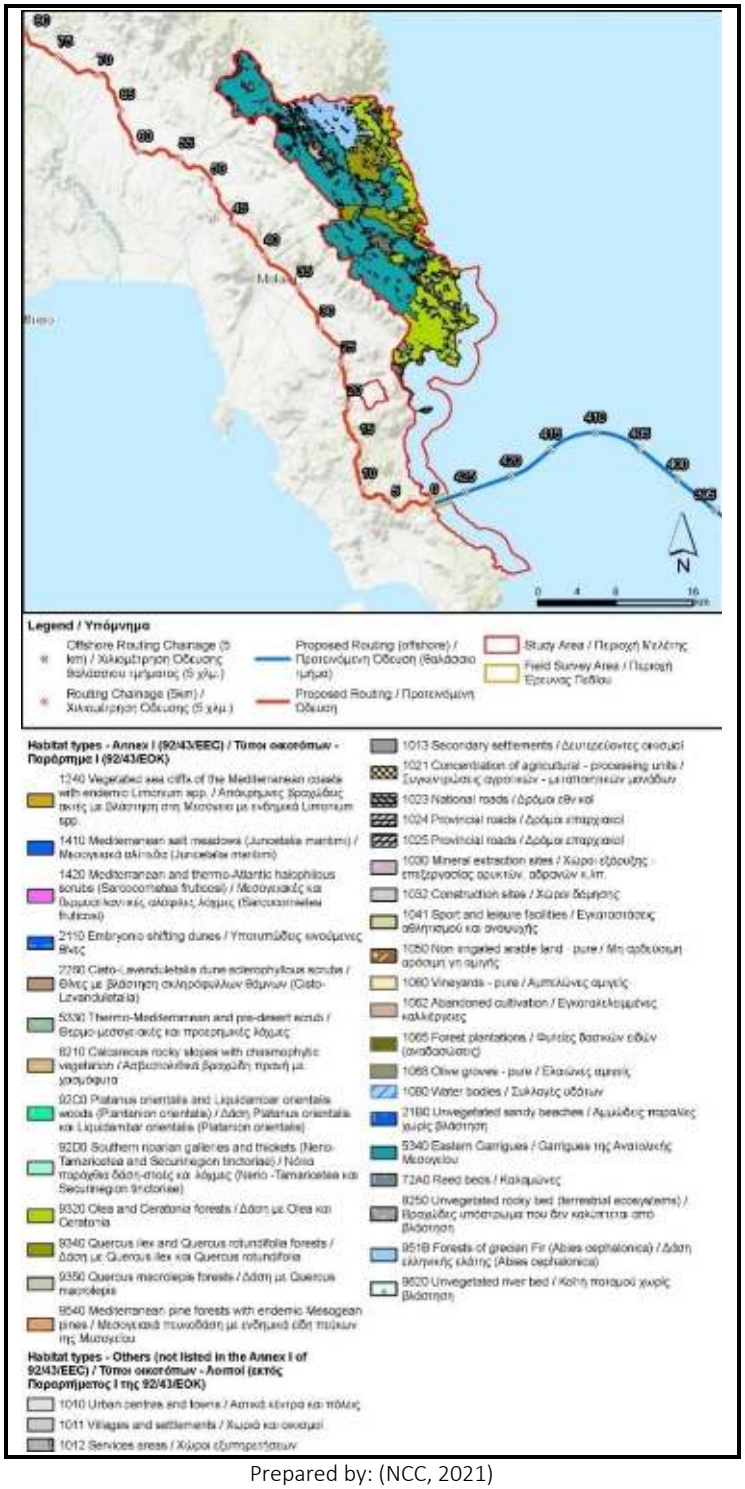
Code	Description of Habitat Type	Area (ha)	Percentage (%)	Classification
Habitat types included in the SDF				
Marine European habitat types				
1110	Sandbanks which are slightly covered by sea water all the time	3,817.00	9.77%	HD: Annex I
1120*	Posidonia beds (*Posidonion oceanicae*)	2,863.00	7.33%	HD: Annex I
1170	Reefs	1,909.00	4.89%	HD: Annex I
Terrestrial European habitat types				
9320	Olea and Ceratonia forests	7,186.68	18.40%	HD: Annex I
9340	*Quercus ilex* and *Quercus rotundifolia* forests	2,447.92	6.27%	HD: Annex I
92C0	*Platanus orientalis* and *Liquidambar orientalis* woods (*Platanion orientalis*)	33.48	0.09%	HD: Annex I
5330	Thermo-Mediterranean and pre-desert scrub	33.16	0.08%	HD: Annex I

Code	Description of Habitat Type	Area (ha)	Percentage (%)	Classification
8210	Calcareous rocky slopes with chasmophytic vegetation	29.25	0.07%	HD: Annex I
92D0	Southern riparian galleries and thickets (Nerio-Tamaricetea and *Securinegion tinctoriae*)	9.80	0.03%	HD: Annex I
9540	Mediterranean pine forests with endemic Mesogean pines	8.77	0.02%	HD: Annex I
1420	Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)	6.59	0.02%	HD: Annex I
9350	*Quercus macrolepis* forests	3.63	0.01%	HD: Annex I
1240	Vegetated sea cliffs of the Mediterranean coasts with endemic *Limonium* spp.	2.90	0.01%	HD: Annex I
2110	Embryonic shifting dunes	2.15	0.01%	HD: Annex I
2260	Cisto-Lavenduletalia dune sclerophyllous scrubs	1.42	0.00%	HD: Annex I
1410	Mediterranean salt meadows (*Juncetalia maritimi*)	0.61	0.00%	HD: Annex I
Other habitat types				
5340	Eastern Garrigues	13,151.47	33.68%	Of national importance
951B	Forests of Grecian fir	2,132.83	5.46%	Of national importance
1062	Abandoned cultivation	1,980.37	5.07%	
1068	Olive groves - pure	1,135.37	2.91%	
1050	Non-irrigated arable land - pure	290.79	0.74%	
8250	Unvegetated rocky bed (terrestrial ecosystems)	115.61	0.30%	
1011	Villages and settlements	78.41	0.20%	
1065	Forest plantations	60.67	0.16%	
1024	Provincial roads	47.01	0.12%	
1023	National roads	42.30	0.11%	
1060	Vineyards - pure	32.16	0.08%	
1013	Secondary settlements	23.25	0.06%	
1032	Construction sites	17.72	0.05%	

Code	Description of Habitat Type	Area (ha)	Percentage (%)	Classification
9620	Unvegetated river bed	14.00	0.04%	
21B0	Unvegetated sandy beaches	13.15	0.03%	
1010	Urban centres and towns	5.13	0.01%	
1030	Mineral extraction sites	4.35	0.01%	
72A0	Reed beds	2.02	0.01%	Of national importance
1012	Services areas	1.68	0.00%	
1041	Sport and leisure facilities	1.53	0.00%	
1025	Provincial roads	0.98	0.00%	
1021	Concentration of agricultural/processing units	0.21	0.00%	
1080	Water bodies	0.06	0.00%	

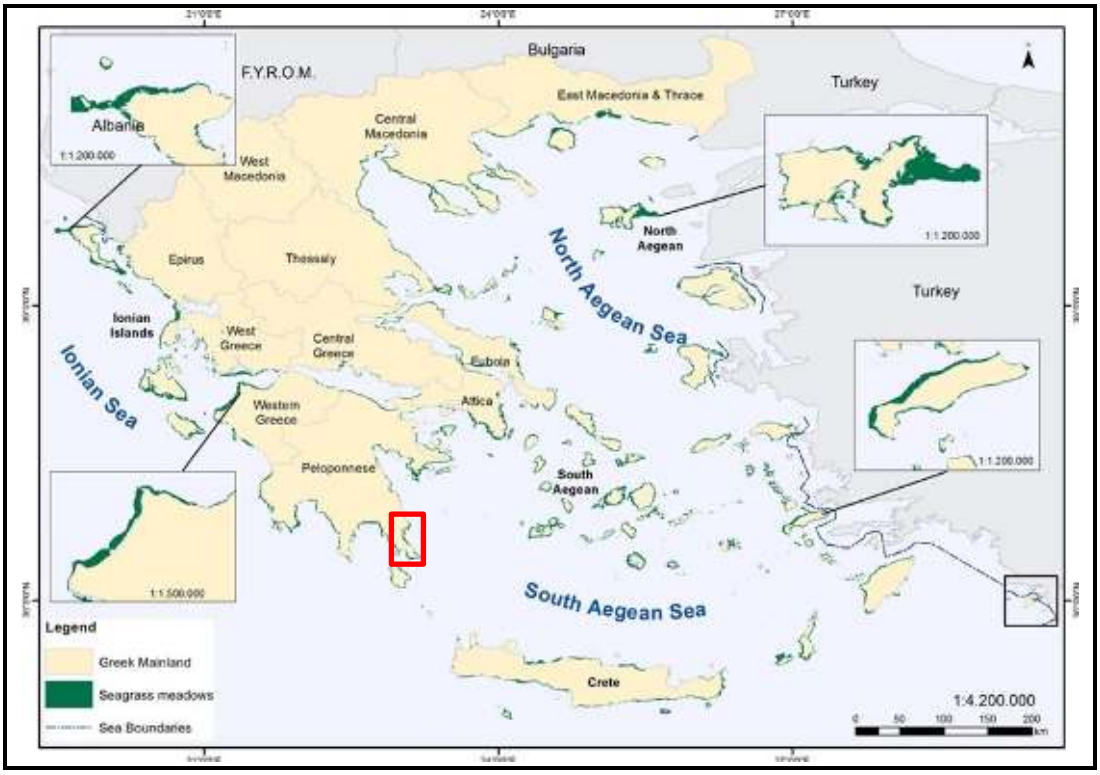
Prepared by: NCC, 2021. Source: SDF and official habitat mapping
Note: HD: Habitats Directive

Map 3 in ANNEX 6 presents the habitat type coverage at the Study Area. The pipeline crosses only the marine part of the Study Area.



Prepared by: (NCC, 2021)

Figure 3-1 Habitat Type Coverage at the Study Area



Prepared by: (NCC, 2021)

Figure 3-2 Seagrass Meadow Coverage (Topouzelis et al., 2018)

3.1.2.2 Fauna

The entire Natura 2000 site offers a great variety of ecological niches and the fauna it hosts is diverse. In the marine environment it is of great importance due to well-developed Posidonia beds. The species for which the site has been designated are 11, namely 7 mammal (*Monachus monachus, Miniopterus schreibersii, Myotis blythii, Myotis emarginatus, Rhinolophus euryale, Rhinolophus ferrumequinum, Rhinolophus hipposideros*), 3 reptile (*Mauremys rivulata, Testudo hermanni, Testudo marginata*) and 1 invertebrate species (*Euplagia quadripunctaria*). The species are residents in the site, while three species are considered rare. ANNEX 1 of this AA presents the species included in the SDF of the site, as well as their presence in the site, population and conservation assessment.

Of the species included in the SDF, all are protected under the Habitats Directive and are included in Annex II, while 10 of them are also in Annex IV. A total of 4 species have been characterised as Endangered or Near Threatened worldwide (IUCN), while at the national level 5 as Critically Endangered, Near Threatened or Vulnerable.

Only one of the indicated species is marine and therefore potentially present in the area of the Natura 2000 site directly affected by the Project: the endangered pinniped *Monachus monachus*.

ANNEX 2 of this AA provides information concerning the threat status of the species included in the SDF of the Study Area based on the most up to date bibliographic sources.

ANNEX 1 of this AA also provides information concerning other species of interest included in the SDF.

3.2 Other Projects – Potential Cumulative Impacts

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

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

The site has no other significant existing or planned projects and infrastructure except of:

- the road network (EO 86) in its terrestrial part; and
- one operating wind park and 7 planned wind park projects under permitting, which are located at a considerable distance (>4.5 km) from the FSA and the pipeline axis.

Regarding the marine part of the SAC, no other existing or planned projects and infrastructure have been identified during this study.

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

3.3.1 Field Survey Methodology

According to 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 [...])"*, unless otherwise stated. Field work should last at least 20 days.

In light of the above, 24 days of field work have been conducted (timing provided in Table 3-2); more specifically:

- 1 day of field work was conducted during March 2021;
- 5 days of field work were conducted during April 2021 (Lighthouse, 2021);
- 15 days of field work were conducted during May-June 2021 (summer survey); and
- 3 days of field work were conducted during September 2021 (autumn survey).

The field work included the following activities:

- Field data collection by marine biodiversity experts for marine mammals and reptiles in the part of the Natura 2000 site which is crossed by the pipeline and the broader area;
- Field data collection by a marine habitat expert for marine habitats and flora with a focus on important habitats and habitats that are suitable for the identified fauna species, collected with the use of ROV and data processing; and
- Field data collection has also been carried out for other elements of biodiversity in the Natura 2000 site, such as seabirds, contributing to the conservation of the ecological integrity of the Natura 2000 site and the ecological coherence of the Natura 2000 network.

It should be noted that seasonality was taken into consideration. Seabirds were surveyed during the breeding and post-breeding period, considered sufficient for the whole yearly cycle. For *Monachus monachus* the survey focused on habitat which conditions the species behaviour and presence, therefore representative for the whole cycle. Sea turtles were surveyed during the nesting season, while other mammal species are not expected to have differentiations in seasonal appearance in the area. Concerning habitats, no seasonal variations are expected.

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

Table 3-2 Timetable of the Field Work Days

Group	Date	No. of Field Work Person-Days
General site assessment	27/03/2021	1
Marine habitats, Flora (PBRS, 2021)	28-29/06/2021	4
Seabed substrate (Lighthouse, 2021)	08/04/2021 11-12/04/2021 15/04/2021 21/04/2021	5
Marine Mammals	01-05/06/2021 20/09/2021	6
Marine Turtles	01-05/06/2021	4

Group	Date	No. of Field Work Person-Days
	20/09/2021	
Seabirds	01-05/06/2021 20/09/2021	4
	Total	24

Prepared by: NCC, 2021

The field work methodological approach aimed at:

- Recording 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 the study on the sensitive species listed in the Annexes (92/43/EEC); and
- Focusing on colonies, breeding and resting sites of important fauna species for the SAC.

A series of factors were considered in organising the field work 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; and
- The homogeneity, extent and diversity of the types of vegetation.

Furthermore, concerning *Caretta caretta* breeding beaches and nesting, information from the local Association "Toulipa Goulimi" was utilised.

3.3.1.1 Field Survey Methodology for Habitats/Flora

PLANET BLUE ROV SERVICES (PBRS, 2021) conducted a marine survey in order to register the ecosystem at the pipeline survey area approaching the Landfall at Agios Fokas. An underwater visual survey with the use of an ROV with a built-in underwater camera was carried out covering the area from the coast to the isobath of 40 m. This is the area where the seabed is expected to be affected by the offshore pipeline placement on the seabed and inside a trench near the coast up to approximately -25 m water depth. The visual recording can provide information on the benthic communities and bottom sediments as well as on the presence of *Posidonia* beds, fish fauna, marine mammals and sea turtles.

The area was covered by an analysis and recording in 3 test sections in traverses of 375 m^2 each.

Reference: PLANET BLUE ROV SERVICES, 2021

Figure 3-3 (a) Vessel *Oceanis* with the ROV Super Achille on its Right, (b) ROV Super Achille Commencing to Submerge

Furthermore, Lighthouse S.p.A. (Lighthouse, 2021) conducted nearshore hydrographic, geophysical and ROV surveys at Landfall 3 (LF3) Agios Fokas in order to locate all seabed obstructions– among others – and identify other seabed factors in the vicinity of the selected pipeline route (corridor) which may affect the design and installation of the pipeline, and to perform a visual survey by means of underwater camera along the alignment of the proposed shore approach. The width of the corridor that was investigated as LF3 tapers from 1,000 m at water depth 20 m to 500 m at shoreline. The corridor length surveyed is 620 m.

The seafloor morphology was surveyed using a towed EdgeTech 4200SP Side Scan Sonar system, a selectable dual-frequency system with 100 kHz and 400 kHz. Both frequencies were acquired and the SSS range was set at 75 m. The SSS parameters used during the survey were as follows. Both High and Low Frequency data were used for seabed interpretation and target detection; High Frequency data were used for the SSS Mosaic generation.

The high-resolution visual survey was performed along the route alignment and along +10 m and -10 m offset from the route alignment by means of an underwater camera mounted on Blue Robotics BlueROV2 in the depth interval 0 m - 20m LAT. The position of the ROV was calculated using a USBL and logged in Hypack Navigation software. The video record contained a visual overlay of location data of the ROV (X, Y, Z, KP and DCC) sent by navigation software. Video files were logged in .m2ts (video and text overlays) format.

A towed underwater camera (TUC) was used to carry out the high-resolution visual survey along the route alignment in the depth interval of 20 m - 50 m LAT, along +10 m and -10 m offset from the route alignment in the depth interval of 20 m - 50 m LAT and in the depth interval 0 m - 50 m LAT within a +/-50 m corridor centred on the route alignment. The video record contained a visual overlay

of location data of the TUC (X, Y, Z, KP and DCC) sent by navigation software. Video files were logged in .mp4 (video and text overlays) format.

3.3.1.2 Field Survey Methodology for Fauna

Although the main objective of the surveys was the FSA, the whole coastline of the Study Area was surveyed in order to gain proper knowledge about the presence of important habitats for marine species, such as seabirds and *Monachus monachus*. The findings outside the FSA and along the coastline are also considered.

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

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

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

Available data from tagged *Calonectris diomedea* individuals were also taken into consideration to estimate the use of the area by the species. The individuals have been tagged by the team of NCC in the frame of other projects at their main colony in Greece at Strofades Island.

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

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

Regarding marine turtles, beach surveys were carried out in order to identify beaches that are potentially suitable for sea turtle nesting as well as to locate any nesting sites, based on signs and tracks on beaches. At sea the ESAS method, while along coastline boat-based line transects, was also carried out.

Reference: (NCC, 2021)

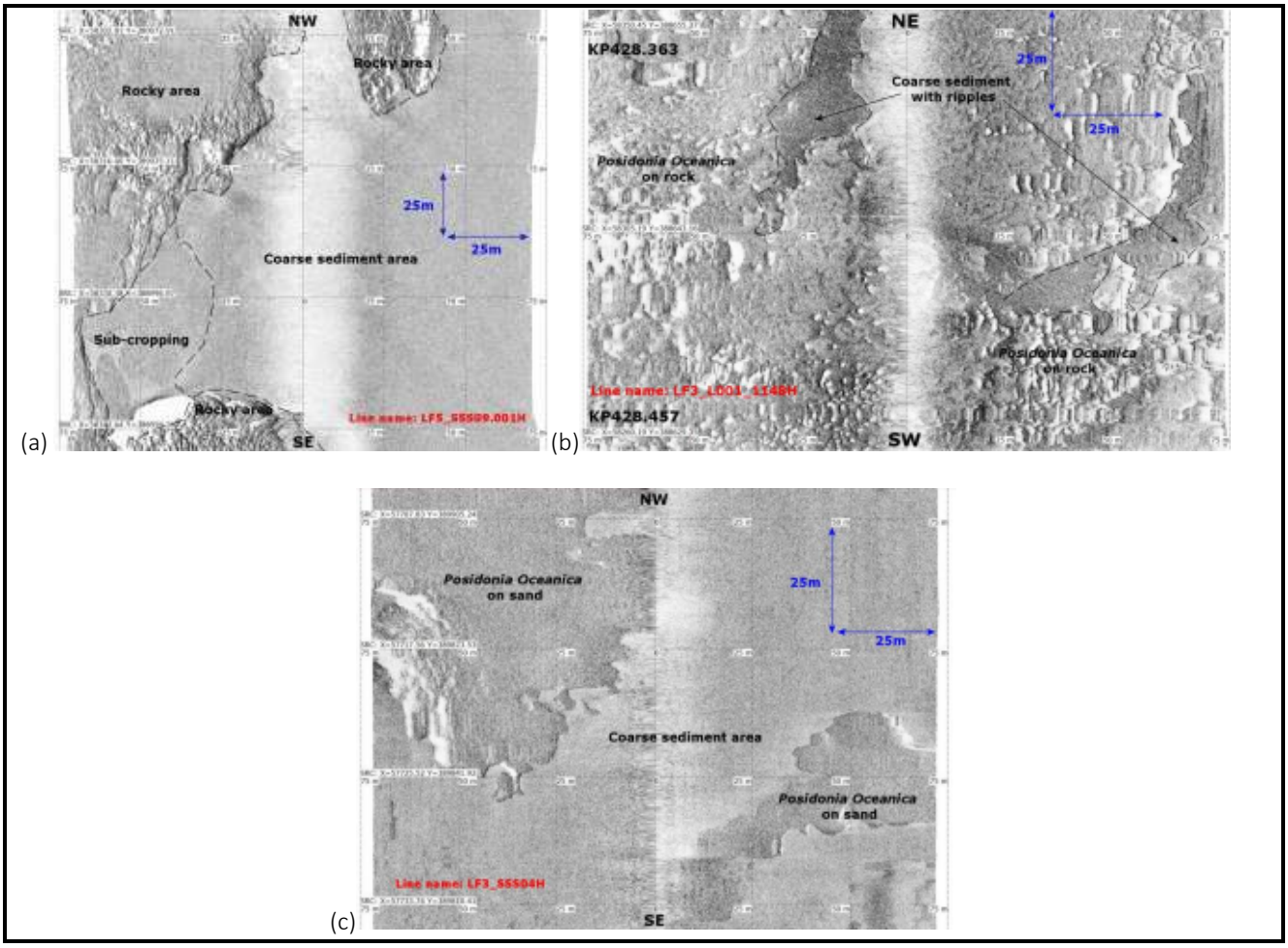
Figure 3-4 Boat-Based Line Transects.

3.3.2 Detailed Description of the Field Survey Area

3.3.2.1 Habitat Types

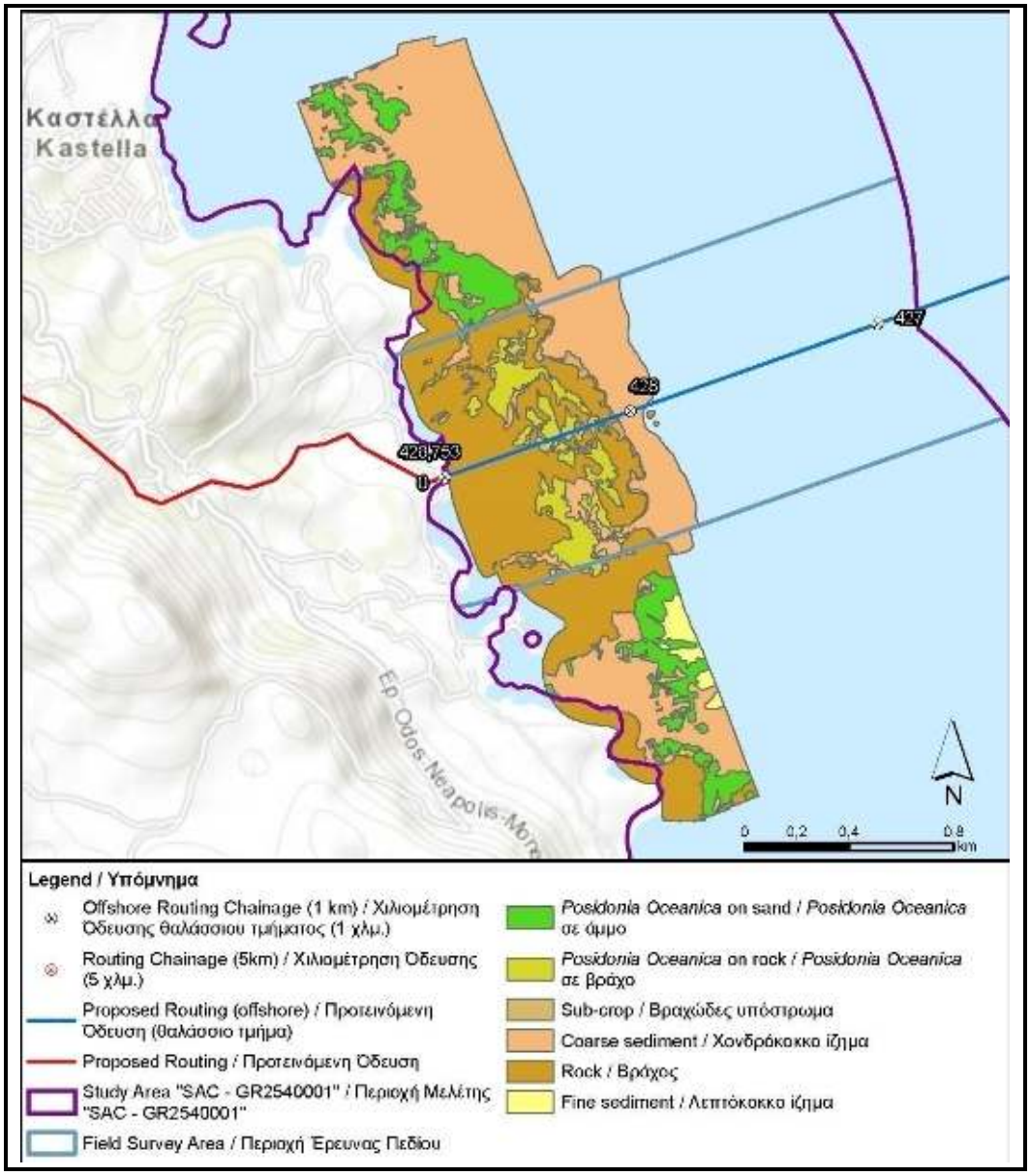
According to the Lighthouse (2021) survey and the results of side scan sonar survey, the route runs through an area with coarse sediment (sand) from the beginning of the survey at KP 428.005 to KP 428.119. From there the route rises up to a scarp and continues across a large area constituted mainly by rock to the end of the survey at KP 428.803 (Figure 3-5(a)). The rocky section between KP 428.177 and KP 428.449 shows two areas with *Posidonia oceanica* on rock, interspersed and related to seabed depressions. Patches of sand with ripples have also been detected (Figure 3-5(b)).

To the NW from the pipeline routing, the area is mainly characterised by coarse sediment and by an extensive *Posidonia oceanica* meadow on sand oriented NW-SE (Figure 3-5(c)) while to the SE it is more heterogeneous with prevailing coarse sediment, *Posidonia oceanica* meadow on sand and several areas with fine sediment. The seabed in the shallower part is always characterised by rock. The seafloor at LF3 is mostly rocky and irregular and partially covered by *Posidonia oceanica* prairie. Some patches of coarse sediment have been also detected, as well as the limit between the rocky seafloor and the sub-crop.



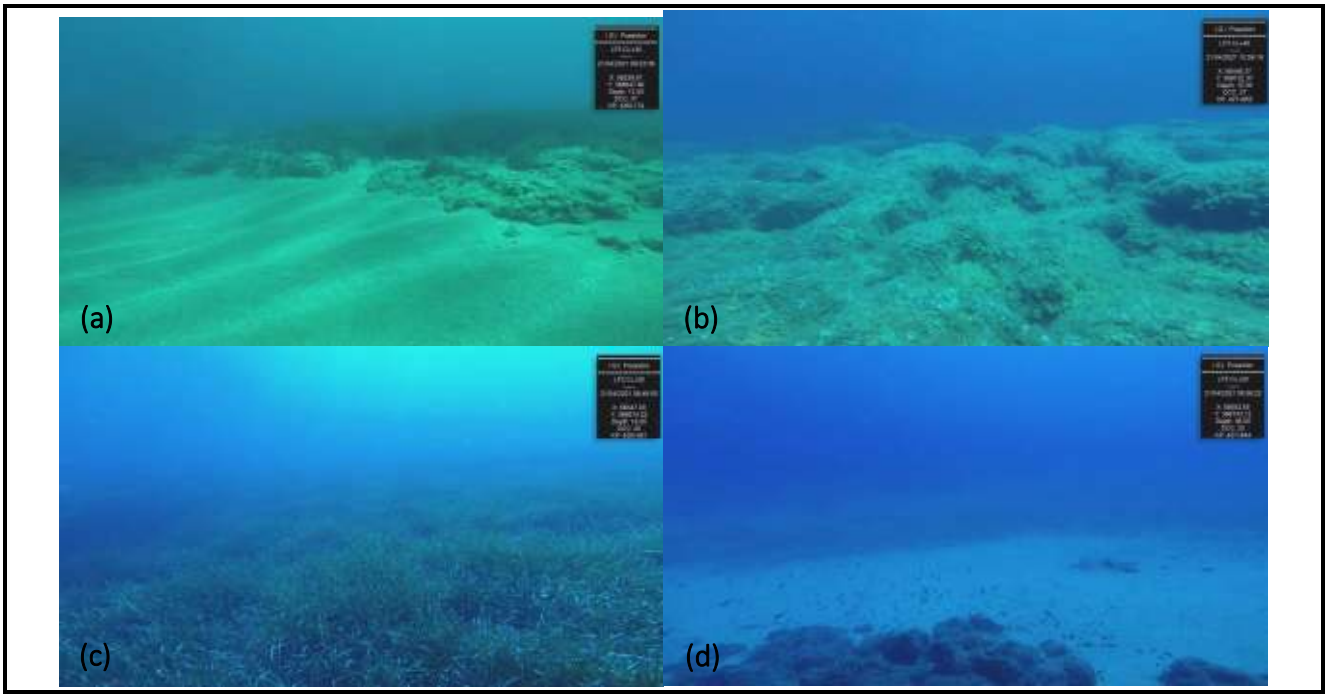
Reference: (Lighthouse, 2021)

Figure 3-5 Side Scan Sonar Images of the Survey Showing (a) Rocky Area and Coarse Sediment, (b-c) *Posidonia oceanica* on Rock and Coarse Sediment



Prepared by: (NCC, 2021). Reference: (Lighthouse, 2021)

Figure 3-6 Seabed Morphological Overview



Reference: (Lighthouse, 2021)

Figure 3-7 ROV Captures Showing (a) Patch of Coarse Sediment Showing Ripple Marks, (b) Irregular Rocky Seafloor, (c) *Posidonia oceanica* Prairie, (d) Rock/Subcrop Limit

Reference: (NCC, 2021)

Figure 3-8 Landfall Terrestrial Area and its Coastal Area

3.3.2.2 Fauna

Several species of conservation concern, including sea turtles, marine mammals and seabirds have been either recorded during current field surveys or were reported by local fishermen.

3.3.2.2.1 Seabirds

Four (4) seabird species were recorded during the survey, none of them included in the SDF

Larus audouinii was recorded within and outside the FSA. The recorded individuals were using the FSA only for foraging and local movements as the Study Area hosts no colonies of the species. Because the surveys took place during the breeding season, the individuals recorded were non-breeders. Although the FSA is used by non-breeders for feeding, the site is not considered to include species' critical habitats.

Phalacrocorax aristotelis desmarestii was recorded within the FSA (1 individual), but particularly in the northern part of the Study Area, where 34 nesting sites and the majority of individuals were recorded. Therefore, although the Study Area seems to be an important breeding area for the species, the FSA is considered to be of marginal importance for the species, because it is located far from the core breeding area.

Few individuals of *Calonectris diomedea* and *Puffinus yelkouan* were recorded within the FSA and the Study Area, indicating that the two species visit the site only occasionally and that the Study Area does not consistitue an important foraging area. This is also indicated through the tracks of *Calonectris diomedea* individuals tagged with GPS tracking devices.

Boat-based surveys provided a unique opportunity to survey parts of the Natura 2000 coastline which are otherwise difficult to access from land. This way, two other species of conservation concern i.e. *Aquila fasciata* and *Falco peregrinus* were recorded south of the Field Survey Area. Based on a record of a single *Aquila fasciata* adult individual, it is not possible to establish species breeding status within the Study Area. The *Falco peregrinus* however is breeding in the Study Area, south of the landfall location, because apart from 2 adults 2 juveniles were also recorded.

Table 3-3 Seabird species Expected or Observed within the FSA

Group	Code	Species	Observed during Fieldwork	Annex of Birds Directives / IUCN / Greek Red List
B	A392	*Phalacrocorax aristotelis desmarestii*	X	I|LC|NT
B	A181	*Larus audouinii*	X	I|LC|VU
B	A464	*Puffinus yelkouan*	X	I|VU|NT
B	A850	*Calonectris diomedea s. str.*	X	I|LC|LC

Prepared by: (NCC, 2021)

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

Reference: (NCC, 2021)

Figure 3-9 *Phalacrocorax aristotelis desmarestii* Individuals at Sea and *Larus audouinii* Individual

Reference: (NCC, 2021)

Figure 3-10 Tracks of Tagged *Calonectris diomedea* at the Broader Area

3.3.2.2.2 Marine Mammals

Although no marine mammal species were recorded during the survey, the presence of one species, included in the SDF, is confirmed within the marine area of the site.

Monachus monachus, the only marine mammal species included in the SDF as species for the designation of the site, has been reported by fishermen; however the species was not recorded

during field surveys. The specific survey carried out found no caves suitable for the species within the FSA; however two caves potentially suitable for resting by the species have been located within the Study Area, one north of Monemvasia (11 km from the landfall) and the other south of the FSA (2.5 km from the landfall). The Natura 2000 site seems to be of minor importance for the species and breeding has not been recorded or reported for the site.

Cetaceans were not recorded either within the FSA or within the Study Area. Outside the current field surveys *Stenella coeruleoalba* and *Tursiops truncatus* have been recorded approximately 15 and 5 nautical miles south of the FSA and outside the Study Area, respectively. Therefore, their presence within the Natura 2000 site is possible, but is not considered significant.

3.3.2.2.3 Sea Turtles

One sea turtle species was recorded during the survey, which is not included in the SDF.

Caretta caretta was recorded outside the FSA, but within the Natura 2000 site (port of Monemvasia, and between Monemvasia and the pipeline landfall and south of the pipeline landfall). One beach is known to be used for nesting by the species located within the FSA, at a distance of 50 m from the landfall. In 2021 the Toulipa Gulimi Association (pers. communication) identified several turtle exits at the beach and no nests, while in 2020 two nests were identified. At the beach Agios Fokas (500 m from the landfall) 7 nests were identified.

Based on the surveys carried out by the Toulipa Gulimi Association, about 50 nests of the species are recorded annually in total at the beaches of Ag. Fokas (9% of the nests), Kastela (2%), the beach Xifias – Livadia (49%), and the consequent beaches Ambelakia – Astakos - Ag. Thekla (40%) (Archelon, pers. Communication), while for 2021 71 nests were identified (Toulipa Gulimi Association, pers. Communication). The beaches are located at 0.5, 1.6, 4.8 and 5.0 km from the landfall, respectively.

Reference: (NCC, 2021)

Figure 3-11 *Caretta caretta* nest at Beach within the FSA (September, 2021)

3.3.2.2.4 Other Species

The species inventory carried out by means of a ROV along the pipeline route by BLUE PLANET (2021) at depths down to -42 m allowed the identification of several species that are listed in the following table. No marine species of conservation concern were observed while one invasive species was identified (*Siganus luridus/rivulatus*).

Table 3-4 Species Observed during ROV Deployment

Group	Eunis Code	Species
Invertebrate		*Spongia sp.*
Invertebrate		*Crambe crambe*
Invertebrate		*Cacospongia sp.*
Invertebrate		*Axinella cannabina*
Invertebrate		*Axinella verrucosa*
Invertebrate		*Agelas oroides*
Fish	5881	*Thalassoma pavo*
Fish		*Chromis chromis*
Fish		*Symphodus sp.*
Fish	5611	*Coris julis*
Fish		*Atherina sp.*

Group	Eunis Code	Species
Fish		*Sparisoma cretensis*
Fish	5844	*Serranus cabrilla*
Fish	5845	*Serranus scriba*
Fish	5630	*Diplodus sargus*
Fish	5631	*Diplodus vulgaris*
Fish	5767	*Oblada melanura*
Fish		*Siganus luridus/rivulatus*

Prepared by: (NCC, 2021), Reference: (PBRS, 2021)

3.3.3 Key Findings

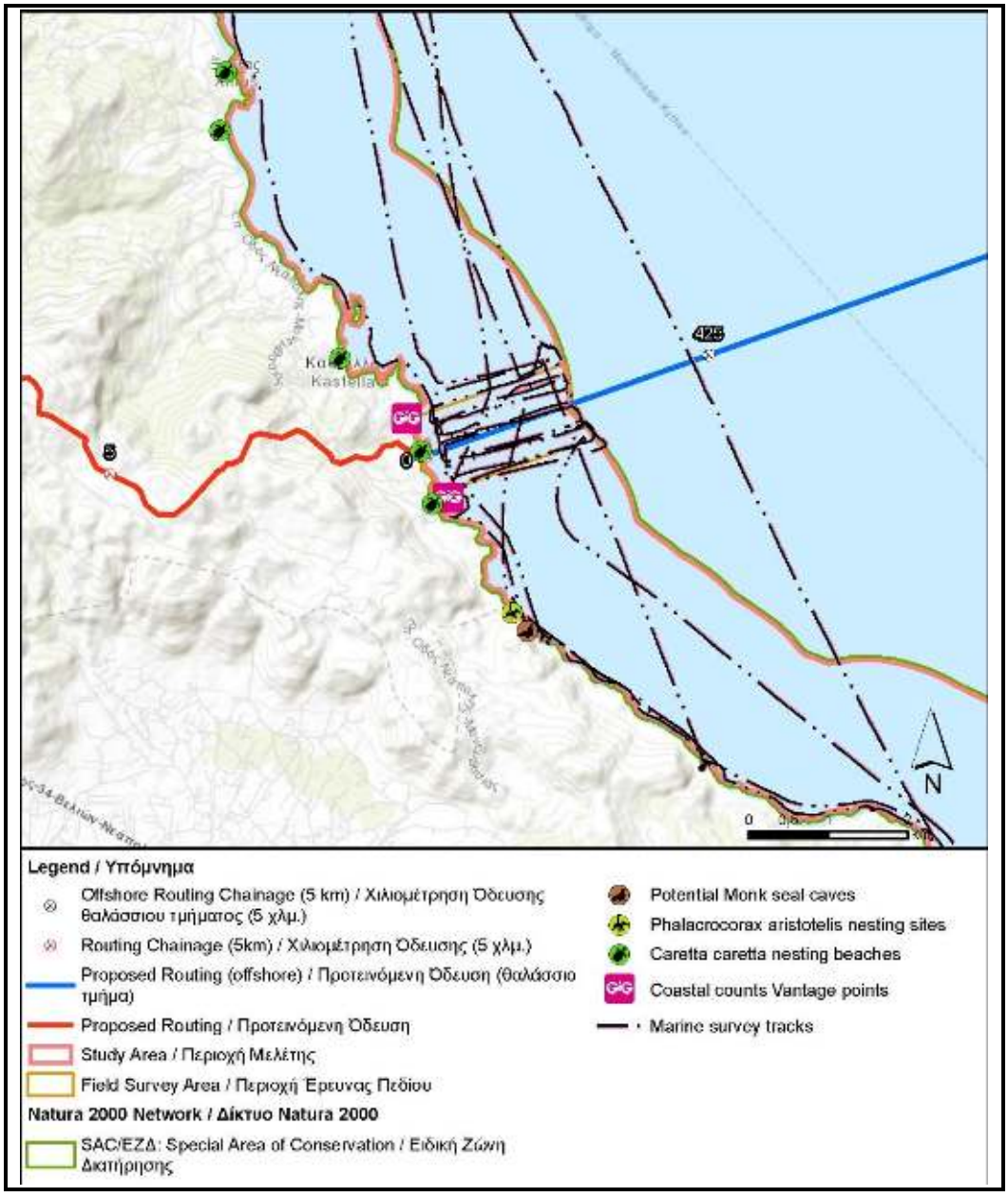
The main findings of interest from the field surveys carried out are summarised as follows:

- *Habitat types*: In the FSA, which is exclusively marine, the presence of the habitat of interest Posidonia beds (1120*) has been confirmed. Posidonia beds is included in Annex I of the Habitats Directive and a priority habitat.
- *Plant species*: No species of interest were found within the FSA;
- *Mammal species*: *Monachus monachus* has been reported in the area; however the species was not recorded during field surveys. No caves suitable for the species have been found within the FSA, however one cave potentially suitable for resting by the species is located at a distance about 2 km from the pipeline routing. The Natura 2000 site seems to be of minor importance for the species and breeding has not been recorded or reported for the site. Cetaceans were not recorded either within the FSA or within the Study Area. The presence of *Stenella coeruleoalba* and *Tursiops truncatus* has been recorded in the past outside the Study Area. Thus, their presence within the Study Area is possible, but is not considered significant;
- *Sea turtles*: *Caretta caretta* was recorded outside the FSA, but within the Natura 2000 site. One beach is known to be used for nesting by the species and is located within the FSA, while within the Study Area several other nesting sites exist. In 2021 the beach had 7 nests. Furthermore in 2020, at the beach at a distance of 50 m from the Landfall 2 nests were found; and
- *Other species*: No other species of interest were observed.

Table 3-5 Species of Interest Recorded during Fieldwork

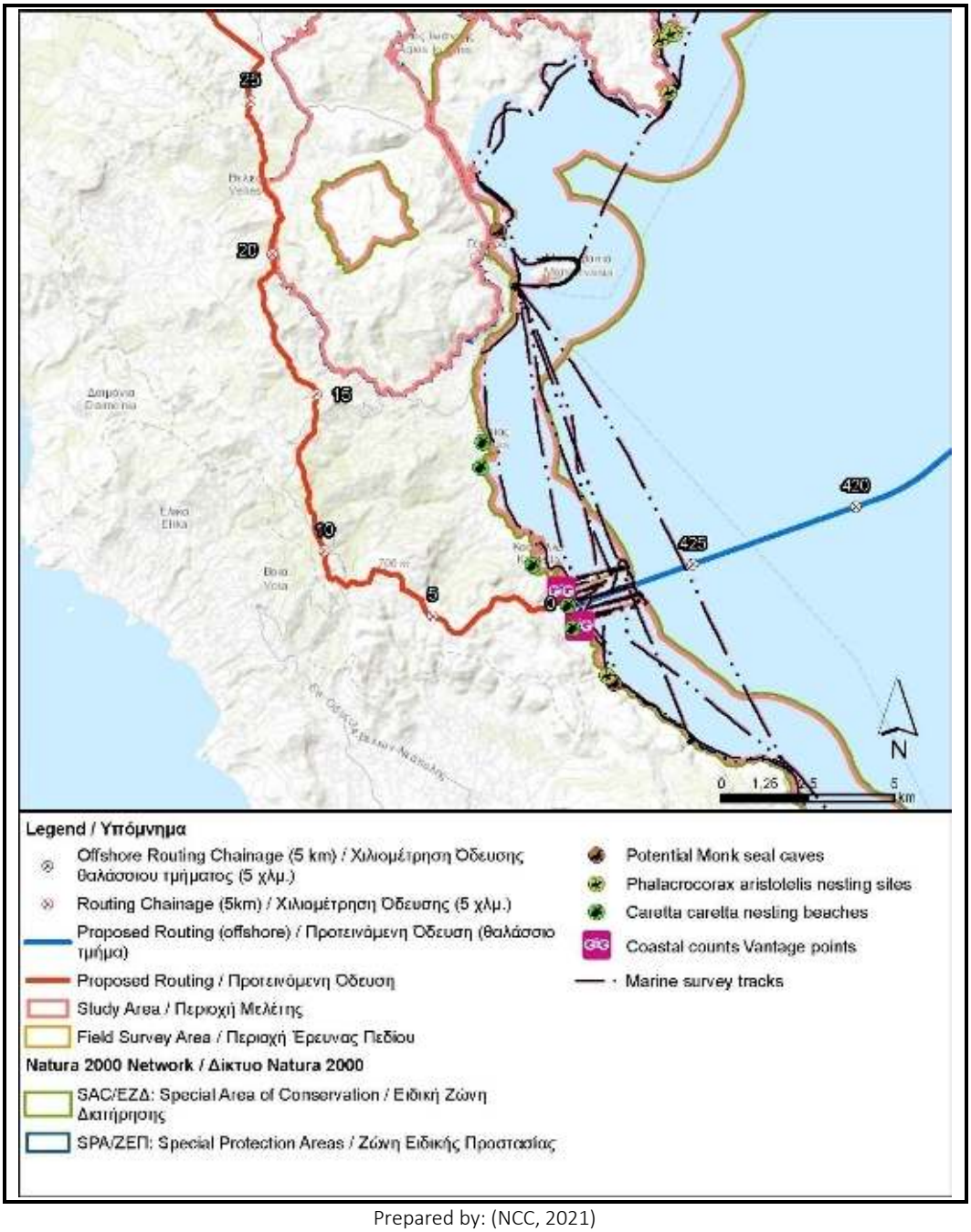
KP	Habitats/Species of Interest
428.20 - 428.45	*Posidonia oceanica*(1120*) on rock
426.84 - 428.75	*Phalacrocorax aristotelis, Larus audouinni, Puffinus yelkouan, Calonectris diomedea, Caretta caretta*
Landfall (at beaches 50 m and 450-500 m distance)	*Caretta caretta* nesting sites

Prepared by: (NCC, 2021)



Prepared by: (NCC, 2021)

Figure 3-12 (a) Field Survey Locations for the Survey of Fauna Groups of Annex II and IV (Directive 92/43/EEC) and Annex I (2009/147/EC), carried out within the FSA and (b) Sensitive Areas for Species of Interest



Prepared by: (NCC, 2021)

Figure 3-13 (a) Field Survey Locations for the Survey of Fauna Groups of Annex II and IV (Directive 92/43/EEC) and Annex I (2009/147/EC), carried out at the Broader Area of the Study Area and (b) Sensitive Areas for Species of Interest

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

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

The specific Conservation Objectives are provided in ANNEX 3.

3.4.2 Conservation Status of Habitats, Flora and Fauna Species

According to the SDF of the SAC, the area hosts a high percentage (15-100%) of the total national area covered by habitat type 9320 (Olea and Ceratonia forests), as well as a significant percentage (2-15%) of the habitat 9340 (*Quercus ilex* and *Quercus rotundifolia* forests). The representativity of the natural habitats in the site is good to excellent, except of the representativity of the habitat 2260 (Cisto-Lavenduletalia dune sclerophyllous scrubs). Their conservation status varies from excellent to good, while the status is good for most of the habitats. Marine habitats 1110 (Sandbanks which are slightly covered by sea water all the time), 1120* (Posidonia beds) and 1170 (Reefs) have excellent representativity, their relative surface is low (0-2%), while their conservation is excellent. The overall value of the site for the conservation of the habitats is indicated as good for all the habitats.

Concerning the species included in the SDF, the SAC hosts a significant percentage (2-15%) of the total national population of *Euplagia quadripunctaria, Myotis blythii, Myotis emarginatus* and *Rhinolophus euryale*. The conservation status of *Euplagia quadripunctaria* is excellent. All the species populations are not-isolated. The overall value of the site for the conservation of the species is assessed as significant and good for the *Euplagia quadripunctaria*. Concerning *Monachus monachus*, the site hosts a small proportion of the national population (0-2%) and the degree of conservation of the habitat features important for the species is assessed as average to reduced.

Detailed information is provided in ANNEX 1.

3.4.3 Threats/Pressures

According to the SDF of the SAC, the main threats are of high, medium and low magnitude. Threats of high magnitude within the site include at the terrestrial area intensive cattle grazing, wildfires and reduction of prey availability, as well as the existence of paths and cycling tracks and wind energy production. For species that use buildings and caves, renovation or demolition of buildings, speleology and recreational cave visits are of high magnitude. At the marine area the threats related to professional passive fishing, trawling and disturbance below surface of the seabed are of high magnitude.

Of medium magnitude are threats that concern grazing, use of chemicals and biocides and disposal of waste from households and recreational facilities, the expansion of urbanised areas and human induced changes in hydraulic conditions. Furthermore, outdoor sports and leisure activities are

medium magnitude threats as well as hunting and leisure fishing. There is also mechanical shallow surface damage to the seabed surface, vandalism and spear-fishing.

Threats of low magnitude within the site include invasive non-native species, as well as problematic native species, removal of hedges and copses or scrub, the presence of port areas, changes in temperature and habitat shifting and alteration.

3.4.4 Ecological Functions

The Natura 2000 site forms an important terrestrial and marine ecosystem in Southern Greece. It holds a significant ecological value and offers a great variety of ecological niches, as it supports several types of marine and terrestrial ecosystems with different life sustaining habitats. This means it functions as a very important area for resting and nesting of migratory birds. Additionally, the site holds many rare floral elements, such as *Euphorbia dendroides* formations and very rare and local endemic plant taxa like *Stachys spreitzenhoferi* ssp. *virella* and *Campanula andrewsii* ssp. *Hirsutula*, as well as important and threatened species of fauna (jackal *Canis aureus*), endemic lizard species and carnivorous mammals. The site also functions as a hosting area of suitable habitats for some colonies of bats of *Myotis blythii* species, *Miniopterus schreibersii*, *Rhinolophus euryalehas, Rhinolophus ferrumequinum* and *Myotis emarginatus*.

The area also functions as an important marine ecosystem based on the presence of well-developed Posidonia beds (Habitat Type 1120*) that cover the largest part of the infralittoral sediments at depths between -5 - -30 m, as well as the presence of biodiversity rich, rocky shores and reefs (Habitat Type 1170) which host important and well-preserved stands of both shallow and deep *Cystoseira* and *Sargassum* canopies. These habitats provide suitable conditions for marine species such as the loggerhead turtle *Caretta caretta* which is a common encounter species in the area.

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.

For the Study Area, human activities (e.g. tourism development, land uses) have been gently compounded in the site, while other natural elements of the biotic and abiotic environment (e.g. morphology, cultural heritage, species, habitats, vegetation cover, etc.) have in combination formed the existing dynamics of the site. These natural environmental elements have shaped current

development trends, which mainly involves tourism development. This means some significant possibilities exist as well in the area for environmental education and ecotourism such as bird watching and nature photography.

4 PROJECT OVERVIEW

4.1 Introduction

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

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

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

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

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

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

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

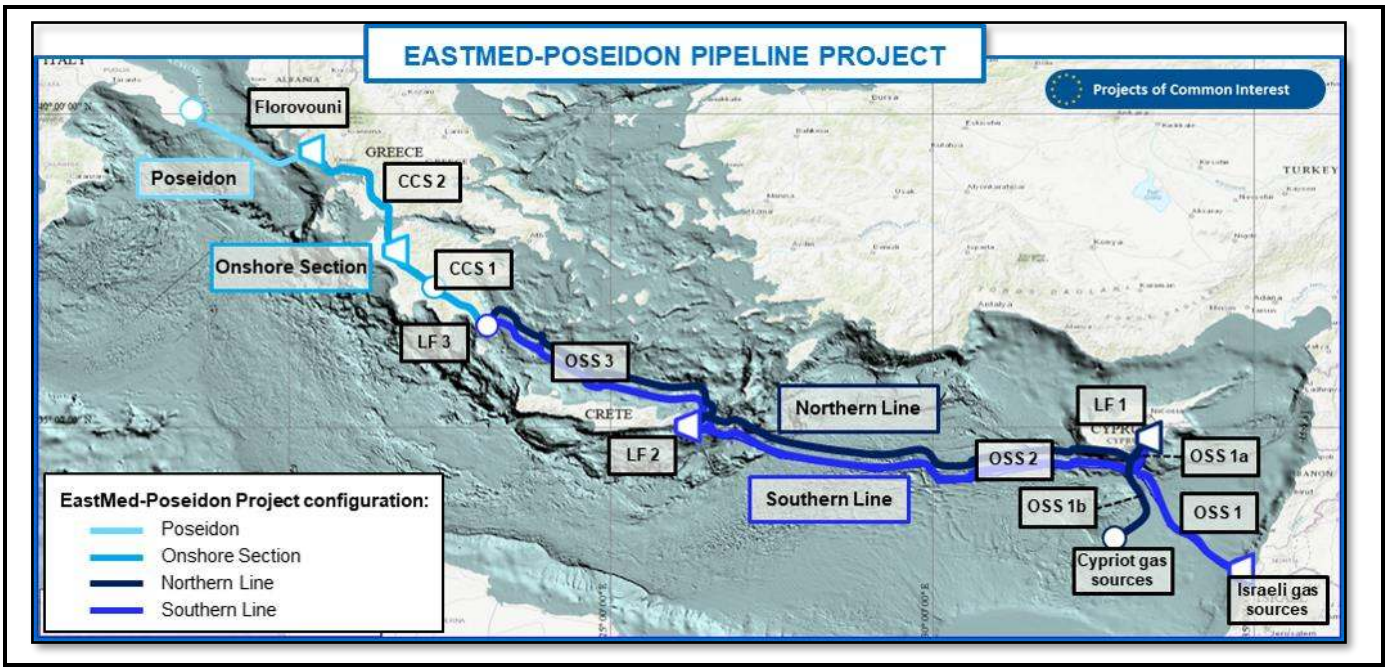
- Delivers dry gas originating from one or more of the Cypriot offshore gas discoveries to the compression and metering stations in Cyprus (CS1/MS1) first, through OSS1b and then in Crete (CS2/MS2N), through OSS2N and from there to the mainland Greece and Poseidon Pipeline Project, as referred in the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

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

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

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

A more comprehensive visualization of the crossing with the Natura 2000 sites is provided in Map 1 of ANNEX 6.



Prepared by: (EastMed, 2020)

Figure 4-1 EastMed Onshore and Offshore Sections – Overview

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

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

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

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

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

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

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

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

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

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

In more detail:

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

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

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

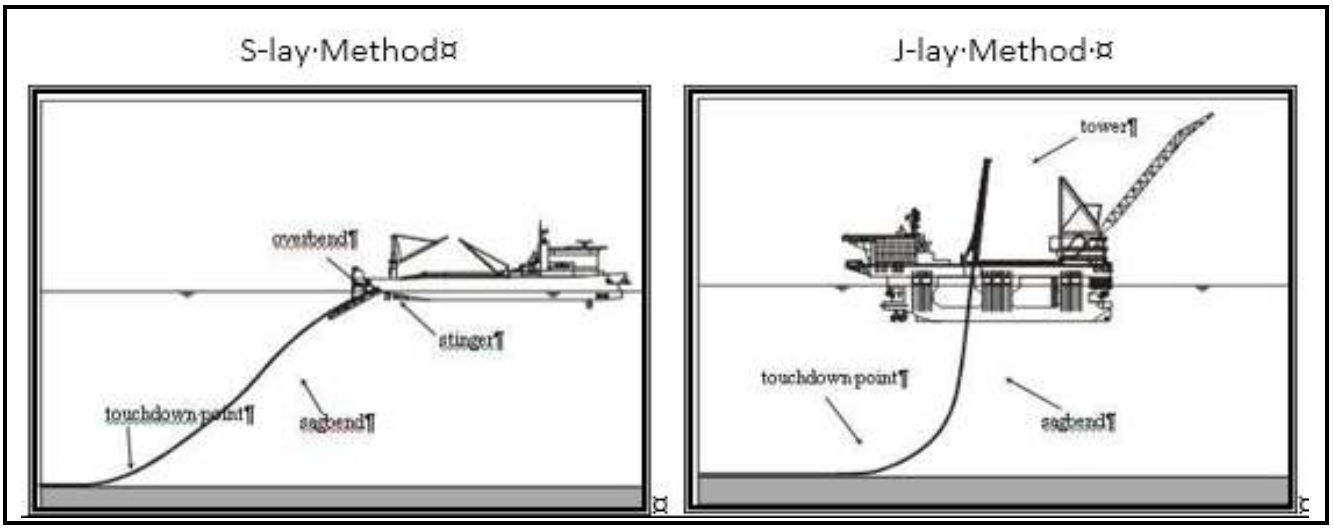
4.2 Pipeline Construction and Pre-commissioning

4.2.1 Construction Overview

4.2.1.1 Offshore Section Installation Method

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

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



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

Figure 4-2 Offshore Pipeline Installation Methods

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

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

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

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

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

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

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

4.2.1.1.1 Indicative Schedule

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

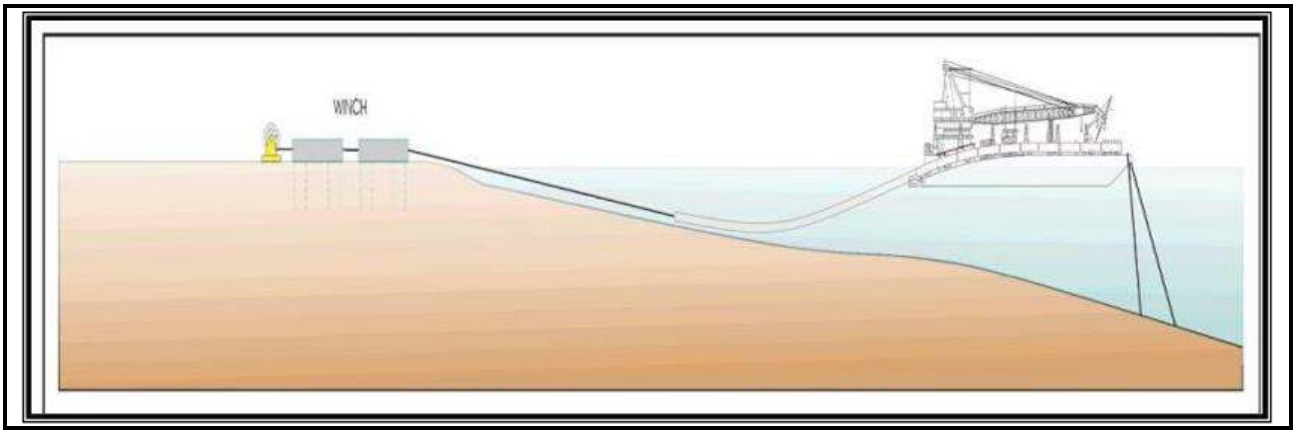
4.2.1.2 Nearshore Section Pipeline Installation Methods

Shore crossing construction methods are presented in the relevant Section, and pipeline installation onto the sea bottom within a trench is described below. One of the following methods can be used:

- Shore Pulling Method. Pipeline is assembled on a barge stationed offshore and the pipeline section is pulled through a pre-dredged trench using land based cable winches. Typically, this method includes offshore mooring of the barge and stringing the pipeline that has been assembled on the barge, pulling towards the shore using land based winches. The site needed onshore for winches, cable drums, power generators, support equipment and construction installations is approximately 2,000 m². Also, an additional area will be required for temporary storage of the trenched material;
- Barge Pulling Method. Pipeline sections are assembled and fully prepared onshore, and then the pipeline string is pulled offshore by a barge equipped with the required winches. The construction site needed for pipeline storage, welding, etc. is larger than the one required in the previously

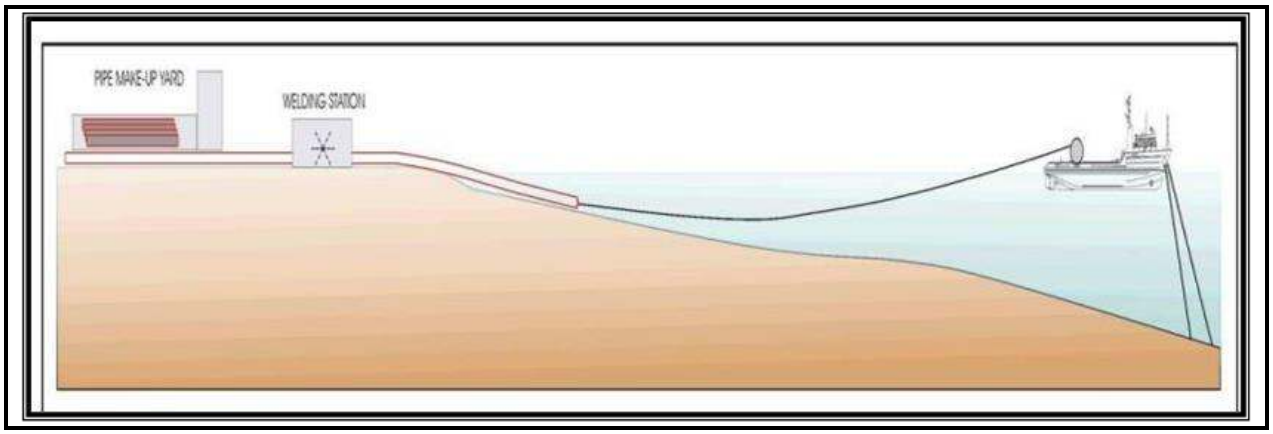
described method, and it is estimated around 10,000 m². A land strip approximately 300 – 500 m long is estimated for placement of the pipeline strings. This land strip could be located along the onshore construction working strip; and

- Barge Pulling via Sheave Block. This third method consists of the combination of the two previously mentioned methods, as it involves both pipeline construction and winching being performed onboard the barge. Like the shore pulling method, the pipeline is constructed on the barge moored offshore and then pulled to shore through a pre-dredged trench. The pulling cable winch goes through an onshore sheave block and back to the barge. The method is technically more demanding than the two methods described above and is used only where there are serious restrictions regarding the available workspace at landfall locations.



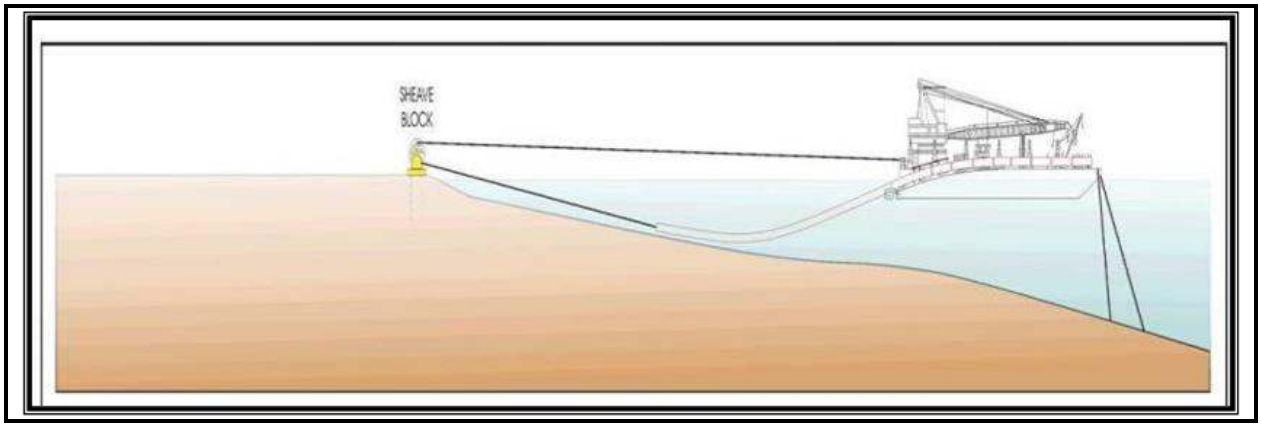
Reference: (EastMed Feasibility Study - Preliminary Design Report – Offshore)

Figure 4-3 Shore Pulling Method



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

Figure 4-4 Barge Pulling Method



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

Figure 4-5 Barge Pulling via Sheave Block

Regarding accessibility, the following are noted: as mentioned, it is envisaged that no new access roads will be required. Existing roads that might be improved and the working strip will be used as the main access roads for the shore crossing construction site. Especially for the shore construction site, some heavy equipment could be transported by shallow vessels. However, given the specific works at the landfall sites, the EPC contractor may deem it necessary to construct a temporary access to the landfall site for personnel, materials, equipment, etc. In such a case (as well as in other places with special characteristics where the EPC contractor may deem temporary construction access necessary), all necessary permits will be acquired by the EPC contractor.

Table 4-1 Comparison of Alternative Pulling Methods at the Landfall Sites (Shore Crossing)

Pulling Method	Advantages	Disadvantages
Shore Pulling Method	Requires less extensive onshore installations. The high pulling capacity land based winch and the cable of sufficient length can easily be installed onshore.	Requires close coordination between the onshore and offshore crews. Requires transportation and installation of one or more high pulling capacity winches.
Barge Pulling Method	Mobilisation of the installation barge of the pre-constructed pipeline parts can wait until the pipeline strings are welded onshore and are ready for pulling. Short installation duration; hence cost minimisation	The available pulling capacity is limited by the power of the onboard winches. A large onshore construction site is required for pipeline string assembly (welding and preconstruction).

Pulling Method	Advantages	Disadvantages
Barge Pulling via Sheave Block	Does not require onshore winching installations. All key operations are controlled onboard the barge.	The length required for the pulling wire is about twice the length required for the shore pulling method with a land based winch. Available pulling capacity is limited by the power of the onboard winches.

Prepared by: (ASPROFOS, 2021)

4.2.1.2.1 Indicative Schedule

The estimated total duration of the shore crossing construction activities is 6 months.

No construction activities are performed during the tourist season (June – August) in order to minimise impacts on tourism in the area during this short period.

4.2.1.3 Onshore Section Construction Methods

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 4-6.

Prepared by: (ASPROFOS, 2021)

Figure 4-6 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
- Reinstatement.

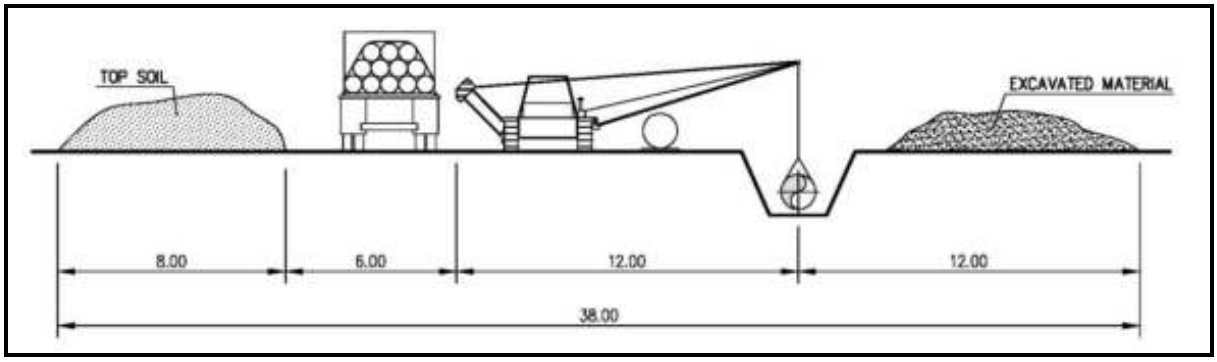
A survey control system in the form of permanent ground markers (PGM) will be installed. A subcontractor will tie all survey works into this control system and confirm the accuracy of the PGM control system.

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

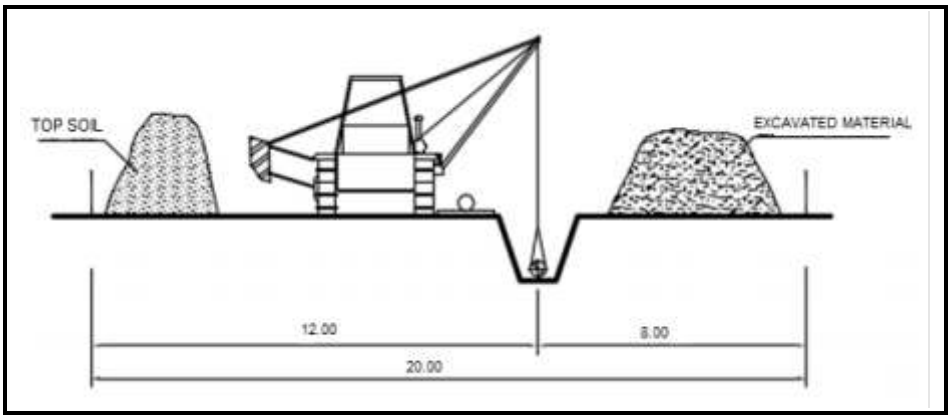
The working strip is the temporary corridor along the pipeline where construction takes place. It must be wide enough to allow all activities to be carried out safely whilst providing sufficient room to store topsoil and trench material separately and keeping crop loss to the farmer to a minimum. The 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 4-7 Regular Working Strip in Open Country for Pipeline ND 48" and 46"

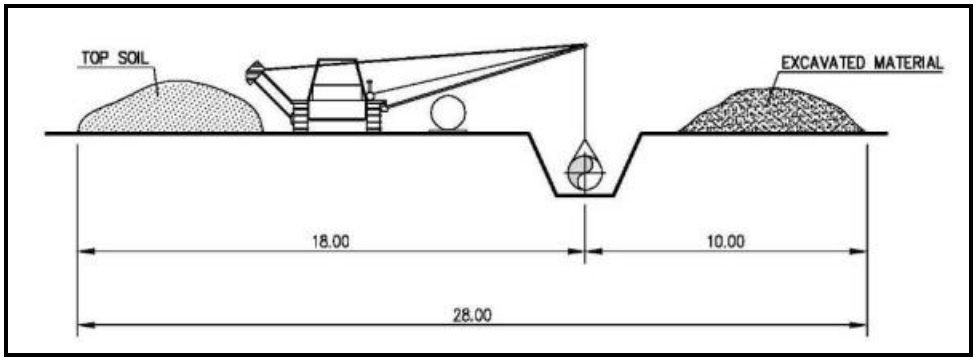
The width of the working strip in open country for pipeline of ND 16'' will be 20 m.



Source: (Design Basis Memorandum – Pipeline and Facilities)

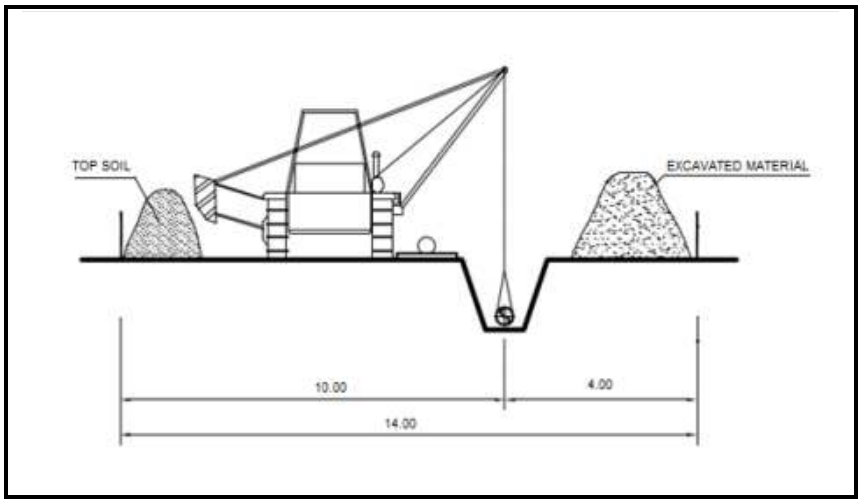
Figure 4-8 Regular Working Strip in Open Country for Pipeline ND 16"

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 4-9 Reduced Working Strip (with Topsoil Stripping) for Pipeline ND 48" and 46"

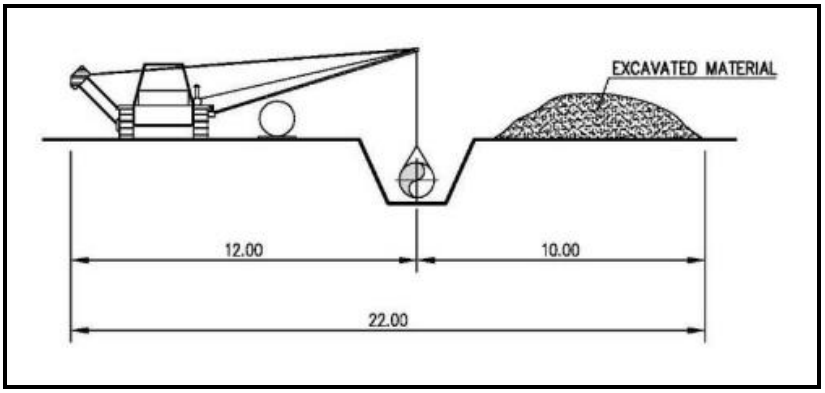


Source: (Design Basis Memorandum – Pipeline and Facilities)

Figure 4-10 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 4-11 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.

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 4-2 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^2)	HDD (Area Required) (m^2)
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.

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 4-3 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 Cleanup 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.

4.2.2.7.1 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 similar projects in dimensions constructed in Greece (i.e., with similar baseline conditions) the indicative construction rates (in terms of project progress) 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 Shore Crossings

The following typical installation sequence expected for the shore crossings at the EastMed landfall locations.

- Step 1: Mobilisation of construction equipment to the landfall site; construction of an access road to the landfall location;
- Step 2: Construction of a cofferdam or construction of causeway at landfall sites.

  A conservative approach is adopted at this stage of the project, where cofferdams and causeways are installed on both sides of the pipeline corridor. If natural backfilling is limited and excavation

of the trench is possible with one single cofferdam/causeway, one cofferdam/causeway can be considered.

- **Step 3:** Trenching using excavation equipment suitable for hard soil and/or rocky soil conditions (e.g., backhoe equipped with hydraulic hammer / chisel, cutter suction dredger) will be employed.

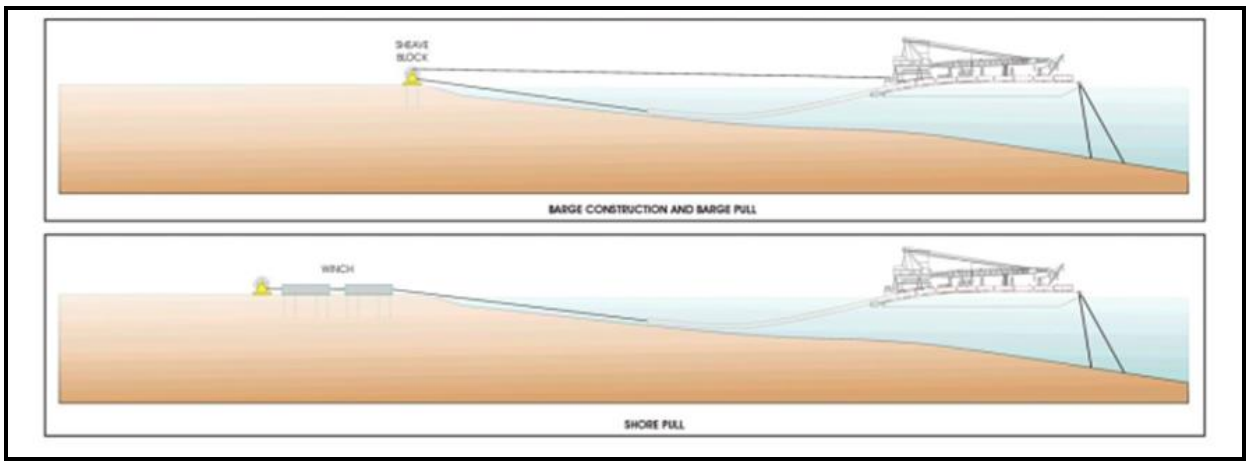
  The trench bottom should be levelled to provide an even and continuous pipe support and shall be clear of debris immediately prior to laying/pulling the pipe. The trench dimensions should be sufficient to accommodate any natural backfilling in the period between excavation and pipeline installation;

- **Step 4:** During pull-in, (Figure 4-12 depicts the pipe pull options) the pipeline joints are welded on board the lay vessel and pulled towards the trench by means of a cable running to shore.

  The pull-in pipeline installation methodology is considered feasible at all landfall locations.

  Survey and dredging equipment will be on site until completion of the pipeline pull operation and will survey, dredge and re-survey the trench as required to ensure that the required depth of pipeline cover will be achieved.

At landfall sites, it is practical to install all pipelines in the same trench from a construction point of view. This will minimise the amount of excavation activities;



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

Figure 4-12 Schematic Pipe Pull Options

- **Step 5:** An S-lay installation vessel will perform the pipe pull and will continue pipe laying; it is assumed that the shore pull operation and subsequent shallow water pipelay is performed by a shallow water S-lay vessel. Depending on the adopted offshore installation scenario, the pipeline

will be laid down in a water depth suitable to perform a surface tie-in or to be recovered by a larger S-lay vessel to continue pipelay activities into deeper water;

- Step 6: Backfill trench with suitable (engineered) backfill material to prevent liquefaction and to ensure backfill stability; backfilling shall not commence until completion of the as-laid survey of the pipeline and removal of any pipeline buoyancy aids. A granular bedding material will be placed under the pipe at free spans in such a manner that any gap under the pipe is effectively filled. Excavated material may be used where possible; and
- Step 7: Demobilise causeways/cofferdams and reinstate construction site.

4.2.4 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.

4.2.4.1 Hydrotest Concept

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

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

- Before hydrotest:
  - Flooding and cleaning,
  - Gauging;
- During hydrotest:
  - Leak detection;
- After hydrotest:

- Dewatering,
- Drying,
- Purging.

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

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

- Flooding, Cleaning and Gauging. After the pipeline is initially flooded, it will be cleaned and gauged. Typically, cleaning and gauging are performed as a single operation together with flooding. Cleaning involves sending a series of pigs through the pipe section to remove any debris (typically weld slag and pipe mill scale, where the latter is expected only in a very limited amount due to the internal coating) from inside the pipeline. One pig bounds the air and water, and another series of pigs can be used to clean the internal pipe-wall. Clean water is pumped in front of the pig train to moisten the debris. Pipeline internal gauging is used to ensure the inner diameter of the pipeline is free from obstructions and excessive ovality. A gauging pig is equipped with a device to determine its location in case it does not reach the pig receiver. If a gauging pig becomes stuck in the pipeline it is freed, the pipe defect is located and eliminated, and the gauging operation is repeated. An alternative gauging method could be used that will pinpoint any defect. Gauging can be performed with an electronic calliper tool for this purpose, optionally combined with a geometry pig to confirm the pipeline geometry as built. The gauging and geometry pigs may be run in the same train as the flooding and flushing pigs; pig speed for this operation should be between 0.3 m/s and 1 m/s. The pipeline system configuration should be designed to allow for pigging in forward or reverse direction. This is achieved by barred tees, lock-open check valves, eliminating non-piggable wye pieces, and designing the pig receivers so that they can also be used as launchers. This philosophy provides benefits during pre-commissioning and possible future repair scenarios;
- Dewatering. The recommended method for dewatering is to use compressed air. This method uses compressed air to drive a pig train through the pipeline while displacing the hydrotest water. The pig train consists of multiple compartments separated by pigs. Some are filled with fresh water to flush the salt from the pipe wall, and some are filled with air. The air is oil free and dry with a dewpoint of at least -65°C at atmospheric pressure and an oil content no greater than 0.01 ppmW;
- Drying and Purging. The dewatering pig train leaves a small film of water, approximately 0.05 mm thick, in the pipe. The absence of water in the pipeline is necessary in order to prevent the

possible formation of methane hydrate. The drying method is air drying which usually employs swabbing pigs to help spread out the water so that it has a larger surface area in order to be more easily collected; and

- Discharge/Disposal Options. Following successful testing, the used water is discharged back into a receiving water body after having passed a sedimentation pool, through which the water will flow very slowly. These pools are sized to provide a retention time of 5 minutes, which is considered enough time to allow the solid particles to be cleaned out of the pipe, to settle and remain in the bottom of the pond. The discharge rate after finalisation of hydrotests will follow the same rules as applicable for abstraction. Hence the same water bodies will be taken into consideration for discharge. Environmental effects are expected to be minimal or negligible when discharge rates are under 10% of the receiving river flow. Discharged water will be free of any chemicals, or, if it is necessary to add any chemical substances (especially at the offshore sections), they will be from the PLONOR list. The contractor for hydrotesting will obtain written approvals from the local authorities and landowner(s) where the hydrotest water will be discharged; water will not be returned to any watercourse without permission of the appropriate local authorities.

4.2.4.2 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.

4.2.4.3 REPLACE plan

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

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

- **Pressurising**. The pipeline will be pressurised using dry air to create back pressure ahead of the cleaning and gauging pig train, which will be introduced in the system in the next step. Back pressure is necessary to ensure the pig-train speed can be controlled on steep slopes. The required back pressure will be assessed in detailed design. The size of the compressor spread determines the time needed for the pressurisation phase. Upon completion of the pressurising step, the pipeline is filled with dry air at elevated pressure;
- **Cleaning and gauging.** Cleaning and gauging activities are, ideally, conducted using a single pig run—a second run may be necessary if too much debris is found in the pig train's last slug after the first run. The pig train will consist of a series of pigs with clearing and gauging (CG) functionalities. The series of pigs will be separated by slugs of monoethylene glycol (MEG), not by slugs of water. MEG is hygroscopic and will absorb condensed water in the pipeline. For this reason, MEG inhibits against hydrates and is a so-called "hydrate-control fluid". The pig train will be propelled by a large slug of nitrogen (with a high purity of, for instance, 95%) of several tens of kilometres followed by ultra-dry air. Now the pipeline is chemically conditioned and a drying step is no longer needed. Upon completion of the pig run, the system is filled with dry air at elevated pressure;
- **Depressurisation.** After successful receipt of all pigs (see the above CG step), the pipeline system will be depressurised by venting to atmospheric pressure from both ends of the pipeline. Upon completion of the depressurisation, the system is filled with dry air at ambient pressure; and
- **Nitrogen purging.** Next, the system will be purged with a nitrogen-rich gas mixture of very high purity (e.g., 98%) to avoid an explosive gas–air interface. The mixture is pumped into the pipeline at low pressure to displace the air contents. Once the oxygen level measured at the outlet is sufficiently low, nitrogen purging is halted. Upon completion of nitrogen purging, the pipeline system is filled with inert gas, slightly above ambient pressure. This means that pre-commissioning has been completed and the system is ready to receive hydrocarbon gas.

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

4.2.4.4 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.

4.2.4.5 Water Abstraction Sources

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

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

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

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

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

Table 4-5 Water Requirements for Hydrotest Sections

Pipeline Spread		Water Source	Approx. Volume Required (m^3)	Pipeline Section
From KP	To KP			
				Short Onshore Section at Crete

Pipeline Spread		Water Source	Approx. Volume Required (m^3)	Pipeline Section
From KP	To KP			
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

Reference: (IGI Poseidon, 2021)

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

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

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

4.2.4.5.1 Discharge and Disposal of SPT Mediums

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

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

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

In any case:

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

The discharge point will be selected based on:

- Results of dispersion analysis;
- Application of diffuser; and

- Assurance of efficient dispersion into environment.

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

4.3 Operation and Maintenance

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

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

4.3.1 Maintenance

4.3.1.1 Pipeline Maintenance

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

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

- Pipeline monitoring
- Supervision of the alignment possibly with road vehicles
- Inspections of special intersections
- Monitoring the population and activities of third parties adjacent to the pipeline
- Installation of the cathodic protection system

- Control and monitoring investigations
- Functional inspections and accreditation of the installation and equipment
- Maintenance of installation and equipment at predetermined intervals

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

4.3.1.2 Maintenance of Compressor Stations and Metering Stations

The maintenance strategy is based on the preventive maintenance, the program defined in the Maintenance Plan and the inspection / testing program. In the subsequent operation, the maintenance program follows the Reliability Centered Maintenance (RCM) principle where maintenance activities are based on the recorded reliability and fault database of the plant equipment.

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

4.4 Decommissioning of the Project

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

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

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

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

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

More specifically, a detailed plan for the decommissioning phase will be submitted to competent authorities for approval in advance of the planned date of end of operation activities, providing details of all necessary activities, in compliance with international best available dismantling practices and technologies available at the time of the execution of the plan.

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

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

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

4.5 Description of the Project Overlap with the Natura 2000 Site

The current Appropriate Assessment concerns the part of the Project that overlaps with the Study Area (Natura 2000 site: GR2540001). The total length of the Project crossing the Study Area is 2 km at the section KP 426-428.

Pipeline will be assembled on a barge stationed offshore and the pipeline section will be pulled through a pre-dredged trench using land based cable winches. At deeper parts, the pipeline will be laid on the seabed. At the trenching area causeways will be installed on both sides of the pipeline corridor.

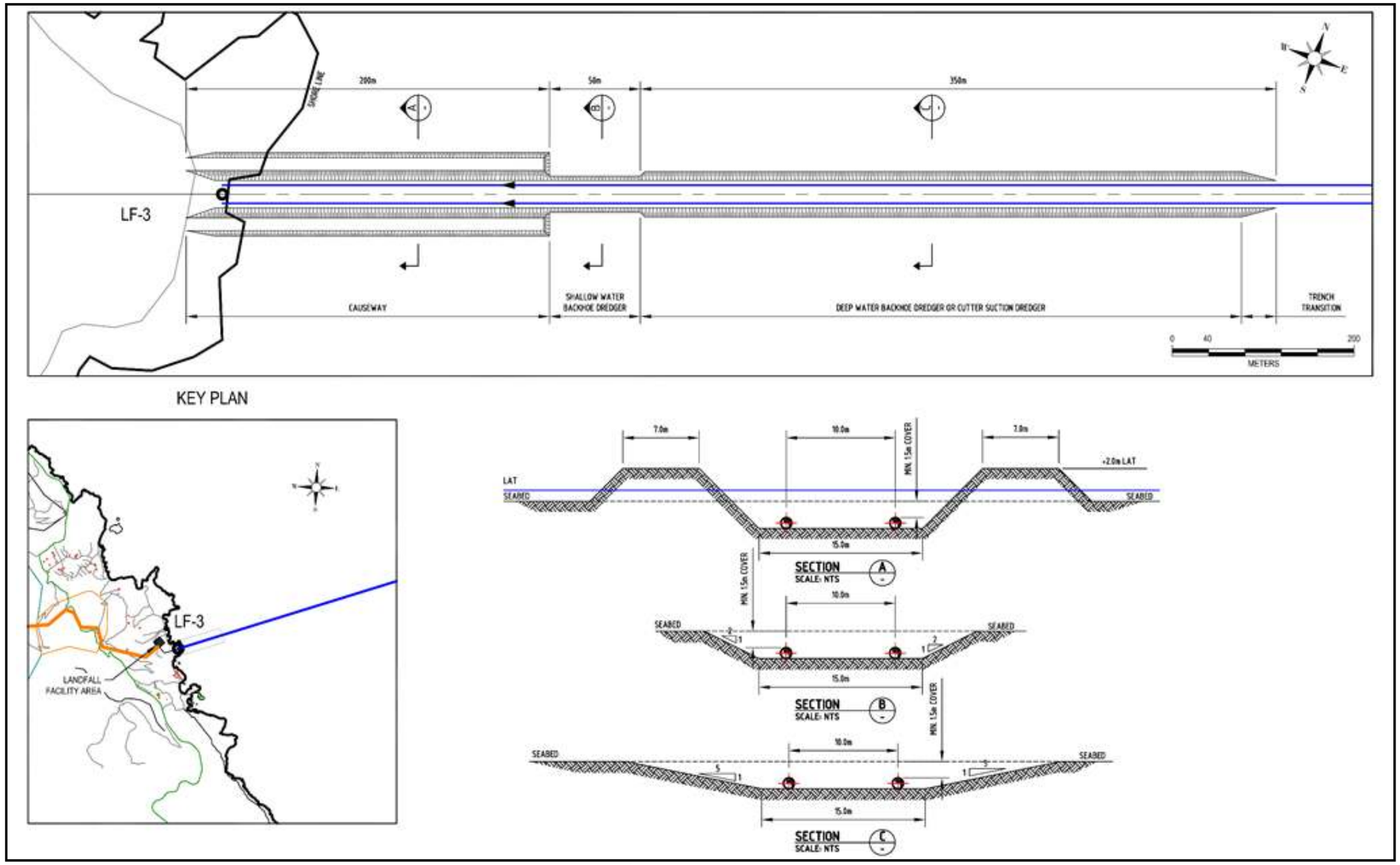
During construction:

- Trenching will take place at a corridor of an approximate (indicative) width of 55 m and length of 600 m, as presented in Figure 4-13, acting as a working strip. At the first 200 m from shore, two causeways will be created and excavation will take place with terrestrial machinery, while for the remaining 400 m shallow and deep water backhoe dredgers or cutter suction dredgers will be used (no cofferdam will be performed). The working strip will be about 55 m nearshore, decreasing to 25 m and increasing again to 40 m in deeper water;
- Vessels, such as dredgers, will anchor at the area;
- It is estimated that 8 months will be required for completion of the work in the area, avoiding the months of July-August;
- Blasting is not expected to be used;
- Dredging material will be generated by the trenching activities and estimated to be approximately 50,000 m³. Two different methodologies are proposed to manage the dredged material in Southeast Peloponnese:
  - The excavated material from LF3 construction will be loaded on (split-hopper) barges and wet stored at seabed level in a temporary offshore storage site, outside the Natura 2000 site. In case a trailer suction hopper dredger (TSHD) is employed, no barges will be used, but the TSHD will sail autonomously to the temporary offshore storage area and discharge its load by opening its bottom doors. Upon completion of pipeline installation in the trench, the stored material will be largely recovered by the dredger and used for backfilling the trench (i.e. reverse process of trenching operations). The proposed location for the temporary offshore storage area is shown in Figure 4-14. This site was selected considering the lowest disturbance on biological and environmental factors and to minimise potential impacts due to possible re suspension and dispersion of the sediment stored;
  - The excavated material from LF3 construction will be loaded on barges and disposed of at a selected offshore disposal site, outside the Natura 2000 site (Figure 4-14). The material

needed for backfilling the trench will be engineered one and taken from available quarries. The location proposed as offshore disposal site has a similar soil condition of the dredged material from LF3 construction works and nearshore trench, and it was selected to provide the lowest impact possible on the surrounding environment and bioconstructions.

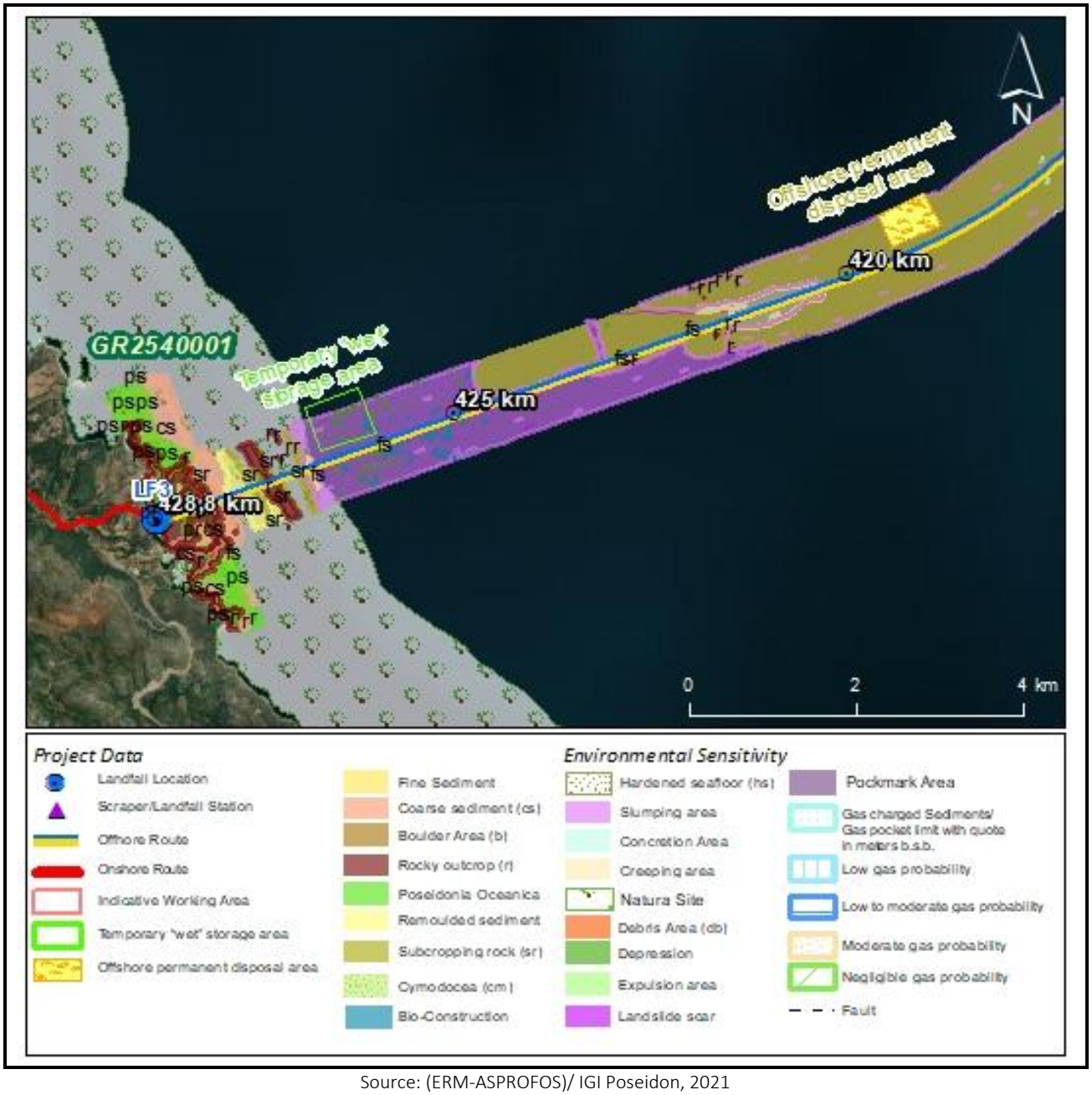
- The dredged material will be handled following the requirements listed in OSPAR guidelines for Management of Dredged Material at Sea; and
- It is highlighted that reuse of the dredged material is recommended. It is noted that this site will be located beyond the *Posidonia* zone and outside the -50 m water depth contour. If the re-evaluation of the chemical analysis classifies the dredging material as toxic, its management will be subject to a separate study.

- Regarding pre-commissioning activities, the system pressure test will not be performed with water and therefore neither water abstraction nor discharge will take place in the specific Natura 2000 site; and
- Activities are expected to take place both at day and at nighttime.



Reference: IGI Poseidon, 2021
Note: The lengths are indicative.

Figure 4-13 Shore crossing at Land falling



Source: (ERM-ASPROFOS)/ IGI Poseidon, 2021

Figure 4-14 Location of Temporary Offshore Storage and Offshore Disposal Sites

5 APPROPRIATE ASSESSMENT

According to the requirements of Article 6 of Directive 92/43/EEC, the guidelines of the European Commission for the Appropriate Assessment and 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 minimise the adverse effects on the site so that its integrity is not affected; and
- Provide a mechanism for approving (in exceptional circumstances) plans or projects for which it cannot be ascertained that they will not adversely affect a Natura 2000 site even after the introduction of mitigation measures, when these plans of projects in the absence of alternative solutions are judged to be of overriding public interest.

5.1 Appropriate Assessment Methodology

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

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

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

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

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

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

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

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

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

Prepared by: (NCC, 2021)

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

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

Prepared by: (NCC, 2021)

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

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

Prepared by: (NCC, 2021)

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

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

Prepared by: (NCC, 2021)

An assessment of the residual impact (i.e. the impact assessed including consideration of the mitigation measures to be adopted) has also taken into account the reversibility that may arise from implementing measures to prevent or mitigate the impacts of the Project on habitats and species.

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

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

Prepared by: (NCC, 2021)

Table 5-6 Impact Significance Definitions

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

Prepared by: (NCC, 2021)

5.2 Assessment of Impacts

The present impact assessment has considered the implementation of adequate mitigation measures and environmental planning aimed at reducing, and where possible, preventing, environmental impacts. Mitigation 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 based on the technical characteristics, the special natural characteristics and the current environmental conditions of the site, 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 characterisation of the area of interest as SAC for the Natura 2000 network, as evaluation indicators the following were used:

(a) loss and fragmentation of habitat type coverage,

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

(c) disturbance/displacement of species of interest; and

(d) direct loss of species of interest.

The examination of the above indicators can provide information on the impact of the project and on whether the project may,

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

as required by the MD 170225/2014.

The section includes an initial screening of species and habitat types, followed by the estimation of Project impacts on the selected species related to (a) pipeline construction and pre-commissioning, (b) pipeline operation, (c) cumulative impacts, while possible impacts to other important species are also presented. Finally, reference to the Alternative Assessment chapter (Chapter 7) of the ESIA is made.

5.2.1 Screening Species / Habitat Types

In regard to habitat types, the habitat that was taken into consideration for the Appropriate Assessment is the marine habitat Posidonia beds (1120*). The rest of the EU habitats within the Study Area is not taken into consideration, either because they are terrestrial and are not expected to be at risk of impact from the activities in the marine environment, or because no information is available on their distribution within the Study Area. In regard to the fauna species, a screening was carried out concerning the species of the SDF that could be potentially be affected by the Project, the only one being *Monachus monachus*. The rest of the species are not marine species and are not expected in the FSA. Its ecological requirements are presented in ANNEX 4. However, it is estimated that it is also an important area for *Caretta caretta*, which is a priority species, so it was also taken into consideration.

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

Group	Code	Species	Presence	Observed during fieldwork	Annex of Habitats Directive / IUCN / Greek Red List
M	1366	*Monachus monachus*	P		II;IV|EN|CR
R	1224	*Caretta caretta*		X	II;IV|VU|EN

Prepared by: (NCC, 2021)

Note: p: permanent (Source: SDF)

Furthermore, the sensitivities of the species of concern, that are not among the qualifying features 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 for their protection and are presented in Table 5-8.

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

Group	Code	Species	Presence	Observed during fieldwork	Annex of Birds Directive / IUCN / Greek Red List
B	A392	*Phalacrocorax aristotelis desmarestii*		X	I|LC|NT
B	A181	*Larus audouinii*		X	I|LC|VU
B	A464	*Puffinus yelkouan*		X	I|VU|NT
B	A850	*Calonectris diomedea s. str.*		X	I|LC|LC

Prepared by: (NCC, 2021)

5.2.2 Pipeline Construction and Pre-commissioning

The Project will cross the Natura 2000 site at its marine part with trenching at the first approximately 600 m from shore at a pre-dredged trench, while, following it, where the depth is greater than 20 m, the pipeline will be laid on the seabed. At the trenching area causeways will be installed on both sides of the pipeline corridor, up to a water depth of approximately 4m. Trenching will take place at a working strip of an approximate width up to 55 m and length of 600 m, as presented in Figure 4-13. In the first 200 m from shore, two causeways will be created and excavation will take place with terrestrial machinery, while for the remaining 400 m shallow and deep water backhoe dredgers or cutter suction dredgers will be used. The working strip will be about 55 m nearshore, decreasing to 25 m and increasing again to 40 m in deeper water.

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

The pipeline will cross the Study Area through trenching with the use of causeways at the area and for a length of about 600 m from land to sea. Causeways will be installed on both sides of the pipeline corridor. Based on the results of Lighthouse (2021) survey, the pipeline routing crosses a rocky area covered with *Posidonia* meadows, which is a priority habitat of the Habitats Directive. According to Boudouresque et al. (2012), the *Posidonia* meadows on rock (the formation present in the area) have very high ecological sensitivity.

Due to trenching and all the necessary working activities, the portion of the *Posidonia* meadows that is present in the area which is expected to be affected directly and be removed is approx. 0.8 ha according to the habitat distribution recorded in the surveys performed. According to the modelling of sediment diffusion at the LF3 site (NTUA, 2022), the suspended sediment concentrations at distances shorter than 20m from the discharge location and for maximum current velocity are lower than the threshold value of 35 mg/L[4]. Thus, the buffer area around the working strip which will be affected by sediment dispersion and deposition on Posidonia meadows is expected to be minimal. As the seabed is not soft the trench is not expected to widen with time after completion of the construction, and the pipeline will be covered again with the rocky material which is not expected to move because of hydrodynamics. According to Charbonnel et al. (1995b), the direct and indirect impacts to *Posidonia* meadows expected by laying a pipe with the use of big trench and filling are expected to be very high, while the potential recolonisation by the meadow is low.

Furthermore, vessels that will operate in the area could damage the *Posidonia* meadows due to anchoring.

The operation of the vessels and other machinery could potentially lead to disposal of garbage, unused material or leakage of oil or other chemicals that could also affect the habitat.

Table 5-9 General Impact Characteristics for Habitats and Flora

Receptor	Nature	Extent	Duration
1120*	Negative. Habitat type loss and deterioration.	Local	Long-term. The impact is long-term, as the recolonisation of an area by *Posidonia* is a very slow progress.

Prepared by: (NCC, 2021)

[4] The guidance value for total suspended solids provided by the MARPOL Resolution MEPC.159(55) (IMO, 2006) is 35 mg/L for its maritime effluent discharge standard, as well as the World Bank / International Finance Corporation (IFC) for marine effluent discharges (World Bank Group, 2015).

The value of the receptor is high as it concerns a priority habitat type of the Habitats Directive. The intensity of the potential effect is low, due to the low percentage of the total coverage of Posidonia meadows affected by construction works., while the frequency is estimated to be medium. As a result the overall impact is assessed as medium.

The reversibility of habitat loss is low, as the recolonization of the areas by *Posidonia oceanica* is very slow, especially in rocky sites, while in some the loss can potentially be irriversible. The residual impact for the Posidonia meadows is medium.

The Conservation Status and the Conservation Objectives of the habitat type (1120*) present in the site is expected to be affected, as its coverage is affected, while deterioration of the surrounding area is also expected.

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

The marine species that were observed in the area utilise the broader Study Area, while no critical habitats are present within the FSA, that is the area that will be directly affected, except for *Caretta caretta*. Two nesting beaches are present within the FSA and the one that is not systematically used is located 50 m from the Landfall site. Concerning other species, no other marine species of interest were observed in the area. The habitats of *Monachus monachus* are not expected to be affected significantly.

According to the National Action Plan for the loggerhead turtle, one of the main objectives is the management of all its breeding habitats to ensure their viability in the future. As a result, all nesting beaches have to be preserved.

The site specific conservation objectives for *Monachus monachus* are the same as the national ones. The species' marine habitat area has to be conserved, as well as its range.

The construction work will not take place at the nesting beaches of *Caretta caretta*, but may affect the hydrodynamics at the area or lead to sediment or other material movement and therefore indirectly affect the beach that is closest to the Landfall site. The impact is mainly potentially expected due to the construction works on rocky substrate at the landfall site and 600 m seawards, especially due to the fact that the beaches are small. Furthermore, the destruction and deterioration of *Posidonia* beds at the vicinity of the nesting beaches may also affect the species.

Table 5-10 General Impact Characteristics for Species Habitats

Receptor	Nature	Extent	Duration
Caretta caretta nesting sites	Negative. Habitat loss or deterioration.	Local	Long-term. The impact is long-term, as the identified nesting beach is very close to the Landfall and is expected to be affected.
Caretta caretta foraging grounds (*Posidonia* beds)	Negative. Habitat loss or deterioration.	Local	Long-term.

Prepared by: (NCC, 2021)

The value of the receptor is high as it concerns a species of Annex II of the Habitats Directive. The intensity of the potential destruction is low as only few individuals choose this particular beach for nesting, while the frequency is estimated to be medium. As a result, the overall impact is medium.

As appropriate mitigation measures can be applied, the reversibility of the impact is medium and the residual impact is low.

The Conservation Objectives concerning the species' habitat quality and coverage are not expected to be affected for *Monachus monachus*, while for *Caretta caretta* the objectives of the National Action Plan are also expected not to be affected, as the beach is not expected to be affected significantly and the individuals using the specific affected beach are few.

Loss of Individuals: **Negligible**

The loss of individuals concerns mainly the destruction of nests (egg loss), loss of young on their way from the nest to the sea (losses on land), or young (mainly) and adults at sea. The presence of vessels during the nesting or fledging period and the work carried out at sea may lead to the injury of individuals. The physical presence and risk of boat strike anchored or slowly moving vessels is not expected to impact adult sea turtles significantly, while fast moving supply vessels impose a greater risk of boat strike (Hazel et al. 2007), the same applies for marine mammals, including cetaceans and *Monachus monachus*.

According to Annex 9H of the ESIA, the distance of Permanent Threshold Shift, which leads to permanent change in the auditory threshold and permanent hearing loss, is estimated to be less than 100 m from the noise source for *Monachus monachus* and sea turtles. Permanent hearing loss can lead to loss of the individuals.

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

Monachus monachus is not expected to be affected in terms of a loss of individuals.

Table 5-11 General Impact Characteristics for Loss of Individuals

Receptor	Nature	Extent	Duration
Caretta caretta	Negative. Loss of individuals.	Local	Short-term. The impact is expected during the construction period.

Prepared by: (NCC, 2021)

The value of the receptor is high as it concerns a species of Annex II of the Habitats Directive. The intensity of the impact is low as only very few individuals, if any, may be affected, while the frequency is estimated to be negligible. As a result the overall impact is negligible.

The Conservation Objectives concerning the species' population are not expected to be affected.

Disturbance: **Negligible**

Disturbance is mainly related to marine mammals and sea turtles. As referred above, the distance for Permanent Threshold Shift for *Tursiops truncatus, Monachus monachus* and sea turtles is estimated to be less than 100 m from the noise source. Furthermore, in terms of behavioural reactions, the predicted noise levels from the pipelaying activities meet the criteria of a distance of 8.5 km at nearshore areas for marine mammals. Sea turtles are expected to have high behavioural reactions within tens of metres of the pipelaying activities, but moderate and low reactions further away from the source. The distance of the pipeline routing from the marine cave suitable for resting of *Monachus monachus* is located, is about 2.5 km, thus a temporal disturbance is expected during the construction period.

As the construction will take place during day and night, disturbance will also include light pollution.Table 5-12 General Impact Characteristics for Disturbance - Fauna

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

Prepared by: (NCC, 2021)

The value of the receptor is high, as it concerns species included in Annex II of the Habitats Directive. The intensity of the impact is low, as it could potentially affect only localised individuals within a population over a short time period and the frequency is also low, as the construction period will last 8 months. Based on the above the impact is estimated to be low. The reversibility is estimated to be medium and the residual impact negligible.

The Conservation Status and the Conservation Objectives concerning the distribution for the mammal species included in the SDF are not expected to be affected.

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

It is expected that the Project will cause no significant changes to the vital defining aspects that determine how the site functions as a habitat or ecosystem. No change to the dynamics of the relationships that define the structure and/or function of the site is expected. The Project does not interfere with predicted or expected natural changes to the site. The Project is not expected to change the balance between key species or reduce the diversity of the site.

5.2.3 Operation and Maintenance

During operation, the physical presence of the pipelines will not have any negative impact on the conservation status of the Natura 2000 site as well as routine inspection/monitoring surveys and, if deemed necessary, localised maintenance intervention works.

Habitat type loss, deterioration, fragmentation: Not applicable.

No loss, deterioration, fragmentation of habitat type is expected during operation. Long-term effects of the installation of the pipeline in terms of habitat loss have been discussed and presented in the assessment of the construction, while no additional effects are expected during the operation of the pipeline.

Species habitat loss, deterioration, fragmentation: Not applicable.

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

Loss of Individuals: Not applicable.

No loss of individuals is expected during operation.

Disturbance: Not applicable.

No disturbance is expected during operation.

Table 5-13 Assessment of Impacts

Phase	Threat	Receptor	Nature	Extent	Duration	Intensity	Value of the receptor	Frequency	Overall importance	Reversibility	Residual impact
Construction	Habitat loss etc.	1120*	Negative	Local	Long term	Low	High	Medium	Medium	Low	Medium
	Habitat loss (Nesting sites)	*C. caretta**	Negative	Local	Long term	Low	High	Medium	Medium	Medium	Low
	Habitat loss (Range, Marine habitat)	*M. monachus**	Negative	Local	Short term	Low	High	Low	Low	Medium	Negligible
	Loss of individuals	*C. caretta**	Negative	Local	Short term	Low	High	Low	Low	Medium	Negligible
	Loss of individuals (breeding popul.)	*M. monachus**	Negative	Local	Short term	Low	High	Low	Low	Medium	Negligible
	Disturbance	*M. monachus**	Negative	Local	Short term	Low	High	Low	Low	Medium	Negligible

Phase	Threat	Receptor	Nature	Extent	Duration	Intensity	Value of the receptor	Frequency	Overall importance	Reversibility	Residual impact
Operation	Habitat loss	Habitat	Negative	*No impact expected*							
		Fauna	Negative	*No impact expected*							
	Loss of individuals	Fauna	Negative	*No impact expected*							
	Disturbance	Fauna	Negative	*No impact expected*							

Prepared by: (NCC, 2021)

5.2.4 Sensitivities of Other Species

The seabirds that are present in the area are not expected to be affected as the area is not a critical habitat for them and is not regularly used by them. The loss of 0.8 ha of *Posidonia* beds (0.02% of the total surface of the habitat in the Study Area) will lead to a small, and not significant, reduction of *Phalacrocorax aristotelis desmarestii* feeding habitat, while avoidance of the construction area is expected by the species.

5.2.5 Cumulative Impacts

It is well established that pipelines, power lines and roads can form a linear intrusion in natural areas leading to habitat loss, fragmentation, and to the creation of barriers to movement of terrestrial species. As mentioned in previous sections, the terrestrial part of site does not has significant existing and planned projects and infrastructure besides the existing road network (EO 86) in close proximity to the pipeline.

There is also one operating wind park and 7 planned wind park projects, currently in the permitting phase, though all are located at a considerable distance (>4.5 km) from the FSA and the pipeline axis. However, given that the pipeline Project route does not cross the terrestrial part of the Natura 2000 site, no cumulative effects into the site are expected from the interaction of the mentioned linear and wind park projects and the pipeline construction.

Regarding the marine part of the SAC, no other existing or planned projects and infrastructures have been identified during the present study.

The routing of the EastMed pipeline crosses the site for less than two kilometres only in a marine area where currently no other project is known. Planned and existing wind parks are located in the terrestrial part of the site at a large distance from the pipelines' routing. The fact that the Project crosses the marine area which is at a distance from other major linear projects within the site leads to a decrease of the cumulative impacts. In summary no cumulative impacts are expected for the site.

5.2.6 Alternative Scenarios

Detailed description of alternative scenarios is given in Chapter 7 of the ESIA.

Scenario 1: Current routing.

Construction works for the current routing are estimated to have medium impact on the qualifying features of the SAC, by respecting the construction time-constraints and by taking appropriate pre-construction mitigation measures.

Scenario 2: Do-nothing Scenario.

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

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

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

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

Given the above and considering the implementation of the aforementioned management and mitigation measures preventing and/or reducing potential impacts, it is concluded that the implementation and operation of the Project will result in medium impact on the priority habitat type of *Posidonia* beds (1120*) and on the ecological functions it performs. It is not considered to affect the ecological integrity of the Study Area and its role in the coherence of the Natura 2000 network.

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, minimise and neutralise any negative impacts of the Project and they are an integral part of its implementation specifications.

In this context the most vulnerable points and sections of the pipeline routing were highlighted and the areas or specific locations where measures should be implemented to prevent/minimise impacts are presented in the following Table.

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

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

Mitigation Commitments to Address the Impact / Risk(*)	Efficiency				KP	Significance of Residual Impact / Risk
	Prevention/ avoidance	Reduction of intensity	Reduction of extent	Restoration		
Construction Phase						
For dredging and shore-crossing activities, implement time-constraints and undertake construction works outside the high season of the nesting and hatching period. Details shall be defined within the Biodiversity Action Plan.	X				426-429	Medium
Mooring should be avoided to the extent possible over *Posidonia oceanica*. If this is not feasible, seagrass-friendly moorings should be installed on meadow clearings, depending on the substrate. Indicatively, sand screws on sandy patches, Dead weight moorings on large sandy patches, or grouted anchors on rocky patches. In meadows without clearings but with a well-developed matte, a special ecological anchor device can be used (e.g. Harmony P anchors). For that reason, moorings installation must be preceded by a detailed preliminary study.	X					
Habitat types loss / Species habitat loss, degradation or fragmentation						

Mitigation Commitments to Address the Impact / Risk(*)	Efficiency				KP	Significance of Residual Impact / Risk
	Prevention/ avoidance	Reduction of intensity	Reduction of extent	Restoration		
No construction materials will be taken from the surrounding environment unless approved by the competent authority	X				426-429	Medium
Disposal of materials at local sand beaches would be avoided.	X					
Technical solutions to minimise sediment plumes, such as placement of protective geotextile screens around construction sites close to shore.		X	X			
All project vessels shall operate under international standards (MARPOL)	X	X	X			
Dredging material should be used as much as possible for backfilling purposes.				X		
Loss of individuals						
Develop a Marine Traffic Management Plan, including maximum speed per marine area, notification procedures, anchoring and berthing areas, guidelines for employees, etc.	X	X	X		426-429	Negligible
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 applicable legislation.	X					
Collection of injured marine wildlife individuals and transfer to wildlife rehabilitation centres (if possible). At all events get into contact with the nearest Port Police authority to report the incident		X				
Disturbance						
Usage of directional lighting.	X		X		426-429	Negligible
All impacts						
Training on ecological aspects/behaviours will be made available for all workers.	X	X	X		426-429	Medium

Mitigation Commitments to Address the Impact / Risk(*)	Efficiency				KP	Significance of Residual Impact / Risk
	Prevention/ avoidance	Reduction of intensity	Reduction of extent	Restoration		
Implementation of Spill Prevention and Response Plan.	X					
On the ship(s) for the offshore pipeline laying, there will be a Marine Mammals Observer(s) (MMOs), using Passive Acoustic Monitoring (PAM) system and visual observations, so as to inform immediately the ship(s) commander(s) for risks of mammals collisions.	X					
On the ship(s) for the shore crossing construction works, there will be a Marine Visual Observer so as to inform immediately the ship(s) commander(s) for risks of marine reptile collisions.	X					
Works can be performed during times of good visibility (e.g., daylight, clear weather conditions) when marine wildlife individuals presence can be sufficiently monitored. Otherwise, monitoring could be performed through other means (e.g. sonars).	X					
Before beginning any noise producing action there should be a dedicated watch to ensure no animals are within a 200 m zone close to the vessels.	X					
Temporary pause of all activities, except for safety related ones, if a marine mammal is detected within a 100 m zone from the construction activities vessels.	X					
Temporary pause of activities if a marine reptile is detected within a 50 m zone from the construction activities vessels.	X					
Construction works 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	X					

Mitigation Commitments to Address the Impact / Risk(*)	Efficiency				KP	Significance of Residual Impact / Risk
	Prevention/ avoidance	Reduction of intensity	Reduction of extent	Restoration		
contractor environmental team when/if required. The Management Body of the Protected Area shall be involved.						
A Biodiversity Action Plan (BAP) will be implemented for the Natura 2000 sites the pipeline crosses for the construction phase.				X		
Excavated material should be used as much as possible for backfilling purposes.				X		
Operation Phase						
A Biodiversity Action Plan (BAP) will be implemented for the Natura 2000 sites the pipeline crosses for the operation phase.				X	426-429	

Prepared by: (NCC, 2021)

Information concerning monitoring of the efficiency of the mitigation measures is provided in section 8 of this Annex.

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. As presented in Chapter 5, impacts on the Natura2000 site integrity are assessed as Medium.

A key mitigation identified in the AA corresponds to the development of a Biodiversity Action Plan (BAP), applicable to both construction and operation phases.

However, if the monitoring of the measures set in the a Biodiversity Action Plan (BAP) shows unsatisfactory results, additional measures shall be decided in consultation with all competent stakeholders.

8 MONITORING PROGRAM

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

8.1 General Monitoring Criteria

During construction

During construction phase, a "pre-construction" team composed of specialised field experts-scientists will monitor/survey the construction corridor. The main goal for the team is to survey potential presence of important species, features and parameters that may need specific handling. This will ensure that any site-specific issues will be highlighted before construction and appropriate measures will be taken before construction activities begin.

Post construction

After construction has been finalised, a monitoring program during the operation of the Project must be conducted. 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 operation. 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 the status of elements of the natural environment in the recovery phase.

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 must 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.

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 on 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 fine tuning of mitigation measures etc. and (b) the presence of the species and the use of the area after construction in order to estimate the long-term impacts of the Project on the Natura 2000 site. Furthermore, concerning the *Posidonia* meadows (1120*), the actual extent of the area affected by removal and secondary impacts area should be monitored as well as the recovery of the habitat, and the efficiency of the mitigation measures during the post-construction period.

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 on which monitoring should focus on, during construction and in post-construction surveys

The species to be monitored are the species included in the SDF of the Habitats Directive that may be affected by the construction and operation of the project, as presented in the present AA, namely *Monachus monachus, Caretta caretta* and Posidonia meadows (1120*).

Monitoring during construction and post-construction period

During construction, monitor of presence of sensitive fauna in deep waters (marine mammals, reptiles) and monitor of presence of sensitive fauna in shallow waters (marine mammals, birds, reptiles) will take place. One monitoring campaign will take place before starting the construction activities at *Caretta caretta* nesting beaches, as well as for Posidonia oceanica.

During post-construction, one monitoring campaign per year after completion of construction will take place, for three sequential years, at *Caretta caretta* nesting beaches. For Posidonia oceanica, one monitoring campaign per year will take place after completion of construction, for three sequential years and one monitoring campaign after five years of construction completion.

For the monitoring of the natural environment, mapping of biocoenosis in the dredging area and adjacent areas, video and photographic survey along the dredging area, sampling of soft/hard seabeds and calculation of the PREI index on Posidonia and determination of species presence, abundance, dimensions, sex and sexual maturity will take place. More specifically, it will take place once after construction, and after 1 and 3 years since the end of construction phase. From then on, during patrolling of the offshore section (with the use of ROV, indicatively every 5 years)

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

In the case of sea turtles, beach surveys should be carried out in order to verify that known nesting beaches and those potentially used, remain used and unaffected, based on signs and tracks on beaches. Furthermore, the presence of the species during construction should be monitored in order to avoid interactions/collisions.

In the case of *Posidonia oceanica* meadows, monitoring by setting up markers just after the pipe has been laid to monitor them using techniques of the *Posidonia* Monitoring Network (Boudouresque et al., 2012). Specific monitoring sites along the pipeline are defined, as well as reference sites and intermediate ones. The tools to be used include: aerial photographs at the upper limit (validated by fieldwork), monitoring markers at both the lower limit and the upper limit of the meadow, measuring meadow cover and shoot density, measuring rhizome baring, assessing the proportion of plagiotropic rhizomes, measuring lepidochronology and leaf biometry characteristics of shoots. This will allow an estimate of (a) the state of the *Posidonia* meadows, (b) the impact of the Project on them and (c) its long-term changes in order to evaluate possible need for further mitigation.

9 CONCLUSIONS

This Appropriate Assessment concerns the offshore section of the EastMed pipeline, which crosses the Special Area of Conservation (SAC) "Ori Gidovouni, Chionovouni, Gaidourovouni, Korakia, Kalogerovouni, Koulochera Kai Periochi Monemvasias Spilaio Solomou Trypa Kai Pyrgos Ag. Stefanou Kai Thalassia Zoni Eos Akrotirio Kamili", GR254001. It has been prepared as a necessary and integral part of the Environmental and Social Impact Assessment of the EastMed Pipeline 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 20 days were carried out in 2021.

The present AA provided a detailed ecological description of the Study Area with special emphasis on the Field Survey Area (a strip of 500 m either side of the proposed pipeline routing). In particular, the AA assessed the potential impacts of the Project on the populations and distribution of protected species and the ecological functions of the site and 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 over Posidonia beds, a marine cave suitable for *Monachus monachus* was identified in 2.5 km from landfall, while the landfall is located next to a nesting site of *Caretta caretta*, used by a small number of animals. As a result, the expected residual impact to habitat types and species of the Study Area are estimated as medium and are mainly related to the loss of 0.8ha of Posidonia meadows.

The present AA proposes key measures for mitigation of the impacts on the local biodiversity, in order to minimize project impacts to the site, namely (a) minimizing trenching in Posidonia meadows and (b) keep constructing period outside the main breeding and hatching period of *Caretta caretta*, following the provisions of the EU Habitat Directive and of the national legislation. By applying those and other mitigation measures proposed in the relevant chapter of the AA, the impact of the project on the ecological integrity of the SAC site is assessed to be medium.

Concerning cumulative impacts, the main linear infrastructure on the adjacent land are at a distance from the routing and are not expected to act cumulatively.

The AA also provides guidelines on the monitoring program to be carried out during construction alongside the execution of construction works, and during the pipeline operation.

Provided that the described above precautions are taken into consideration, it is well beyond doubt that the impacts of the crossing of the project on the ecological integrity of the Special Area of

Conservation (SAC) “Ori Gidovouni, Chionovouni, Gaidourovouni, Korakia, Kalogerovouni, Koulochera Kai Periochi Monemvasias Spilaio Solomou Trypa Kai Pyrgos Ag. Stefanou Kai Thalassia Zoni Eos Akrotirio Kamili",GR254001, of the Natura 2000 network, will be medium.

10 STUDY TEAM

Name		Role
Tasos Dimalexis	Dr. Biologist	Project Coordinator Site assessment Marine field survey
Margarita Tzali	Environmental Engineer, MSc	Project Manager AA compilation
Alexandra Kontou	Environmentalist, MSc	AA compilation
Vassilis Goritsas	Environmentalist, MSc	Data management/Map production
Jakob Fric	Physicist	Development of databases / Data management Seabird expert Marine field survey, Preparation of texts
Kimonas Koemtzopoulos	Biologist MSc	Marine mammal expert Marine field survey
Olga Mavridi	Biologist	Field worker: Marine field survey

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ANNEX 1 SDF Data

Table 1 Habitat types present on the site and assessment for them

Code	Population		Assessment			
	Cover (ha)	Data quality	Repres.	Rel.surf.	Cons.	Global
1240	2.896	G	A	C	A	B
1410	0.605	G	B	C	B	B
1420	6.588	G	A	C	B	B
2110	2.151	G	B	C	B	B
2260	1.424	G	D	-		
5330	33.161	G	A	C	A	B
8210	29.249	G	A	C	A	B
92C0	33.477	G	B	C	B	B
92D0	9.804	G	A	C	A	B
9320	7186.685	G	B	A	B	B
9340	2447.924	G	B	B	B	B
9350	3.634	G	B	C	B	B
9540	8.774	G	B	C	B	B
1110	3817	M	A	C	A	B
1120	2863	M	A	C	A	B
1170	1909	M	A	C	A	B

Prepared by: (NCC, 2021)

Definition:

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

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

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

Degree of conservation of the structure and functions of the natural habitat type concerned and restoration possibilities (Conservation Status): This criterion comprises three sub-criteria: i) degree of conservation of the structure, ii) degree of conservation of the functions, iii) restoration possibility

/ A = 'excellent conservation' (= excellent structure, independent of the grading of the other two sub-criteria, = structure well conserved and excellent prospects independent of the grading of the third criterion), B = 'good conservation' (= structure well conserved and good prospects independent of the grading of the third sub-criterion, = structure well conserved and average/maybe unfavourable prospects and restoration easy or possible with average effort, = average structure/partially degraded, excellent prospects and restoration easy or possible with average effort, = average structure/partially degraded, good prospects and restoration easy), C = 'average or reduced conservation' (= all other combinations)

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

Table 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
I	6199	*Euplagia quadripunctaria*	p				C	DD	B	A	C	B
M	1310	*Miniopterus schreibersii*		400	500	i		M	C	B	C	C
M	1366	*Monachus monachus*	p			i	P	N	C	C	C	C
M	1307	*Myotis blythii*		700	1000	i		M	B	B	C	C
M	1321	*Myotis emarginatus*		600	1000	i		M	B	B	C	C
M	1305	*Rhinolophus euryale*		400	500	i		M	B	B	C	C
M	1304	*Rhinolophus ferrumequinum*		150	200	i		M	C	B	C	C
M	1303	*Rhinolophus hipposideros*		30	100	i		M	C	B	C	C
R	2373	*Mauremys rivulata*	p				R	DD	C	B	C	C
R	1217	*Testudo hermanni*	p				R	DD	C	B	C	C

Group	Code	Species Name	Population						Assessment			
			Type	Min	Max	Unit	Abund.	Data Quality	Pop.	Cons.	Isol.	Global
R	1218	*Testudo marginata*	p				R	DD	C	B	C	C

Prepared by: (NCC, 2021)

Definitions:

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

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

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

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

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

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

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

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

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

Other species

There are also 48 other species of importance for the area included in the SDF, 4 of which are amphibians, 4 insects, 1 fish, 5 mammals, 22 plants and 12 reptiles, of which 24 are included in the National Red Data Lists, 23 in International Conventions, while 18 are listed in Annex IV of the Habitats Directive and 1 in Annex V and 3 are listed for other reasons. 21 species are endemic. For further detail please refer to the SDF.

ANNEX 2 Threat Status

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

Group	Code	Species Name	IUCN (2020)	Greek Red Data Book (2008)	Endemic - Greek Red Data Book (2008)	Habitats Directive Annex II	Habitats Directive Annex IV	Bern Convention	Bonn Convention	CITES	Observed during field work
I	6199	*Euplagia quadripunctaria*				Y					
R	2373	*Mauremys rivulata*		LC		Y-CTC	Y-CTC	III			
M	1310	*Miniopterus schreibersii*	NT	NT		Y	Y	II	II		
M	1366	*Monachus monachus*	EN	CR		Y	Y	II	I; II	I	
M	1307	*Myotis blythii*	LC	LC		Y	Y	II	II		
M	1321	*Myotis emarginatus*	LC	NT		Y	Y	II	II		
M	1305	*Rhinolophus euryale*	NT	NT		Y	Y	II	II		
M	1304	*Rhinolophus ferrumequinum*	LC	LC		Y	Y	II	II		
M	1303	*Rhinolophus hipposideros*	LC	LC		Y	Y	II	II		
R	1217	*Testudo hermanni*	NT	VU		Y	Y	II		II	
R	1218	*Testudo marginata*	LC	LC		Y	Y	II		II	

Prepared by: (NCC, 2021)

Definitions:

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

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

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

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

Habitats Directive (92/43/EC). Annex II: core areas of their habitat must be protected under the Natura 2000 Network and the sites managed in accordance with the ecological requirements of the species, Annex IV: strict protection regime must be applied across their entire natural range within the EU, both within and outside Natura2000 sites.

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

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

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

ANNEX 3 Specific Conservation Objectives

Site Specific Conservation Objectives (2018)

1240, 2260, 5330, 8210, 9320, 9340, 9350, 9540, 92C0, 92D0:

The General Conservation Objectives apply to these habitat types.

1410, 1420, 2110:

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

Callimorpha quadripunctaria:

Achieving the Favourable Reference Value (FRV) of the population i.e., the species presence in at least 9 cells 10x10km. No significant (10%) distribution reduction below the distribution FRV value and long-term goal is to achieve distribution FRV. The distribution FRV is estimated at 241.98 km^2. Full conservation of the extent and functionality of the species habitat.

Testudo hermanni:

The average population density in areas with suitable habitat greater than or equal to 4 ind./ha. Conservation of a suitable habitat at a percentage of > 50% in 10 cells of 1x1km grid in the Natura 2000 site. Recording of the species presence in 28 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.

Testudo marginata:

The average population density in areas with suitable habitat greater than or equal to 5 ind./ha. Conservation of a suitable habitat at a percentage of> 50% in 38 cells of 1x1km grid in the Natura 2000 site. Recording the species presence in 38 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.

Mauremys rivulata:

Recording the species presence in this Natura 2000 site. On the habitat quality, see general conservation objectives for the Natura 2000 site in relation to the species' habitat conservation degree. Species preference of permanent freshwater ecosystems.

Barbastella barbastellus:

The General Conservation Objectives apply to this species.

Monachus monachus:

Avoidance of the species' habitat degradation, with special emphasis on the reproduction of areas and the suitability of breeding and rest sites. Reduction of the fishing pressure and adverse seal-fishery interactions and ensuring sustainable fish stocks that constitute the species food. Conservation of the existing distribution with a view to achieve at least at the level of the FRV: 361,801 km^2 at national level. Long term conservation of the existing population with a view to achieve at least the FVR value at national level: 500 individuals at national level. Conservation of the species population health. Assurance of habitat connectivity and avoidance of potential anthropogenic barriers. Conservation of the genetic diversity of the population. Anthropogenic activities to such an extent that they do not adversely affect the species population.

ANNEX 4 Ecological Requirements

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

Code	Species Name	Habitat		Threats	Presence Status in Greece	Significant Presence Status in the Study Area[1]
		Reproduction	Foraging			
Annex II (92/43/EEC) species of the Study Area - Reported in chapter 3.2 of the site's SDF						
1366	*Monachus monachus*					
Other important Annex II and IV species of the Study Area not included in the site's SDF						
1224	*Caretta caretta*	sandy shores	coastal and open sea	Degradation of nesting beaches and the nearby sea area, due to the development of coastal areas, light pollution, nuisance and intensive tourist use of the beaches, entanglement in fishing gear, intentional killing, ingestion of plastic waste, climate change	Greek seas, nesting colonies in the Ionian (Zakynthos, Kyparissia gulf etc.)	

Prepared by: (NCC, 2021)

ANNEX 5 Photographic Documentation

Study Area

Note: The photographs provide an overview of the Natura 2000 site and come from the photographical archive of NCC Ltd. and from Lighthouse (2021)

Photographs	
	
	
	

Photographs	
	
	
	

Photographs	
	
	

Prepared by: (NCC, 2021)

Field Survey Area

Photograph	Filename / Date
	DJI_0466.JPG

Photograph	Filename / Date
	20210603_125929.jpg
	20210603_125743.jpg
	20210603_125609.jpg

Photograph	Filename / Date
	20210921_071607.jpg

Prepared by: (NCC, 2021)

ANNEX 6 Maps

REFERENCE DOCUMENTS / DRAWINGS
ΣΧΕΤΙΚΑ ΕΓΓΡΑΦΑ / ΣΧΕΔΙΑ

DOCUMENT / ΑΡ. ΕΓΓΡΑΦΟΥ	

LEGEND/ ΥΠΟΜΝΗΜΑ

Project Components / Στοιχεία του Έργου

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

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

Contract No: / Αρ. Συμβολαίου: project code

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

COMPANY / ΕΤΑΙΡΕΙΑ: IGI Poseidon

ENGINEER/CONSULTANT ΜΗΧΑΝΙΚΟΣ/ ΜΕΛΕΤΗΤΗΣ: Asprofos engineering, ERM

PROJECT TITLE - ΤΙΤΛΟΣ ΕΡΓΟΥ

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

DOCUMENT TITLE - ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ

APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE "SAC - GR2540001" /
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 "ΕΖΔ - GR2540001"

Map n°:	*STUDY AREA: NATURA 2000 SITES CROSSED BY ONSHORE EASTMED PIPELINE / ΠΕΡΙΟΧΗ ΜΕΛΕΤΗΣ: ΠΕΡΙΟΧΕΣ NATURA 2000 ΠΟΥ ΤΕΜΝΕΙ Ο ΑΓΩΓΟΣ EASTMED*	
M1-F2 S02		
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

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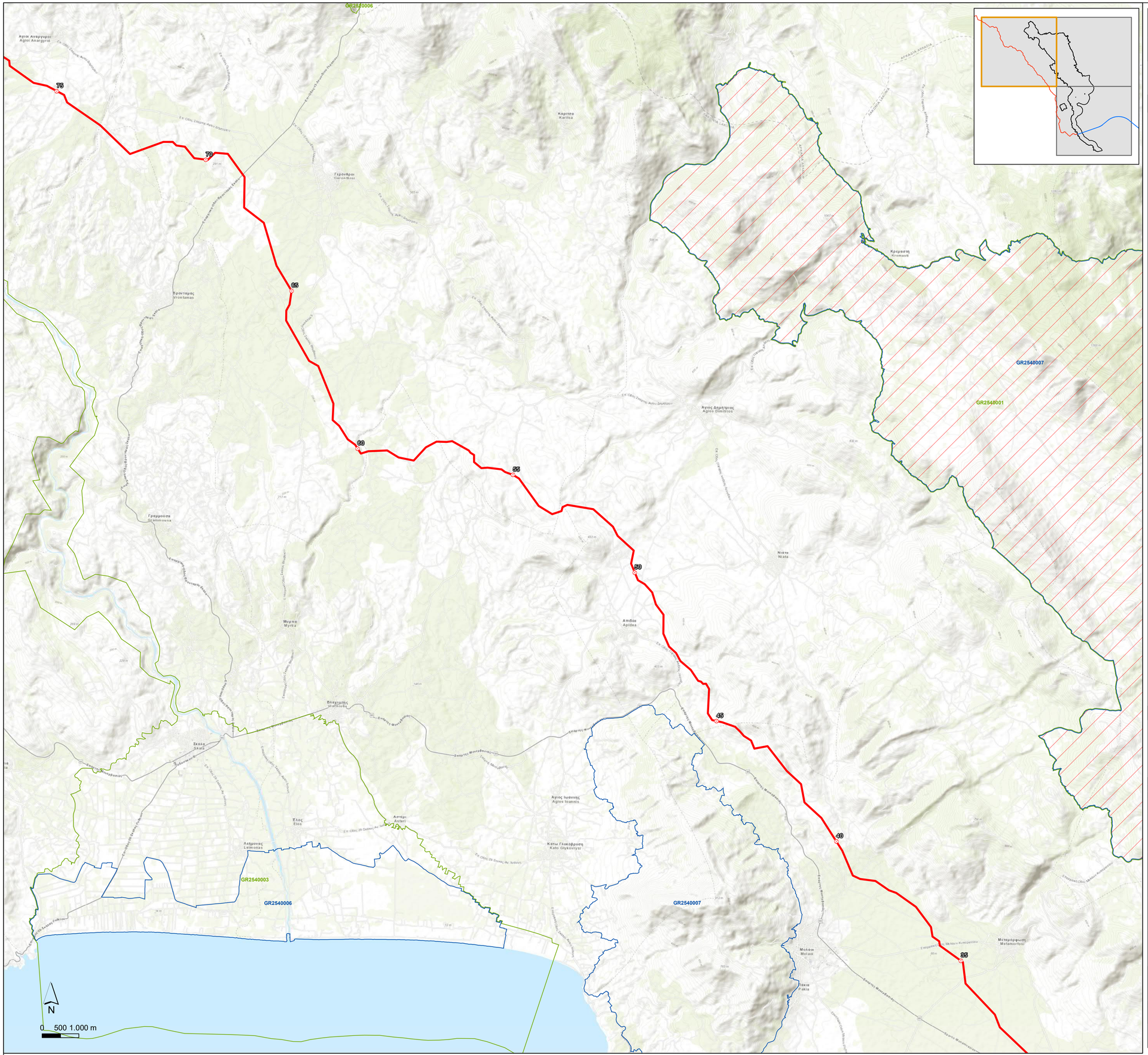

REFERENCE DOCUMENTS / DRAWINGS
ΣΧΕΤΙΚΑ ΕΓΓΡΑΦΑ / ΣΧΕΔΙΑ

DOCUMENT / ΑΡ. ΕΓΓΡΑΦΟΥ	DOCUMENT TITLE / ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ
M2-F02 S02A01	APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE "SAC GR2540001" FOR THE OFFSHORE SECTION OF EASTMED PIPELINE PROJECT ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 "SAC GR2540001" ΓΙΑ ΤΟ ΘΑΛΑΣΣΙΟ ΤΜΗΜΑ ΤΟΥ ΔΙΑΣΥΝΔΕΤΗΡΙΟΥ ΑΓΩΓΟΥ ΦΥΣΙΚΟΥ ΑΕΡΙΟΥ EASTMED

LEGEND/ ΥΠΟΜΝΗΜΑ

Project Components / Στοιχεία του Έργου

- Offshore Routing Chainage (1 km) / Χιλιομέτρηση Όδευσης θαλάσσιου τμήματος (1 χλμ.)
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- Field Survey Area / Περιοχή Έρευνας Πεδίου

Natura 2000 Network / Δίκτυο Natura 2000

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

NOTES/ ΣΗΜΕΙΩΣΕΙΣ

Rev. Αναθ.	Date Ημερομ.	Description Περιγραφή	Drawn Σχεδίαση	Checked Έλεγχος	Approved Έγκριση
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Contract No:
Αρ. Συμβολαίου:

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

COMPANY / ΕΤΑΙΡΕΙΑ: IGI Poseidon

ENGINEER/ CONSULTANT: Asprofos engineering, ERM

PROJECT TITLE - ΤΙΤΛΟΣ ΕΡΓΟΥ

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

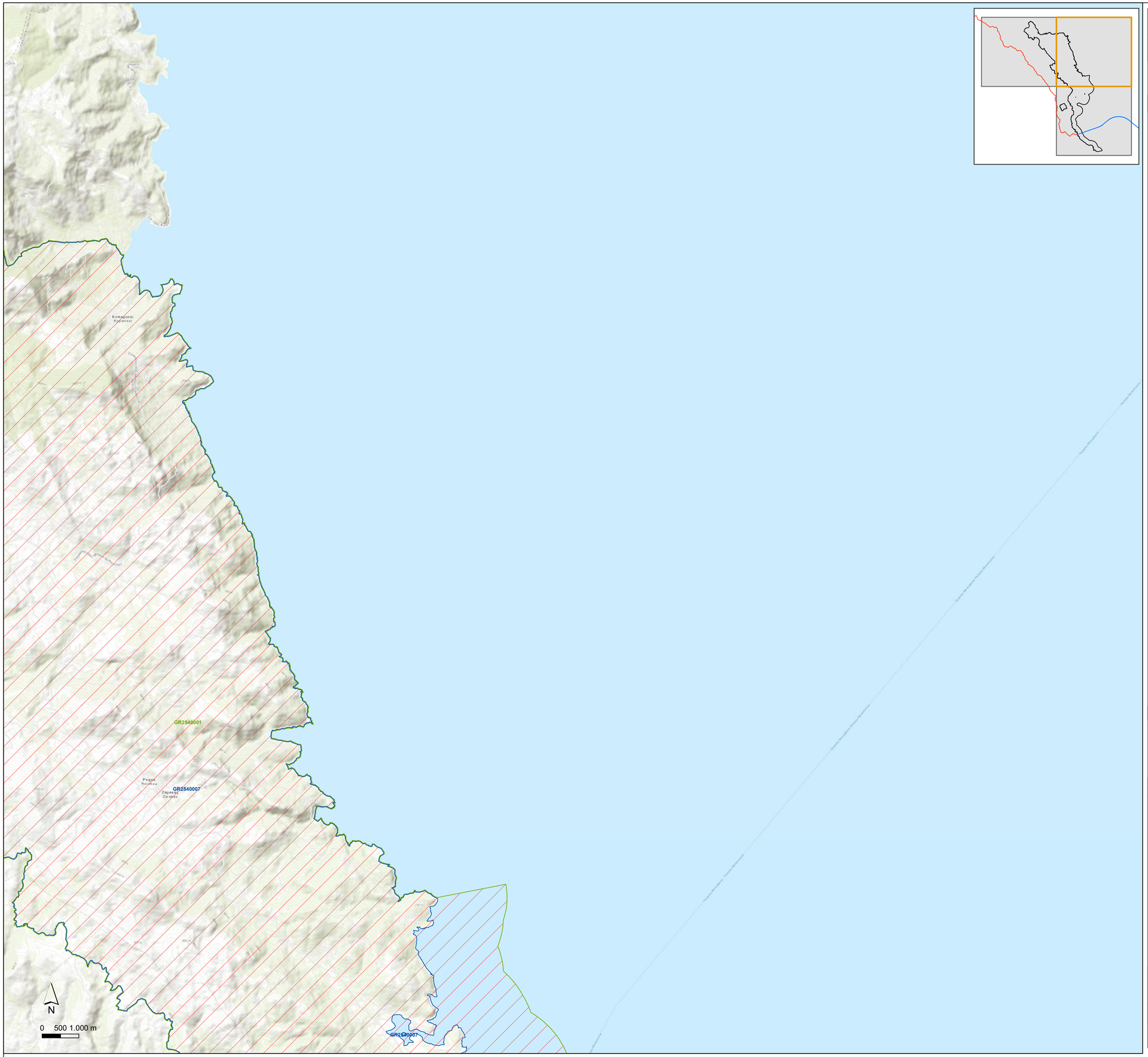
DOCUMENT TITLE - ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ

APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE "SAC - GR2540001" /
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 "ΕΖΔ - GR2540001"

Map n°:	
M2-F02 S02A01	*STUDY AREA / ΠΕΡΙΟΧΗ ΜΕΛΕΤΗΣ*

Scale/Κλίμακα	Project DWG No./ Αρ. Σχ. Έργου:		Rev/Αναθ
1:50.000			0A
Size/Μέγεθος A1	Company's DWG No/Αρ. Σχ. Εταιρείας -	Engineer's DWG No/Αρ. Σχ. Μελετητή: AUT-11727500-STU-XXX/ Section 11.1.1	Sheet/Φύλλο 1 of 3

Document Name: Map2_STUDY_AREA_ver3.1_2022.01.09_A1_offshore



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DOCUMENT / ΑΡ. ΕΓΓΡΑΦΟΥ	DOCUMENT TITLE / ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ
M2-F03 S02A02	APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE "SAC GR2540001" FOR THE OFFSHORE SECTION OF EASTMED PIPELINE PROJECT ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 "SAC GR2540001" ΓΙΑ ΤΟ ΘΑΛΑΣΣΙΟ ΤΜΗΜΑ ΤΟΥ ΔΙΑΣΥΝΔΕΤΗΡΙΟΥ ΑΓΩΓΟΥ ΦΥΣΙΚΟΥ ΑΕΡΙΟΥ EASTMED

LEGEND/ ΥΠΟΜΝΗΜΑ

Project Components / Στοιχεία του Έργου

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NOTES/ ΣΗΜΕΙΩΣΕΙΣ

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

Contract No:
Αρ. Συμβολαίου:

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

COMPANY / ΕΤΑΙΡΕΙΑ: IGI Poseidon

ENGINEER/ CONSULTANT: Asprofos engineering, ERM

PROJECT TITLE - ΤΙΤΛΟΣ ΕΡΓΟΥ

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

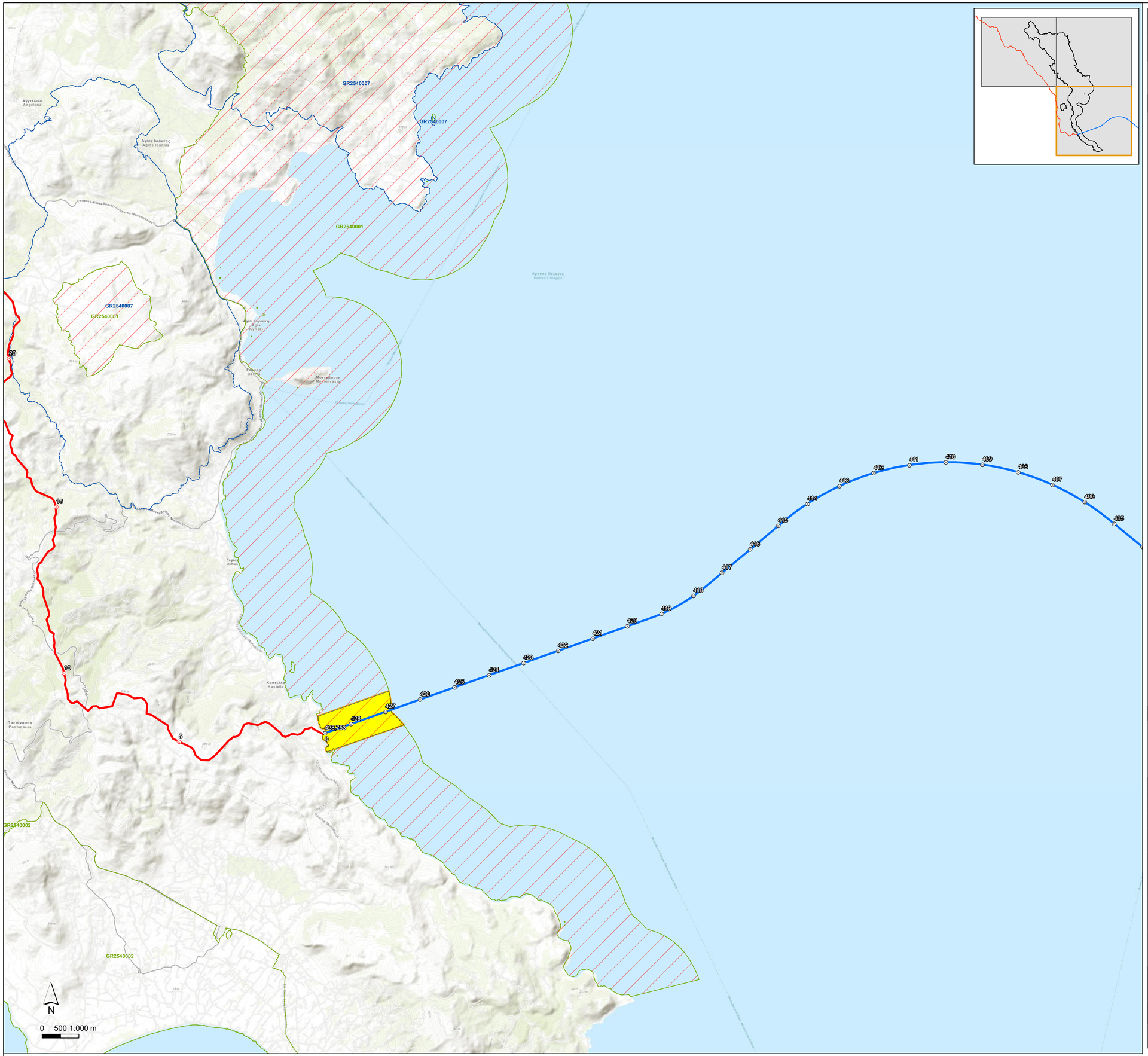
DOCUMENT TITLE - ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ

APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE "SAC - GR2540001" /
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 "ΕΖΔ - GR2540001"

Map n°:	
M2-F03 S02A02	*STUDY AREA / ΠΕΡΙΟΧΗ ΜΕΛΕΤΗΣ*

Scale/Κλίμακα	Project DWG No./ Αρ. Σχ. Έργου:		Rev/Αναθ
1:50.000			0A
Size/Μέγεθος A1	Company's DWG No/Αρ. Σχ. Εταιρείας -	Engineer's DWG No/Αρ. Σχ. Μελετητή: AUT-11727500-STU-XXX/ Section 11.1.1	Sheet/Φύλλο 2 of 3

Document Name: Map2_STUDY_AREA_ver3.1_2022.01.09_A1_offshore



REFERENCE DOCUMENTS / DRAWINGS
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M2-F04 S02B02	APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE "SAC GR2540001" FOR THE OFFSHORE SECTION OF EASTMED PIPELINE PROJECT ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 "SAC GR2540001" ΓΙΑ ΤΟ ΘΑΛΑΣΣΙΟ ΤΜΗΜΑ ΤΟΥ ΔΙΑΣΥΝΔΕΤΗΡΙΟΥ ΑΓΩΓΟΥ ΦΥΣΙΚΟΥ ΑΕΡΙΟΥ EASTMED

LEGEND/ ΥΠΟΜΝΗΜΑ

Project Components / Στοιχεία του Έργου

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NOTES/ ΣΗΜΕΙΩΣΕΙΣ

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

Contract No:
Αρ. Συμβολαίου:

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

COMPANY / ΕΤΑΙΡΕΙΑ: IGI Poseidon

ENGINEER/ CONSULTANT: Asprofos engineering, ERM

PROJECT TITLE - ΤΙΤΛΟΣ ΕΡΓΟΥ

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

DOCUMENT TITLE - ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ

APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE "SAC - GR2540001" /
ΕΙΔΙΚΗ ΟΙΚΟΛΟΠΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 "ΕΖΔ - GR2540001"

Map n°:		
M2-F04 S02B02	*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
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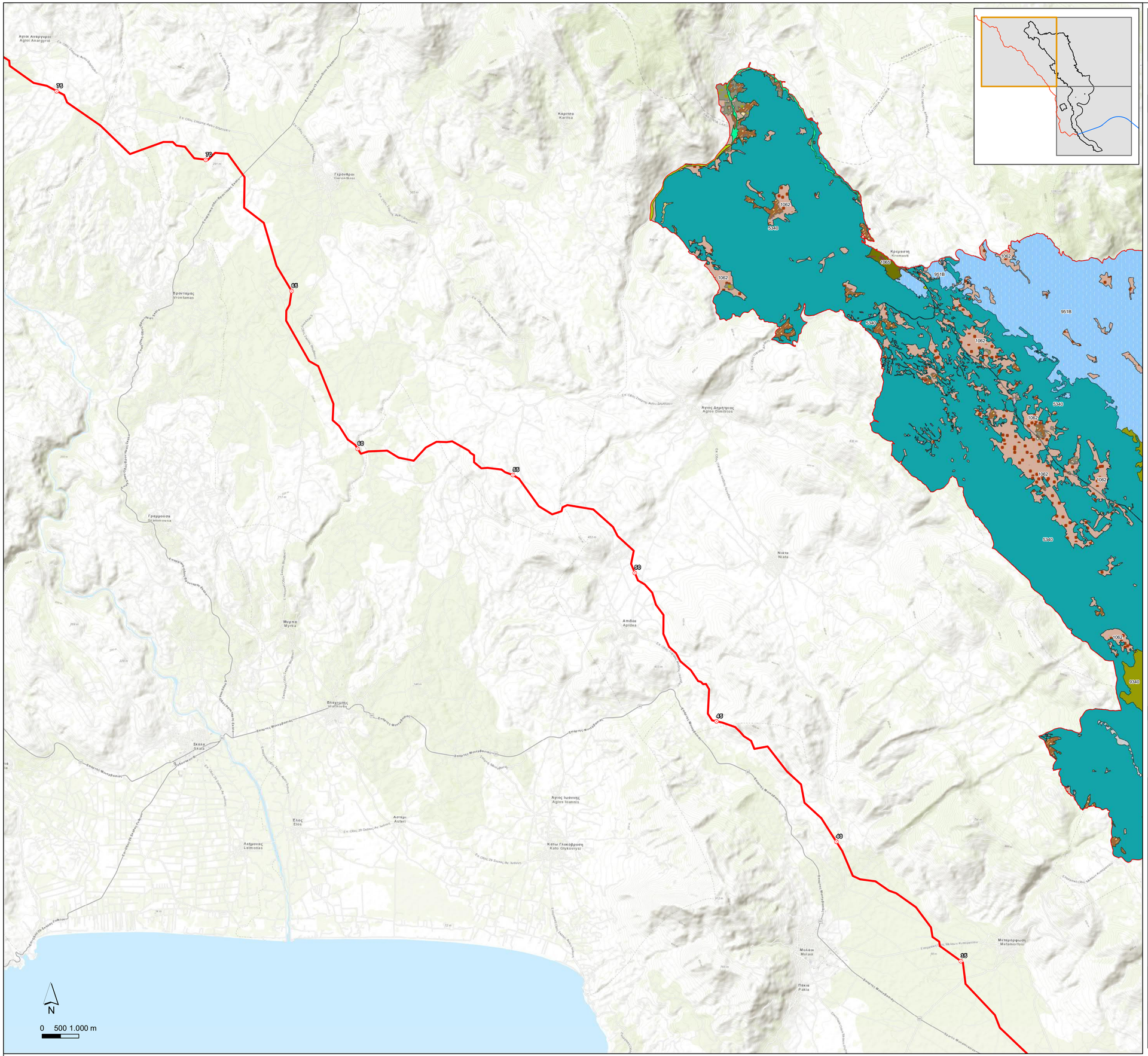

REFERENCE DOCUMENTS / DRAWINGS
ΣΧΕΤΙΚΑ ΕΓΓΡΑΦΑ / ΣΧΕΔΙΑ

DOCUMENT / ΑΡ. ΕΓΓΡΑΦΟΥ	DOCUMENT TITLE / ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ
M3-F02 S02A01	APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE "SAC GR2540001" FOR THE OFFSHORE SECTION OF EASTMED PIPELINE PROJECT ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 "SAC GR2540001" ΓΙΑ ΤΟ ΘΑΛΑΣΣΙΟ ΤΜΗΜΑ ΤΟΥ ΔΙΑΣΥΝΔΕΤΗΡΙΟΥ ΑΓΩΓΟΥ ΦΥΣΙΚΟΥ ΑΕΡΙΟΥ EASTMED

LEGEND/ ΥΠΟΜΝΗΜΑ

Project Components / Στοιχεία του Έργου

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

- 1240 Vegetated sea cliffs of the Mediterranean coasts with endemic Limonium spp. / Απόκρημνες βραχώδεις ακτές με βλάστηση στη Μεσόγειο με ενδημικά Limonium spp.
- 1410 Mediterranean salt meadows (Juncetalia maritimi) / Μεσογειακά αλίπεδα (Juncetalia maritimi)
- 1420 Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi) / Μεσογειακές και θερμοατλαντικές αλόφιλες λόχμες (Sarcocornietea fruticosi)
- 2110 Embryonic shifting dunes / Υποτυπώδεις κινούμενες θίνες
- 2260 Cisto-Lavenduletalia dune sclerophyllous scrubs / Θίνες με βλάστηση σκληρόφυλλων θάμνων (Cisto-Lavanduletalia)
- 5330 Thermo-Mediterranean and pre-desert scrub / Θερμο-μεσογειακές και προερημικές λόχμες
- 8210 Calcareous rocky slopes with chasmophytic vegetation / Ασβεστολιθικά βραχώδη πρανή με χασμόφυτα
- 92C0 Platanus orientalis and Liquidambar orientalis woods (Plantanion orientalis) / Δάση Platanus orientalis και Liquidambar orientalis (Platanion orientalis)
- 92D0 Southern riparian galleries and thickets (Nerio-Tamaricetea and Securinegion tinctoriae) / Νότια παρόχθια δάση-στοές και λόχμες (Nerio -Tamaricetea και Securinegion tinctoriae)
- 9320 Olea and Ceratonia forests / Δάση με Olea και Ceratonia
- 9340 Quercus ilex and Quercus rotundifolia forests / Δάση με Quercus ilex και Quercus rotundifolia
- 9350 Quercus macrolepis forests / Δάση με Quercus macrolepis
- 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 Παραρτήματος Ι της 92/43/ΕΟΚ)

- 1010 Urban centres and towns / Αστικά κέντρα και πόλεις
- 1011 Villages and settlements / Χωριά και οικισμοί
- 1012 Services areas / Χώροι εξυπηρετήσεων
- 1013 Secondary settlements / Δευτερεύοντες οικισμοί
- 1021 Concentration of agricultural - processing units / Συγκεντρώσεις αγροτικών - μεταποιητικών μονάδων
- 1023 National roads / Δρόμοι εθνικοί
- 1024 Provincial roads / Δρόμοι επαρχιακοί
- 1025 Provincial roads / Δρόμοι επαρχιακοί
- 1030 Mineral extraction sites / Χώροι εξόρυξης - επεξεργασίας ορυκτών, αδρανών κ.λπ.
- 1032 Construction sites / Χώροι δόμησης
- 1041 Sport and leisure facilities / Εγκαταστάσεις αθλητισμού και αναψυχής
- 1050 Non-irrigated arable land - pure / Μη αρδεύσιμη-αρόσιμη γη αμιγής
- 1060 Vineyards - pure / Αμπελώνες αμιγείς
- 1062 Abandoned cultivation / Εγκαταλελειμμένες καλλιέργειες
- 1065 Forest plantations / Φυτείες δασικών ειδών (αναδασώσεις)
- 1068 Olive groves - pure / Ελαιώνες αμιγείς
- 1080 Water bodies / Συλλογές υδάτων
- 21B0 Unvegetated sandy beaches / Αμμώδεις παραλίες χωρίς βλάστηση
- 5340 Eastern Garrigues / Garrigues της Ανατολικής Μεσογείου
- 72A0 Reed beds / Καλαμώνες
- 8250 Unvegetated rocky bed (terrestrial ecosystems) / Βραχώδες υπόστρωμα που δεν καλύπτεται από βλάστηση
- 951B Forests of grecian Fir (Abies cephalonica) / Δάση ελληνικής ελάτης (Abies cephalonica)
- 9620 Unvegetated river bed / Κοίτη ποταμού χωρίς βλάστηση

NOTES/ ΣΗΜΕΙΩΣΕΙΣ

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

Contract No:
Αρ. Συμβολαίου: project code

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

COMPANY / ΕΤΑΙΡΕΙΑ: IGI Poseidon

ENGINEER/ CONSULTANT: Asprofos engineering, ERM

PROJECT TITLE - ΤΙΤΛΟΣ ΕΡΓΟΥ

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

DOCUMENT TITLE - ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ

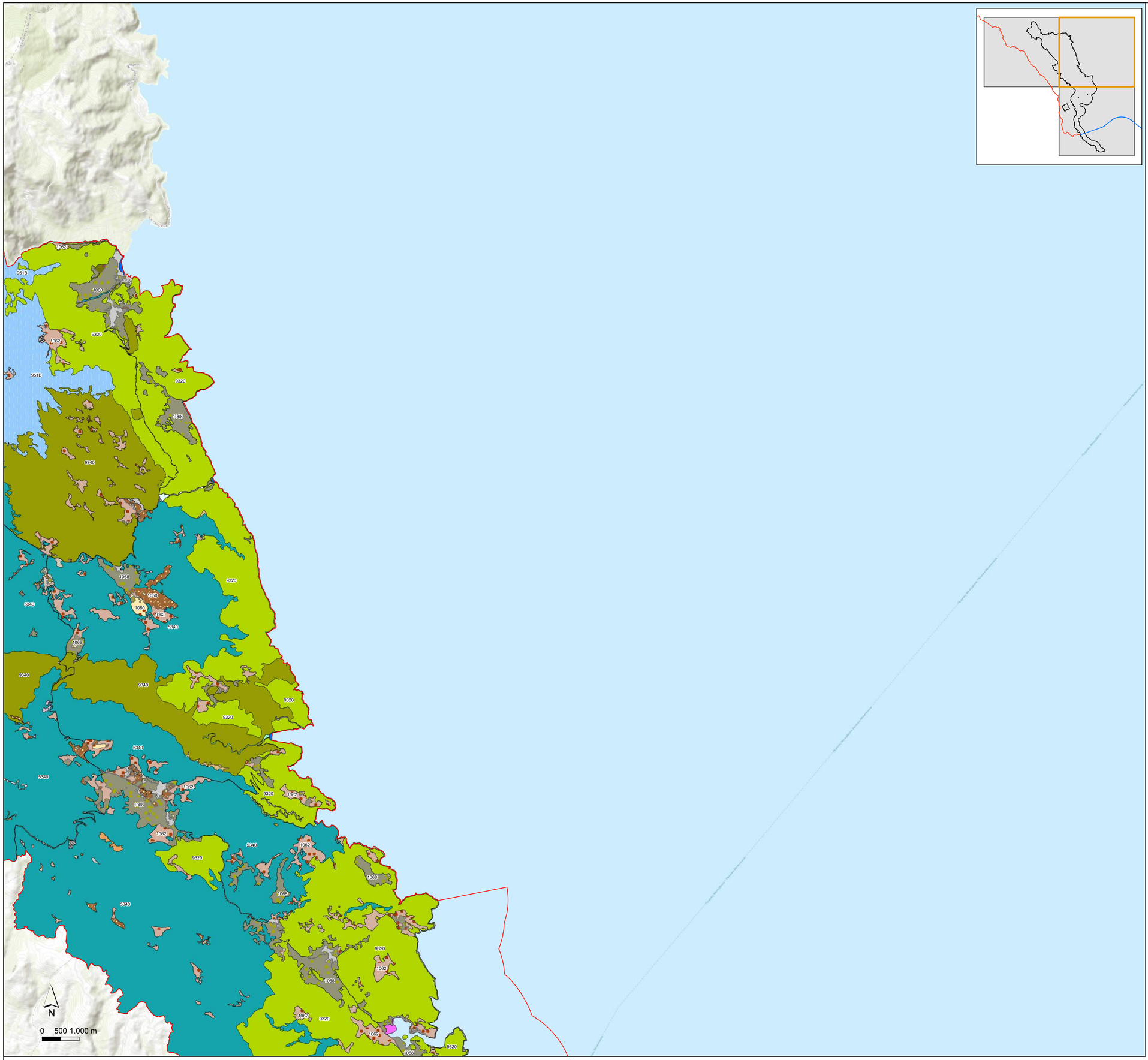
APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE "SAC - GR2540001" /
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 " - GR2540001"

Map n°:	
M3-F02 S02A01	*HABITAT TYPES - ECOLOGICAL SPATIAL UNITS INSIDE STUDY AREA /* *ΤΥΠΟΙ ΟΙΚΟΤΟΠΩΝ - ΟΙΚΟΛΟΓΙΚΕΣ ΧΩΡΙΚΕΣ ΕΝΟΤΗΤΕΣ* *ΣΤΗΝ ΠΕΡΙΟΧΗ ΜΕΛΕΤΗΣ*

Scale/Κλίμακα	Project DWG No./ Αρ. Σχ. Έργου:	Rev/Αναθ
1:50.000		0A

Size/Μέγεθος	Company's DWG No/Αρ. Σχ. Εταιρείας	Engineer's DWG No/Αρ. Σχ. Μελετητή:	Sheet/Φύλλο
A1	-	AUT-117727500-STU-XXX/ Section 11.1.1	1 of 3

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



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ΣΧΕΤΙΚΑ ΕΓΓΡΑΦΑ / ΣΧΕΔΙΑ

DOCUMENT / ΑΡ. ΕΓΓΡΑΦΟΥ	DOCUMENT TITLE / ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ
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LEGEND/ ΥΠΟΜΝΗΜΑ

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- 1420 Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi) / Μεσογειακές και θερμοατλαντικές αλόφιλες λόχμες (Sarcocornietea fruticosi)
- 2110 Embryonic shifting dunes / Υποτυπώδεις κινούμενες θίνες
- 2260 Cisto-Lavenduletalia dune sclerophyllous scrubs / Θίνες με βλάστηση σκληρόφυλλων θάμνων (Cisto-Lavanduletalia)
- 5330 Thermo-Mediterranean and pre-desert scrub / Θερμο-μεσογειακές και προερημικές λόχμες
- 8210 Calcareous rocky slopes with chasmophytic vegetation / Ασβεστολιθικά βραχώδη πρανή με χασμόφυτα
- 92C0 Platanus orientalis and Liquidambar orientalis woods (Plantanion orientalis) / Δάση Platanus orientalis και Liquidambar orientalis (Platanion orientalis)
- 92D0 Southern riparian galleries and thickets (Nerio-Tamaricetea and Securinegion tinctoriae) / Νότια παρόχθια δάση-στοές και λόχμες (Nerio -Tamaricetea και Securinegion tinctoriae)
- 9320 Olea and Ceratonia forests / Δάση με Olea και Ceratonia
- 9340 Quercus ilex and Quercus rotundifolia forests / Δάση με Quercus ilex και Quercus rotundifolia
- 9350 Quercus macrolepis forests / Δάση με Quercus macrolepis
- 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 Παραρτήματος I της 92/43/ΕΟΚ)

- 1010 Urban centres and towns / Αστικά κέντρα και πόλεις
- 1011 Villages and settlements / Χωριά και οικισμοί
- 1012 Services areas / Χώροι εξυπηρετήσεων
- 1013 Secondary settlements / Δευτερεύοντες οικισμοί
- 1021 Concentration of agricultural - processing units / Συγκεντρώσεις αγροτικών - μεταποιητικών μονάδων
- 1023 National roads / Δρόμοι εθνικοί
- 1024 Provincial roads / Δρόμοι επαρχιακοί
- 1025 Provincial roads / Δρόμοι επαρχιακοί
- 1030 Mineral extraction sites / Χώροι εξόρυξης - επεξεργασίας ορυκτών, αδρανών κ.λπ.
- 1032 Construction sites / Χώροι δόμησης
- 1041 Sport and leisure facilities / Εγκαταστάσεις αθλητισμού και αναψυχής
- 1050 Non-irrigated arable land - pure / Μη αρδεύσιμη-αρόσιμη γη αμιγής
- 1060 Vineyards - pure / Αμπελώνες αμιγείς
- 1062 Abandoned cultivation / Εγκαταλελειμμένες καλλιέργειες
- 1065 Forest plantations / Φυτείες δασικών ειδών (αναδασώσεις)
- 1068 Olive groves - pure / Ελαιώνες αμιγείς
- 1080 Water bodies / Συλλογές υδάτων
- 21B0 Unvegetated sandy beaches / Αμμώδεις παραλίες χωρίς βλάστηση
- 5340 Eastern Garrigues / Garrigues της Ανατολικής Μεσογείου
- 72A0 Reed beds / Καλαμώνες
- 8250 Unvegetated rocky bed (terrestrial ecosystems) / Βραχώδες υπόστρωμα που δεν καλύπτεται από βλάστηση
- 951B Forests of grecian Fir (Abies cephalonica) / Δάση ελληνικής ελάτης (Abies cephalonica)
- 9620 Unvegetated river bed / Κοίτη ποταμού χωρίς βλάστηση

NOTES/ ΣΗΜΕΙΩΣΕΙΣ

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

Contract No:
Αρ. Συμβολαίου: project code

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

COMPANY / ETAIPEIA: IGI Poseidon

ENGINEER/ CONSULTANT: Asprofos engineering, ERM

PROJECT TITLE - ΤΙΤΛΟΣ ΕΡΓΟΥ

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

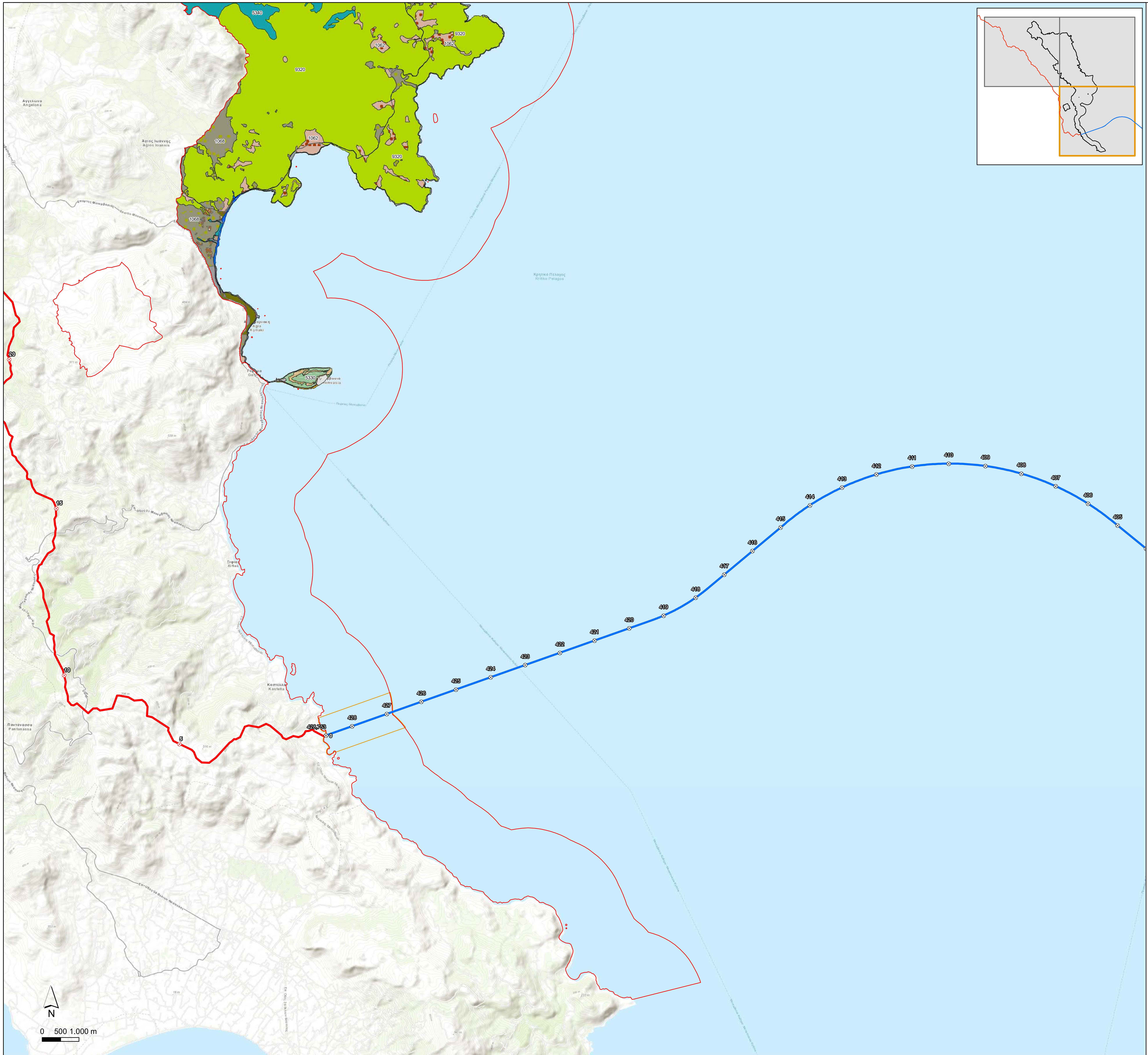
DOCUMENT TITLE - ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ

APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE "SAC - GR2540001" /
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 " - GR2540001"

Map n°:	
M3-F03 S02A02	*HABITAT TYPES - ECOLOGICAL SPATIAL UNITS INSIDE STUDY AREA /* *ΤΥΠΟΙ ΟΙΚΟΤΟΠΩΝ - ΟΙΚΟΛΟΓΙΚΕΣ ΧΩΡΙΚΕΣ ΕΝΟΤΗΤΕΣ* *ΣΤΗΝ ΠΕΡΙΟΧΗ ΜΕΛΕΤΗΣ*

Scale/Κλίμακα	Project DWG No./ Αρ. Σχ. Έργου:		Rev/Αναθ
1:50.000			0A
Size/Μέγεθος: A1	Company's DWG No/Αρ. Σχ. Εταιρείας: -	Engineer's DWG No/Αρ. Σχ. Μελετητή: AUT-11727500-STU-XXX/Section 11.1.1	Sheet/Φύλλο 2 of 3

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



REFERENCE DOCUMENTS / DRAWINGS
ΣΧΕΤΙΚΑ ΕΓΓΡΑΦΑ / ΣΧΕΔΙΑ

DOCUMENT / ΑΡ. ΕΓΓΡΑΦΟΥ	DOCUMENT TITLE / ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ
M3-F04 S02B02	APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE "SAC GR2540001" FOR THE OFFSHORE SECTION OF EASTMED PIPELINE PROJECT ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 "SAC GR2540001" ΓΙΑ ΤΟ ΘΑΛΑΣΣΙΟ ΤΜΗΜΑ ΤΟΥ ΔΙΑΣΥΝΔΕΤΗΡΙΟΥ ΑΓΩΓΟΥ ΦΥΣΙΚΟΥ ΑΕΡΙΟΥ EASTMED

LEGEND/ ΥΠΟΜΝΗΜΑ

Project Components / Στοιχεία του Έργου

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

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

- 1240 Vegetated sea cliffs of the Mediterranean coasts with endemic Limonium spp. / Απόκρημνες βραχώδεις ακτές με βλάστηση στη Μεσόγειο με ενδημικά Limonium spp.
- 1410 Mediterranean salt meadows (Juncetalia maritimi) / Μεσογειακά αλίπεδα (Juncetalia maritimi)
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- 9350 Quercus macrolepis forests / Δάση με Quercus macrolepis
- 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 Παραρτήματος I της 92/43/ΕΟΚ)

- 1010 Urban centres and towns / Αστικά κέντρα και πόλεις
- 1011 Villages and settlements / Χωριά και οικισμοί
- 1012 Services areas / Χώροι εξυπηρετήσεων
- 1013 Secondary settlements / Δευτερεύοντες οικισμοί
- 1021 Concentration of agricultural - processing units / Συγκεντρώσεις αγροτικών - μεταποιητικών μονάδων
- 1023 National roads / Δρόμοι εθνικοί
- 1024 Provincial roads / Δρόμοι επαρχιακοί
- 1025 Provincial roads / Δρόμοι επαρχιακοί
- 1030 Mineral extraction sites / Χώροι εξόρυξης - επεξεργασίας ορυκτών, αδρανών κ.λπ.
- 1032 Construction sites / Χώροι δόμησης
- 1041 Sport and leisure facilities / Εγκαταστάσεις αθλητισμού και αναψυχής
- 1050 Non-irrigated arable land - pure / Μη αρδεύσιμη-αρόσιμη γη αμιγής
- 1060 Vineyards - pure / Αμπελώνες αμιγείς
- 1062 Abandoned cultivation / Εγκαταλελειμμένες καλλιέργειες
- 1065 Forest plantations / Φυτείες δασικών ειδών (αναδασώσεις)
- 1068 Olive groves - pure / Ελαιώνες αμιγείς
- 1080 Water bodies / Συλλογές υδάτων
- 21B0 Unvegetated sandy beaches / Αμμώδεις παραλίες χωρίς βλάστηση
- 5340 Eastern Garrigues / Garrigues της Ανατολικής Μεσογείου
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- 8250 Unvegetated rocky bed (terrestrial ecosystems) / Βραχώδες υπόστρωμα που δεν καλύπτεται από βλάστηση
- 951B Forests of grecian Fir (Abies cephalonica) / Δάση ελληνικής ελάτης (Abies cephalonica)
- 9620 Unvegetated river bed / Κοίτη ποταμού χωρίς βλάστηση

NOTES/ ΣΗΜΕΙΩΣΕΙΣ

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

Contract No: / Αρ. Συμβολαίου: project code

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

COMPANY / ΕΤΑΙΡΕΙΑ: IGI Poseidon

ENGINEER/ CONSULTANT: Asprofos engineering; ERM

PROJECT TITLE - ΤΙΤΛΟΣ ΕΡΓΟΥ

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

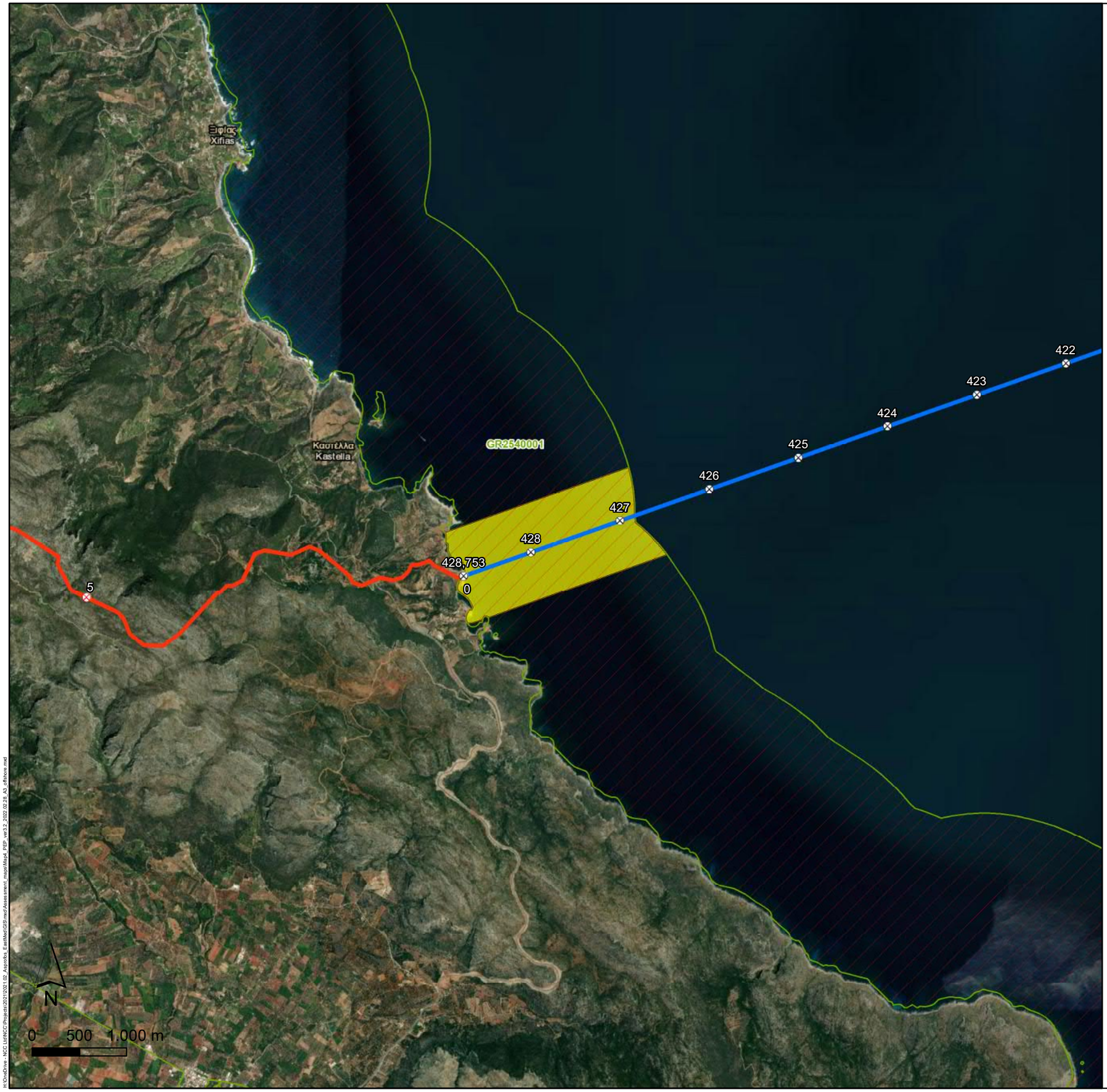
DOCUMENT TITLE - ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ

APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE "SAC - GR2540001" /
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 " - GR2540001"

Map n°:	
M3-F04 S02B02	*HABITAT TYPES - ECOLOGICAL SPATIAL UNITS INSIDE STUDY AREA / ΤΥΠΟΙ ΟΙΚΟΤΟΠΩΝ - ΟΙΚΟΛΟΓΙΚΕΣ ΧΩΡΙΚΕΣ ΕΝΟΤΗΤΕΣ ΣΤΗΝ ΠΕΡΙΟΧΗ ΜΕΛΕΤΗΣ*

Scale/Κλίμακα	Project DWG No./ Αρ. Σχ. Έργου:		Rev/Αναθ
1:50.000			0A
Size/Μέγεθος A1	Company's DWG No/Αρ. Σχ. Εταιρείας: -	Engineer's DWG No/Αρ. Σχ. Μελετητή: AUT-11727500-STU-XXX/ Section 11.1.1	Sheet/Φύλλο 3 of 3

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



REFERENCE DOCUMENTS / DRAWINGS
ΣΧΕΤΙΚΑ ΕΓΓΡΑΦΑ / ΣΧΕΔΙΑ

DOCUMENT TITLE / ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ

APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE " GR2540001"
FOR THE ONSHORE SECTION OF EASTMED PIPELINE PROJECT
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 " GR2540001"
ΓΙΑ ΤΟ ΘΑΛΑΣΣΙΟ ΤΜΗΜΑ ΤΟΥ ΔΙΑΣΥΝΔΕΤΗΡΙΟΥ ΑΓΩΓΟΥ ΦΥΣΙΚΟΥ ΑΕΡΙΟΥ EASTMED

LEGEND/ ΥΠΟΜΝΗΜΑ

Project Components / Στοιχεία του Έργου

- Offshore Routing Chainage (1 km) / Χιλιομέτρηση Όδευσης θαλάσσιου τμήματος (1 χλμ.)
- Routing Chainage (5km) / Χιλιομέτρηση Όδευσης (5 χλμ.)
- Proposed Routing (offshore) / Προτεινόμενη Όδευση (θαλάσσιο τμήμα)
- Proposed Routing / 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/ΕΖΔ: Special Area of Conservation / Ειδική Ζώνη Διατήρησης

NOTES/ ΣΗΜΕΙΩΣΕΙΣ

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

Contract No:
Αρ. Συμβολαίου:

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

COMPANY / ΕΤΑΙΡΕΙΑ: IGI Poseidon

ENGINEER/CONSULTANT ΜΗΧΑΝΙΚΟΣ/ ΜΕΛΕΤΗΤΗΣ: Asprofos engineering, ERM

PROJECT TITLE - ΤΙΤΛΟΣ ΕΡΓΟΥ

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

DOCUMENT TITLE - ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ

APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE " - GR2540001" /
ΕΙΔΙΚΗ ΟΙΚΟΛΟΠΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 " - GR2540001"

Map n°: M4-F02 S02A01	*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_offshore

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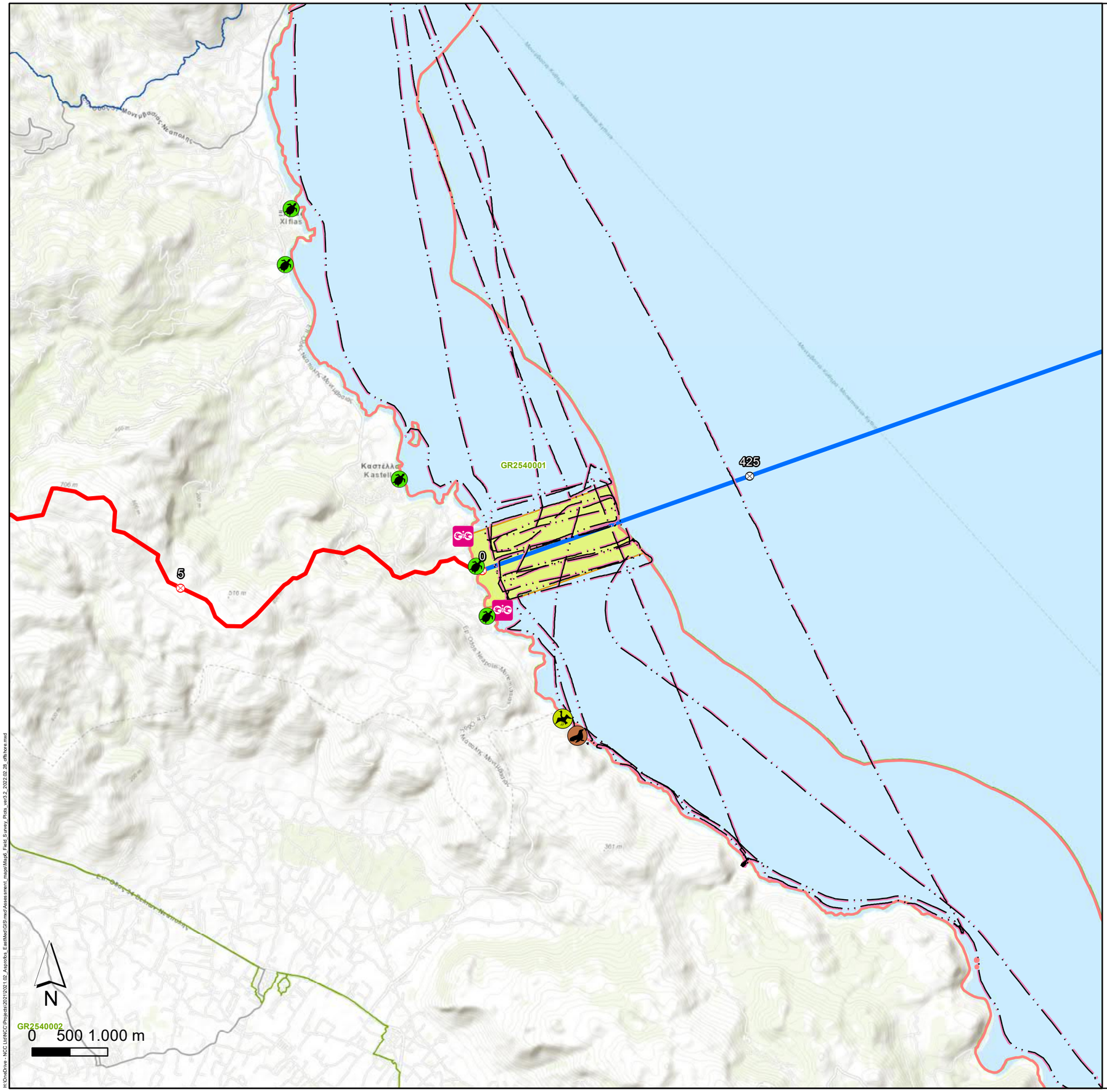

REFERENCE DOCUMENTS / DRAWINGS
ΣΧΕΤΙΚΑ ΕΓΓΡΑΦΑ / ΣΧΕΔΙΑ

DOCUMENT TITLE / ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ

APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE " GR2540001"
FOR THE ONSHORE SECTION OF EASTMED PIPELINE PROJECT
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 " GR2540001"
ΓΙΑ ΤΟ ΘΑΛΑΣΣΙΟ ΤΜΗΜΑ ΤΟΥ ΔΙΑΣΥΝΔΕΤΗΡΙΟΥ ΑΓΩΓΟΥ ΦΥΣΙΚΟΥ ΑΕΡΙΟΥ EASTMED

LEGEND/ ΥΠΟΜΝΗΜΑ

Project Components / Στοιχεία του Έργου

- Offshore Routing Chainage (5 km) / Χιλιομέτρηση Όδευσης θαλάσσιου τμήματος (5 χλμ.)
- Routing Chainage (5km) / Χιλιομέτρηση Όδευσης (5 χλμ.)
- Proposed Routing (offshore) / Προτεινόμενη Όδευση (θαλάσσιο τμήμα)
- Proposed Routing / Προτεινόμενη Όδευση
- Study Area / Περιοχή Μελέτης
- Field Survey Area / Περιοχή Έρευνας Πεδίου
- Field Survey Area inside Natura 2000 site / Περιοχή Έρευνας Πεδίου εντός περιοχής Natura 2000
- Potential Monk seal caves
- Phalacrocorax aristotelis nesting sites
- Caretta caretta nesting beaches
- Coastal counts Vantage points
- Marine survey tracks

Natura 2000 Network / Δίκτυο Natura 2000

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

NOTES/ ΣΗΜΕΙΩΣΕΙΣ

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

Contract No:
Αρ. Συμβολαίου:

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

COMPANY / ΕΤΑΙΡΕΙΑ: IGI Poseidon

ENGINEER/CONSULTANT ΜΗΧΑΝΙΚΟΣ/ ΜΕΛΕΤΗΤΗΣ: Asprofos engineering, ERM

PROJECT TITLE - ΤΙΤΛΟΣ ΕΡΓΟΥ

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

DOCUMENT TITLE - ΤΙΤΛΟΣ ΕΓΓΡΑΦΟΥ

APPROPRIATE ASSESSMENT OF THE NATURA 2000 SITE " - GR2540001" /
ΕΙΔΙΚΗ ΟΙΚΟΛΟΓΙΚΗ ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΠΕΡΙΟΧΗΣ NATURA 2000 " - GR2540001"

Map n°:	*FIELD SURVEY PLOTS / ΣΗΜΕΙΑ ΔΕΙΓΜΑΤΟΛΗΨΙΑΣ*	
M6-F02 S02A01		
Scale/ Κλίμακα: 1:50.000	Project DWG No./ Αρ. Σχ. Έργου:	Rev/ Αναθ: 0A
Size/ Μέγεθος: A3	Company's DWG No/ Αρ. Σχ. Εταιρείας: - / Engineer's DWG No/ Αρ. Σχ. Μελετητή: AUT-11727500-STU-XXX/ Section 11.1.1	Sheet/ Φύλλο: 1 of 1

Document Name: Map6_Field_Survey_Plots_ver3.2_2022.02.28_offshore

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