WEST PATRAIKOS LEASE AREA

ENVIRONMENTAL REPORT 2020

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WEST PATRAIKOS LEASE AREA – ENVIRONMENTAL REPORT 2020

HSE Policies & System, Environmental Studies and Implementation

1. Introduction

During the course of 2020, HELPE West Patraikos Exploration and Production of Hydrocarbons Single Member S.A., 100% subsidiary of HELLENIC PETROLEUM EXPLORATION AND PRODUCTION OF HYDROCARBONS (UPSTREAM) S.A., acting as the Operator in the "West Patraikos" Lease Area, implemented a series of HSE policies and systems and completed Environmental Studies, which are presented in the following sections.

According to the Lease Agreement and the Provisions of Article 12 for «Environmental Protection», the Lessee (Hellenic Petroleum) «shall not be liable for any environmental condition or damage existing in the Contract Area prior to the commencement of the Lessee's operation therein. For this purpose, the Lessee shall prepare a baseline report, to detail the condition of the environmental parameters and resources at the time prior to operation commencement. The baseline report will be submitted for review to the Lessor (Hellenic Hydrocarbons Resources Management – HHRM). If no objections will rise by the latter within twenty (20) Business Days of its submission, the report is deemed accepted».

HELPE Patraikos is fulfilling its commitments and is planning its exploration program by implementing the most up-to-date, safe and environmentally friendly technological methods and practices with the outmost respect to the local social and physical environment of W. Patraikos lease area. Upon entering the second (2nd) exploration phase and before drilling the first (1st) Exploration Well (ECHO-1), currently a matured target, HELPE Patraikos was committed to prepare and submit an Environmental Baseline Survey (EBS-Stage 2), which shall cover specifically the site of the first exploration Well including the prospect area of the geological target.

The Environmental Baseline Survey (EBS-Stage 2) part of which are the Geohazards Site Survey and the Environmental Sampling Habitat Assessment has been completed in collaboration with the Hellenic Centre for Marine Research (HCMR) and RPS Ltd during November 2018. The EBS-Stage 2 has been submitted to the Competent Authorities (HHRM) on 10 June, 2020.

HELPE Patraikos also prepared an Environmental and Social Impact Assessment (ESIA) Study related to the drilling of the first (1st) Exploration Well in "West Patraikos" Lease Area. The (ESIA) Study has been uploaded by HELPE Patraikos on the Environmental Registry electronic platform of the Ministry (YPEN) on 2 October, 2020.

Concerning the Seismicity Monitoring Program that HELPE Patraikos has established in collaboration with the National Observatory of Athens (NOA) in the wider area of West Patraikos since October 2018, is ongoing during 2020. This very important for the safety of the drilling operations Monitoring Program is expected to continue during the entire drilling campaign.

The Critical Habitats and Biodiversity Monitoring Program established in W. Patraikos by HELPE Patraikos in collaboration with Nature Conservation Consultants (NCC) and MOm (the Hellenic Society for the study and protection of the Monk Seal since 2018, continued throughout 2020 with very interesting results regarding sensitive avifauna species (e.g. Shearwater (Artemis)).

At the end of 2ndQ of 2020, HELPE Patraikos signed an Associate Membership Agreement with Oil Spill Response Limited (OSRL). OSRL's consultancy services, have been provided for the preparation and review of the Oil Spill Contingency Plan as an integral part of the ESIA.

1.1. Environmental Baseline Survey Stage 2

According to Article 12 «Environmental Protection» paragraph 14, HELPE shall not be liable for any environmental condition or damage existing in the Contract Area prior to the commencement of the HELPE'S operation therein and nothing in this Agreement shall be construed to hold HELPE Patraikos liable in relation to any such pre-existing environmental condition or damage. For this purpose, a Baseline Report (Stage 1), covering the whole extent of the boundaries of the Lease Area was prepared by HELPE Patraikos, and was submitted and approved by the Ministry of Environment and Energy, to detail the condition of the environmental parameters and resources at the time prior to operation commencement

Prior to entering the second (2nd) Exploration Phase and before the drilling of the first exploration well, HELPE Patraikos is committed to prepare and submit a Baseline Survey (EBS-Stage 2) which will be focused in an area limited around the drillable target(s).

The EBS-Stage 2, shall addresses the existing physical, biological and socioeconomic environment and sensitivities of West Patraikos Gulf area and provide updated environmental data that might not covered in the Environmental Baseline Survey Stage 1.

The purpose of the Environmental Baseline Survey Stage 2 is the collection of data as well as the study and evaluation of the environmental conditions in the research area in order to:

- Survey the conditions of the environment within the research area before starting any drilling operations.
- Be part of an integrated system for monitoring the condition of the Environment in the research area, to allow the monitoring of any impact of the individual stages of the exploration program.

In this context, HELPE Patraikos assigned to the Hellenic Center for Marine Research (HCMR) in collaboration with the University of Patras, University of Thessaly, and the Ionian University to elaborate the EBS - Stage 2 Study.

The EBS-Stage 2 began to be implemented during 4Q 2019 and the Study fulfilled within the 2nd half of 2020, including detailed sampling and evaluation.

The following main objectives were met:

- ✓ Update of the baseline conditions and the current state of the Environment in prospect area including Physical and Anthropogenic Environment as well as of the prevailing socioeconomic conditions.
- ✓ Incorporating Final Results of the marine Geohazards Site Survey and the Environmental Sampling & Habitat Assessment that have been conducted by HELPE Patraikos in collaboration with HCMR and RPS Ltd at the end of 2018.
- ✓ Incorporating the Results of the Critical Habitats and Biodiversity Monitoring Program which continues from 2018 until today, aiming to record, study and protect the endangered marine species in the West Patraikos wider area.
- ✓ Establishment of Environmental & Socioeconomic Indicators.

The contents of the EBS-Stage 2 are as follows:

1. SCOPE OF WORK

It refers to the area around the drillable target of West Patraikos (Prospect Area) and the wider Inner Ionian Sea which includes the Prospect Area. The EBS-2 will support the Environmental & Social Impact Assessment (ESIA) for the exploration well(s) in West Patraikos Lease Area.

2. LEGAL REGULATORY FRAMEWORK

3. ENVIRONMENTAL BASELINE OF PROSPECT AREA
    a. OCEAN CIRCULATION & PHYSICAL PARAMETERS
    b. WATER COLUMN
    c. SEAFLOOR SEDIMENTS

4. ENVIRONMENTAL BASELINE OF WEST PATRAIKOS AREA
    a. CLIMATE & WEATHER CHARACTERISTICS
    b. GEOLOGY & SEISMICITY
    c. SEAFLOOR MORPHOLOGY & QUALITY
    d. OCEAN CIRCULATION & PHYSICAL PARAMETERS
    e. WATER COLUMN
    f. SEAFLOOR SEDIMENTS
    g. BENTHIC COMMUNITIES & HABITATS
    h. BIOMONITORING OF HEAVY METALS & BIOACCUMULATION OF HYDROCARBONS
    i. FISHERIES & FISH FAUNA
    j. MARINE MAMMALS & SEALS
    k. MARINE BIRDS
    l. ACOUSTIC ENVIRONMENT

5. SOCIO-ECONOMIC BASELINES
    a. the General Considerations on the Exploitation of Oil & Gas Energy Wealth
    b. Thorough Analysis of the Socio-Economic Environment, including:
        i. the Administrative Structure,

ii. Population,
iii. Population Changes and Population Age Distribution,
iv. Education,
v. Migration.

c. Socio-Economic Indicators, including
i. Gross Domestic Product and Production Structure.

d. Analysis of Human Activities, including:
i. Fishing and Aquaculture,
ii. Shipping, Telecommunications and Underwater cable network,
iii. Tourism and Underwater Heritage Sites.

6. ENVIRONMENTAL INDICATORS

A long list of indicators has been established to be applied for the monitoring and evaluation of the environmental and socio-economic state of the West Patraikos area. The following indicators are presented:

1. Water Column
   - Eutrophication Index for the Prospect Area
   - Eutrophication Index for West Patraikos Area
2. Water Column Quality Indicators: Plankton
   - Ecological Quality Ration (EQR) of Chlorophyll-a
   - Biomass, Abundance and Diversity Indexes
3. Water Column Quality Indicators: Hydrocarbons
   - Total Petroleum Hydrocarbons
   - Polycyclic Aromatic Hydrocarbons
4. Seafloor Sediment Quality Indicators Heavy Metals
   - Enrichment Factor
   - Sediment Quality Guidelines (SQGs)
5. Water Column Quality Indicators: Hydrocarbons
   - Aliphatic Hydrocarbons,
   - Polycyclic Aromatic Hydrocarbons
6. Quality Indicators for the Benthic Ecosystem
   - Assessment of the Condition of Benthic Communities
   - Assessment of Habitat Loss
   - Assessment of Habitat Damage
7. Heavy Metals with Transplanted Mussels and Native Species
   - Concentration of Heavy Metals in Benthic Organisms,
   - Concentration of heavy metals in natural populations,
   - Concentration of Heavy Metals in Zooplankton,
   - Concentration of Heavy Metals in Transplanted Mussels.
8. Bioaccumulation of Hydrocarbons
   - Aliphatic Hydrocarbons (AHC)
   - Polycyclic Aromatic Hydrocarbons (PAH)
9. Sea birds:
   - Population Trends

- Breeding Performance
- Foraging Activity and Distribution
- Levels of Inorganic and Organic Pollutants

10. Developing a System of Indicator for Monitoring the Socioeconomic Impacts

EBS Stage 2 SUBMISSION

The EBS-Stage 2 submitted to Competent Authorities (Hellenic Hydrocarbons Resources Management and the Department of Environmental Permitting-DIPA) on 10th June, 2020 and officially approved by written response of HHRM to HELPE Patraikos on 18th September, 2020.

1.2. Environmental and Social Impact Assessment (ESIA) for exploration well(s)

Each project, work, activity or any other part of the Petroleum Operations that is subject to an Environmental and Social Impact Assessment (ESIA), shall commence only after the Terms of Environment (ToE) have been approved. Regarding Environmental Licensing and more specific according to the provisions of Law 4014/2011 «on Environmental licensing of projects and activities, regulation of illegally constructed buildings, with the aim to promoting a better environmental stability», HELPE is obliged to apply for Approval of Environmental Impact Assessment (category A projects subcategories: A1 and A2). Category A includes works and activities, which may cause severe environmental impact because of their nature, size or location. Category A is divided into groups 1 and 2. Exploration and Exploitation Projects are under Category A1.

For activities of both groups of Category A, an ESIA is needed in the form an overall scientific assessment. An Environmental and Social Impact Assessment (ESIA) shall include at least the following minimum matters:

- description of the proposed activities;
- description of the potential affected environment, including specific information necessary to identify and assess the environmental effect of the proposed activities;
- assessment of the likely or potential environmental impacts of the proposed activity and the alternatives, including the direct or indirect cumulative, short-term and long-term effects;
- identification and description of measures available to mitigate adverse environmental impacts of proposed activity and assessment of those measures;
- indication of gaps in knowledge and uncertainty which may be encountered in computing the required information;
- a brief and non-technical summary of the information provided

According to the provisions of Article 12 of the Lease Agreement for the «Environmental Protection», HELPE Patraikos shall conduct all Petroleum Operations in a manner, which will assure the protection of environment in accordance with Good Oilfield Practices. Furthermore, HELPE Patraikos shall prepare and submit to the competent governmental

authority, an Environmental Impact Study (EIA) for the relevant Petroleum Operations in respect of which an Environmental Impact Assessment (EIA) procedure is required.

The EIA shall, as a minimum:

- fully comply with the requirements of the EIA legislation in force;
- meet the requirements and guidelines set out by SEA (Strategic Environmental Assessment); and
- be prepared by a third party with adequate expertise in the field of environmental studies, which will be appointed by the Lessee to work on its behalf.

In this context, HELPE Patraikos assigned to the Hellenic Centre for Marine Research (HCMR) in collaboration with RPS Ltd to elaborate the ESIA Study for the ECHO-1 Exploration Well in W. Patraikos Lease Area.

The Environmental & Social Impact Assessment (ESIA) Study for ECHO-1 Exploration Well commenced in 4Q 2019 and works fulfilled within 3rdQ 2020.

The ESIA Study is addressing:

- Environmental and socio-economic background,
- Metocean data update
- Impact assessment & Oil Spill Modelling
- Mitigation & Control Measures
- Environmental Management Plan and Monitoring Program

More specifically in the context of ESIA Study the following issues were studied in detail regarding the area around the drillable target:

- **Project Description**
  - Offshore Operations
  - Logistical Support
  - Emissions Summary
- **The Environment**
  - Physical Environment
    - Oceanography and Climatic Factors
    - Water and Sediment Characteristics
  - Biological Environment
    - Plankton and Benthic Fauna
    - Fishes
    - Marine Mammals
    - Marine Turtles
    - Birds
    - Specialized Marine Ecosystems
    - Protected Areas
  - Socio-Economic Environment
    - Administrative Structure & Demographics

  - Oil and Gas Activities
  - Shipping, Navigation, Ports and Vessel Management
  - Cultural Heritage and Tourism
- **Impact Assessment**
- **Environmental and Social Management Plan (ESMP)**
- **Environmental Monitoring Plan**
- **Baseline Monitoring Plan**
- **Conclusions**

IMPACT ASSESSMENT

The Environmental Impact Assessment process has systematically identified and assessed all potential impacts associated with the drilling operations. This is in terms of an impact's direct or indirect potential to interact with the existing receptors of the physical, biological or socio-economic environment. The impacts were also examined to ascertain a potential breach of relevant environmental and social policy, national and international legal frameworks, corporate environmental policy and management systems. The impacts were considered in terms of: (i) Planned events – impacts resulting from routine activities e.g. presence of the MODU and drilling activity; and (ii) Unplanned events - impacts occurring from incidents and accidents e.g. failure of equipment, procedures not being followed, unforeseen events; with the potential to result in spills, leaks, fire or explosion.

Each impact has been classified according to the likelihood of occurrence (ranging from remote to certain) and the potential severity of the impact upon either environmental or social receptors (scaled from negligible to severe). After assessment of likelihood and consequence, an importance risk factor (Low, Medium or High) was assigned to the individual impacts indicating their scale and significance:

- Low Risk - risk is broadly acceptable and generic control measures are assumed in the design process but require continuous improvement;
- Medium Risk - risk is tolerable but mitigation measures are required reduce the risk as much as practicable;
- High Risk - risk is not acceptable and mitigation measures are required to move the risk to either the Medium or Low risk categories; and
- Positive impacts (to be enhanced if practicable).

All identified negative impacts classified as either a High or Medium risk were considered in the ESIA to be significant and required implementation of mitigation measures to reduce the risk to As Low As Reasonably Practicable (ALARP). Mitigation measures in line with good industry practice have been highlighted for inclusion into the project design.

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

An ESMP has been developed and is proposed to ensure all phases of the ECHO-1 exploration well have effective environmental protection in the wider context of HELPE Group's (of which HELPE Patraikos is a subsidiary) Health, Safety and Environmental (HSE) Management System. The ESMP indicates where and how this structured management approach will be used to

enable the ongoing process of identification, assessment and control of environmental risks throughout the lifecycle of the project. The teams and crewmembers on the MODU, support vessels and wider HELPE Patraikos operations teams will be required, as a minimum, to undertake the actions listed in the Environmental and Social Management Plan (ESMP). The ESMP details the appropriate mitigation to be undertaken to minimise effects arising from planned and unplanned events identified during the ESIA process. The ESMP also assigns responsibilities for each identified action and will be used as a monitoring tool throughout the project.

Through the Environmental & Social Management & Environmental Monitoring Plan, the main principles are presented in order to achieve the following:

- Monitoring and recording of project inputs (e.g. use of chemicals, resource consumption, etc.) and outputs (e.g. discharges, emissions and wastes) for measurement against corporate requirements or statutory standards, consent limits or targets;
- Measurement of ambient environmental quality using ecological/biological, physical and chemical indicators;
- Monitoring of critical habitats and biodiversity (cetaceans, sea turtles, seabirds, monk seals)
- Monitoring of socio-economic interactions (e.g. public consultation, local content, grievances received and responded to)
- Environmental baseline studies – background data gathering and field sampling in the area of prior to exploration drilling, while drilling and post-drilling

BASELINE MONITORING PLAN

A site survey and Environmental Sampling Habitat Assessment in the West Patraikos license area was conducted in November 2018 with the collaboration of HELPE Patraikos and the Hellenic Centre for Marine Research (HCMR). The findings of the Environmental Sampling Habitat Assessment Report are taken to constitute the baseline conditions of the Broader Project Area and it is proposed to revisit the sampling sites from that survey upon completion of the ECHO-1 project to establish the post-project environmental information directly comparable with the results of the 2018 site survey and environmental sampling habitat assessment.

CONCLUSIONS

The Environmental and Social Impact Assessment process for the ECHO-1 exploration well planned by HELPE Patraikos has systematically identified and assessed potential environmental and social impacts associated with the project's planned and unplanned events.

Through the proposed mitigation and the proposed Environmental and Social Management Plan the potential environmental and social negative impacts that may result from the project are all reduced to as low as reasonably practicable (ALARP). Following implementation of the proposed Environmental and Social Management Plan and given the temporal and spatial

extents of the proposed drilling operations, there should be no significant long-term environmental or social impacts resulting from the project.

The impact assessment has highlighted that in the event of a worst-case hydrocarbon release, there is the potential for significant (assessed as Medium after mitigation measures are considered) effects on the following receptors:

- Geological, Tectonic and Soil (Geological Features);
- Geological, Tectonic and Soil (Sediment Composition);
- Geological, Tectonic and Soil (Sediment Quality);
- Natural Environment (Fish / Shellfish);
- Natural Environment (Seabirds);
- Natural Environment (Marine Mammals);
- Natural Environment (Marine Reptiles);
- Natural Environment (Protected / Sensitive Areas);
- Anthropogenic (Technical Infrastructure);
- Anthropogenic (Fishing);
- Anthropogenic (Tourism/Leisure);
- Anthropogenic (Socio-Economic);
- Anthropogenic (Cumulative Impact); and
- Water Quality.

However, it should be noted that blow-outs are extremely rare events. Given the control measures that HELPE Patraikos will have in place for hydrocarbon releases, the risk of hydrocarbon spills occurring is reduced to acceptable levels.

1.3. Oil Spill Modelling and Contingency Plan

HELPE Patraikos is following Greek and oil industry internationally recognized Good Practice, in the development of a full planning scenario identifying potential risks. Although the likelihood of a large oil spill is very low, the risks have been assessed objectively and mitigation measures have been identified and applied to reduce identified risks. In this aim integral parts of the Study were the modeling of a hypothetical accident that resulted in an oil spill dispersion and the analysis of their results. These were based on stochastic and deterministic oil slick dispersion modeling scenarios calculated over four seasons and based on Blowout, Surface Release due to well testing, and Surface Release due to vessel collision.

For this purpose, an Oil Spill Model can form the core in an operational forecast system for oil spill responses. With this tool, the trajectory of an oil slick can be determined as well as its properties under the actual meteorological (Metocean) conditions. Such deterministic modelling will give information required to optimize responses and meet national and international regulatory requirements.

Hypothetical oil/hydrocarbon spills has been simulated using a special oil spill modelling package. The comprehensive 3D fate and transport modelling system includes transport and

weathering algorithms to calculate the mass of oil components in various environmental compartments (water surface, shoreline, water column, atmosphere, sediments). An oil spill modelling report has been generated which include the description of the environmental conditions and datasets, the modelling methodology and main modelling results.

Based on these data, an initial Contingency Plan was prepared which of course should be updated on the basis of the latest data that will be valid during the period of exploratory drilling works both in terms of natural and man-made environment, national and European legislation, and available resources as well as local, regional and national emergency plans.

ESIA FOR ECHO-1 WELL SUBMISSION

The Environmental & Social Impact Assessment (ESIA) Study for ECHO 1 Exploration Well completed and delivered to Competent Authorities (HHRM) and uploaded on the Environmental Registry electronic platform of the Ministry of Environment and Energy (YPEN) on October 2, 2020.

1.4. Stakeholder Engagement/Communication Strategy

Covid-19 pandemic restrictions as well as internal guidelines related to Group's Corporate Affairs Policy put on hold any personal contact and engagement with key Stakeholders in the wider area of West Patraikos Gulf. Prior to the initiation of the Official Public Consultation Process, the Communication Strategy has been internally agreed and reactivated.

1.5. Environmental Monitoring for Critical Habitats & Biodiversity Indicators

2020

In the context of the Environmental Monitoring Program that HELPE Patraikos has installed since 2018 is of primary importance the study of endangered and protected species and especially the provision of adequate and documented scientific data on the status of marine mammals (Mediterranean seals, dolphins) and seabirds.

As part of this objective, HELPE W. Patraikos collaborates with specialized environmental experts and organizations, such as the Nature Conservation Consultants (NCC) and the Hellenic Society for the study and protection of the Mediterranean monk seal (MOm) with an absolute success during the last three years. This collaboration is fully covering the need for the provision of high scientific level services for the study of the endangered marine species and important habitats in the W. Patraikos Gulf and the Inner Ionian Sea Archipelago.

This research significantly contributed to the production of up-to-date Marine Biodiversity Reference Data in the area of West Patraikos as well as to the identification of important and sensitive areas, which should receive special attention and protection before, during and after the completion of drilling works.

During 2020, a third phase of the project took place, to further update the baseline information for the target species, to assess their interactions with human activities like fishing and to propose guidelines for the development of the Wildlife Response Plan for the project area.

The NCC, in collaboration with MOm, has successfully covered the subject and completed all the relevant field surveys and the studies. In particular, the implementation of the Program during 2020 included the following services:

- **WP I Systematic monitoring of the Mediterranean monk seal** at breeding sites in the wider research area. (August - October 2020).
- **WP II Coastal Environmental Records and Study of seabird colonies** in the wider project area during the breeding season in the wider project area. (February - May and September - October 2020).
- **WP III Pelagic Studies for marine mammals, seabirds and sea turtles** in the wider project area using a research boat. Field research for seabirds, cetaceans and sea turtles implemented by marine scientific experts using adequate equipment (hydrophones) and research vessel (February - May 2020).
- **WP IV Contribution to the elaboration of an Emergency Response Plan** for marine biodiversity in the event of oil spill incidents in West Patraikos, in collaboration with local organizations and international organizations such as SEA ALARM for the protection of marine life. (June - October 2020).

The aforementioned field surveys conducted during 2020 so that observations and recordings covered the four (4) seasons of the year. The reporting periods were June and November 2020.

Indicatively, one of the most interesting monitoring surveys and studies conducted it was the one in the beginning of spring 2020, in Ionian Sea where specialized biologists from Nature Conservation Consultants (NCC), after obtaining the relevant permits placed (GPS-GSM) telemetric transmitters in several individuals of seabirds (Mediterranean Shag), in order to monitor their seasonal movement. The Mediterranean Shag is a protected seabird species that looks like a cormorant, but is very rare and it is included in the European Directive on the conservation of wild birds. The Mediterranean Shag can be readily be seen in coastal areas and feeds in benthic and pelagic fish species. Its population in Greece is estimated at about 1.300-1.450 pairs. From the data gathered so far, it turns out that even though most of the shags in which a transmitter was placed remain in the wider nesting area, commuting daily to find food in distances up to 20km, some of the birds move to more distant areas, confirming earlier observations of long-distance movement of the species in the Ionian and the Adriatic Sea.

MAIN CONCLUSIONS OF THE COASTAL SURVEY FOR MONK SEAL

The results of the Coastal Survey provide a more in-depth image of the monk seal population and breeding activity in the wider project area. From the overall evaluation of the data collected up to date, the main findings can be concluded as following:

• Pupping activity was confirmed to occur constantly (every year) within the study area (at Atokos island) establishing this as the main pupping nucleus in the region.

• Constant presence of monk seal individuals was once again recorded around the Formikoula islets complex.

• An additional six (6) individual monk seals were identified during this study making the total number of identified individuals in the area to twenty (20) different monk seals. This corresponds to a minimum population of thirty (30) individuals of all age categories (excluding newborn pups).

• The most important sub-areas within the project area have been confirmed to be those of Atokos as a breeding nucleus and Formikoula islands and thus special care in terms of future monitoring and protection (especially of uncontrolled tourism activities but also from future drilling operations) should be given.

• It is evident that the establishment of a monitoring scheme that has already started providing more detailed and accurate information on the demographic parameters and breeding status of the local monk seal population.

• The results of this study further highlight the importance of a management scheme, especially in the cases on Formikoula and Atokos as well as preventative measures and an Emergency Response Plan in case of an accident.

MAIN CONCLUSIONS OF THE PELAGIC SURVEYS

The present study is the continuation of the 2018 and 2019 pelagic surveys in the Inner Ionian Sea Archipelago. Although the same visual observation methods of cetaceans, sea turtles and seabirds were applied as during the previous year significant differences in the abundance and distribution of the marine species of interest were observed:

- In spring 2020, the number of the observed species of interest of cetaceans, sea turtles and seabirds were significantly reduced. Namely, among 6 seabird species observed in spring 2019, only one, i.e. *Scopoli's Shearwater*, and no cetaceans were observed in 2020. Among the recorded species of interest, the abundance of individuals was also reduced, particularly for the *Scopoli's Shearwater* where 958 individuals were recorded spring 2019 and only 313 were recorded in spring 2020. Species of interest were recorded only in the northern and central part of the Pelagic Surveys Area, while none were recorded in the southern part, contrary to the presence of species of interest throughout the entire Pelagic Surveys Area during previous years.
- In autumn 2020, the abundance, the distribution and the diversity of the observed species of interest of cetaceans and seabirds seem to have recovered to levels recorded in autumn 2018.
- The results of the pelagic surveys in 2020 combined with the *Scopoli's Shearwater* telemetry again highlight a close association of the presence, abundance and distribution of some species of interest, particularly *Bottlenose Doplhins, Scopoli's*

Shearwater, European Storm-petrels and Yellow-legged Gulls with the fishing activities, particularly trawling, which seems to play a key role, attracting multi-species assemblages in particular fishing routes and plots and thus defining the spatio-temporal distribution of these species.

- The quarantine measures and the reduced demand for fish due to Covid-19 outbreak, leading to significantly reduced fishing effort in the Project Area provided a unique case study on the potential impact of reduced fishing activities on the distribution of the main marine top predators at the project area.
    - the abundance of the Yellow-legged Gulls (217 individuals in 2019 and 208 individuals in 2020) which are resident in the Project Area did not change due to reduced fishing activities, however its distribution was concentrated mainly around fishing vessels presence,
    - the abundance of the Scopoli's Shearwater (958 individuals in 2019 and 313 individuals in 2020), for which no colony sites have been found in the wider Project Area, and are considered to be originating from the largest species colony in the Ionian Sea on Strofades, was reduced significantly due to reduced fishing activities, indicating that the species changed its foraging areas affected by the availability of food provided by fishing vessels. This is indicative of the potential consequences on the species distribution if the fishing activities are modified.
- Temporary changes in fishing practices could also be considered as an active management measure to prevent potential impacts of other human activities. In the case of hydrocarbons explorations, diverting fisheries from the survey areas is expected to divert species associated with fisheries from these areas, thereby reducing risk of potential impacts on these species.

ENVIRONMENTAL SENSITIVITY MAPPING

As an important contribution to the elaboration of an Emergency Response Plan for marine biodiversity in the event of an oil spill incident, HELPE Patraikos in collaboration with NCC considered as very useful the elaboration of Environmental sensitivity index (ESI) Maps. The ESI Maps provide a compilation of information regarding coastal resources that could be at risk in the event of an oil spill.

This information is used in the framework of oil spill preparedness and is applied to plan cleanup strategies before an accident occurs. In case of an oil spill responders have to be able to take quick decisions concerning the locations along shoreline and at sea that have to be protected. Special attention and priority have to be given to the areas that host sensitive biological resources.

The environmental sensitivity mapping was carried out based on the methodology of NOAA (1997) and the maps compile information on biological resources, which include birds, marine mammals, sea turtles and sensitive marine habitats (i.e. Posidonia meadows and Submarine structures made by leaking gases). Emphasis is given on rare, threatened, endangered species and protected species.

2021

The high-level scientific work of the consortium and the excellent collaboration with our scientific consultants in West Patraikos, enable us to continue our surveys during the 2nd exploration phase in 2021 in order to establish an integrated Environmental Management Plan. In this context, HELPE Patraikos aims to continue the monitoring activities in the lease area to further update the current state environmental information.

Pelagic surveys will be strengthened, by adding specific components for the fisheries/bird/marine mammal interactions, in order to provide information that will further improve the effectiveness of the Wildlife Response Plan.

In particular, Critical Habitats and Biodiversity Monitoring research will benefit from the following surveys:

- WP I: **Coastal survey for Monk Seals** breeding performance in the project area.
- WP II: **Coastal survey for breeding seabirds** to assess their breeding performance in the wider project area.
- WP III: **Pelagic surveys for marine mammals, seabirds and sea turtles,** using research vessel and light aircrafts in the open sea of the project area. Interactions among marine biodiversity and fishing vessels will be assessed through devoted field surveys, in order to provide information that will guide management prescriptions related to the Wildlife Response Plan.

The implementation of the aforementioned work packages and the delivery of the respective reports will include:

- *2021 Report on the Mediterranean Monk Seal monitoring,*
- *2021 Report on the seabird breeding performance Monitoring*
- *2021 Report of the pelagic/aerial/fisheries interactions surveys, including a final update of the baseline information for the target species.*

1.6. Seismicity Monitoring in West Patraikos

According to the provisions of the Joint Ministerial Decision (JMD) of August 8th 2013, which has approved the Strategic Environmental Impact Assessment (SEA) for the exploration and production of hydrocarbons in West Patraikos, prior to drilling the exploration well the active tectonics and existing seismicity should be considered for the adjacent areas.

Due to the seismicity of Western Greece and with the aim of safe drilling operations, HELPE Patraikos is collaborating with the National Observatory of Athens (NOA), in order to monitor the existing seismicity in real time by installing a local network of seismic stations, capable of monitoring seismic events and local micro seismicity. The resulting data are valuable to trace any active seismogenic zones that might exist in the area. Even though West Patraikos lease

area is an area with low seismicity, constant monitoring was deemed necessary and useful, in order to assess the seismicity evolution in real time.

The seismological network consists of fifteen (15) portable seismographs supported by real-time data transmission in order to accurately identify any active seismogenic fault-zones and to estimate the seismic hazards in the wider area of West Patraikos.

The seismological stations were placed appropriately, so that to achieve the maximum density of the network by using, where possible, even the small islets of Patraikos. The instalment and the recording started in October 2018 and since then a large number of micro and macro seismic events has been recorded in the nearby areas, the majority of which are aftershocks of the strong earthquake of 25/10/2018 in the offshore area SW of Zante.

Seismic monitoring showed that within the narrower study area of West Patraikos there was not an actual increase in seismicity. Throughout the seismic sequence, HELPE Patraikos HSE staff stay in constant communication and collaboration with the seismologists of the Geodynamic Institute of NOA. Automatic notification systems were developed (limited access webpage, SMS paging system with automatic alerts for the project's team), in order for HELPE Patraikos and the competent authorities to timely respond to any relevant need.

Beyond these automatic monitoring systems, specialized analysts of the Geodynamic Institute analyze and process daily the seismic data. The local West Patraikos network that HELPE Patraikos developed in collaboration with the National Observatory of Athens constitutes a seismic monitoring standard by incorporating all the modern digitalization technologies and transmission of data.

Regarding the Seismicity monitoring period October 2018 - April, 2020, the following reports have been completed by the Geodynamic Institute of NOA and submitted to HELPE Patraikos during 2ndQ of 2020:

- Final Report on Seismic Monitoring and Recording in the West Patraikos Lease Area
- Seismic Hazard Assessment Report in the region of West Patraikos Gulf

Part of the newly acquired data within 2020 have been incorporated into the ESIA Study.

An important conclusion is that the vast majority of the recorded seismic events were aftershocks of the strong Mw6.8 earthquake of 26/10/2018 at Zakynthos offshore area. Despite the fact that the region was affected by this event over a large radius, the recorded seismic events within the area of interest, until 30 April 2020, were few.

The relevant contract has been amended for 2Q 2020 – 3Q 2021. Seismicity monitoring is ongoing throughout all the HELPE Patraikos exploration activities, creating an extra monitoring and precaution measure, shielding this way the safe planning of the exploration activities and in parallel taking in consideration the very strict European and Greek legal framework for safety in offshore operations.

2021

Although the seismic events which have been recorded by NOA during the last years within the narrow study area of West Patraikos were very rare, the monitoring of the seismicity and micro-seismicity in collaboration with Geodynamic Institute of NOA, will continue throughout the exploration phase in 2021 covering all the pre-drilling monitoring period and until the end of the Exploration Well. In the context of the relevant contract with NOA that has been amended in 2Q 2020, two additional reports on seismic monitoring and recording of real time seismicity in the lease area of West Patraikos will be completed regarding the period April 2020 - September 2021.

In addition, maps with the seismic sources of the area will be constructed resulting from the combination of geophysical and seismic data and a stochastic modeling of the strong seismic motion from these sources will be made. Calibration of the modeling parameters will be based on actual recordings from accelerators located in the area.

1.7. Oil Spill Preparedness Services-Associate Membership with Oil Spill Response

For HELPE Group, the protection of the environment is the first priority and with this aim it is crucial to quickly and effectively respond in case of an incident. In the context of the preperation and the designing of the drilling campaign for the first exploration well in West Patraikos Lease Area, HELPE Patraikos consistently focuses on preventing and avoiding any incident that may affect the environment.

In this aim, HELPE Patraikos signed an Agreement in order to participate in the International Organization of Oil Spill Response Limited (OSRL) as an Associate Member.

Oil Spill Response Limited (OSRL) is an organization that has the largest companies in the oil & gas sector as members and provide them an immediate intervention in case of any pollution incident. More than 160 Oil Companies participate in OSRL with founding members oil industry's super majors such as Total, Repsol, Exxon Mobil, Chevron, Aramco, ConocoPhilips, Equinor, Woodside, SHELL, BP, Eni etc. The cooperation with OSRL enables HELPE Patraikos to make full use of the OSRL's services and means which could be needed in order to deal with any incident related to oil pollution during all the exploration and production phases in West Patraikos Lease area including the exploration activities period up to 2021 and beyond.

During the 3rdQ 2020, an additional contract has been signed between HELPE Patraikos and OSRL regarding the provision of Training and Consultancy Services during the exploration activities in West Patraikos lease area.

Also, in collaboration with OSRL, the HSE Division of HELPE Patraikos prepared in 4thQ 2020 an Informative Leaflet for the Public Consultation process and the Stakeholders Engagement Plan. This Informative Leaflet describing oil spill preparedness and response actions and OSRL services in the context of the Associate Membership and Consultancy Services Agreements in West Patraikos lease area.

The staff of HELPE Patraikos HSE Division has been certified through an Oil Spill Response Management Course at IMO level 3 provided by OSRL during the 4thQ of 2020.

2021

Various other training seminars designed by OSRL on issues related to the intervention and response during an oil pollution incidents and crisis management are expected to be attended by HELPE Patraikos staff in 2021.

1.8. HELPE Group's Corporate Major Accident Prevention Policy

The Corporate Major Accident Prevention Policy of the HELPE Group was shaped accordingly so that it can meet in the best possible way the relevant international standards. The Corporate Major Accident Prevention Policy is a prerequisite for the compliance with Offshore Safety Directive and Greek Legislation.