Lebanese Oil & Gas Initiative
المبادرة اللبنانية للنفط والغاز

Environmental Impact of Petroleum Activities in Lebanon

Review of the Strategic Environmental Assessment (SEA) - May 2017

Developed by:
Lebanese Oil and Gas Initiative (LOGI)

In Collaboration with:
Publish What You Pay (PWYP)

Funded by:
The Friedrich-Ebert-Stiftung (FES)

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ABOUT THE LEBANESE OIL AND GAS INITIATIVE

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LOGI is an independent non-profit based in Beirut. LOGI's mission is to help Lebanon maximize the economic and social benefits of its oil and gas wealth – and avoid the resource curse.

ABOUT THE REPORT

This report was developed in collaboration with Publish What You Pay (PWYP) and funded by the The Friedrich-Ebert-Stiftung (FES).

Publish What You Pay is the world's largest coalition of civil society organisations working to end corruption in the oil, gas and mining sector. We work with communities affected by the extractive sector, and with government officials and company executives in more than 40 countries to ensure that the revenues generated by natural resource exploitation benefit all citizens.

Designed by 247 STUDIOS (www.247studios.me)

ABOUT KLEMEN STRMŠNIK

Environmental expert and consultant:

Klemen Strmšnik (B. Sc. Geography) is a project manager at private consultancy company ZaVita, svetovanje, Ltd. He has over 10 years of experience in environmental consulting, management of natural resources and different types of evaluations of strategies, plans and programmes on national and international level (e.g. SEA, EIA, AA, Ex-ante, Mid-term, etc.). Throughout his career, he was involved-in or led the preparation of over 25 Strategic Environmental Assessments (SEA) in Slovenia, Croatia and countries of Western Balkans region.

Based on his international experience in SEA implementation he was also involved in several SEA trainings and capacity buildings in 9 different countries through EU funded capacity building projects – such as "Strengthening capacities for SEA at regional and local level in Croatia (EPTISA Servicios de Ingenieria S.L. for IPA Fund, 2012-2014)" and "Capacity building on SEA/EIA within the project Environment and Climate Regional Accession Network – ECRAN (Hulla & Co Human Dynamics KG for EU Commission, 2014-2016)".

Klemen led the preparation of over 25 SEAs in Slovenia, Croatia and countries of Western Balkans region.

He is a co-author of the "Training Manual on SEA/EIA (M. Smutny, M. Cashmore, K. Strmšnik - prepared within EU-funded project ECRAN implemented by Human Dynamics, 2014)" and is currently preparing 2 sets of SEA-linked guidelines for the Ministry of Environment and Spatial Planning of the Republic of Slovenia – "Guidance for siting of SEVESO installations in Slovenia – best practices for Spatial planners and SEA/EIA evaluators" and "Guidance for high quality SEA implementation in Spatial Planning sector".

Linked to the specific topic of development of oil and gas activities he was a team member in "SEA and Appropriate Assessment for Plan for exploration and exploitation of hydrocarbons in Adriatic Sea in Croatia (Croatian Hydrocarbon Agency, 2014-2015)" and a "Member of the revision committee responsible for quality control of the SEA for Hydrocarbon Exploration and Production in Offshore Montenegro (Environmental Protection Agency of Montenegro, 2016)". He was also a team member in a "Feasibility Study for "South Stream pipeline" delivering environmental aspects of the Slovenian section of the pipeline international corridor (DIEM ltd., 2009)".

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EXECUTIVE SUMMARY

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See examples of potential risks and communities impacted in Table 2.

As Lebanon gears up to explore its offshore oil and gas resources it is critical that environmental protection is a front and center priority. Oil and gas development activities have high environmental risks which could impact Lebanon's marine mammals, turtles and fishes, air quality, sea water quality, underwater archeological sites, human health, and have negative climate change impacts. While Lebanese citizens at large would be directly impacted, specific communities most at risk include those along the Lebanese coast, businesses working in the fisheries, tourism and shipping sectors, as well as environmental non-profits.

To understand and avoid these risks, industry best practice and international standards require developing a "Strategic Environmental Assessment (SEA)" in relation to petroleum activities. The SEA process enables governments to understand environmental constraints, potential impacts, develop solutions, and collect and disseminate the appropriate data and information to stakeholders. A robust SEA would also enable the Lebanese government to identify possible gaps in national legislation, and enforce new measures on petroleum companies and local communities. It creates a formal platform to engage civil society, and often leads to multi-stakeholder platforms that monitor the performance of oil and gas companies. In short, The SEA is a critical assessment tool required for proper policy and environmental planning.

As Lebanon gears up to explore its offshore oil and gas resources it is critical that environmental protection is a front and center priority.

2012

Lebanese Government commissioned an SEA

The Lebanese Government recognized the importance of carrying a SEA and requires it by law before opening areas for petroleum activities and awarding licenses. In 2011, the Lebanese Government commissioned a SEA which was finalized in 2012, and published in 2014. The published SEA report is a complex ~800-page document, which could be perceived by the public to be challenging to understand.

2014

Lebanese Government published the SEA

The Lebanese Oil and Gas Initiative (LOGI), in collaboration with Publish What You Pay (PWYP) and supported by the Friedrich Ebert Stiftung (FES), hired an international and independent expert to review, synthesize, and disseminate the findings of the SEA in a more comprehensible way to citizens, civil society, media and decision makers. The goal of this report is to offer constructive suggestions to support the development of Lebanon's oil and gas resources in a transparent and sustainable manner.

Main recommendation: Lebanon's Strategic Environmental Assessment (SEA) should be re-done.

After a detailed review of Lebanon's SEA the independent evaluator concluded that the current SEA report and process did not deliver expected results and should thus be re-done. This is a vital step that Lebanon is highly recommended to take to drastically improve the protection of the environment and decrease the likelihood of significant impacts.

We recommend that a renewed SEA process builds on the 2012 SEA and complements the analysis with additional data, analysis and stakeholder inclusion. The main reasons underlying this conclusion include:

1. ***Incomplete report does not meet international standards:***
   Lebanon's 2012 SEA report is missing several key components and cannot be considered complete in line with EU and international guidelines.

2. ***Limited cooperation with Ministries and no involvement of civil society:***
   a successful SEA process requires the Lebanese government to cooperate with all relevant ministries, responsible authorities and include the public in the decision-making process. The renewed SEA process should include extensive stakeholder consultations in the SEA report development phase, as well as extensive public consultations based on the final draft of the SEA report.

3. ***Does not meet new Lebanese environmental legislation:***
   there was new SEA and EIA legislative framework adopted in Lebanon in 2012. The current SEA report does not satisfy the standards set by the new environmental legislation.

4. ***Outdated and incomplete data:***
   the SEA was completed 3 years ago and had several gaps in environmental data. New information collected in these past years could significantly improve the quality of the current SEA.

Next steps: Upgrade Lebanon's SEA in parallel to the first oil and gas licensing round

In order to avoid further delay in the first licensing round, LOGI believes the timing is perfect for the Lebanese Government to consider updating the SEA in parallel to the licensing round. Similar to Montenegro and Croatia, the Lebanese Government could insert a new clause in the licensing round conditions stating that the SEA is under upgrade and that its findings, conclusions and mitigation measures will be obligatory for all operators.

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See potential options for next steps in Table 1

Table 1.

Three possible scenarios for Lebanon to upgrade its Strategic Environmental Assessment (SEA)

#	Scenario	Conditions	Estimated Time
01	Short licensing round delay	Data gaps from 2012 SEA has been collected since then	• 3-6 months for new SEA Report • 2-3 months for public participation, potential correction of the SEA Report and adoption process.
02	No delay of licensing round: update SEA in parallel to licensing round	Data gaps from 2012 SEA has not been collected and is still not available.	• 6 months for new SEA Report • 3 months for public participation, potential correction of the SEA Report and adoption process.
		Data collection will be required in next oil and gas development phases, and will involve a more intensive environmental monitoring plan.	
		Insert clause in the licensing round conditions making new SEA conclusions binding to all operators.	
03	Long licensing round delay until new data is collected	Data gaps from 2012 SEA has not been collected and is still not available.	• 1-2 years for data collection • 3-6 months for new SEA Report • 2-3 months for public participation, potential correction of the SEA Report and adoption process.
		Develop new SEA based on newly collected data.	

Lebanon's Strategic Environmental Assessment (SEA) is incomplete... LOGI recommends the SEA to be upgraded in parallel to the O&G first licensing round.

Table 2.

Examples Of Petroleum Activities' Environmental Risks And Impact On Communities

	Potential Environmental & Social Impacts
Environmental Risks *Effects of seismic surveys on Marine Mammals, Turtles and Fishes* **Petroleum Operations Phase** *Prospecting*	**Summary** Seismic surveys (air gun noise) has the potential to adversely affect the marine ecosystem. **Impacts** • Seismic surveys may produce temporary or permanent behavioral changes in marine mammals and sea turtles (e.g., attraction or avoidance). • Seismic surveys may produce temporary or permanent hearing impairment in some fishes, but would be unlikely to cause serious injury except at very close range. • Also, by disturbing fishes, air gun operations may indirectly cause a temporary reduction in fish catch near survey vessels. • Possibility of temporary exclusion of fishing activities from certain areas and potential gear damage or entanglement.
Environmental Risks *Impacts of all expected activities on Biodiversity* **Petroleum Operations Phase** *Prospecting, Exploration, Exploitation*	**Summary** Placement of any equipment and impact of drilling discharges have the potential to adversely affect sea-bottom species and habitats. **Impacts** • All above stated consequences of the prospecting phase will be much more significant than described above, as biodiversity hot-spots or important reproduction grounds are much more vulnerable and the density of affected marine ecosystem is much higher. • Disruption of reproduction cycle due to activities in all phases could have devastating impact on affected marine biota, resulting in reduction of numbers – in case of economic fish species also in dramatic decrease of already overfished fish populations. • Placement of any equipment and impact of drilling discharges on deep-water coral communities or chemosynthetic communities could represent a significant impact on biodiversity.

Affected Communities	Potential Mitigation Measures
• Authorities responsible for conservation and management of nature • Fishing sector and its employees • NGOs linked to nature protection, etc.	1) Required licenses to implement a protocol to reduce the risk of auditory trauma to affected marine biota. 2) The protocol should include at minimum provisions for soft start, visual monitoring, and shutdown of the array. 3) Pre-agreement with fishing sector on coordination of activities.
• Authorities responsible for conservation and management of nature; • Tourism sector and its employees; • Fishing sector and its employees; • NGOs linked to nature protection, etc.	1) Declaration of “exclusion areas” where all activities are prohibited. 2) Declaration of “seasonal ban on certain activities” in periods of reproduction or migration, etc. 3) Declaration of “best available techniques and technology” to be used to reduce expected impacts.

Potential Environmental & Social Impacts

Environmental Risks
Impacts of Sea Floor Disturbances on Submerged Infrastructure and Archaeological Resources

Petroleum Operations Phase
Prospecting, Exploration

Summary Depending on the type of drilling rig used, sea floor sediments could be disturbed/damaged during installation and removal of drilling rigs. The same applies for installation of production facilities.

Impacts
- Potential damage to shipwrecks or other submerged archaeological resources could be significant in cases where such activities would be implemented directly on or in vicinity of such objects/areas.
- Potential damage to submerged infrastructure (e.g. existing submerged telecommunication/energy infrastructure, etc.) could be significant in cases where such activities would be implemented directly on or in vicinity of such infrastructure.

Environmental Risks
Impacts of building new gas pipelines

Petroleum Operations Phase
Exploration

Summary A part of the plan is also construction of the on-shore gas pipeline. It is planned to use an existing disused railway route (except for a smaller part around Beirut where offshore pipeline is planned).

Impacts
- Loss of agricultural land and impacts on different types of on-shore protected areas (e.g. drinking water protection zones, natural heritage areas, cultural heritage areas, etc.)
- Potential resettlement of individuals and businesses linked to existing housing within the corridor.
- Potential conflicts with crossings of other existing infrastructure and potential buffer zones of high risk industrial zones.
- Identified conflict between proposed onshore pipeline using the disused railway as a route and the plan to resurrect the railway line for public transport.

Environmental Risks
Impacts of Oil Spills and Gas Releases

Petroleum Operations Phase
Exploration, Exploitation

Summary Such events are rare and result from accidents. There are numerous mitigation measures in use by the industry to prevent such events. However, accidents do happen.

Impacts
- Potentially affected resources could in “worst case scenarios oil spills” include water quality, air quality, benthic communities, marine mammals, sea turtles, marine and coastal birds, coastal habitats, protected areas, recreation and tourism and coastal communities. Response and cleanup activities in coastal and offshore waters could interfere with local fishing and shipping activities.
- An accidental gas release could have significant localized effects on air quality and human health. The extent of the risk would depend on the size and gas concentration of the release and ambient meteorological conditions.

Affected Communities	Potential Mitigation Measures
• Authorities responsible for conservation and management of cultural heritage; • Tourism sector and its employees; • NGOs linked to cultural heritage protection, etc.	1) Declaration of "exclusion areas" where all activities are prohibited. 2) Remote sensing survey of the sea floor to evaluate the potential for shipwrecks and other submerged archaeological resources or submerged infrastructure prior to implementation of any activities. 3) Coordination with other sectors responsible for management of submerged infrastructure.
• Authorities responsible for public health and public transport; • Affected local communities; • Individuals and businesses who will need to be resettled; • CSOs linked to civil rights and high quality of living, etc.	1) Alternative corridors avoiding identified critical locations. 2) Pre-agreement with local communities, businesses and individuals who will be resettled.
• Authorities responsible for public health, accidental preparedness and response • Individuals and businesses in the fishing, tourism and shipping sectors • NGOs related to environmental protection	1) Additional oil spill trajectory modelling is recommended to aid in predicting the fate of an oil spill at various locations in the licensed area, identifying potentially affected environmental resources, and determining minimum response times for contingency planning. 2) Periodical testing of preparedness and response for big accidents of all involved services (also on international level). 3) Legally binding contracts with operators ensuring liability for any environmental damages.

Table 2.

Summary of recommendations: needed improvements to Lebanon's 2012 Strategic Environmental Assessment (SEA)

Step In The Renewed SEA Process	***Already Delivered By The Existing SEA Process***	***Should Be Delivered By The Renewed SEA Process***
PLAN - Preparation of the Draft Plan for Petroleum Activities in Lebanese Waters	A substantial amount of very well presented and useful information on expected oil and gas activities. Description of 7 scenarios.	We recommend that the responsible planning authority prepare an overall strategic document with clearly defined content and full description of planned activities. It is not necessary that such a plan be very voluminous, but it should be very concrete.
SEA - Stakeholder and interested public engagement plan	Transparent overview of the implemented stakeholder involvement and all set-up registers (e.g. Legal Register, Stakeholder Register; Consultation Register; Concerns Register) can be used for the preparation of the Stakeholder and interested public engagement plan and its implementation.	This should be one of the first activities in the SEA process carried out by selected SEA practitioners, given that the design and implementation of this plan will to a large extent influence the level of involvement of stakeholders and interested public in the SEA process. We recommend appropriately expanding the list of stakeholders and interested public In order for this step to be successful; it will also require close cooperation of the responsible planning authority, as well as clear support from the Lebanese Government.
SEA - Collection of all available data surveys and baseline analysis carried out since 2012	Significant parts of a very concrete and straightforward gap analysis could be used for the purpose of baseline analysis.	We hope that identified data efficiencies motivated responsible authorities to begin with systematic data collection since 2012. Collection of all such available data surveys and baseline analysis should be done. Collected information should be analyzed, thus up-grading the findings of the existing SEA. (same comment previously made applies here as well)
SEA - Scoping	Identified environmental and social issues from the gap analysis could be used for the purpose of scoping. Description of 7 scenarios and evaluation of their potential impacts can be used in scoping. Oil-spill modeling scenarios can be used in scoping.	Key aim of this step is to review all environmental and social issues and to identify the most important ones to be further assessed in the next steps of the SEA process. Well-defined scope of the assessment enables keeping SEA focused on the key issues. Scoping should also preliminary outline: Possible alternatives or options which should be addressed within the SEA. Territorial dimension of likely impacts. Analyses and surveys to be conducted, as well as methods and tools to be used. Stakeholders to be involved and the level and nature of their involvement in the SEA process.

Step In The Renewed SEA Process	*Already Delivered By The Existing SEA Process*	*Should Be Delivered By The Renewed SEA Process*
SEA - Development of environmental goals and sets of environmental indicators	Parts of the gap analysis could be used to define environmental goals and environmental indicators.	We recommend that environmental goals of the SEA are defined, corresponding to identified key environmental issues. It is considered good practice to also define a clear set of verifiable environmental indicators. Indicators have to be clearly linked to environmental goals and are a very transparent tool to show how proposed activities will impact key environmental aspects.
PLAN & SEA - Preparation of relevant and realistic alternatives	The current SEA Report identifies several alternatives, but unfortunately doesn't deliver their presentation or assessment.	We highly recommend that responsible planning authorities and the SEA team seriously consider different types of alternatives, which could be realistically implemented in practice. These can be linked to alternatives like: "location alternatives" (e.g. limited number of blocks open for interventions, alternative corridors for the gas pipeline, etc.), "timeline alternatives" (e.g. prescribed order of blocks to be opened for implementation of planned activities, time periods that have to pass and conditions that have to be met in this time period before the next block is open for implementation of planned activities etc.), "exclusion zones" (e.g. zones where all or certain interventions are not allowed due to protected areas, important marine spawning grounds, underwater archeological sites, underwater infrastructure corridors, etc.), any other relevant alternatives developed in the SEA process.
SEA - Baseline analysis / Current state of the environment	Parts of the gap analysis could be used for the purpose of definition of current state of the environment	Evaluation of likely impacts cannot be conducted without proper understanding of the existing situation for the key issues identified in scoping and their likely evolution without the plan. We recommend that it be based on key conclusions of the previously described step 5. Baseline analysis provides a basis for impact assessment, formulation of mitigation measures and monitoring scheme.

Step In The Renewed SEA Process	*Already Delivered By The Existing SEA Process*	*Should Be Delivered By The Renewed SEA Process*
SEA - Impacts analysis and formulation of mitigation measures with monitoring	Parts of the gap analysis could be used for the purpose of impact analysis. Presentation of 7 scenarios and evaluation of their potential impacts can be used in impact identification and analysis. Very useful oil-spill modeling scenarios can be used in impact identification and analysis. Elements of the impact analysis are to certain extent delivered in chapters "3. Scenarios" and "4. Risk and impact assessment and evaluation".	Any SEA review should analyze the significant adverse, as well as positive effects of the proposed plan or its alternatives. In the interest of clarity and transparency, a verifiable methodology should be prepared, if possible based on environmental indicators. It is extremely important not to focus only on the individual impacts, but to also address likely cumulative effects, which can result from individually minor, but collectively significant actions taking place over a period of time. Based on the identified and assessed impacts the SEA must suggest measures to address the likely adverse effects, as well as enhance positive impacts. As a final step, appropriate monitoring scheme must be designed to ensure appropriate monitoring of implementation of planned activities and interventions.
SEA - Compiling the SEA Report	N/A	The aim of this stage is to prepare an easily readable and understandable SEA Report, which provides all important information, data, conclusions and recommendations in a clear way. This is very important, as it serves as a basis for consultations with relevant authorities, stakeholders and interested public. Optimally, the report should also indicate if (and how) any inputs from SEA have been already accepted and integrated into the plan.
SEA – Quality control	N/A	The SEA Report provides inputs to the decision-making process. The quality control should thus ensure that SEA Report provides reliable and objective information to be considered when adopting the plan. We recommend that a relevant quality control mechanism be applied in the renewed SEA process. It is also our recommendation that renewed SEA process should include extensive stakeholder consultations in SEA Report development phase.
PLAN & SEA - Public consultations with key stakeholders and interested public	N/A	It is our recommendation that renewed SEA process should include extensive public consultations based on final draft of the SEA Report. The SEA Report should be accompanied by the "non-technical summary", which should cover all main SEA phases and be written in plain English. The main purpose of this summary is to ensure that the SEA Report is easily understandable by the general public, and becomes the base document for public discussion. Public consultations can take many forms and it is important that the Stakeholder and interested public engagement plan clearly indicates how, when and where public consultations will be implemented.

Step In The Renewed SEA Process	Already Delivered By The Existing SEA Process	Should Be Delivered By The Renewed SEA Process
PLAN & SEA - Transboundary consultations	N/A	We also recommend that, based on results of the renewed SEA Report, neighboring countries should be notified in light of potential tran-sboundary impacts and proposed mitigation measures. Such an approach can significantly strengthen the trust between countries, present Lebanon as a responsible and constructive partner in Eastern Mediterranean region and most importantly assure pre-agreed and well-coordinated response in case of unexpected events. We emphasize that such an approach is extremely important as similar strategies, plans and programs adopted by other countries might also have significant impacts on Lebanese territory. Thus, cooperation is critical to ensure sustainable development and ensure adequate protection of the environment.
SEA - Potential revision of the SEA Report	N/A	Responsible planning authority and SEA practitioners should review all received comments during public consultation and tran-sboundary consultation processes. They should decide whether comments are sound, well augmented and constructive. In the event that they are not, the SEA Report should be revised.
PLAN - Integration of mitigation measures from the SEA Report into the Plan	N/A	It is the responsibility of the responsible planning authority to make sure that mitigation measures from the SEA Report are appropriately integrated into the plan. Decision-makers should consider findings and conclusions provided by SEA Report and decide whether their integration into the plan are appropriate.
PLAN & SEA - Adoption of the SEA Report and the Plan	N/A	The existing international good practice insists that the SEA is always prepared for a concrete strategy, plan or program and that both documents are adopted together.

BRIEF

The Review of the Strategic Environmental Assessment (SEA) for Petroleum Activities in Lebanese Waters

The Client

Lebanese Oil and Gas Initiative (LOGI)

The Contractor

ZaVita, svetovanje, d.o.o.

Team Leader and Key Expert:
Klemen Strmšnik, B. Sc. Geography

Supporting Team Members
Matjaž Harmel, B. Sc. Forestry
Sabina Cepuš, B. Sc. Environmental Sciences

About ZaVita svetovanje Ltd.

ZaVita svetovanje Ltd. is a consultancy company created by a group of experts in the fields of environmental protection, management of natural resources, nature conservation, rural development and strategic planning. Its clients include international institutions, national authorities, local communities, and private companies.

Introduction

INTRODUCTION

Background

Scientific estimates suggest that Lebanon may hold substantial amounts of oil and gas in its onshore and offshore territories. If proven, such reserves could potentially allow Lebanon not only to meet its own domestic energy demand, but also to become an oil and gas exporter – providing a substantial source of revenue, which could be channeled towards public services to improve the lives of its citizens. Naturally, the Lebanese Government initiated the process of setting-up the system for exploitation of oil and gas, as well as the process of the first offshore exploration and production licensing.

To support these on-going processes and ensure that potential negative impacts are appropriately controlled and minimized, while benefits are maximized, the Government of Lebanon has commissioned a comprehensive Strategic Environmental Assessment (SEA). RPS Energy Ltd was awarded the contract to develop the SEA for the Offshore Petroleum Sector in Lebanon on behalf of the Ministry of Energy and Water and it was completed in 2012. In 2014, in response to demands from civil society, the Lebanese Petroleum Administration (LPA) released its SEA – an eight-volume study that evaluates the likely environmental and social impact of introducing and developing oil and gas activities in Lebanon.

2017

Lebanon announced ratification of two oil and gas decrees

However, a political deadlock in Lebanon led to a standstill of the exploration process. At the beginning of 2017 the Lebanese Government announced ratification of two oil and gas decrees - one pertaining to block delineation and the other to the Tender Protocol and Exploration and Production Agreement (EPA), thus moving Lebanon closer to exploring for oil and gas in its offshore waters. However, there are still some major challenges to overcome in this process. The LPA is currently developing a health, safety and environment (HSE) action plan, but civil society has not been consulted on this plan to date. The SEA study itself, its findings and the implications of developing oil and gas reserves remain highly complex and incomprehensible to the Lebanese public.

Context And Objectives Of This Review

Transparency and accountability will be crucial in ensuring environmentally and socially sustainable use of these strategic natural resources. There is a short but critical window of opportunity to strengthen the capacity of civil society to engage with the Lebanese Government on issues relating to social and environmental impacts; and how these can be managed and mitigated to safeguard current and future generations. Now is the time for civil society to focus on building its own capacities so that it can play a meaningful role in this decision making process.

The Lebanese Oil and Gas Initiative (LOGI) in collaboration with Publish What You Pay (PWYP) and other civil society groups launched a project that aims to strengthen civil society participation in Lebanon's oil and gas sector development and mitigate the social and environmental impacts of resource extraction. The objectives of this project are as follows:

1. To promote meaningful participation of civil society in mitigating environmental and social impacts of extractive industry activities in Lebanon.
2. To ensure that the HSE action plan includes strong environmental safeguards by enabling civil society, especially environmental organizations, to participate in the development of the plan.
3. To establish an effective and collaborative network of civil society organizations in Lebanon to ensure sustained and informed participation by civil society as Lebanon's extractive sector is developed further.

Promotion of meaningful participation of civil society in mitigating environmental impacts of extractive sector activities in Lebanon will happen by raising the level of understanding and awareness of Lebanese civil society around the social and environmental consequences of the prospective offshore exploration.

The project partners decided to involve independent international experts to review, synthesize, constructively critique and disseminate the findings of the SEA in a more comprehensible way to citizens, civil society, media and decision makers, thus supporting and promoting transparency and accountability of the decision making process. This review is composed of the following 3 parts:

1. Part 1 of this review delivers key messages of the Review of the SEA. They were summarized based on the findings of Part 2 of this report. It is primarily aimed at decision makers and delivers general conclusions and overall recommendations.
2. Part 2 delivers a much more technical expert evaluation of the SEA and concrete recommendations. It is primarily aimed at responsible planning authorities, SEA practitioners and relevant stakeholders.
3. Part 3 delivers concrete recommendations on needed next steps. It is aimed at all the involved parties including decision makers, responsible planning authorities, SEA practitioners, relevant stakeholders, as well as the general public.

Project Aim

- *Strengthen civil society participation in Oil and Gas*
- *Mitigate the impacts of resource extraction*

PART 1:

Main Conclusions of the Review of the SEA for Petroleum Activities in Lebanese Waters

MAIN CONCLUSIONS

Of The Review Of The SEA For Petroleum Activities In Lebanese Waters

We hope that responsible planning authorities and decision makers in Lebanon will understand this document as a constructive step forward in ensuring appropriate protection of environment and society in Lebanon. It is not our goal to block future development, however we want to make sure that exploitation of any natural resource in Lebanon is planned and executed in a transparent, controlled and sustainable manner.

It is our wish to become a constructive partner in this decision making process. This is why we decided to prepare the Review of the SEA for Petroleum Activities in Lebanese Waters, which delivers transparent, augmented and, above all, constructive suggestions for improvement of this very important document.

We strongly believe that the SEA upgrade will result in better solutions for oil and gas developments and will significantly reduce potential negative impacts. But most importantly, such a development plan will be widely accepted and supported by Lebanese society and will be subsequently easier to implement in practice.

We also hope that such cooperation will become a new standard in any decision-making process in Lebanon.

SEA

Developed in line with EU SEA Directive (2001/42/EC) guidance documents

Before delivering main conclusions, we would like to state that the review team attempted to understand the wider context and conditions under which the SEA was prepared. The following facts influenced the quality of the SEA preparation:

- The SEA Decree was officially adopted by the Lebanese Government in May 2012. Thus, it would be unrealistic to expect that this SEA was prepared in line with current legislation, as it was prepared in the period 2011/2012. However, the SEA team made it clear that they consider that the SEA was prepared in line with EU SEA Directive (2001/42/EC) guidance documents.
- The Gap Analysis identified significant lack of current, systematically collected and reliable data on the vast majority of environmental and social issues. In such cases, existing international good practice strongly recommends the use of the "precautionary principle" – unfortunately, in this case this principle was used only on a "declarative level".
- Only limited information was available to the SEA team about proposed interventions as the responsible planning authorities did not deliver an overall strategic document (e.g. Strategy, Plan or Programme). Instead, responsible planning authorities delivered

a generic exploration, exploitation and production plan based on the assumption that typical activities would be implemented. Subsequently, the SEA team was forced to base their assessment on potential scenarios, which were based on a relatively long list of assumptions, results of available seismic surveys, a map of blocks and proposed corridor for onshore pipeline.

- According to the SEA Report, the SEA team was faced with unresponsive and sometimes openly un-cooperative stakeholders. There are many reasons for this situation, however it is the responsibility of the decision makers to support the SEA process and ensure free access to relevant plans, information and data.

Conclusion 1:

The SEA was not prepared for a concrete strategic document with clearly defined content.

Only limited information was available to the SEA team about proposed interventions, as the responsible planning authorities did not deliver an overall strategic document (e.g. Strategy, Plan or Programme). Instead, responsible planning authorities delivered a generic exploration, exploitation and production plan based on the assumption that typical activities would be implemented. Subsequently, the SEA team was not given a clear set of planned activities for evaluation. This is a significant obstacle for any SEA, as without a concrete plan one can never be sure which activities are actually part of the plan. This is why existing international good practice insists that a SEA is always prepared for a concrete strategy, plan or program and that both documents are adopted together.

As a direct response to vague description of planned activities the SEA team developed 7 scenarios that were based on expert opinion and a substantial list of assumptions. The SEA itself states: "Some of these may ultimately prove unfounded, but they were made with expert judgment using available information at the time and an assessment of comparable findings in the East Mediterranean." If these assumptions indeed prove "unfounded" this could significantly influence the conclusions of the SEA. In this case revision of the SEA might be necessary at later stages, when more data will be available.

Recommendation 1:

It is our recommendation to responsible planning authorities to prepare an overall strategic document with clearly defined content and full description of planned activities.

Without a concrete strategic document and a well-developed framework of proposed activities it is very hard to deliver a comprehensive and high quality SEA. It is not necessary that such a plan is very voluminous, but it should be very concrete. Since the Lebanese government is in the process of the first licensing round, we believe that there is much more information available to the SEA team than there was in 2011/2012 period (e.g. in which blocks activity will first start, data surveys/baseline analysis prepared by the Lebanese responsible authorities in the last 4 years, etc.).

Such new information represents significant change of the plan, which was the subject of the SEA. From our point of view such a document should encompass at least the following information:

1. Delineation of blocks where activities will take place and planed order in which they will opened for implementation of planned activities (with conditions under which they will be opened for implementation of planned activities).

2. List of expected activities (with general description) to be implemented in every phase – 1) prospecting; 2) exploration; 3) exploitation; 4) decommissioning.

3. List of all connected activities considered to be an integral part of the document – clearly stating and describing interventions like onshore interventions (e.g. conversion of existing oil-power plants into gas-power plants, building of the onshore coastal gas pipeline, etc.) and identifying potential alternatives (e.g. alternative corridors for the gas pipeline, alternative order of blocks to be opened for implementation of planned activities, etc.).

4. Proposed timeline for adoption of this document with clearly stated 1) key procedural steps where public consultations will be implemented and 2) key procedural steps in which findings from the SEA Report will be incorporated into the plan.

5. Only if we know what activities or interventions are the subject of the SEA, we can discuss their impacts in a transparent and well articulated manner. This expectation is supported by existing international good practice, which insists that the SEA is always prepared for a concrete strategy, plan or program and that both documents are adopted together.

Conclusion 2:

The SEA Report is missing several key components and cannot be considered complete in line with EU and international guidelines.

The aim of any SEA Report is to prepare a well-readable and understandable document, which provides all important information and data, conclusions and recommendations in a clear and transparent way. This is very important as it serves as a basis for consultations with relevant stakeholders and interested public. Optimally, the report should also indicate if (and how) any inputs from SEA have been already accepted and integrated in the draft plan or program.

There is no doubt that the SEA team put a lot of effort into development of this SEA. It delivers a substantial amount of very well presented and useful information on expected oil and gas development, a concrete and very straightforward gap analysis, very useful oil spill modeling scenarios, transparent overview of the implemented stakeholder involvement, as well as several documents which are usually not a part of the SEA (e.g. National Contingency Plan and Field Survey Instruction Manual) but rather individual documents prepared in the post-SEA phase.

It is unfortunate that all this effort was invested into the SEA without making sure that it will be used for its basic purpose, as it is one of our main conclusions that it fails to deliver all information and conclusions that any SEA should. Despite the fact that the SEA is voluminous, it is still missing several key components, its composition is very complex and crucial information can be found at different parts of all 8 volumes. This makes it very hard to read and interpret, even for experienced SEA practitioners.

Additionally, we must conclude that the SEA Report failed to deliver the majority of the key components in line with good practice and EU guidance:

- **Screening –** the SEA Report (vol. 1) does not provide any information about this step of the SEA. However, there is no doubt that a SEA is needed in case of preparation of such strategic document.

- **Scoping –** the SEA Report (vol. 1) does provide some sort of scoping when it identifies "significant issues" and "key issues" in chapter 3. Scenarios. However, it is not clear how a long list of "significant issues" from chapter 3 was reduced to the list of 13 "key issues" proposed for further assessment. This is important as it is not clear why and how usually important environmental issues (e.g. degradation of marine biodiversity, pollution of sea-water, impact on fish stocks, etc.) were eliminated from further assessment. This raises serious doubt that the scoping step was done in a clear, transparent and well articulated manner.

- **Baseline analysis / Current state of environment** - the SEA Report does not deliver any type of Baseline analysis / Current state of environment summary or the link to Vol. 4 where similar data is presented (though not in needed quality). As stated later-on this proves to be problematic from clarity, transparency and argumentation point of view.

- **Impact analysis and evaluation** - Impact analysis and evaluation is to a certain extent delivered in chapters "3. Scenarios" and "4. Risk and impact assessment and evaluation". However, in chapter 3 only the significance of expected impacts of 7 scenarios is evaluated. On the other hand, chapter 4 delivers only a description of proposed methodology to be used, while no actual assessment of impacts is delivered. This is recognized as a serious deficiency and it puts all conclusions and recommendations delivered in chapter "6. Assessment and recommendations" under a serious and substantial question mark. Additionally, trans-boundary issues and cumulative impacts have not been addressed by the SEA Report. It is our strong opinion that this is not acceptable, as cumulative and trans-boundary impacts are key impacts to be dealt with on the SEA level. Additionally, no alternatives were identified, evaluated or suggested by the SEA.

- **Mitigation measures and Monitoring** - In the end the SEA Report does not deliver a clear and transparent set of mitigation measures aimed at activities planned with the plan for petroleum activities in Lebanese waters or a concrete monitoring plan. A monitoring framework is very important for monitoring the implementation of oil and gas development activities and serves as an early warning system if something does not go "according to plan".

Missing from SEA (vol.1)

- *Screening*
- *Scoping*
- *Baseline Analysis*
- *Impact Analysis and Evaluation*
- *Mitigation Measures & Monitoring*

Based on the above critique we must conclude that the SEA Report did not deliver:

- Environmental goals to be targeted and a set of verifiable indicators clearly stating links between proposed activities of the plan and their impacts on environment.
- Relevant assessment of activities linked to the proposed plan in expected quantity and quality.
- Answers to main questions put in front of the SEA team – e.g. which activities are/are not acceptable from the environmental point of view? Which scenario should/shouldn't be followed and why? Are there any alternatives to proposed actions and what kind of impacts could be linked to them? Which are the proposed changes of the plan?
- A clear and concrete set of mitigation measures clearly linked to proposed activities or the framework for their implementation.
- A monitoring framework for monitoring proposed activities during their implementation.

In the end, we must conclude that the SEA Report from the scoping phase on fails to deliver key information, conclusions and argumentation, which would normally be expected from such a document. Subsequently, the SEA Report leaves the SEA process incomplete and in our opinion it cannot be considered adequate for the decision making process.

This puts under question mark even the prepared National Contingency Plan, as it is not based on clear and properly backed conclusions or explicit mitigation measures from the SEA Report. It could happen that both, the National Contingency Plan and the Field Survey Instruction Manual, will need substantial updates if this SEA will be improved based on comments and recommendations delivered by this review.

Recommendation 2:

It is our recommendation to responsible planning authorities and decision-makers to re-do the SEA.

Other SEAs developed recently & of adequate quality

1. Cyprus

2. Montenegro

3. Croatia

Based on the above stated conclusion and its argumentation we strongly believe that the SEA should be substantially up-graded form all procedural, methodological and content points of view. We also believe that a revised SEA would point to other (so-far) unidentified or less developed issues. We base this conclusion on results of similar SEAs prepared in recent years in the wider Mediterranean region.

We would like to emphasize that there were several good practice guidelines developed in the last few years, which are based on practical experience from different countries all over the world. Additionally, this SEA review team is aware of at least 3 SEAs in the last few years, which were all prepared for exploration, drilling and exploitation phases of off-shore oil and gas development activities in Mediterranean region. They were prepared in Cyprus, Montenegro and Croatia and they were all prepared at an adequate quality sought for by this review.

This is why we strongly believe that a high quality SEA can also be prepared for petroleum activities in Lebanese waters. We recommend that the renewed SEA is prepared:

- In line with the new SEA and EIA legislative frameworks adopted in Lebanon in 2012.
- In-line with EU and international good-practice guidelines developed in the last few years, which are based on practical experience from different countries all over the world.
- In-line with findings of this review and based on above proposed main components of the SEA Report.
- Based on findings of similar SEAs prepared in the last few years for exploration, drilling and exploitation phases of off-shore oil and gas development activities in the Mediterranean region.
- Based on extensive and constructive involvement of stakeholders and interested public.

Conclusion 3:

The SEA is voluminous and its composition is confusing. This makes it hard to interpret even by experienced SEA practitioners, let alone the general public. The SEA Report was also not presented through public consultations.

We already concluded that the current SEA is voluminous, that its composition is very complex and that crucial information can be found at different parts of all 8 volumes. This makes it very hard to read and interpret, even for experienced SEA practitioners. This also means that it is virtually "unreadable" for the general public and as such fails to clearly and transparently present main findings and conclusions. We strongly believe that as such it cannot be used as a basis for consultations with relevant stakeholders or the interested public. Subsequently, the SEA Report leaves the SEA process incomplete and in our opinion it cannot be considered adequate for the decision making process.

It is our understanding that public consultations were not carried out based on the SEA Report and that no trans-boundary consultations have been initiated so far. As a response, we have to state that in line with EU guidelines and good practice both consultations should have been carried out. Comments from the consultation processes should have been noted and taken into consideration in the decision-making process and if needed the SEA Report should also have been up-graded in line with relevant comments.

Additionally, we recognized that the SEA team underestimated the importance of the SEA and overall stakeholder involvement in the decision-making process on the strategic level. It is the level of Strategy/Program/Plan which determines important strategic decisions which are very hard to contest at later detailed project development/ESIA phases. Yes, different types of stakeholders have different capacities and possibilities for constructive cooperation. They also play very different roles in the decision-making process. But it is one of the key roles of the SEA to ensure that all stakeholder considerations are heard and appropriately addressed.

Recommendation 3:

It is our recommendation that the renewed SEA process should include extensive stakeholder consultations in the report development phase, as well as extensive public consultations based on final draft of the SEA Report.

We strongly believe that only open and transparent communication with all stakeholders and the interested public can result in a widely accepted oil and gas sector development plan. The current SEA itself delivers well augmented recommendations for further communication in consultation processes. These should also be considered alongside recommendations from this report. Thus, we recommend that in a renewed SEA process the list of stakeholders is widened to at least include local communities and other potentially missed key stakeholders. The SEA Report should be accompanied by the "non-technical summary", which should be written in plain language and should cover all main SEA phases. The main purpose of this summary is to make the SEA Report understandable to the general public. We also suggest that a stakeholder and general public engagement plan are prepared in advance and appropriately implemented at different stages of the SEA process.

We also recommend that, based on results of the renewed SEA Report, neighboring countries should be notified in light of potential trans-boundary impacts and proposed mitigation measures. Such an approach can significantly strengthen the trust between countries, present Lebanon as a responsible and constructive partner in the Eastern Mediterranean region and most importantly assure a well-coordinated response in case of unexpected events. We emphasize that such an approach is extremely important as similar strategies, plans and programs adopted by other countries might also have significant impacts on Lebanese territory, thus cooperation is critical to ensure sustainable development and ensure adequate protection of the environment.

Conclusion 4:

Reviewed documents represent a very good and sound base for preparation of a complete SEA in line with EU and international guidelines.

Despite all the critiques, it is our opinion that reviewed documents could be used as a very good and sound base for preparation of a complete SEA in line with EU and international guidelines. This will also significantly shorten the renewed SEA process and allow the SEA team to focus on important issues.

Recommendation 4:

It is our recommendation that renewed SEA process should not start from scratch, but should rather build upon well-prepared elements of the reviewed documents.

As it is one of our main goals to constructively support this process we want to highlight the following elements of the current SEA that were very well done and useful for the renewed SEA process:

- A substantial amount of the very well presented information on expected oil and gas activities expected could be easily used to present the expected content of the plan.
- Parts of a very concrete and straightforward gap analysis could be used for baseline analysis.
- Presentation of scenarios and evaluation of their potential impacts can be used in both scoping and impact identification and evaluation.
- Very useful oil spill modeling scenarios can be used in impact identification and evaluation.
- Transparent overview of the implemented stakeholder involvement and all set-up registers (Legal Register, Stakeholder Register; Consultation Register; Concerns Register) can be used for the preparation of the stakeholders and general public engagement plan and its implementation.
- Several documents which are usually not a part of the SEA (e.g. National Contingency Plan and Field Survey Instruction Manual) but rather individual documents prepared in the post-SEA phase and be also built upon after the renewed SEA Report is delivered.

We strongly believe that the effort put into the reviewed document should not be lost, but rather harvested and used in the renewed SEA process.

CONCLUSIVE STATEMENT

We would like to sum-up the key message of this part of the review with the following statement.

We strongly believe that the current SEA Report and SEA process did not deliver expected results and should thus be re-done. Main reasons why the SEA should be re-done are:

1. There was new SEA and EIA legislative framework adopted in Lebanon in 2012 and any development plan of such importance as Petroleum activities in Lebanese Waters should be in-line with such important legislation.

2. The responsible planning authority did not provide an overall strategic document (e.g. Strategy, Plan or Programme) with clearly defined content to the SEA team for evaluation.

3. There was a 3-year gap between the SEA and further activities in oil and gas development. In between new information became available linked to development activities, which could significantly improve the quality of the SEA.

4. We hope that identified data efficiencies motivated responsible authorities to begin with systematic data collection – such new data on key environmental and social issues, which could significantly improve the quality of the SEA.

5. The SEA Report is missing several key components and cannot be considered complete in line with EU and international guidelines. The Review of the Strategic Environmental Assessment (SEA) for Petroleum Activities in Lebanese Waters delivers constructive and well-intended recommendations and suggestions for improvement of the SEA, which should be taken into account when re-doing the SEA.

6. It is necessary that the Lebanese Government ensures cooperation of all ministries and responsible authorities and delivery of all relevant strategic documents in order to properly check for conflicts of interest and evaluate cumulative impacts. The renewed SEA process should include extensive stakeholder consultations in SEA Report development phase, as well as extensive public consultations based on final draft of the SEA Report.

7. Since the Lebanese government is in the process of the first licensing round there is a unique window of opportunity to exploit al new available data and information, as well as conclusions of this review and to re-do the SEA in time before licenses are awarded and activities initiated. This would drastically improve the protection of the environment and decrease the likelihood of appearance of significant impacts.

PART 2:

Detailed Review of the SEA for Petroleum Activities in Lebanese Waters

DETAILED REVIEW

Of The SEA For Petroleum Activities In Lebanese Waters

Part 2 delivers a more technical expert evaluation of the SEA and concrete recommendations. As such, it is primarily aimed at the responsible planning authorities, SEA practitioners and relevant stakeholders.

2.1. Used approach and methodology

This project will be implemented in the period from March to June 2017 through the following stages:

1. Review of the SEA and development of constructive suggestions for improvement;
2. Communication with Lebanese government entities, key stakeholders, target groups and development of infographics;
3. Mission to Beirut and training workshop for dissemination of key SEA findings and messages.

Stage 1 -
Review of the SEA and development of constructive suggestions for improvement:

Firstly, the project team will collect all publicly available data on the Plan and the SEA for Petroleum Activities in Lebanese Waters. These documents will represent the basis for the review and will be thus shortly described in order to clarify which documents were the subject of the review.

Secondly, the project team will review all documents and comment them using a matrix based technique presented below. Potentially identified shortcomings will be clearly stated or described. Experts will deliver experience based and well-argumented comments, as well as concrete suggestions for improvement of the SEA. In this way, the project team will focus on identified shortcomings in a transparent, concrete and constructive manner.

No.	Report Segment/Chapter	Comments	Suggestions for Improvement
1			
2			

Results from this phase of the project will be summarized in a special chapter dedicated to conclusions and policy memo and delivered to the client in a form a coherent Final Draft Report. Based on the Report an explanatory web-conference will be held with the client to explain the conclusions, train LOGI staff and coordinate further steps.

Stage 2 -
Communication with Lebanese government entities, key stakeholders, target groups and development of infographics

We expect that the Client will circulate the Final Draft Report to Lebanese government entities and key stakeholders and collect their feedback and suggestions for improvement. In case of need, additional explanatory web-conferences might be organized. The Final Report will be developed based on the feedback received. In the meantime, the client will start developing material for awareness campaigns and the project team will help them vulgarize and simplify the key SEA messages. These infographics, animations, and videos will be used to facilitate workshops with communities (e.g. Unions of Fishermen) and social media campaigns for key target groups.

Stage 3 –
Mission in Beirut and training workshop for dissemination of key SEA findings and messages:

The project team leader will also support the Lebanese Oil and Gas Initiative (LOGI) and Publish What You Pay (PWYP) by traveling to Beirut and:

- Actively participating in meetings with various government entities – this includes preparation for the meetings with LOGI/PWYP representatives, presentation and argumentation of conclusions of the SEA review to various government entities, and leading a constructive discussion and debate leading to final recommendations.
- Design and deliver workshop trainings in Beirut to disseminate the findings of the SEA review.

2.2. *Short description of reviewed documents*

This Review is focused on the SEA for Petroleum Activities in Lebanese Waters, which was prepared by the company RPS Energy Ltd in the period 2011/2012 and is publicly available at the official web-site of the Lebanese Petroleum Administration – on the following web-link: http://www.lpa.gov.lb/sea.php.

The SEA is composed out of the following 8 volumes:

1. Vol. 1 SEA Report (2197-RPT-ALL-0002 rev 0);
2. Vol. 2 National Contingency Plan (2197-RPT-ALL-0003 rev 1);
3. Vol. 3 Stakeholder Management (2197-RPT-ALL-0004 rev 0);
4. Vol. 4 Gap Analysis (2197-RPT-ALL-0001 rev 1);
5. Vol. 5 GIS (2197-RPT-ALL-0005 rev 1);
6. Vol. 6 Registers (2197-RPT-ALL-0006 rev 0);
7. Vol. 7 Onshore Pipeline Route (2197-MAP-ALL-0001 rev 0);
8. Vol. 8 Field Survey Instruction Manual (2197-PRC-ALL-0002 rev 1).

Even though only Vol. 1 is directly dedicated to the Strategic Environmental Assessment, for this assignment all 8 volumes are understood as integral and supporting documents to the Vol. 1 document.

In addition to the stated documents, the evaluation team (supported by LOGI staff) asked the Lebanese Petroleum Administration to deliver the CD containing GIS data used in the preparation of the SEA. This CD should be annexed to Vol. 5. However, the data is not available online. Unfortunately, at the time of preparation of this document we did not receive the requested information and it was subsequently not included in this review.

It is important to state that The SEA Decree was officially adopted by the Lebanese Government in May 2012. Thus, it would be unrealistic to expect that this SEA was prepared in line with the current legislation, as it was prepared in the period 2011/2012. However, the SEA team made it clear that they consider that the SEA was prepared in line with EU SEA Directive (2001/42/EC) guidance documents.

2.3. *Comments on reviewed documents with suggestions for improvement*

Before delivering comments on reviewed documents with suggestions for improvement, we would like to state that the review team tried to understand the wider context and conditions under which the SEA was prepared. This is why we decided to state the most important factors which, in our opinion, influenced the quality of the SEA, as it was prepared.

1. The SEA Decree was officially adopted by the Lebanese Government in May 2012. Thus, it would be unrealistic to expect that this SEA was prepared in-line with current legislation, as it was prepared in the period 2011/2012. However, the SEA team made it clear that they consider that the SEA was prepared in line with EU SEA Directive (2001/42/EC) guidance documents.

2. The Gap Analysis identified a significant lack of reliable data on a large number of environmental and social issues. The best approach would be the collection of the needed data before the SEA Report is completed. However this would significantly prolong the process of adoption of the plan. In such a scenario, existing international good practice strongly recommends the use of the “precautionary principle”* in this case, this principle was used rather on a “declarative level”.

3. Only limited information was available to the SEA team about proposed interventions as the responsible planning authorities did not deliver an overall strategic document (e.g. Strategy, Plan or Program). Instead, responsible planning authorities delivered a generic exploration, exploitation and production plan based on the assumption that typical activities would occur. Subsequently, the SEA team was forced to base their assessment on potential scenarios, which were based on a relatively long list of assumptions, results of available seismic surveys, a map of blocks and proposed corridor for on-shore pipeline. This is a significant obstacle, as without a concrete plan one can never be sure which activities are actually part of the plan and which are not.

4. According to the SEA Report, the SEA team was faced with unresponsive and sometimes openly uncooperative stakeholders. It is the responsibility of the decision-makers to support the SEA process and ensure free access to relevant plans, information and data. According to existing international best practices, the SEA is the responsibility of the adequate planning authority – this means that no strategy, plan or program should be approved without an SEA or based on an inadequate SEA.

The table below lists detailed comments on all 8 volumes of the SEA. For better clarity and transparency, comments are listed for each volume separately, although volumes are interconnected and some comments refer to several volumes.

** The precautionary principle (or precautionary approach) to risk management states that if an action or policy has a suspected risk of causing harm to the public, or to the environment, in the absence of scientific consensus (that the action or policy is not harmful), the burden of proof that it is not harmful falls on those taking that action.*

The principle is used by policy makers to justify discretionary decisions in situations where there is the possibility of harm from making a certain decision (e.g. taking a particular course of action) when extensive scientific knowledge on the matter is lacking. The principle implies that there is a social responsibility to protect the public from exposure to harm, when scientific investigation has found a plausible risk. These protections can be relaxed only if further scientific findings emerge that provide sound evidence that no harm will result.

In some legal systems, as in law of the European Union, the application of the precautionary principle has been made a statutory requirement in some areas of law.

VOL. 1 SEA REPORT

1.1 General Comment

The aim of any SEA Report is to prepare a well-readable and understandable document, which provides important information, data, conclusions and recommendations in a clear and coherent way. This is very important as it serves as a basis for consultations with relevant stakeholders and interested public. This is why conclusions and recommendations have to be clearly formulated i.e. SEA report needs to explicitly describe:

- Identified impacts to the environment, their characteristics (direct/indirect, short/medium/long-term, cumulative/synergy, transboundary) significance and level of acceptability from the environmental point of view,
- What is suggested (mitigation measures, monitoring schemes, conditions to be adopted by decision-makers etc.),
- Why it is suggested (e.g. in order to minimize certain adverse effects), and
- Who / which institutions should perform these actions (planning agency, project developer, environmental agencies, decision-makers etc.).

Optimally, the report should also indicate if (and how) any inputs from SEA have been already accepted and integrated in the draft plan or program.

In light of the above listed expectations, it is our overall conclusion that the SEA Report (Vol. 1) is missing several key components and cannot be considered complete in line with EU and international guidelines. Even if we consider all 8 volumes of the SEA to be integral parts of the SEA Report, the conclusion is the same.

We find the SEA (all 8 volumes) voluminous and its composition confusing, even for experienced SEA practitioners. It would be extremely helpful if the SEA team would make systematic connections between different volumes of the SEA, especially when some chapters in Vol. 1 are based on conclusions from another volume (e.g. Vol. 4). Currently, there is a lot of confusion as Vol. 1 does not contain at least main conclusions made at different phases of the SEA implementation.

Although each SEA should be tailor-made – considering the main features of the plan or program, characteristics of the area affected by the plan or program, key environmental and health problems to be addressed within the assessment etc. – there are several common steps which are typically performed within any SEA process in line with EU and international guidelines. Thus, any SEA Report should include the following key chapters:

- Screening
- Scoping
- Baseline analysis / Current state of environment
- Impact analysis and evaluation
- Mitigation measures
- Monitoring

Unfortunately, the SEA Report is not compiled in this manner and does not provide such data in any other adequate form or quality in other 7 volumes. Below we deliver summarized argumentation for stated conclusions, but more detailed explanations can be found in comments linked to individual chapters.

Although the SEA Report (vol. 1) does not provide any information about the screening step of the SEA, there is no doubt that SEA is needed in case of preparation of such strategic document.

The SEA Report does not deliver any type of Baseline analysis / Current state of environment summary or the link to Vol. 4 where similar data is presented (though not in needed quality). As stated later-on this proves to be problematic from clarity, transparency and argumentation point of view.

It is our overall conclusion that the SEA Report is missing several key components and cannot be considered complete in line with EU and international guidelines.

The SEA Report (vol. 1) does provide some sort of scoping when it identifies “significant issues” and “key issues” in chapter 3. Scenarios. It is not clear how a long list of “significant issues” from chapter 3 was reduced to the list of 13 “key issues” proposed for further assessment. It is not clear why and how important environmental concerns (e.g. degradation of marine biodiversity, pollution of sea-water, impact on fish stocks, etc.) were eliminated from further assessment. Also, the identified 13 “key issues” are a mix of environmental/economic/socio-cultural/industrial/other issues. The stated comments raise serious doubts that the scoping step was done in a clear, transparent and well thought manner. We strongly believe that a part of this problem is rooted in the fact that no baseline analysis data is provided in the SEA Report and is subsequently not taken into account by other parts of the SEA Report.

Impact analysis and evaluation is to a certain extent delivered in chapters 3. Scenarios and 4. Risk and impact assessment and evaluation. However, in chapter 3 only the significance of expected impacts of 7 scenarios is evaluated. On the other hand, chapter 4 delivers only a description of proposed methodology to be used, while no actual assessment of impacts. This is a serious deficiency.

Additionally, it is not clear how and why important environmental and social topics were excluded from further assessment, as they were clearly identified both in chapter 3 and Vol. 4. Some other topics like adaptation of planned actions to Climate Change or Earthquake zones were not addressed at all.

In the end the SEA Report does not deliver a clear and transparent set of mitigation measures when it comes to activities planned in Lebanese waters or a concrete monitoring plan.

In fact, we could conclude that the SEA Report from the scoping phase on fails to deliver key information, conclusions and their argumentation, which would normally be expected from such a document.

Suggestion for Improvement/Recommendation

In light of this, as well as other general and specific comments, it is our overall recommendation that the SEA should be redrafted. In this process, all comments, suggestions and recommendations should be appropriately addressed and resolved.

1.2 General Comment

One of the main benefits of the SEA is that it enables the identification of environmental effects for a number of proposals included in the strategic document and thus it can address likely cumulative effects, which can result from individually minor but collectively significant actions taking place over a period of time.

Similar logic applies also to likely transboundary impacts, as their early identification, assessment and mitigation (including alterative solutions) is much easier on the SEA phase (when plans and programs are still acceptable to change) than on ESIA phase when we are already considering concrete and often spatial located projects.

The SEA Report itself states: "Transboundary issues and cumulative impacts have not been addressed during this SEA phase. Both will be critical in the context of oil and gas development in Lebanon and the potential for cumulative impacts will need careful analysis for many environmental and social aspects."

It is our strong opinion that this is not acceptable, as cumulative and transboundary impacts are key impacts to be dealt with on the SEA level.

The SEA Report states: "Transboundary issues and cumulative impacts have not been addressed during this SEA phase." which we find unacceptable, since they are key impacts to be dealt with.

Suggestion for Improvement/Recommendation

In light of this, as well as other general and specific comments, it is our overall recommendation that the SEA should be redone. In this process, also cumulative and transboundary impacts should be investigated.

1.3 General Comment

We consider the preparation of the Stakeholder Engagement Strategy (Vol. 3) to be a pro-active and planned approach towards communication with stakeholders and developed Consultations Register (Vol. 6) to be a transparent presentation of the implemented stakeholder consultations process.

However, the SEA team was often faced with un-responsive and sometimes openly un-cooperative stakeholders (mostly from other ministries and sectors). Additionally, it is our understanding that public consultations were not carried out based on the SEA Report and that no trans-boundary consultations have been initiated so-far.

If our understanding is correct, we have to state that in line with EU guidelines and good practice both consultation should have been carried out. Comments from consultation processes should have been noted and taken into consideration in the decision-making process and if needed the SEA Report should also have been up-graded in line with relevant comments.

Suggestion for Improvement/Recommendation

In light of this, as well as other general and specific comments, it is our overall recommendation that the SEA should be rewritten. It is also our recommendation that renewed SEA process should include extensive stakeholder consultations in SEA Report development phase (supported by the decision-makers which should ensure free access to all relevant plans, information and data), as well as extensive public and transboundary consultations based on final draft of the SEA Report.

1.4 Purpose and objectives of the strategic environmental assessment [2.1]

The SEA Report states: “Lebanon has expressed an interest in acceding to the EU Convention’s Protocol on Strategic Environmental Assessment (SEA) and has been invited to participate in meetings under the Protocol. In the context of this bid the EU SEA Directive (2001/42/EC) guidance documents will also be employed as they are entirely compatible with the relevant Lebanese Laws.” Based on this statement it is the understanding of the review team that the SEA was prepared in line with EU and international guidance and will be reviewed in this manner.

The SEA report also defines the following objectives:

1. To integrate environmental, socio-cultural and socio-economic aspects in the exploration and development of offshore oil and gas resources and related industries in order to ensure a balanced and sustainable development.
2. Establish a basis for the development of institutional strengthening in order to build competence and capacity in dealing with the identified aspects.
3. Ensure that all relevant issues are addressed at the earliest stages of oil and gas exploration and development and that appropriate advice is given to support decision making.
4. Establish a common understanding and joint baseline for project specific environment and socio-economic related assessments.
5. Identify sampling and testing requirements as needed.
6. Establish thresholds for acceptable cumulative effects.
7. Identify potential environmental sensitive areas and provide guidance for the protection of such areas whilst at the same time exploiting oil and gas resources.
8. Identify key issues to be dealt with in order to ensure a focused discussion amongst decision makers.
9. Identify environmental and socio-economic related opportunities and risks associated with various scenarios of oil and gas exploitation and develop appropriate guidelines for maximizing benefits and minimizing risks.
10. Ensure that relevant stakeholders are identified and involved and that their concerns and expectations are considered during the decision-making process.
11. Outline mitigation and monitoring requirements and objectives to establish best practice and ensure effective impact management for future oil and gas development.

As already stated in general comments,

We concluded that the SEA Report (as well as all 8 volumes of the SEA) does not follow EU guidelines for SEA implementation in full – both from purpose and content point of view.

Given stated general and specific comments in this chapter, achievement of the stated SEA objectives can also be considered at least “arguable” in most cases – despite given argumentation in chapter 7. Conclusions.

Suggestion for Improvement/Recommendation

We highly recommend that the renewed SEA process is based on EU and international guidance on SEA implementation.

1.5 SEA Report structure [2.2]

There is no doubt that the SEA team put a lot of effort into the development of this SEA. **It delivers a substantial amount of well presented and useful information on expected oil and gas development,** a concrete and very straightforward gap analysis, very useful oil-spill modeling scenarios, transparent overview of the implemented stakeholder involvement, as well as several documents which are usually not a part of the SEA (e.g. National Contingency Plan and Field Survey Instruction Manual) but rather individual documents prepared in the post-SEA phase.

However, **we find the SEA (all 8 volumes) voluminous and its composition complex and confusing even for experienced SEA practitioners.** Crucial information can be found at different parts of all 8 volumes. Currently, there is a lot of confusion as the SEA Report (Vol. 1) does not contain the summary/main conclusions made at different phases of the SEA implementation or at least systematic connections between different volumes of the SEA (e.g. Vol. 4). Thus, we highly recommend that the SEA Report should be re-structured, as already suggested in comment 1.1.

The SEA Report is also missing a non-technical summary, which should be written in plane language and should cover all main SEA phases. The main purpose of this summary is to make the SEA Report understandable to the general public.

Suggestion for Improvement/Recommendation

It is our recommendation that the SEA Report is re-structured in line with EU guidelines. If the current structure is maintained we highly suggest that the SEA team makes systematic connections between different volumes of the SEA, especially when some chapters in Vol. 1 are based on conclusions from another volume (e.g. Vol. 4).

1.6 SEA methodology [2.3]

In our understanding, this chapter delivers rather a general description of the overall approach towards the implementation of the SEA process than the actual methodology used for assessment phase. The actual methodology used for assessment can be found in chapter 4. Risk and impact assessment and evaluation.

1.7 Description and objectives of plan [2.4]

It is highly recommendable that the SEA Report contains a summarized description of planned activities. We understand the wish of the SEA team not to burden the SEA Report with a too detailed description of the plan, however it would be extremely helpful if this chapter contained proper link to other relevant SEA volumes (especially Vol. 4) where more detailed presentation of expected activities is already presented.

We also noticed that this chapter does not mention the gas pipeline running almost full length of the Lebanese coastline, and gives only brief description of the plan to turn 4 existing oil-power plants into gas-power plants. These developments are all considered to be connected developments, thus more detailed presentation or proper link to other relevant SEA volumes (like Vol. 7, where more detailed presentation of expected activities is already presented) should be added.

Suggestion for Improvement/Recommendation

It is our recommendation that the SEA Report is re-structured and the suggestions taken into account. Short and concise description of the plan should be presented. It is very important to make a direct link to the official plan that was assessed.

1.8 Assessment of alternatives to plan [2.5]

The SEA recognized Lebanon's energy crisis, which in reality creates an urgency and expediency for the Plan to exploit any oil and gas reserves. The SEA also concluded that this situation possibly detracts from the exploration of recognized alternative solutions – e.g.:

- Development of thermal, solar, wind, hydroelectric, bio-energy technologies, waste-energy in Lebanon – these all have long-term potential in Lebanon, but remain largely unexplored options (except from waste-energy, which is already under development).
- Reduction of Lebanon's energy consumption and optimization of the efficiency of its industry and institutions.

However, none of the above-mentioned alternatives was taken under serious consideration.

SEA states that all such solutions are long-term solutions, which cannot provide relief to the current energy crisis. We can only partially agree with this argument, as the SEA itself assumes that, given objective circumstances, the time from licensing to production for gas fields will be at least 10 years and for oil fields at least 6-8 years. This gives the Lebanese government a window of opportunity to seriously explore the potential for energy production from above-mentioned alternatives, thus already preparing solutions if Scenario 1 will occur in practice. In our opinion the SEA could also propose % of income from Petroleum activities in Lebanon which should be on-purpose devoted to development of mentioned alternatives and their promotion. This would enable long term transition towards cleaner energy.

The SEA recognizes another alternative: "A short term solution to Lebanon's immediate energy crisis is to bring in floating, oil fueled power plants and anchor these adjacent existing power plants; this is a quick, 'plug and play' option as an immediate solution to a crisis." But this alterative is quickly dismissed, as it was not clear whether this is still an option or not.

No other attempts to identify potential alternatives were pursued. **In our opinion this phase of the SEA was underestimated, as in other SEAs in similar cases alternatives linked to "exclusion or no-operation zones" were investigated by the SEA itself.** Usually such zones were linked to rich biodiversity areas, spawning grounds, high importance tourism areas etc. In some cases, "step by step" alternatives (alternatives stating that only 1 zone – usually the least vulnerable one – will be open for activities) were proposed. This being said, we want to emphasize that stated approaches are not the only ones possible and it is the responsibility of the SEA team and responsible planning authorities to come up with realistic and implementable alternatives, suited to the situation in environment.

We also identified an additional alternative – it is possible that an underwater pipeline along the Lebanese coast is built (like the part around Beirut in Vol. 7), instead of running along disused railway on-shore, if the conflict of interests with the Ministry of Public Works and Transport is not resolved.

Suggestion for Improvement/Recommendation

It is our recommendation that in the renewed SEA process more effort is invested in identification and assessment of alternatives – not only conceptual ones, but also location and exclusion zone linked alternatives.

1.9 Identification of other plans, programmes and policies [2.6]

It is our understanding that the SEA team was often faced with un-responsive and sometimes openly un-cooperative stakeholders (from other ministries and sectors). The SEA Report states: "Although plans and programs were requested from the ministries consulted these were either not in a document format or unavailable. There was reluctance in many departments to discuss future plans as a culture of secrecy still exists... **The only area of conflict identified was between the MoEW's proposed onshore pipeline using the disused railway as a route and the Ministry of Public Works and Transport,** Urban Planning Directorate proposal, still relatively unformulated, to resurrect the railway line for public transport. It is recommended that this issue remain open and all available plans and programmes from Lebanese ministries are collated as a specific exercise."

As already stated, proper cooperation of key stakeholders in essential for identification of conflicts and assessment of cumulative impacts, thus the decision-makers should ensure it.

On the other hand, we cannot agree with the recommendation of the SEA team, as we believe that any identified conflict of such importance should be solved before the SEA is finalized, as potentially new solutions (e.g. underwater pipeline along the Lebanese coast instead along disused railway on-shore) will have substantially different impacts on the environment than the current solution. In this case, it is our opinion that the SEA must be repeated and corrected to include "new proposed alternatives".

Suggestion for Improvement/Recommendation

It is highly recommended that the Lebanese Government ensures collection and allows access to all relevant Sectoral Strategies, Programmes and Plans in order to evaluate cumulative and synergic impacts. This is not only important for this specific SEA but also to ensure coherency and compatibility of sectoral strategic documents in order to avoid collisions – like the identified collision between MoEW's proposed onshore pipeline using the disused railway as a pipeline route and the Ministry of Public Works and Transport, Urban Planning Directorate proposal to resurrect the railway line for public transport.

1.10 Scenario

The SEA Report developed 7 scenarios which were based on expert opinion and several assumptions. The SEA itself states: "Some of these may ultimately prove unfounded, but they were made with expert judgement using available information at the time and an assessment of comparable findings in the East Mediterranean.

In light of limited information available to the SEA team, as well as many technological solutions which can only be decided upon at more detailed planning stages, we agree that this was the only sensible approach. However, we would like to point out that stated assumptions do not always follow "the precautionary principle" and that some of the SEAs conclusions rely heavily on assumptions made. If these assumptions prove "unfounded" this could significantly influence the conclusions of the SEA. In this case revision of the SEA might be necessary at later stages, when more data will be available.

This being said, we would also like to comment on some of the made assumptions. The SEA states: "The assumptions made are as follows:

1. There will only be a single drilling rig operating at any one time, except for scenario 5 which assumes multiple operations. The support vessels and helicopters will therefore be consistent with that needed by a single rig.
2. Drilling operations and subsequent production will take place at depths >1000m, except for Scenario 6 which will be in shallower, nearshore waters.
3. Exploratory drilling will take 60 – 80 days drilling per well.
4. Deep water drilling rigs are few; a constraint to any programme will be rig availability.
5. Only large companies will have the resources to operate under these conditions.
6. As environmental survey data is deficient and no seasonal windows have been identified, it is assumed there can be year-round drilling. This may change after analysis of survey data.
7. Offshore activities during exploration, field development and operations will be supported by an onshore base, including supply of all necessary goods and services and transportation of personnel and materials, handling of waste materials returned from offshore, etc.
8. 5Tcf (gas) or 2million barrels (oil) is taken as a cut off for commerciality.

9. The lead time from licensing to production for gas fields will be at least 10 years.

10. The lead time for oil fields development is at least 6 -8 years.

11. The priority for Lebanon is domestic gas consumption, on a gas to power basis.

12. An onshore terminal is probably only realistic in the north, close to Tripoli due to land availability. Further south a nearshore barge solution may be preferable."

The stated assumptions do not always follow "the precautionary principle" and that some of the SEAs conclusions rely heavily on assumptions made.

Comments linked to above stated assumptions:

Assumptions 1 - 5
It is not clear whether one drilling rig is planned to be operational per EEZ or per block or even per 3D seismic survey area. This becomes even more relevant when combined with assumption no. 5, as "large companies" can afford to employ more than 1 drilling rigs. There is even more chance that this might occur, if we take into account that different "large companies" might bid for different blocks.

Assumption 2
It is not clear why the SEA team decided to take into the account the assumption that drilling operations and subsequent production will take place at depths >1000m. If this was based on the additional assumption: "As there are three well identified areas that have undergone 3D seismic survey, as illustrated in the map below, it was assumed that Scenarios 1-5 would take place somewhere within them.", then all conclusions based on assumption no. 2 already proved to be unfounded. Namely the Ministry of Energy and Water declared on the 26th of January 2017 that blocks 1, 4, 8, 9 and 10 will be open for bidding during the first offshore licensing round in Lebanon. Vast areas of stated blocks do not overlap with 3D seismic survey areas as presented in the SEA. Also blocks 4 and 10 encompass also areas where water is shallower than 1000 m. Thus, all conclusions made on these assumptions should be appropriately revised.

Assumptions 3 - 6
We can agree with the assumption that the exploratory drilling will take 60 – 80 days drilling per well, however there is no way to estimate how many wells will be drilled. If we also assume that year-round drilling will be employed this might bring us to a situation where one or more rigs are year-round drilling wells on different locations in EEZ. Such development of events is very similar to Scenario 5. In such a case only Scenario 5 seems to be realistic.

Assumption 8
We are not sure what is the purpose of this assumption and how it is linked to the conclusions of the SEA? Further explanation should be given.

Additionally, we would like to point out that stated assumptions should be supplemented with additional assumptions, which are mentioned in different volumes and chapters of the SEA. Additional assumptions that need to be mentioned are:

- "As there are three well identified areas that have undergone 3D seismic survey, as illustrated in the map below, it was assumed that Scenarios 1-5 would take place somewhere within them. Scenario 6 is in the nearshore by Tripoli, and Scenario 7 is located in the coastal zone." We believe that this assumption already proved to be unfounded, as already explained in comment to Assumption 2.
- "The existing oil fueled power stations located along the coast would be converted to gas fueled power stations; electricity would remain the national power source as it is not practical to supply domestic gas directly." We have to point out that this assumption is based on assumption that gas will be found in enough quantities to make the transition from oil-powered to gas-powered power plants economically sound decision. However, it is possible that this will not happen and oil-powered power plants will continue operation with the existing technology, thus reducing all recognized positive impacts on the environment.
- "The Zone of Influence for the proposed oil and gas development has been identified as the whole Exclusive Economic Zone (EEZ) and the coastal littoral extending inland to the 200m contour."

Suggestion for Improvement/Recommendation

In light of the overall recommendation that the SEA should be updated in line with other comments from this report, we recommend that expressed issues should be appropriately addressed in this process.

3 Scenarios

In this chapter, firstly each out of 7 scenarios was described. Then planned activities were cross-referenced with environmental/economic/socio-cultural/industrial/ other issues and the significance of each impact was determined. **A question which arises is how the decision about the level of significance of individual impact was determined, as methodology and criteria for this step are not defined.**

In the sub-chapter Summary of Significant Impacts, Risks and Opportunities for all 7 scenarios were summarized according to identified "significant issues".

Firstly, it is not clear what is the reasoning behind the decision to focus only on "high" level impacts, when "medium" or even "low" level impacts can also be considered significant in light of specific situations and locations – e.g. low/medium impact on sea-water quality might be significant in case current state of sea-water quality is

already poor due to other factors like wastewater pollution; low/medium impact on fish can be extremely significant if it is located within fish-spawning grounds, etc. We recommend that the methodological approach is additionally explained and that "medium" or even "low" level impacts are seriously considered in light of specific situations and locations.

Secondly, it is not clear how a long list of "significant issues" from chapter 3 was reduced to the list of 13 "key issues" proposed for further assessment.

Thirdly, despite the fact that all 7 scenarios were compared through the number of significant issues, there was no attempt from the SEA team to answer the question of adequacy or ranking of possible scenarios according to their impacts on identified "significant issues". As this question was in fact not addressed also in later SEA phases, the inability of the SEA report to identify best possible scenarios from environmental and social point of view becomes one of the major deficiencies of this SEA Report.

Suggestion for Improvement/Recommendation

In light of the overall recommendation that the SEA should be updated in line with other comments from this report, we recommend that expressed issues should be appropriately addressed in this process.

The inability of the SEA report to identify best possible scenarios from an environmental and social point of view becomes one of the major deficiencies of this SEA Report.

4. Risk and impact assessment and evaluation

The chapter clearly describes the methodology of the assessment of the impacts, describes the process of a detailed impact assessment and again repeats 13 identified "key issues" to be addressed by the SEA. Later-on it delivers an Example of an Impact Assessment for a Drilling Project and describes the "theoretical approach" of the mitigation step.

Unfortunately, the SEA Report does not deliver any concrete assessment of identified impacts or "key issues", thus leaving the impression that presented method of assessment was never carried out in practice. This is a serious deficiency as it puts all conclusions and recommendations delivered in chapter 6. Assessment and recommendations under a serious and substantial question mark.

Suggestion for Improvement/Recommendation

In light of the overall recommendation that the SEA should be updated in line with other comments from this report, we recommend that expressed issues should be appropriately addressed in this process.

5. Oil spill models

We consider current presentation of oil spill models to be very clear, transparent and concrete and we welcome such an approach in any SEA. Such an approach can prove extremely useful in the process of identification and assessment of impacts, especially those of transboundary nature. **However, the chapter provides no interpretation of stated results and in the SEA Report there is no effort to use such a valuable tool for impacts assessment and identification of potential mitigation measures.** As transboundary impacts were not assessed by the SEA Report at all, also this crucial piece of information is lost.

Suggestion for Improvement/Recommendation

We strongly recommend that oil spill models are appropriately interpreted and are used in the process of identification and assessment of potential impacts.

6. Assessment and Recommendations

According to the SEA Report: "... section evaluates the major, high level concerns that have become apparent through the initial SEA process... The issues selected focus on the following list which has been derived from both the Scenario outcome (see section 3) and the results of the SEA consultation process...". Further on there are only 6 issues included in assessment and provided with recommendations.

Despite the fact that the review team took the following warning from the SEA team: "Other volumes describe issues in greater detail; the Gap Analysis, Volume 4, focuses on environmental and socio-economic aspects that have the potential to be affected by oil and gas activities and assesses the available information held; the Stakeholder Management, Volume 3, discusses the range of concerns voiced by many individuals and organizations who have been consulted as part of the SEA process. The approach is integrated and documents should be read in conjunction with each other." seriously, **it is still not clear to us how the list of 13 "key issues" got reduced to only following 6 issues:**

- National Contingency Plan
- Relevant HSE legislation and Regulatory Framewor
- Data Deficiency and Data Management
- Increase Environmental Awareness and Protection
- Onshore Pipeline Construction
- Transboundary Issues and Cumulative Impacts

All other issues were eliminated from assessment without proper justification. We find this conclusion very worrying, as after chapter 3 the SEA Report loses on clarity, transparency and proper assessment. It also loses all connection to important issues identified in Vol. 4 and chapter 3 of the SEA report.

If we focus on the assessment and recommendations delivered for the remaining 6 issues we can conclude that first 4 issues (National Contingency Plan; Relevant HSE legislation and Regulatory Framework; Data Deficiency and Data Management; Increase Environmental Awareness and Protection) deal with general political/legislative/ administrative issues which can only indirectly be linked to actual activities planned with the plan for petroleum activities in Lebanese waters. For the 5th issue (Proposed Onshore Pipeline Construction) only general description of the proposed intervention and stakeholder consultation is provided. No assessment of the proposed intervention is given and no direct recommendations. For the 6th identified issue (Transboundary Issues and Cumulative Impacts) the SEA Report states: "Transboundary issues and cumulative impacts have not been addressed during this SEA phase." Later on, it states some identified transboundary issues but delivers no assessment or concrete recommendations.

All in all, we must conclude that this chapter:

- Did not deliver environmental goals to be targeted and a set of verifiable indicators clearly stating links between proposed activities of the plan and their impacts on environment.
- Did not deliver any relevant assessment of activities linked to the proposed plan in expected quantity and quality.
- Did not deliver any answer to main questions put in front of the SEA team – e.g. Which activities are/are not acceptable from the environmental point of view? Which scenario should/shouldn't be followed and why? Which are the proposed changes of the plan?
- Did not deliver a clear and concrete set of mitigation measures clearly linked to proposed activities or the framework for their implementation.
- Did not deliver a monitoring framework for monitoring proposed activities during their implementation.

Subsequently the chapter cannot be considered appropriate. This leaves SEA incomplete and in our opinion it cannot be considered adequate for a decision-making process.

Suggestion for Improvement/Recommendation

vIn light of the overall recommendation that the SEA should be updated in line with other comments from this report, we recommend that expressed issues should be appropriately addressed in this process.

7. Conclusion

We would expect that this chapter in the SEA Report would deliver a summary of main conclusions and would clearly address the issue of environmental and social acceptability of impacts from different scenarios. In other words, we would expect to get the answers to the following questions:

- Which scenarios are/are not acceptable from environmental and social point of view?
- Why are some scenarios acceptable and are there any conditions they have to fulfill?
- Which mitigation measures were defined and who/when/in what way is responsible for their implementation?
- Is there a monitoring plan which should be put in place who/when/in what way is responsible for its implementation?

However, **this chapter delivers only a general argumentation on how contractual obligations from the SEA Team were fulfilled,** which is why strongly suggest that this chapter is appropriately up-graded.

Suggestion for Improvement/Recommendation

We strongly recommend that the SEA Report is upgraded and that given comments are in this process appropriately taken into account.

Many issues were eliminated from assessment without proper justification, which is very worrying, as after chapter 3 the SEA Report loses on clarity, transparency and proper assessment.

VOL. 2
NATIONAL CONTINGENCY PLAN

2.1 General comment

This document delivers:

A. National Strategy for marine pollution – "Its purpose…is to establish the national framework for preparing for and responding to oil spills in the Republic of Lebanon (RoL) marine waters. The objective is to provide the basis for more efficient oil spill response operations under the overall authority of the Lebanon Ministry of Energy and Water.

In particular, the NCP provides the legal basis for implementing the Government of Lebanon's (GoL) obligations under the Oil Pollution Preparedness, Response and Cooperation Convention, 1990 (OPRC) (see Annex A). It also implements the Government's obligations under the regional Barcelona Convention for the protection of the Mediterranean Sea (see Annex C)."

B. Operational Procedures – "The following is a checklist of duties required of the MoEW oil spill response team. For ease of reference, it recalls the responsibilities of the Designated Representative in the event of a Tier Two or Tier Three oil pollution incident, as set out in Section 4. It also constitutes a checklist for organizations establishing their own local oil pollution emergency plans."

C. Data Directory and

D. Appendices

As such, this document can only partiallly be considered as an integral part of the SEA, as only some parts (all such chapters are stated in the comment 2.2) include elements of baseline analysis, impact analysis and proposed mitigation measures.

All other parts have very little to do with the SEA evaluation. They are much more focused on establishment of appropriate mechanisms for reaction to potential oil-spills, establishing, equipping and training responsible authorities and coordinating the actions/standard operating procedures in case of an oil-spill.

Suggestion for Improvement/Recommendation

From the SEA point of view, there is no need for improvement of this document at this moment. As already explained, we do not consider it to be an integral part of the SEA. However, we recognize its importance in further oil and gas development phases and thus recommend that it should be up-dated in case SEA will be modified upon this review.

We also recommend that the SEA states obligatory application of the National Contingency Plan in further development of the Oil and Gas sector in Lebanon. This should be done through introduction of a new "Mitigation measures" chapter in Vol. 1 of the SEA.

2.2 Chapters of the National Strategy for marine pollution:

6.2.10 Protection of sensitive areas and species
7. Policy on the use of dispersants
8. Sensitive areas: priorities for protection
9. Media relations plan
10. Training and exercises
APPENDIX B: Generic risk assessment

All stated chapters include elements of baseline analysis, impact analysis and proposed mitigation measures – some of them are very concrete and well thought through. However, it is not clear why the SEA team decided to include them in this document, rather than in the SEA Report, where they should be stated.

Suggestion for Improvement/Recommendation

We recommend that all recognized elements of baseline analysis, impact analysis and proposed mitigation measures should be appropriately transferred in the SEA Report (Vol. 1).

VOL. 3. STAKEHOLDER MANAGEMENT

3.1 General comment

We believe that preparation of the Stakeholder Engagement Strategy is a pro-active and planned approach towards communication with stakeholders. We also consider it to be a very good theoretical base for development of a Stakeholder Engagement Plan. We also find the used approach of development of the Consultations Register (vol. 6) and presentation of meeting notes (to furthers support Consultations Register) to be a transparent presentation of the implemented consultations process.

However, both documents underestimate the importance of the SEA and overall stakeholder involvement in the decision-making process on the strategic level. Thus, we consider them to be only partially effective in their main task – open and transparent communication with key stakeholders.

It is also our understanding that public consultations were not carried out based on the SEA Report and that no transboundary consultations have been initiated so-far. If our understanding is correct, we have to state that in line with EU guidelines and good practice both consultation should have been carried out. Comments from consultation processes should have been noted and taken into consideration in the decision-making process and if needed the SEA Report should also be upgraded in line with relevant comments.

Suggestion for Improvement/Recommendation

The SEA should be updated and improved and a new stakeholder engagement campaign should accompany it. The stakeholder engagement campaign should also be followed by public and trans-boundary consultations campaigns, based on the upgraded SEA Report.

3.2 Stakeholder Engagement Strategy

Establish the scope of engagement associated with the purpose [3.2]

The document states: "During the Strategic Environmental Assessment (SEA) phase participation is limited to high-end consultations. Due to the developmental nature of an SEA, means it is premature to develop detailed community engagement. However, it is important to stress the need for information disclosure and transparency at all times." Similar statements can be found in several other chapters of this document.

Good practice shows that even in early planning/development phases of any Strategy/ Program/Plan inclusion of all interested public – regardless of their level of organization or power within the decision-making process – is crucial for appropriate implementation of the SEA. This is why we cannot agree that "...it is premature to develop detailed community engagement." Yes, different types of stakeholders have different capacities and possibilities for constructive cooperation. They also play very different roles in the decision-making process. But it is one of the key roles of the SEA to ensure that all stakeholder considerations are heard and appropriately addressed.

Suggestion for Improvement/Recommendation

We suggest that the quoted statement is removed from the SEA. We also suggest that in renewed SEA process the list of stakeholders is widened to at least include local communities and other potentially missed key stakeholders. We also suggest that a stakeholders and general public engagement plan is prepared in advance and appropriately implemented at different stages of the SEA process.

3.3 Stakeholder Engagement Plan

3. Scope;
4.1 Roles & Responsibilities;
7. Future development for stakeholder engagement

The document states: "The SEA phase of stakeholder engagement is not as vigorous or as in-depth as at the ESIA phase; the main focus being data collection and validation; identification of stakeholders that could affect the overall scheme of the project and developing a general awareness of public opinion." In the next paragraph, it also states: "The SEA is in its very nature exploratory and 'non-invasive' so there is limited opportunity for participation; it is more a scoping exercise for future Social Impact Assessments."

Later-on, in chapter 4.1 Roles & Responsibilities, it also states: "At this SEA phase stakeholder engagement is more concerned with identifying the interests of other high level groups, such as other government Ministries and Directorates (e.g. Water, Tourism) and the fisheries industry. Engagement with the public, NGOs and other specific interests will be the focus of the ESIAs, although initiated during SEA phase."

Similar statements can be found in several other chapters of this document (e.g. Engagement Plan SEA phase). All such statements clearly underestimate the importance of the SEA and overall stakeholder involvement in the decision-making process on the strategic level. They are also not in coherence with the EU SEA Directive. It is the level of Strategy/Program/Plan which determines important strategic decisions which are very hard to contest at later detailed project development/ESIA phases.

As already stated in the previous comment; yes, different types of stakeholders have different capacities and possibilities for constructive cooperation. They also play very different roles in the decision-making process. But it is one of the key roles of the SEA to ensure that all stakeholder considerations are heard and appropriately addressed.

This is why we consider this approach not to be fully inclusive. The SEA team itself in chapter 7. Future development for stakeholder engagement delivers several suggestions for further stakeholder consultation e.g. public consultation meetings for better involvement of the interested public and NGOs.

Suggestion for Improvement/Recommendation

In light of a general recommendation, that the SEA should be up-dated in line with other comments from this report, we recommend that all-encompassing stakeholder engagement is assured in line with the EU SEA Directive. Recommendations of the SEA team should also be taken into account.

We also recommend that NGOs, individuals and local communities along the coastline are actively included in public consultations. Not only because of potential oil-spills and the fact that the new pipeline will run along the coastline of almost all Lebanon, but also because the development of oil and gas sector generates important impacts and pressures just through its daily operations.

VOL. 4. GAP ANALYSIS

4.1 General comment

This document was prepared with a clear intent to deliver a broader overview of current environmental and social situation in Lebanon and identify main gaps. It defines:

- The focus area of proposed interventions;
- Linkages between SEA and EIA/ESIA and
- Suggested ESIA schedule and content;
- Very concrete presentation of expected oil and gas development activities;
- A gap analysis.

It identifies significant data deficiencies and systemic deficiencies in current environmental protection framework in Lebanon and appropriately warns that such deficiencies should be resolved by responsible authorities.

The gap analysis part of the document provides the general overview of the situation of specific elements of the environment, however it is for some environmental topics not prepared in detail enough to consider it a full baseline analysis. For this, some topics lack location of existing problems in space, argumentation based on data (if possible trend analysis), as well as summarized, all-encompassing and transparent identification of key issues to be addressed in later stages of the SEA.

It is the overall evaluation that Vol. 4 Gap Analysis fulfills its task as a gap analysis, and also delivers a lot of useful information, which could be up-graded into the baseline analysis. Thus, we consider it a very good SEA supporting document.

Suggestion for Improvement/Recommendation

As stated in conclusion, this document represents a very good SEA supporting document. However, we recommend that the SEA should be upgraded to a full SEA level and that this document should be used by the SEA team as a foundation for it.

4.2 Data gap analysis conclusions [5]

As already stated, the gap analysis identifies significant data deficiencies and systemic deficiencies in current environmental protection framework in Lebanon and appropriately warns that such deficiencies should be resolved by responsible authorities.

In our opinion, the SEA team too quickly accepted identified data and systemic deficiencies and abandoned the attempt to deliver a full SEA. Instead, they identified deficiencies and suggested that these should be resolved prior to implementation of the ESIA.

This can even be considered sensible in light of magnitude of identified deficiencies and estimated time needed to overcome them, but only if the SEA team would turn to the "precautionary principle" and despite deficiencies delivered a full SEA. Selected approach in practice means that the SEA pushed environmental and social impact identification, assessment and mitigation to the ESIA phase. Subsequently several important aspects of the SEA – such as cumulative and transboundary impacts – could very likely remain unidentified, as they are much harder to identify and deal with in the ESIA phase. As this document is considered to be a gap analysis, there is no need to further improve it as such. However, we recommend that the SEA should be upgraded to a full SEA level and that our suggested comments are seriously considered in this process.

4.3 Oil and Gas [1]

This chapter delivers a concrete and well-presented description of expected off-shore oil and gas development activities, as well as first overview of potential impacts. As we understand it, it is also a base document for preparation of scenarios described in the SEA Report (Vol.1).

However, it does not deliver a similar description of activities linked to on-shore pipeline running almost the full length of Lebanon's coast, as well as similar description of connecting activities linked to transformation of current oil-power plants into gas-power plants. The pipeline is graphically presented in Vol. 7, but there is no detailed description of those activities, which are also a consisting part of the evaluated plan. Turning oil-power plants into gas-power plants can be considered as "connected activities", as they (in our understanding) fully depend on successful implementation of the evaluated plan.

Suggestion for Improvement/Recommendation

There are two potential solutions to given comments and either of them can be considered our recommendation. It is our recommendation that the SEA should be upgraded to a full SEA level and we suggest that in this process a summary of all proposed activities (offshore and onshore) are presented in a special chapter prior to the presentation of scenarios, or that at least adequate attention is turned to the appropriate chapter of the upgraded Vol. 4 and Vol. 7.

In our opinion, the SEA team too quickly accepted identified data and systemic deficiencies and abandoned the attempt to deliver a full SEA.

4.4 Environmental Law [2]

The chapter delivers an overview of the environmental legal framework in Lebanon, identifies key stakeholders from governmental sector and identifies existing gaps. We find that this chapter to be a strong support to the SEA in several ways. However, the SEA Decree was officially adopted by the Lebanese Government in May 2012, so this chapter is currently no longer up-to date. This is of course the consequence of the fact that the SEA was prepared in the period 2011/2012.

Suggestion for Improvement/Recommendation

In light of the overall recommendation that the SEA should be up-graded to a full SEA level, we recommend that this chapter should be appropriately up-dated in this process.

4.5 Onshore Ecology [3]

This chapter contains a lot of useful information, which is missing in the SEA Report (Vol. 1), as already described in comments to the SEA Report. In order to be as constructive as possible, we deliver comments and recommendations for individual sub-chapters bellow. Recommendations are given below.

4.6 Regulatory Framework; [3.2]
Strategy and Future Plans [3.3]

In-line with EU guidelines any SEA should in scoping phase identify the key environmental issues to deal with (e.g. on-shore biodiversity) in later SEA phases. For each/a group of key-issues the SEA should determine “specific environmental goals” and a set of criteria (e.g. indicators) for assessment of potential impacts on set environmental goals.

These chapters deliver all the information needed to establish “specific environmental goals of the SEA” – for example: “Preservation of on-shore biodiversity and protected areas”. In light of the overall recommendation that the SEA should be up-graded to a full SEA level, we recommend that this document should be used by the SEA team as a foundation for preparation of a new chapter in the SEA Report (Vol. 1) - Impact analysis and assessment, which should also include identification and argumentation of “specific environmental goals”.

4.7 Impact from Development of Petroleum Activities [3.4]

In-line with EU guidelines any SEA should identify and evaluate impacts on environment. This chapter delivers a clear identification of potential impacts of development of petroleum activities in Lebanon (including pipeline installation and the construction of Liquefied Natural Gas (LNG) plants as well as any Onshore Processing Facility (OPF)). However, these impacts are identified only for the following environmental and social segments (Physical Presence & Land take; Noise; Waste Management; Light; Water; Traffic; Energy Demand; Atmospheric), missing out on potential impacts on other environmental and social issues like – cultural heritage (e.g. archeological sites in route); surface water network, ground water bodies; resettlements of people living on the proposed pipeline corridor, biodiversity – especially linked to so-far recognized important areas, etc.

Suggestion for Improvement/Recommendation

In light of the overall recommendation that the SEA should be up-graded to a full SEA level, we recommend that this document should be used by the SEA team as a foundation for preparation of a new chapter in the SEA Report (Vol. 1) - Impact analysis and assessment, which should also include in line with comments revised identification of potential impacts.

4.8 ESIA Data Requirements [3.6]; *Description of Existing Data [3.7]*

In-line with EU guidelines any SEA should deliver a Baseline analysis. These chapters deliver a lot of useful information and indicate that, despite recognizes data deficiencies, some concrete data needed for a concrete baseline analysis exists.

Suggestion for Improvement/Recommendation

In light of the overall recommendation that the SEA should be up-graded to a full SEA level, we recommend that this document should be used by the SEA team as a foundation for preparation of a new chapter in the SEA Report (Vol. 1) - Baseline analysis / Current state of environment. All data should also be up-dated.

4.9 Missing Data [3.8]

This chapter delivers a very good overview of data gaps ideally needed for any SEA evaluation. Best possible response would be collection of crucially needed data before SEA Report is finished, however this would significantly prolong the process of adoption of the plan or program.

We can say from our-own practical experience, that in rare situations all such data is actually available. In case of missing data, and considered as good practice, "precautionary principle" and best-possible expert assessment should be implemented in the SEA process and precautionary mitigation measures should be prescribed based on recognized situation.

Suggestion for Improvement/Recommendation

As this document is considered to be a gap analysis, there is no need to further improve it as such in light of given comments. However, we recommend that the SEA should be up-graded to a full SEA level and that made comments should be considered in this process.

4.10 Discussion [3.9]

This chapter delivers general and partial assessment of expected impacts and proposes several mitigation measures.

Suggestion for Improvement/Recommendation

In light of the overall recommendation that the SEA should be up-graded to a full SEA level, we recommend that this document should be used by the SEA team as a foundation for preparation of 2 new chapters in the SEA Report (Vol. 1) - Impact analysis and assessment; Mitigation measures, which should also include findings of this chapter.

4.11 Offshore Ecology [4];

Water [5];
Air [6];
Waste [7];
Social [8];
Health [9];
Tourism [10];
Cultural Heritage [11];
Anthropogenic Effects [12]

The composition and general content of all stated chapters is very similar to chapter 3 Onshore Ecology, which is why we consider all comments delivered to its sub-chapters to be relevant also for chapters 4-12. Of course, comments should be appropriately adopted to the topic of an individual chapter. In comments below we focus only on specific comments linked to specific topics.

Suggestion for Improvement/Recommendation

We recommend that all recommendations from 4.6 to 4.10 are appropriately interpreted in context of chapters 4-12 and are taken into account in the process of the up-grade of the SEA.

4.12 All chapters linked to description of existing data

In cases where the SEA team has only "older" data available it is considered to be good practice to use the "precautionary principle" and "best-possible expert assessment" in order to still deliver assessment of impacts on a specific segment of the environment. This approach can be further supported through consultations with key stakeholders in order to pre-agree on how the level of details to be included and the assessment approach to be used. Also, poor state of environment (if reversible) should be considered a limitation to new developments rather than used for justification like – environment is already degraded, so new developments will not change the situation much.

Suggestion for Improvement/Recommendation

We recommend that the approaches we suggested are considered in the SEA upgrade process.

VOL. 5 GIS

5.1 General comment

This document delivers an overview on GIS application during the SEA preparation phase, methodological approach used in GIS databases creation and concrete suggestions for further use of GIS results. It is thus considered to be a supporting document from the SEA point of view.

Suggestion for Improvement/Recommendation

From the SEA point of view, there is no need for improvement of this document. However, we recommend that the following RPS recommendation: "The Ministry sets up a Geoportal –accessible either internally within the Ministry itself or externally via the public internet (with secure restricted access), which will help increase the dialogue between the ministry and its stakeholders by sharing information and data." should be made obligatory by the SEA Report. This should be done through introduction of a new "Mitigation measures" chapter in Vol. 1.

5.2 CD with GIS datasets used in the SEA

During this SEA review the reviewers did not have access to the CD with GIS data used in the SEA, as it was not published alongside other SEA documents on the official web-site. This in-ability to access data drastically reduces the transparency of the SEA. It also reduces the ability of the reviewers to properly assess the importance, availability and quality of datasets used for the SEA.

Suggestion for Improvement/Recommendation

It is highly recommended that the Lebanese Government ensures access to all data used in the SEA process. This is not important only for this SEA but also for all other SEAs/ ESIAs carried out in Lebanon.

VOL. 6 REGISTERS

6.1 General comment

As stated in the chapter "1.1. Introduction" this document represents primary sources for the foundation of Registers, which will be set up for the MoEW.

We believe this is a very good representation of all used documents, datasets and information, as well as very good representation of the stakeholder engagement and response in the SEA process. We also believe that this document represents a very useful tool for further phases of development of the Oil and Gas sector. This tool is able to ensure transparent collection and distribution of documents, data and information already collected in the SEA phase to all interested parties. It also represents a baseline for all envisaged ESIA studies.

Suggestion for Improvement/Recommendation

As we recognized its constructive purpose and importance for ensuring coordinated further development of the Oil and Gas sector we recommend that the SEA states obligatory foundation of Registers and assigns MoEW to maintain and regularly up-date these databases throughout the lifespan of petroleum activities in Lebanon. This should be done through introduction of a new "Mitigation measures" chapter in Vol. 1 of the SEA.

6.2 Legal Register [1.2]

Currently it is not clear to the independent reader why some of the legal documents were incorporated in this register, as the register is missing some data on the content/ explanation of individual documents. Also, some of the documents are extremely old (e.g. 1925, 1926, etc.) and this automatically poses the question of their relevance to current situation.

Suggestion for Improvement/Recommendation

We suggest that either SEA evaluators (in the process of the SEA up-date) or MoEW (in the process of foundation of registers) deliver at least a short explanation about the main topics the document covers (e.g. in bullet-points) and reviews relevance of all stated documents.

6.3 Data Acquisition Register [1.5]

It is evident from the register that a lot of effort was invested into data collection by the SEA team. However, as already stated in comments on other volumes, this data was not used for actual assessment of identified impacts on different environmental and social aspects.

Suggestion for Improvement/Recommendation

We recommend an upgrade of the existing SEA Report (vol. 1) with the following chapters:
- Baseline for environmental/social aspects;
- Scoping;
- Environmental goals;
- Evaluation of the identified impacts;
- Mitigation and enhancement measures;
- Monitoring.

6.4 Concerns Register [1.6]

It is evident from the register that a lot of effort was invested into data collection of all possible concerns. However, it is clear from the review of the SEA Report (Vol. 1) that the level of their inclusion in the SEA is very questionable.

Suggestion for Improvement/Recommendation

In light of the overall recommendation that the SEA should be up-dated in line with other comments from this report, we recommend that expressed issues should be appropriately addressed in this process.

VOL. 7 ONSHORE PIPELINE ROUTE

7.1 General comment

This document delivers a detailed cartographic presentation of the onshore pipeline route and is thus considered supporting document from the SEA point of view.

Despite showing cca. 400 m wide corridor around proposed pipeline route on orto-photo images it does not show any other important features mentioned in different scenarios (e.g. locations of power-plats to be up-graded from oil to gas technology, potential on-shore supply bases, etc.). As already identified in other parts of this review, this document delivers virtually no other relevant information on the chosen corridor or proposed activities for its construction. It doesn't even warn about the potential conflict with the existing disused railway corridor planned to be renewed by the Ministry of Public Works and Transport or show the identified overlap. It also doesn't consider avoiding this conflict through identification of potential alternative corridors (e.g. an underwater pipeline along the Lebanese coast could be built (like the part around Beirut in Vol. 7), instead of running along disused railway on-shore). We can expect other conflicts exist (e.g. existing housing within the corridor, crossings with other infrastructure, etc.), which remain unidentified.

It also doesn't show main environmental features dealt with in the SEA. This being said, we have to emphasize that during this SEA review the reviewers did not have access to the CD with GIS data used in the SEA, as it was not published alongside other SEA documents on the official web-site.

Suggestion for Improvement/Recommendation

From the SEA point of view, it would be good to exploit such a supporting document for presentation of all important features mentioned in different scenarios. This is how an independent reader could get a better overview of all proposed interventions.

VOL. 8 FIELD SURVEY INSTRUCTION MANUAL

8.1 General comment

As stated in the chapter "2. Purpose" this document describes the various methods and sampling procedures that will be used during the field surveys to ensure consistency across the project and to the standard required by RPS Energy. This document will be primarily used in the process of data collection for Environmental and Social Impact Assessment Studies and their base studies.

We believe that this document represents a very useful tool for ESIA studies, which will be performed for in next phases of development of the Oil and Gas sector. It also represents sound methodological and standardization tool for any monitoring prescribed by SEA or following ESIA. However, this document cannot be considered as an integral part of the SEA, as it has very little to do with the SEA evaluation. It only represents a response to identified gaps in data availability and ensures collection of high quality and compatible data form various locations within EEZ.

Suggestion for Improvement/Recommendation

From the SEA point of view, there is no need for improvement of this document. As already explained, we do not consider it to be an integral part of the SEA. However, we recognize its constructive purpose and importance for ensuring coordinated, sound data based and sustainable further development of the Oil and Gas sector. This is why we recommend that the SEA states obligatory application of the Field Survey Instruction Manual in all data collection processes and ESIA studies linked to further development of the Oil and Gas sector in Lebanon. This should be done through introduction of a new "Mitigation measures" chapter in Vol. 1 of the SEA.

PART 3:

Suggested Next Steps

SUGGESTED NEXT STEPS

"We strongly believe that the current SEA Report and SEA process did not deliver expected results and should thus be re-done."

So, the logical first step, from our point of view, should be to re-start the SEA process and to re-do the SEA Report. But the SEA process is much more than just a "tick-box exercise". Which is why, we suggest the process is undertaken through the following steps:

1. **Communication with interested bidders –** as the Lebanese Government already kicked off the call for its first licensing round it is very important to inform interested bidders of this new development. This information should be passed to them as soon as possible. We recommend that the Lebanese Government informs the bidders that the SEA is in the process of renewal based on new available information since 2012. It should also be accompanied with a clear message that any conclusions and mitigation measures identified by the renewed SEA Report will be considered obligatory and will have to be respected during implementation of expected oil and gas activities. We also recommend that the Lebanese Government regularly informs interested bidders on the progress of the SEA process.

2. **Preparation of the Plan for Petroleum Activities in Lebanese Waters –** we recommend that the Lebanese Government empowers, as soon as possible, the responsible planning authority to prepare an overall strategic document with clearly defined content and full description of planned activities. It is not necessary for the plan to be voluminous, but it should be very concrete. Such a document should encompass at least the following information:

   • Delineation of blocks where activities will take place and planed order in which they will opened for implementation of planned activities (with conditions under which they will be opened for implementation of planned activities).

   • List of expected activities (with general description) to be implemented in every phase – 1) prospecting; 2) exploration; 3) exploitation; 4) decommissioning.

   • List of all connected activities considered to be an integral part of the document – clearly stating and describing interventions like onshore interventions (e.g. conversion of existing oil-power plants into gas-power plants, building of the on-shore coastal gas pipeline, etc.) and identifying potential alternatives (e.g. alternative corridors for the gas pipeline, alternative order of blocks to be opened for implementation of planned activities, etc.).

   • Proposed timeline for adoption of this document with clearly stated 1) key procedural steps where public consultations will be implemented and 2) key procedural steps in which findings from the SEA Report will be incorporated into the plan.

Without a concrete strategic document and well developed framework of proposed activities it is very hard to deliver a comprehensive and high quality SEA. Only if we know what activities or interventions are the subject of the SEA, we can discuss their impacts in a transparent and well argumented manner.

Interested bidders should be informed that the first licensing round has started, along with a clear message that any mitigation measures identified by the renewed SEA Report will be considered obligatory.

3. **Launch of the public tender for selection of SEA practitioners –** to reduce the amount of time needed to complete the SEA process we recommend that the responsible planning authority initiates the public tendering procedure for the selection of SEA practitioners as soon as possible. We also recommend that the demand for the appropriate methodology and expected quality should be clearly stated in the tender documentation in order to ensure the proper implementation of the SEA process.

4. **Stakeholder and interested public engagement plan –** the preparation of the Stakeholder and interested public engagement plan should be one of the first activities in the SEA process done by selected SEA practitioners. In order for this step to be successful, it will also require close cooperation of the responsible planning authority, as well as clear support from the Lebanese Government – especially through ensured access to all relevant strategic documents and data, crucial for the SEA.

5. **Collection of all available data surveys and baseline analysis carried out since 2012** – parallel to the previous step, collection of all available data surveys and baseline analysis carried out since 2012 should be done and collected information should be analyzed, thus up-grading the findings of the existing SEA.

6. **Scoping –** well-defined scope of the assessment enables keeping SEA focused on the key problems and thus minimizes personal and time demands. Scoping should also preliminary outline:
   - Possible alternatives or options which should be addressed within the SEA.
   - Territorial dimension of likely impacts.
   - Analyses and surveys to be conducted, as well as methods and tools to be used.
   - Stakeholders to be involved and the level and nature of their involvement in the SEA process.

We highly recommend that conclusions of the scoping are summarized in the "Scoping Report" and are presented to and commented by key stakeholders (e.g. planning authorities, environmental and health agencies, representatives of key interest groups, etc.). Such an approach allows for wide discussion and acceptance of identified key issues to be tackled with in the following SEA phases – thus reducing the possibility of disagreement regarding issues recognized as not relevant for the SEA process (e.g. if the gas pipeline is no longer a part of the plan, discussion about its impacts is no longer relevant and expected on-shore impacts will be significantly reduced).

We recommend that environmental goals of the SEA are defined (as a final stage of the scoping phase), corresponding to identified key environmental issues. It is considered good practice to also define a clear set of verifiable environmental indicators. Indicators have to be clearly linked to environmental goals and are a very transparent tool to show how proposed activities will impact key environmental aspects.

7. **Baseline analysis / Current state of the environment –** evaluation of likely impacts cannot be conducted without proper understanding of the existing situation for the key issues identified in scoping. We recommend that it is developed on key conclusions of the previously described step 5. Baseline analysis provides a basis for impact assessment, formulation of mitigation measures and monitoring scheme.

8. **Impacts analysis and formulation of mitigation measures (including monitoring) –** any SEA should analyze the significant adverse, as well as positive effects of the proposed plan or its alternatives. In order to that in a clear and transparent way a verifiable methodology should be prepared, if possible based on environmental indicators. It is extremely important not to focus only on the individual impacts, but to also address likely cumulative effects, which can result from individually minor, but collectively significant actions taking place over a period of time. Based on the identified and assessed impacts the SEA has to suggest measures to address the likely adverse effects, as well as to enhance positive impacts. As a final step, appropriate monitoring scheme has to be designed to ensure appropriate monitoring of implementation phase.

9. **Compiling the SEA Report** – the aim of this stage is to prepare a well-readable and understandable SEA Report, which provides all important information and data, conclusions and recommendations in a clear way. This is very important, as it serves as a basis for consultations with relevant authorities, stakeholders and interested public. Optimally, the report should also indicate if (and how) any inputs from SEA have been already accepted and integrated in the plan.

10. **Quality control** – the SEA Report provides inputs to the decision-making process. However, only assessment providing reliable and objective information should be considered in the decision-making process, otherwise it may lead to counter-productive results. The quality control should thus ensure that SEA process provides reliable and objective information to be considered when adopting the plan. We recommend that some sort of quality control mechanism is ensured in the renewed SEA process. It is also our recommendation that renewed SEA process should include extensive stakeholder consultations in SEA Report development phase.

11. **Public consultations with key stakeholders and interested public -** It is our recommendation that renewed SEA process should include extensive public consultations based on final draft of the SEA Report. The SEA Report should be accompanied by the "non-technical summary", which should be written in plane language and should cover all main SEA phases. The main purpose of this summary is to make the SEA Report understandable to the general public, thus making it the base document for public discussion. Public consultations can take many forms and it is important that the Stakeholder and interested public engagement plan clearly indicates how, when and where public consultations will be implemented.

12. **Transboundary consultations -** We also recommend that, based on results of the renewed SEA Report, neighboring countries should be notified in light of potential transboundary impacts and proposed mitigation measures. Such an approach can significantly strengthen the trust between countries, present Lebanon as a responsible and constructive partner in Eastern Mediterranean region and most importantly assure pre-agreed and well-coordinated response in case of unexpected events. We emphasize that such an approach is extremely important as similar strategies, plans and programmes adopted by other countries might also have significant impacts on Lebanese territory. Thus, cooperation is critical to ensure sustainable development and ensure adequate protection of the environment.

13. **Potential revision of the SEA Report –** responsible planning authority and SEA practitioners should review all received comments during public consultation and transboundary consultation processes. They should decide whether comments are sound, well argumented and constructive or not and if needed revise the SEA Report.

14. **Integration of mitigation measures from the SEA Report into the Plan** – it is the responsibility of the responsible planning authority to make sure that mitigation measures from the SEA Report are appropriately integrated into the plan. Decision-makers should consider findings and conclusions provided by SEA Report and decide whether their integration into the plan are appropriate.

15. **Adoptions of the SEA Report and the Plan.**

What topics should the SEA focus on?

This is a very hard question which should be answered by the SEA itself. However, as already stated the SEA Report did not deliver a clear list of key topics to be dealt with. This is why we turned to relevant international good practice and based on findings of several other SEAs prepared for similar plans, developed the following list of important topics. These should be taken into account at least in the scoping phase of the renewed SEA process:

- Air quality;
- Water quality (in case of on-shore activities also topics like surface/ground water quality and physical disturbance of riverbeds, etc.);
- Sediments/Geology/Seismology;

- Land take / urbanization;
- Waste management;
- SEA and costal biodiversity (with sub-topics like Plankton; Fishes; Deepwater corals; Chemosynthetic communities; Soft bottom benthos; Marine mammals; Sea turtles; Marine and coastal birds; Coastal habitats; Protected areas, etc.) (in case of on-shore activities also topics like on-shore biodiversity and protected areas, etc.);
- Cultural heritage and landscape (with sub-topics like Shipwrecks and other underwater/costal archeological sites) (in case of on-shore activities also on-shore cultural heritage areas and buildings, etc.);
- Other economic activities (with sub-topics like Fishing activities; Shipping activities; Underwater infrastructure; Recreation and Tourism; etc.) (in case of on-shore activities also topics like agriculture, etc.);
- Human health;
- Other social aspects (with sub-topics like Coastal communities; Reallocation; Security; Living conditions; etc.);
- Climate Change – from two perspectives; 1) impact of proposed activities on climate change and 2) impact of expected climate change scenarios on proposed solutions of the plan (e.g. were CC scenarios taken into account when planning for increased severity of the storms, increase in temperature, etc.).

The importance of Realistic and Relevant Alternatives

Additionally, we have to emphasize the importance of realistic and relevant alternatives, which were to a great extent neglected in the current SEA. We highly recommend that responsible planning authorities and the SEA team seriously consider different types of alternatives which could be implemented in practice. These can either be linked to:

- “Location alternatives” (e.g. limited number of blocks open for interventions, alternative corridors for the gas pipeline, etc.),
- “Time-line alternatives” (e.g. prescribed order of blocks to be opened for implementation of planned activities, time periods that have to pass and conditions that have to be met in this time period before the next block is open for implementation of planned activities etc.),
- “Exclusion zones” (e.g. zones where all or certain interventions are not allowed due to protected areas, important marine spawning grounds, underwater archeological sites, underwater infrastructure corridors, etc.),
- Or any other relevant alternatives developed in the SEA process.

Who should be involved in the SEA process?

International best practice recognizes the following main groups of key actors typically involved in the SEA process:

- **Responsible planning authorities** are authorities responsible for preparation of the Plan, submitting them for adoption and/or for their implementation. Planning authorities should ensure that the Plan in question is prepared in a form of a concrete strategic document, is not in conflict with other similar strategic documents and that the SEA is carried out. It is also responsible for its quality and meeting legal provisions. This group usually includes ministries, regional and municipal governments, etc.

- **Environmental and health authorities** are those governmental and/or public authorities in charge of relevant environmental and health issues. They might include environmental or environmental health inspectorates (national, regional or local level), environmental or health research institutions performing a public task or units in government (national, regional or local) likely to be concerned by, or have expertise in, the effects of implementing the plan or programme in question. Environmental and health authorities should be involved in SEA process through data sharing and active warning about potential impacts to be investigated through the SEA. They also have an opportunity to provide comments on the plan or programme, as well as on the SEA report.

- **Decision-makers** are governmental and/or public bodies in charge of approving or adopting the Plan in accordance with relevant legal provisions and administrative structure. In this case, this will be Lebanese Government or Parliament. In terms of SEA decision-makers should consider findings and conclusions provided by SEA report and ensure they are integrated into the Plan.

- **Interested public** can be defined as one or more physical or legal persons and their associations, organizations or groups. Public should have an early, timely and effective opportunities to participate in SEA process when all options are open and comments provided should be considered in the plan or programme and in the SEA. As this is a very diverse group we believe it is best to state few concrete examples like:

  o Local communities situated along the Lebanese coastline and in the vicinity of potentially planned on-shore interventions;

  o Businesses and Associations of employees working in likely impacted sectors (e.g. fisheries, agriculture, tourism, etc.);

  o Businesses and Associations of employees working in oil and gas driven sectors (e.g. energy, industry, logistics, etc.)

  o Different types of NGOs' (e.g. those interested in preservation of nature and environment; those interested in resolving social issues and prosperity; etc.);

  o All other interested physical or legal persons.

• **Foreign countries** should be involved in SEA process in case that the plan or programme is likely to have transboundary effects i.e. potential environmental and health impacts going beyond the administrative borders of the country, where the plan or programme is prepared. As oil-spill models provided by the current SEA already show significant transboundary impacts in accidental situations, we have no doubt that potential transboundary impacts are relevant. In such case, the foreign countries likely to be affected, should be informed on likely environmental and health effects and have an opportunity to provide comments on the draft plan or programme and SEA report.

Of course, different stakeholders have different capabilities to participate in the SEA process, and play very different roles in the decision-making process. But it is one of the key objectives of the SEA to ensure that all stakeholders are considered and appropriately addressed.

Therefore, we strongly believe that the renewed SEA process should be straightforward, transparent and most of all constructive. We recommend that in the renewed SEA process the list of stakeholders is widened in-line with above identified key stakeholders and target groups. We also suggest that "a stakeholder and interested public engagement plan" is prepared in advance and appropriately implemented at different stages of the SEA process.

The renewed SEA process should be straightforward, transparent, and most of all constructive. "A stakeholder and interested public engagement plan" should be prepared in advance and appropriately implemented at different stages of the SEA process.

A proper SEA process needs to follow a rigorous planning and decision-making process as shown in the diagram below:

Planning Process	SEA Process	Stakeholder and Interested Public Engagement Process
Preparation of the Draft Plan for Petroleum Activities in Lebanese Waters		
	Stakeholder and interested public engagement plan	Identification of key stakeholder groups and interested public
	Collection of all available data surveys & baseline analysis carried out since 2012	
	Scoping	Consultations with key stakeholders and representatives of interested public on the scope of the SEA
	Development of environmental goals and sets of environmental indicators	
Preparation of relevant and realistic alternatives	Preparation of relevant and realistic alternatives	
	Baseline analysis / Current state of the environment	
	Impacts analysis and formulation of mitigation measures with monitoring	
	Compiling the SEA Report	
	Quality control	Consultations with key stakeholders on the quality of the SEA Report
Public consultations with key stakeholders and interested public	Public consultations with key stakeholders and interested public	Public consultations with key stakeholders and interested public
Transboundary consultations	Transboundary consultations	Transboundary consultations
	Potential revision of the SEA Report	
Integration of mitigation measures from the SEA Report into the Plan		
Addoption of the Plan	Addoption of the SEA	

What are best practices to refer to?

It is the opinion of this review team that any oil and gas development plan and corresponding SEA is specific. However, we also believe that learning from previous experiences and SEA evaluations can be highly beneficial. Used approaches, evaluation methods, proposed solutions and mitigation measures, and other methodologies. can all be modified to the Lebanese case study to a certain extent.

This team is aware of 3 SEAs in the last few years, which were all prepared for exploration, drilling and exploitation phases of off-shore oil and gas development activities. They were prepared in Cyprus, Montenegro and Croatia. These SEAs have undergone public and transboundary consultations. Therefore, we believe they should be available for review if responsible authorities in those countries are contacted through official channels. Of course, there could be other examples which we are not aware of, thus we encourage the experts preparing a renewed SEA for Lebanon to search for more examples.

We would also like to emphasize that there were several good-practice guidelines developed in the last few years, which are based on practical experiences from various countries around the world. These can be easily accessed online including:

- **UNECE website:**
https://www.unece.org/env/eia/sea_protocol.html;

- **European Commission website:**
http://ec.europa.eu/environment/eia/sea-legalcontext.htm;

- **IAIA website:**
http://www.iaia.org/training-manuals.php.

APPENDIX 1:

Summary of the Republic of Cyprus' (SEA) concerning Hydrocarbon Activities within the Exclusive Economic Zone, November 15, 2008

SUMMARY OF CYPRUS' SEA

Summary of the Republic of Cyprus' (SEA) concerning Hydrocarbon Activities within the Exclusive Economic Zone, November 15, 2008

This appendix is a summary of the main findings of the Strategic Environmental Assessment (SEA) concerning Hydrocarbon Activities within the Exclusive Economic Zone of the Republic of Cyprus (Environmental Report; 15 November 2008). This SEA was prepared by the Consortium of Aeoliki Ltd. CSA International, Inc. in cooperation with the University of Cyprus Oceanographic Centre. Its' main intent is to present potential impacts and proposed mitigation measures. We believe this will enable readers to better understand potential impacts in the Lebanese context.

Prospecting	***Exploration***	***Exploitation***
Phase		
Activities to locate hydrocarbons and/or evaluate hydrocarbon potential by methods other than drilling. Prospecting includes seismic surveys, geological and geochemical sampling, electromagnetic surveys, and remote sensing.	The process of drilling one or more exploratory wells in a block to determine whether commercially exploitable hydrocarbons are present.	The process of exploiting commercial quantities of hydrocarbons. Key activities include drilling of development wells, installation of production facilities, installation of export facilities such as pipelines, routine operation of these systems, and eventual decommissioning.
Impact Factors		
• Air gun noise • Vessel traffic and towed streamers • Effluent discharges • Air pollutant emissions • Sea floor disturbance	• Drilling rig installation and removal • Drilling rig presence • Drilling discharges • Other effluent discharges • Marine debris • Air pollutant emissions • Well testing • Support activities	• Facility installation • Presence of structures • Drilling discharges • Operational discharges • Marine debris • Air pollutant emissions • Support activities • Structure removal
Affected Resources In the SEA the following resources were considered for the impact analysis:		
• Air quality • Water quality • Sediments/geology • Plankton • Fishes • Deepwater corals • Chemosynthetic communities	• Soft bottom benthos • Marine mammals • Sea turtles • Marine and coastal birds • Coastal habitats • Protected areas • Fishing activities	• Shipping activities • Telecommunications cables • Shipwrecks • Recreation and tourism • Coastal communities

Prospecting	Exploration	Exploitation
	Impact Factors	
• Effects of Sea Floor Disturbances and Drilling Discharges on Deepwater Corals Chemosynthetic Communities • Effects of Sea Floor Disturbances and Drilling Discharges on Chemosynthetic Communities • Effects of Sea Floor Disturbances on Shipwrecks and Submerged Archaeological Resources • Effects of Air gun Noise on Marine Mammals and Turtles • Effects of Seismic Survey Vessels and Towed Streamers on Fishing and Shipping • Effects of Well Testing on Air and Water Quality • Effects of Helicopter Traffic on Important Bird Areas • Effects of Structure Removals on Marine Mammals and Sea Turtles • Effects of Oil Spills		
	What Was Considered As A Significant Impact?	
In this Environmental Report, an impact is considered significant if it is likely to result in one or more of the following: • Violation of air or water quality standards, effluent limits, or emission limits; • Persistent contamination of water or sediments resulting in harm to aquatic life, human health, or beneficial uses of the environment; • Damage to, or contamination of, sensitive or protected habitats, fishery resources, or recreational resources such as beaches or parks; • Damage to marine or coastal habitats to the extent that ecosystem function and ecological relationships would be altered; • Death, injury, disruption of critical activities (e.g., breeding, nesting, nursing), or damage to critical habitat of a species listed by the IUCN as endangered, critically endangered, or vulnerable; • Frequent or continual interference with other marine uses such as fishing, shipping, recreation and tourism, or telecommunications; • Damage to or contamination of important cultural, historical, or religious sites on land or in the sea (e.g., shipwrecks, submerged archaeological sites); and/or • A threat to public health or public safety.		

PROSPECTING PHASE

Evaluation Of Prospecting Impact Factors

Prospecting for hydrocarbon resources in the marine environment encompasses a variety of techniques, including seismic surveys, geological and geochemical sampling, electromagnetic surveys, and remote sensing surveys (Continental Shelf Associates, Inc., 2004). In general, seismic surveys are the activities of most interest with respect to environmental impacts. The other techniques typically have little or no environmental impact.

Table 5.1 summarizes the characteristics of potential prospecting survey activities that may occur offshore the Republic of Cyprus. Several of these methods may also be used during other phases of offshore oil and gas activity (e.g., during exploration and/or exploitation).

Some prospecting activities have already been conducted in the license area. A two-dimensional (2D) seismic survey was conducted in the license area by Petroleum Geo-Services (PGS) in 2006. The survey covered an area of approximately 51 000 km2 within the EEZ. A three-dimensional (3D) seismic survey was conducted in Block 3 in 2007.

The level of future prospecting activities associated with the licensing programme is unknown. For this analysis, it is assumed that:

- One or more additional 2D and/or 3D survey(s) will be conducted to provide coverage of certain or all licensing blocks.
- Geological or geochemical sampling is likely to occur in all blocks that are licensed for exploratory drilling.
- Ocean bottom cable surveys are unlikely to be conducted in the license area due to the water depths (248 to 2866 m).

Effects of:	*Short description*	*Conclusions*
Air gun Noise	Air gun noise has the potential to adversely affect marine biota. The resources of concern with respect to significant impacts are marine mammals, sea turtles, and fishes. Although plankton, invertebrate nekton, benthic fauna, and other biota could be affected, those impacts are not likely to be significant and are not discussed here.	Seismic surveys may produce temporary or permanent hearing impairment in some fishes, but would be unlikely to cause serious injury except at very close range. Also, by disturbing fishes, air gun operations may indirectly cause a temporary reduction in fish catch near survey vessels. Literature and data are insufficient to conclusively determine whether such effects will occur and if so, their areal extent and duration.
Vessel Traffic & Towed Streamers	During 2D and 3D streamer surveys, an exclusion zone or safety zone is maintained around the seismic vessel and streamer arrays. The zone is necessary to prevent fishing vessels or other ships from crossing the streamer arrays. This helps to avoid damaging the seismic array and fishing gear.	Movements of fishing vessels and other ships may be temporarily interrupted during streamer surveys due to the extent of the moving safety zone around the streamers. There is also the potential for towed streamer arrays to become entangled with long-line sets.

Potential prospecting survey activities may occur offshore the Republic of Cyprus and several of these methods may also be used during other phases of offshore oil and gas activity.

	Existing control measures	*Recommended mitigation measures*
	No existing control measures were identified. Some petroleum companies and seismic survey operators voluntarily implement measures such as a "soft start" that may reduce impacts on fishes.	Require licensees to implement a protocol to reduce the risk of auditory trauma to marine mammals and sea turtles. The protocol should include at minimum provisions for soft start, visual monitoring, and shutdown of the array. For explanation see Section 5.2.3.4.
	No specific control measures for this activity were identified. However, the Hydrocarbons Regulations of 2007 require licensees to ensure that operations are conducted in an environmentally acceptable and safe manner, consistent with the applicable environmental legislation and good international industry practice. It is assumed that licensees would be required to notify the relevant Cyprus maritime authorities of the planned survey location and schedule. Also, it is assumed that survey vessels would use appropriate signals in accordance with International Maritime Law (including communications via radio, lights, and flags) to warn other vessels of the exclusion zone.	Licensees should be required to consult with stakeholders prior to conducting streamer surveys to ensure that conflicts with fishing and shipping activities are minimized. For explanation see Section 5.2.3.4.

Effects of:	*Short description*	*Conclusions*
Effluent Discharges	Effluent discharges from survey vessels will include treated sanitary waste, domestic waste, deck drainage, and bilge and ballast water. Impacts will be similar to those of effluent discharges from other ships in the region. For example, effluents may affect concentrations of suspended solids, nutrients, and chlorine, as well as generating biochemical oxygen demand (BOD). These discharges are expected to be diluted rapidly in the open ocean. Impacts would likely be undetectable beyond tens of meters from the source and are considered to be negligible.	Effluent discharges from survey vessels will be similar to those from other vessels in the region and are expected to have negligible impacts on offshore water quality.
Air Pollutant Emissions	Engines of seismic survey vessels (including the source boat and chase boats) will emit air pollutants including carbon monoxide (CO), nitrogen oxides (NOx), Sulphur oxides (SOx), particulate matter (PM), and volatile organic compounds (VOCs), as well as greenhouse gases such as carbon dioxide (CO_2) and methane (CH_4). Some of these gases are known to degrade to form different compounds, and these degradation products and transformation processes are important in the context of problems such as global warming and acidification. The emissions are indistinguishable from those of existing maritime traffic in the region and are expected to be rapidly diluted and dispersed in the atmosphere. There may be some decrease in air quality within several hundred meters around the vessels during operations. However, no detectable impacts on air quality in Cyprus are expected based on the relatively small quantities of pollutants emitted and the operational distances from shore.	Air pollutant emissions from seismic survey vessels would be similar to those of existing ship traffic in the region and are expected to have negligible impacts on air quality.
Sea Floor Disturbance	Some types of seismic surveys involve a small amount of sea floor disturbance (see Section 5.2.1). The extent of sea floor disturbance would be minimal, and in most cases impacts would be negligible. However, resources that could be significantly affected include (1) Deepwater coral communities, (2) chemosynthetic communities, (3) telecommunications cables, and (4) shipwrecks and other submerged archaeological resources.	Ocean bottom cable surveys (if any), vertical cable surveys, and VSP surveys may disturb small areas of the sea floor. There is a slight possibility of impacts to deep-water corals, chemosynthetic communities, shipwrecks, or other submerged archaeological resources if they are present at the survey location. However, due to the minimal amount of sea floor disturbance during these surveys, no significant impacts are expected.

	Existing control measures	*Recommended mitigation measures*
	Survey vessels must comply with MARPOL requirements including provisions concerning sewage, food waste, oily waste, and garbage.	No additional mitigation is recommended. For explanation see Section 5.2.3.4.
	Survey vessels must comply with MARPOL Annex VI, which sets limits on Sulphur oxide and nitrogen oxide emissions from ship exhausts and prohibits deliberate emissions of ozone-depleting substances including halons and chlorofluorocarbons. MARPOL also sets limits on emissions of nitrogen oxides from diesel engines and prohibits the incineration of certain products on board such as contaminated packaging materials and polychlorinated biphenyls. Also, under the Hydrocarbons Regulations of 2007, licensees are required to ensure that all machinery, equipment, and installations used by the licensee and subcontractors comply with generally accepted standards in the international petroleum industry and are of proper construction and kept in good working order.	No additional mitigation is recommended. For explanation see Section 5.2.3.4.
	No existing control measures were identified.	No additional mitigation is recommended. For explanation see Section 5.2.3.4.

EXPLORATION PHASE

Evaluation Of Exploration Impact Factors

During the Exploration phase, one or more exploratory wells would be drilled in a block to determine whether commercially exploitable hydrocarbons are present. An operator may also conduct additional seismic surveys and/or other prospecting surveys to help select drilling locations and identify geohazards. These have been previously characterized under Section 5.2 and are not repeated here.

Drilling an exploratory well in the deep-water environment typically takes 70 to 90 days (Regg et al., 2000). However, the duration may range from 40 to 120 days, depending on the target well depth and any problems encountered during drilling. Typically, a self-contained, mobile drilling rig would be brought into the area to drill a well. Based on water depths in the licensing area (248 to 2866 m), the most likely type of drilling rigs

Effects of:	*Short description*	*Conclusions*
Drilling Rig Installation & Removal	Depending on the type of drilling rig used, sea floor sediments could be disturbed during installation and removal of drilling rigs. Conventionally moored semi-submersibles typically are held on location by radially deployed anchors, and the setting and dragging of anchors and chains disturbs sea floor sediments (Figure 5.6). The length or "scope" of each mooring line may be five to seven times the water depth. According to MMS (2007b), the disturbed sea-bottom footprint for a conventionally-moored semi-submersible varies depending on the mooring configuration but is generally 2 to 3 ha. This represents 0.001% or less of the area of a license block. After a drilling rig is removed, anchor scars will likely remain on the bottom for months to years (EG&G Environmental Consultants, 1982; Shinn et al., 1990, 1993; Dustan et al., 1991). In a recent study of drill sites in the Gulf of Mexico at depths of about 1000 m, Continental Shelf Associates, Inc. (2006) detected anchor scars up to 14 years after drilling was completed. Individual anchor scars ranged from less than 100 m to over 3 km in length. The anchor scars will eventually disappear as sediments are redistributed by currents and benthic organisms.	Where conventionally moored semi-submersibles are used, approximately 2 to 3 ha of sea floor sediments and benthic communities will be physically disturbed by anchors and cables. The impacts are likely to persist for several years. Where dynamically positioned semi submersibles or drill ships are used, there will be no anchoring impacts. Impacts of anchoring in soft bottom areas are considered negligible due to low density and low diversity of the deep-water benthic communities. However, placement of anchors on deep-water coral communities or chemosynthetic communities would represent a significant impact and should be avoided. Potential damage to shipwrecks or other submerged archaeological resources could be significant and should be avoided.

would be semi-submersibles or drill ships. Each well would be drilled to a predetermined depth and either temporarily suspended or abandoned in accordance with industry standards. During drilling, the rig would discharge drilling fluids and cuttings and other effluents in accordance with the effluent limits summarized in Section 3.4.0

If a hydrocarbon formation is discovered during exploratory drilling, a well test may be conducted. A well test is a procedure to determine the productive capacity, pressure, permeability, and/or extent of a hydrocarbon reservoir, and it may involve burning a small quantity of oil or gas. If a well is deemed productive, it may be suspended by installing cement or mechanical plugs to isolate the hydrocarbon intervals and fitting a well suspension cap to allow reentry of the well at a later date (for completion and production).

If no commercially exploitable reservoir is found during exploratory drilling, a well would be permanently plugged with cement or mechanical plugs and abandoned. A site clearance survey would be conducted to ensure that any debris from drilling activities is removed from the sea floor around each drill site.

Existing control measures	*Recommended mitigation measures*
No existing control measures were identified.	Before conducting any sea floor disturbing activities: - any pertinent information available to identify hard bottom areas that could support deep-water coral communities should be used. If any such areas are identified, licensees should be required to maintain a separation distance of at least 100 m from the location of all proposed sea floor disturbances (including those caused by anchors, anchor chains, and wire ropes). - licensees should be required to evaluate the potential for high-density chemosynthetic communities around each proposed wellsite and, if any such features are identified, maintain a separation distance of at least 100 m from the proposed sea floor disturbances (including those caused by anchors, anchor chains, and wire ropes) within the activity footprint. - licensees should be required to (1) conduct a remote sensing survey of the sea floor to evaluate the potential for shipwrecks and other submerged archaeological resources and (2) submit an archaeological assessment report by a qualified marine archaeologist to include any identified archaeological resources and recommendations for avoidance or further investigation (see Section 6.0 for details). For explanation see Section 5.2.3.4.

Effects of:	*Short description*	*Conclusions*
Drilling Rig Presence (including Noise and Lights)	Exploratory drilling rigs typically are on site for approximately 70 to 90 days. During this time, the physical presence of the rig, as well as noise and lights from drilling activities, may affect marine biota including plankton, fishes, marine mammals, sea turtles, and birds. For a single, temporary structure such as a drilling rig, the effects are negligible. The potential impact for permanent structures (e.g., production platforms) is discussed further under Exploitation (see Section 5.4.5).	The physical presence of the rig will attract pelagic fishes. Birds may use offshore rigs as stopping places. Noise and lights may cause minor behavioral changes in marine mammals and sea turtles (e.g., attraction or avoidance). Due to the brief duration of exploratory drilling and the small number of drilling rigs that would be present at any time, the impacts are considered negligible. Most drilling rigs are not likely to be visible from shore.
Drilling Discharges	To understand the fate of drilling discharges in the license area, it is helpful to recognize three types of discharges: • Sea floor releases of cuttings, seawater, and excess cement slurry during initial jetting of wells. Most of this material settles within tens of meters around the wellsite, producing the thickest accumulations (several centimeters to tens of centimeters); • Discharges of WBFs and cuttings from the drilling rig. These occur after the marine riser is set, allowing drilling fluids and cuttings to be returned to the drilling rig. The discharged cuttings tend to sink rapidly within a few hundred meters, whereas the drilling fluids may disperse over several kilometers, producing a thin or even undetectable layer (Boothe and Presley, 1989); • Discharges of SBF cuttings from the drilling rig. When SBF systems are used, the SBF itself is recycled, but cuttings are discharged along with small amounts of adhering drilling fluids. The SBF cuttings tend to clump together and sink rapidly near the wellsite, generally within a few hundred meters (Neff et al., 2000; OGP, 2003) (Figure 5.7).	Drilling fluids and cuttings will accumulate on the sea floor, resulting in changes in bottom contours, grain size, barium concentrations, and perhaps concentrations of other metals. These changes occur primarily within about 500 m around each wellsite and may persist for several years. Impacts of these accumulations in soft bottom areas are considered minor or negligible due to low density and low diversity of the associated deep-water benthic communities. However, discharges in areas of deep-water coral communities and chemosynthetic communities could represent a significant impact and should be avoided.
Other Effluent Discharges	Other routine discharges during exploratory drilling typically include treated sewage and domestic wastes (including food waste), deck drainage, and miscellaneous discharges. These are subject to MARPOL regulations.	Discharges of effluents such as treated sewage, domestic wastes, deck drainage, and miscellaneous wastes may affect water quality near drilling rigs. The effluents will be similar to those from other vessels in the region, and effects on offshore water quality are expected to be negligible.

	Existing control measures	*Recommended mitigation measures*
	No existing control measures were identified.	No additional measures are recommended.
	No existing control measures were identified.	Before conducting any sea floor disturbing activities any pertinent information available to identify hard bottom areas that could support deep-water coral communities should be used. If any such areas are identified, licensees should be required to maintain a separation distance of at least 500 m from any proposed drilling fluid and cuttings discharge location. Before conducting drilling activities in the license area, licensees should be required to evaluate the potential for high-density chemosynthetic communities around each proposed wellsite and, if any such features are identified, maintain a separation distance of at least 500 m from the location of any proposed drilling fluid and cuttings discharge. For explanation see Section 5.2.3.4.
	Drilling rigs and support vessels must comply with MARPOL requirements including provisions concerning sewage, food waste, oily waste, and garbage.	No additional mitigation is recommended. For explanation see Section 5.2.3.4.

Effects of:	Short description	Conclusions
Marine Debris	Offshore oil and gas operations generate trash including paper, plastic, wood, glass, and metal. Most is associated with galley and food service operations and with operational supplies such as shipping pallets, containers used for drilling fluids and chemical additives (sacks, drums, and buckets), and protective coverings used on mud sacks and drilling pipes (MMS, 2007b). Some personal items, such as hardhats and personal flotation devices, are accidentally lost overboard from time to time. Generally, galley, operational, and household trash is collected and stored on the lower deck near the loading dock in large receptacles covered with netting. Drilling operations require the most supplies, equipment, and personnel, and therefore generate more solid trash than production operations.	Marine debris accidentally lost overboard from offshore drilling rigs and service vessels has the potential to adversely affect marine mammals, turtles, and birds through entanglement and ingestion. In addition, metal debris such as welding rods and buckets can clutter the sea floor around drill sites.
Air Pollutant Emissions	Drilling rigs typically are powered by diesel engines that emit air pollutants including CO, NOx, SOx, PM, VOCs, and greenhouse gases such as CO2 and CH4. Support vessels and helicopters will also emit air pollutants from combustion of diesel fuel (vessels) and aviation fuel (helicopters).	Air pollutant emissions from drilling rigs are expected to have negligible impacts on air quality. Due to the distance offshore, no impacts on coastal or onshore air quality are expected.

	Existing control measures	Recommended mitigation measures
	Drilling rigs and support vessels must comply with MARPOL requirements including the prohibition of disposing trash into the sea. The discharge requirements for the Mediterranean Sea as a "special area" under Annex V will take effect on 1 May 2009. After that date, disposal into the Mediterranean Sea of the following will be strictly prohibited: all plastics, including but not limited to synthetic ropes, synthetic fishing nets, plastic garbage bags, and all other garbage including paper products, rags, glass metal, bottles, crockery, dunnage, lining and packing materials. Under the Hydrocarbons Regulations of 2007, licensees are required to (a) remove all equipment and installations, structures, plants, appliances, and pipelines from the relinquished area or former licensed area in a manner agreed with the Minister pursuant to an abandonment plan provided by the Contract; and (b) perform all necessary site restoration activities in accordance with good international petroleum industry practice, and take all other action necessary to prevent hazards to human life or to the property of others or the environment.	No additional mitigation is recommended. For explanation see Section 5.2.3.4.
	Drilling rigs and support vessels must comply with MARPOL Annex VI, which sets limits on Sulphur oxide and nitrogen oxide emissions from ship exhausts and prohibits deliberate emissions of ozone-depleting substances including halons and chlorofluorocarbons. MARPOL also sets limits on emissions of nitrogen oxides from diesel engines and prohibits the incineration of certain products on board such as contaminated packaging materials and polychlorinated biphenyls. Also, under the Hydrocarbons Regulations of 2007, licensees are required to ensure that all machinery, equipment, and installations used by the licensee and subcontractors comply with generally accepted standards in the international petroleum industry and are of proper construction and kept in good working order.	No additional mitigation is recommended. For explanation see Section 5.2.3.4.

Effects of:	*Short description*	*Conclusions*
Well Testing	If a hydrocarbon formation is discovered during exploratory drilling, well testing may be conducted. A well test is a procedure to determine the productive capacity, pressure, permeability, and/or extent of a hydrocarbon reservoir. The most common test sequence consists of a short flow period, perhaps 5 to 10 minutes, followed by a buildup period of about an hour that is used to determine initial reservoir pressure. This is followed by a flow period of 4 to 24 hours to establish stable flow to the surface, if possible, and then by the final shut-in or buildup test that is used to determine permeability thickness and flow potential (Schlumberger, 2008a). If hydrocarbons are brought to the surface during the well test, they are disposed of by burning. The oil, water, and chemicals are pumped to a burner on a flare boom where the fluids are atomized in a chamber using compressed air and the mixture ignited. This combustion will result in emissions to the atmosphere. Gas from well testing is either flared or vented directly to the atmosphere.	Air pollutant emissions from well testing will have a localized effect on air quality near the wellsite during the test period. Due to the distance offshore, no impacts on coastal or onshore air quality are expected. Fallout of oil droplets from well testing can produce a sheen on the sea surface.
Support Activities	During exploratory drilling, offshore service vessels and helicopters will provide support from an onshore base. Usually well-developed ports with the capacity to provide the needed support services are used. Due to the limited nature of exploratory activities, it is anticipated that no new facilities would be needed at this stage. Typical functions/requirements for an onshore base include: • Dock space to serve as a loading/offloading point for equipment and machinery supporting offshore operations; • Dispatching personnel and equipment; • Temporary storage for materials and equipment; • 24-hour dispatcher. A typical project would involve two offshore service vessels making at least one round trip per day (cew boats and supply boats + anchor handling tugs and anchor handling tug supply vessels. Additional support for offshore oil and gas exploration activities is provided by helicopters (one helicopter would be used to transport personnel, deliver smaller essential supplies, and for safety and emergency support) The helicopter is assumed to make two round trips per day.	Support operations for exploratory drilling are likely to use existing port facilities in Cyprus and would represent a negligible increase in the existing level of operations at these ports. No new or expanded facilities are expected. Due to the short duration of exploratory drilling projects and the relatively infrequent nature of the support vessel traffic, the likelihood of striking a marine mammal or turtle is considered low. Helicopters crossing coastal habitats may disturb bird colonies; the impacts would be minor in most cases, but potentially significant if the route passed across coastal SPAs or IBAs.

	Existing control measures	*Recommended mitigation measures*
	Under the Hydrocarbons Regulations of 2007, licensees are required to ensure that all machinery, equipment, and installations used by the licensee and subcontractors comply with generally accepted standards in the international petroleum industry and are of proper construction and kept in good working order.	During well testing, licensees should be required to (1) use a high-efficiency burner to reduce the amount of hydrocarbon fallout and (2) monitor the sea surface to ensure that no visible sheen is produced. For explanation see Section 5.2.3.4.
	No existing measures were identified. It is assumed that licensees would be required to notify the relevant Cyprus maritime authorities of the planned development and production facility location, support base, and frequency of support vessel operations.	Licensees should be advised that helicopters engaged in support operations should avoid flying over SPAs and IBAs when traveling to or from the drilling rig. A map of SPAs and IBAs should be provided for this purpose. For explanation see Section 5.2.3.4.

EXPLOITATION PHASE

Exploitation is the process of developing and producing commercial quantities of hydrocarbons. Key activities include drilling and completing development wells, installing production facilities and pipelines, routine operation of these systems, and eventual decommissioning. To date, no development or production activities have occurred in the license area.

A variety of development and production systems could be used within the Cyprus offshore license area. The type of facilities selected by an operator would depend on factors such as water depth, reservoir type, and proximity to existing oil and gas infrastructure and support operations. Examples could include conventional fixed

Effects of:	*Short description*	*Conclusions*
Facility Installation	Sea floor-disturbing activities during installation of production facilities will resuspend bottom sediments, crush benthic organisms, and produce turbidity. The total area of sea floor disturbed during a typical offshore platform installation is estimated to be 2 ha (MMS, 2007b). Spars and subsea facilities usually disturb smaller areas. The detailed impacts of facility installation will depend on the type of facility selected for a particular project. Sources of impact for conventional, bottom-founded structures include: • Towing of components to the site; • Placement of structures on the sea floor, including foundation templates, platform jackets, manifolds, well trees, flowline sleds, umbilical termination units, and other equipment; • Driving of piles or anchor piles into the sea floor (e.g., with a hydraulic hammer); • Anchoring of barges during facility installation; • Effluent discharges, air pollutant emissions, and noise from barges and tugs involved in the facility installation. Pipeline installation for any particular project is likely to take several weeks to several months.	Installation of production facilities will disturb the sea floor; the extent will depend on the type of structure but is estimated to be 2 ha per platform facility. Pipeline installation typically disturbs of sea floor about 0.32 hectares per kilometer, or 50 hectares for a 160-km pipeline. The impacts are likely to persist for several years. Impacts in soft bottom areas are considered negligible due to low density and low diversity of the deep-water benthic communities. However, placement of facilities in areas of deep-water corals or chemosynthetic communities would represent a significant impact. Potential damage to shipwrecks or other submerged archaeological resources could be significant and should be avoided.
Presence of Structures (including Noise and Lights)	In contrast to exploratory drilling rigs, production facilities typically remain in place for 20 to 30 years. During this time, the physical presence of the platform, as well as noise and lights from routine operations, may affect marine biota including plankton, fishes, marine mammals, sea turtles, and birds. In addition, the presence of subsea pipelines can create an "artificial reef" effect on the sea floor, attracting epibiota and fishes.	The physical presence of platforms will attract pelagic fishes. Birds may use offshore platforms as stopping places. Noise and lights may cause minor behavioral changes in marine mammals and sea turtles (e.g., attraction or avoidance). Benthic communities may be affected by sloughing of organic debris from platforms, and by the physical presence of pipelines on the sea floor. The impacts are considered minor.

platforms, compliant towers, floating production systems, or subsea systems controlled remotely from platforms in shallow water or on land. Design, fabrication, installation, and startup of an offshore development and production facility typically requires 7 years or more from discovery to initial production (Regg et al., 2000).

Offshore production facilities conduct limited processing of oil and gas for transport. Examples include liquid/gas separation, H2S removal, and gas compression. Once transported to shore, the oil or gas would require further processing by facilities such as oil refineries, gas processing plants, or petrochemical plants. The need for such onshore processing plants, if any, has not been determined at this stage.

Exploitation activities also typically include seismic operations such as high-resolution site surveys, vertical seismic profile surveys, and vertical cable surveys, all of which have been previously characterized under Section 5.2 and are not repeated here.

	Existing control measures	*Recommended mitigation measures*
	No existing control measures were identified.	Before conducting any sea floor disturbing activities: - Any pertinent information available to identify hard bottom areas that could support deep-water coral communities should be used. If any such areas are identified, licensees should be required to maintain a separation distance of at least 100 m from the location of all proposed sea floor disturbances (including those caused by anchors, anchor chains, and wire ropes). - Licensees should be required to evaluate the potential for high-density chemosynthetic communities around each proposed wellsite and, if any such features are identified, maintain a separation distance of at least 100 m from the proposed sea floor disturbances (including those caused by anchors, anchor chains, and wire ropes) within the activity footprint. - Licensees should be required to (1) conduct a remote sensing survey of the sea floor to evaluate the potential for shipwrecks and other submerged archaeological resources and (2) submit an archaeological assessment report by a qualified marine archaeologist to include any identified archaeological resources and recommendations for avoidance or further investigation (see Section 6.0 for details). For explanation see Section 5.2.3.4.
	No existing control measures were identified.	No additional measures are recommended.

Effects of:	*Short description*	*Conclusions*
Drilling Discharges	The fate and effects of drilling discharges during exploration have been discussed in Section 5.3.5. Effects during development drilling would be qualitatively similar. However, because numerous wells would be drilled at each production location, the areal extent and severity of benthic impacts would be greater than for exploratory drilling.	Drilling fluids and cuttings will accumulate on the sea floor, resulting in changes in bottom contours, grain size, barium concentrations, and perhaps concentrations of other metals. These changes occur primarily within a few hundred meters around each wellsite and may persist for several years. Impacts of these accumulations in soft bottom areas are considered minor or negligible due to low density and low diversity of the associated deep-water benthic communities. However, discharges in areas of deep-water coral communities or chemosynthetic communities could represent a significant impact and should be avoided.
Operational Discharges	Routine discharges during production include produced water, workover and completion fluids, treated sewage and domestic wastes (including food waste), deck drainage, and miscellaneous discharges.	Operational effluent discharges, including produced water, are likely to have minor or negligible effects on water quality within a few tens to hundreds of meters around production facilities.
Marine Debris	All solid waste generated during development and production will be transported to shore for disposal at approved facilities. In general, less solid waste is generated during production than during drilling activities. Monthly solid waste based on historical data for a typical drillship is expected to be about 40 000 kg, including general waste, galley waste, used waste oil and oil/fuel filters, absorbents, oily water, cardboard, plastic, paper, batteries, wood, etc. Most petroleum companies have implemented waste management programmes that apply the principles of source reduction, reuse, and recycling to reduce the amount of waste generated. Disposal of trash and debris in the ocean is prohibited under MARPOL, and drilling rigs operate under a Garbage Management Plan to ensure adherence to MARPOL. However, material from drilling rigs occasionally may accidentally fall overboard.	Marine debris accidentally lost overboard from offshore production facilities and service vessels has the potential to adversely affect marine mammals, turtles, and birds through entanglement and ingestion. In addition, metal debris such as welding rods and buckets can clutter the sea floor around wellsite's.

	Existing control measures	*Recommended mitigation measures*
	No existing control measures were identified.	Before conducting drilling activities, licensees should be required to use any pertinent information available to identify hard bottom areas that could support deep-water coral communities. If any such areas are identified, licensees should be required to maintain a separation distance of at least 500 m from any proposed drilling fluid and cuttings discharge location. Before conducting drilling activities in the license area, licensees should be required to evaluate the potential for high-density chemosynthetic communities around each proposed wellsite and, if any such features are identified, maintain a separation distance of at least 500 m from the location of any proposed drilling fluid and cuttings discharge. For explanation see Section 5.2.3.4.
	Offshore platforms and support vessels must comply with MARPOL requirements including provisions concerning sewage, food waste, oily waste, and garbage.	No additional mitigation is recommended. For explanation see Section 5.2.3.4.
	Platforms and support vessels must comply with MARPOL requirements including the prohibition of disposing trash into the sea. The discharge requirements for the Mediterranean Sea as a “special area” under Annex V will take effect on 1 May 2009. After that date, disposal into the Mediterranean Sea of the following will be strictly prohibited: all plastics, including but not limited to synthetic ropes, synthetic fishing nets and plastic garbage bags and all other garbage including paper products, rags, glass metal, bottles, crockery, dunnage, lining and packing materials.	No additional mitigation is recommended. For explanation see Section 5.2.3.4.

Effects of:	Short description	Conclusions
Air Pollutant Emissions	Table 5.10 lists estimated emissions for a typical development well and production platform. Platform equipment typically is powered by natural gas or diesel engines that emit air pollutants including NOx, CO, SO2, and VOCs, as well as PM and greenhouse gases such as CO2 and CH4. Support vessels and helicopters also emit air pollutants from combustion of diesel fuel (vessels) and aviation fuel (helicopters).	Air pollutant emissions from offshore production facilities are expected to have negligible impacts on air quality. Due to the distance offshore, no impacts on coastal or onshore air quality are expected.
Support Activities	During the exploitation phase, offshore service vessels and helicopters will provide support from an onshore base. It is not known at this stage whether new or expanded facilities would be needed to support development and production. A typical project would involve two support vessels making at least one round trip per day between the shore base and the offshore facility. One helicopter also would be used for personnel movement and other trips as needed to transport critical equipment to the rig. Support vessels and helicopters would normally follow the most direct route between the wellsite and the onshore base, weather and traffic permitting.	Support operations are likely to use existing port facilities in Cyprus and would represent a minor increase in the existing level of operations at these ports. It is not known whether new or expanded facilities are expected to support exploitation operations. Vessel traffic involves a small risk of striking a marine mammal or turtle. The likelihood of striking a marine mammal or turtle is considered low. Helicopters crossing coastal habitats may disturb bird colonies; the impacts would be minor in most cases, but potentially significant if the route passed across coastal SPAs or IBAs.
Structure Removal	During decommissioning, platform facilities would be removed. Typically, the platform legs are cut at the mudline so that no obstruction would protrude from the sea floor (MMS, 2005a). It is not known at this time whether explosive charges would be used during decommissioning in the license area. For offshore pipelines, the most common international practice is to abandon the pipeline in place (Scandpower Risk Management Inc., 2004). Prior to abandonment, pipelines are purged until the hydrocarbon levels are undetectable. In some cases, after the pipeline is purged, the pipe may be recovered as scrap. In general, the environmental impacts of abandoning a pipeline in place are minimal, as compared with those of removing it such as emissions and sea floor disturbance (Scandpower Risk Management Inc., 2004).	Removal of offshore production structures has the potential to kill or injure marine mammals or turtles if explosives are used to sever the platform legs.

	Existing control measures	*Recommended mitigation measures*
	Offshore platforms and support vessels must comply with MARPOL Annex VI, which sets limits on Sulphur oxide and nitrogen oxide emissions from ship exhausts and prohibits deliberate emissions of ozone-depleting substances including halons and chlorofluorocarbons. MARPOL also sets limits on emissions of nitrogen oxides from diesel engines and prohibits the incineration of certain products on board such as contaminated packaging materials and polychlorinated biphenyls. Also, under the Hydrocarbons Regulations of 2007 licensees are required to ensure that all machinery, equipment, and installations used by the licensee and subcontractors comply with generally accepted standards in the international petroleum industry and are of proper construction and kept in good working order.	No additional mitigation is recommended. For explanation see Section 5.2.3.4.
	No existing measures were identified. It is assumed that licensees would be required to notify the relevant Cyprus maritime authorities of the planned development and production facility location, support base, and frequency of support vessel operations.	Licensees should be advised that helicopters engaged in support operations should avoid flying over SPAs and IBAs when travelling to or from the production facility. A map of SPAs and IBAs should be provided for this purpose. For explanation see Section 5.2.3.4.
	No existing measures were identified.	Licensees should be required to follow international best practice for safe structure removal including monitoring for marine mammals and turtles if explosives are to be used. For explanation see Section 5.2.3.4.

ACCIDENTAL EVENTS

Evaluation Of Accidental Events Impact Factors

Accidental Events	*Short description*	*Conclusions*
Crude Oil Spill from a Blowout	A crude oil spill is a rare event that could occur as a result of a blowout. A blowout is an uncontrolled flow of reservoir fluids into the wellbore, and sometimes catastrophically to the surface. A blowout may consist of saltwater, oil, gas, condensate, or a mixture of these. During drilling, all wells are equipped with a BOP, a special assembly of high pressure valves fitted to the top of a well to prevent high-pressure oil or gas from escaping.	Depending on spill characteristics, oceanographic and meteorological conditions, and the effectiveness of spill response measures, a crude oil spill from a blowout could have significant environmental and socioeconomic effects. Potentially affected resources could include water quality, air quality, benthic communities, marine mammals, sea turtles, marine and coastal birds, coastal habitats, protected areas, recreation and tourism, and coastal communities. Response and cleanup activities in coastal and offshore waters could interfere with local fishing and shipping activities.
Diesel Fuel Spill	A diesel fuel spill is an accident that could occur during any phase of offshore hydrocarbon activities (prospecting, exploration, or exploitation). Potential sources would include vessel collisions or groundings, tank ruptures, or a hose break during at-sea refueling operations. A large spill, such as one resulting from a diesel tank rupture, would be an extremely rare event.	Depending on spill size, oceanographic and meteorological conditions, and the effectiveness of spill response measures, a diesel fuel spill could have significant environmental and socioeconomic effects. The main effects would be degraded water quality near the spill site and localized toxicity to water column biota. Except in the event of a large diesel spill close to shore, significant effects on coastal habitats, protected areas, recreation and tourism, and coastal communities are unlikely. Response and cleanup activities in coastal and offshore waters could interfere with local fishing and shipping activities

Potential accidents considered in this SEA are (1) oil spills and (2) hydrogen sulphide releases. An oil spill is an accident that could occur during any phase of offshore hydrocarbon activities (prospecting, exploration, or exploitation). Potential sources considered here, in order of importance, include (1) a crude oil spill from a blowout; (2) a diesel fuel spill; (3) a drilling fluid base oil spill; and (4) streamer cable fluid leak.

A release of hydrogen sulphide (H2S) is an accident that could occur during the exploration or exploitation phase.

	Existing control measures	*Recommended mitigation measures*
	Under MARPOL, ships (including drilling rigs) are required to have in place a Shipboard Oil Pollution and Emergency Plan (SOPEP). The SOPEP will contain the necessary reporting procedures and actions required to control discharge, and the steps necessary to initiate an external response for any spills. In addition, the Hydrocarbons Regulations of 2007 require operators to have a Contingency Plan for hydrocarbon leakages or spillage. Prior to the commencement of any drilling operations, the licensee prepares and submits to the Minister for evaluation and approval a contingency plan for hydrocarbon leakage. In the event of leakage, the licensee is required to immediately apply the contingency plan.	No additional mitigation is recommended. However, additional oil spill trajectory modelling is recommended to aid in predicting the fate of an oil spill at various locations in the license area, identifying potentially affected environmental resources, and determining minimum response times for contingency planning. (See Chapter 6 for details.)
	Under MARPOL, ships (including drilling rigs) are required to have in place a SOPEP. The SOPEP will contain the necessary reporting procedures and actions required to control discharge, and the steps necessary to initiate an external response for any spills. In addition, the Hydrocarbons Regulations of 2007 require operators to have a Contingency Plan for hydrocarbon leakages or spillage. Prior to the commencement of any drilling operations, the licensee prepares and submits to the Minister for evaluation and approval a contingency plan for hydrocarbon leakage. In the event of leakage, the licensee is required to immediately apply the contingency plan.	No additional mitigation is recommended. However, additional oil spill trajectory modelling is recommended to aid in predicting the fate of an oil spill at various locations in the license area, identifying potentially affected environmental resources, and determining minimum response times for contingency planning. (See Chapter 6 for details.)

Accidental Events	Short description	Conclusions
Drilling Fluid Base Oil Spill	SBFs contain a synthetic base oil that is mixed with other constituents to prepare the drilling fluid. In the Gulf of Mexico, an offshore region with frequent drilling activity, there were 53 SBF spills between 2001 and 2004 (MMS, 2007b). Most spills were less than 50 bbl, but three were greater than 1000 bbl. Two of the three large spills were caused by an emergency disconnect of the marine riser, and the third by riser failure. For impact analysis, it was assumed that a small spill of SBF base oil could occur at a wellsite in the license area.	There is a small risk of a spill of base oil from SBFs during exploration or exploitation. The main effects would be on the benthic community beneath the drilling rig or platform, including burial, smothering, and impacts of localized anoxia.
Streamer Cable Fluid Leak or Spill	Streamer cables towed by seismic survey vessels typically contain a light aliphatic hydrocarbon (similar to kerosene) for electrical insulation and neutral buoyancy. Breaks in the cable are rare and usually occur when currents drag the cables around a fixed structure (e.g., a platform). Fish bites from large fishes may also occasionally puncture towed streamer cables. If a streamer cable were damaged or began leaking, small volumes of the cable fluid could be released into the ocean. In most cases, the spill would be limited to the volume of one section of the streamer, which is roughly 100 to 200 L of fluid (Continental Shelf Associates, Inc., 2004).	There is a small risk of a leak or spill from streamer cables during seismic surveys. The volume would typically be small (e.g., 100 to 200 L), and the spill would have minor, localized effects on water quality.
Hydrogen Sulphide Release	A release of hydrogen sulphide (H2S) is an accident that could occur during the exploration or exploitation phase. Sulphur may be present in oil as elemental Sulphur, within H2S gas, or within organic molecules (MMS, 2007b). Although Sulphur-rich petroleum is often called "sour" regardless of the type of Sulphur present, the term "sour" should properly be applied to petroleum containing appreciable amounts of H2S, and "Sulphur-ous" should be applied to other Sulphur-rich petroleum types. Gas streams with H2S are frequently treated offshore by amine units to reduce the corrosive properties of the product.	An accidental H2S release could have significant localized effects on air quality and human health. The extent of the risk would depend on the size and H2S concentration of the release and ambient meteorological conditions.

CUMULATIVE AND SYNERGETIC EFFECTS

Eclogycal Context

To evaluate cumulative effects, it is necessary to consider the ecological context of the license area and the existing environmental stresses and issues. Hadjichristophorou (2002) identifies several key environmental characteristics of the region:

- The Levantine Basin, because of its relative isolation, has a high degree of endemism;
- Salinity and temperature in surface waters are higher in than the rest of the Mediterranean;
- The area is ultra-oligotrophic, i.e., it has a very low concentration of nutrients; and
- It has low productivity due to its ultra-oligotrophic nature, and consequently has a relatively high species diversity and very low biomass.

	Existing control measures	Recommended mitigation measures
	Under MARPOL, ships (including drilling rigs) are required to have in place a SOPEP. The SOPEP will contain the necessary reporting procedures and actions required to control discharge, and the steps necessary to initiate an external response for any spills.	Other recommendations (see Section 5.3.5 and 5.4.5) for avoiding deep-water coral and chemosynthetic communities during project siting should suffice to also avoid significant impacts from an SBF base oil spill.
	Under MARPOL, ships including seismic survey vessels are required to have in place a SOPEP. The SOPEP will contain the necessary reporting procedures and actions required to control discharge, and the steps necessary to initiate an external response for any spills.	No additional mitigation is recommended.
	Under the Hydrocarbons Regulations of 2007, licensees are required to submit a well location report including geological and geophysical information and safety measures to be used in the drilling of the well.	Licensees should be required to submit information on expected H2S levels for prospective drill sites as part of the approval process for drilling activities. Where there is a significant risk of encountering H2S during operations, licensees should be required to submit an H2S Contingency Plan.

Key Factors Affecting Ecologycal Equilibrium

Demetropoulous (2002) identifies several key factors affecting the ecological equilibrium of the Cyprus marine environment:

- Fishing and overfishing, in particular with trawlers but also with many other methods, in shallow waters;
- Urban and tourism development of the coastal zone, which affects habitats and species dependent on this zone (sea turtles, monk seals, ghost crabs, etc.);
- Pollution – especially increases in nutrients. The sensitivity of the marine waters surrounding Cyprus to nutrients is very high, as the background levels of these substances (nitrates and phosphates) are very low; and
- The Lessepsian migration, which is the movement of Indo-Pacific organisms into the Mediterranean Sea through the Suez Canal. Several hundred species have established themselves in the Eastern Mediterranean and now comprise over 12% of the Eastern Mediterranean marine fauna. Recent immigrants include the green alga Caulerpa racemosa, which has spread explosively since about 1990 to cover very large areas of seabed around Cyprus.
- The coastal area of Cyprus is under pressure from economic development, including in particular tourism, recreation, urban and infrastructural development and, to a lesser extent, agricultural and industrial development.

Issue	Identified problems	Status	Trend
Coastal mass tourism/ tourism infrastructure	Destruction of coastal habitats (e.g., beaches, sand dunes, marquis) physical alteration of coastline, lights, and trampling	Affects most of the coast of the island. Of special significance to remaining natural areas (e.g., Chrysochou Bay, Akamas)	Increasing rapidly
Urbanization and industrialization of coastal zone	Destruction of habitats, physical alteration of coastline, pollution, and landscape	Affects mainly the vicinity of coastal towns, but also natural areas, wetlands, etc.	Increasing
Fishing on sensitive ecosystems/habitats	Trawling on Posidonia meadows	Affects most of the south coast (Cape Pyla to Paphos). More serious in Episkopi Bay to Petra to Romiou	Stable
Pollution mainly from organic pollutants and nutrients	Destruction of habitats	Affects mainly Limassol Bay and Zygi – Moni area	Stable – some increase in nutrients
Coastal works – mainly breakwaters	Affects habitats/species in shallow waters and beaches	Apparent mainly but not exclusively in bays, Limassol, Larnaca. Potential problem in Chrysochou Bay	Stable – increasing threats in new areas/bays
Freshwater availability	Affects coastal wetlands and coastal salt lakes	Important for the functioning of wetlands and aquatic birds	Stable – increasing
Overfishing	Affects species diversity/ equilibria	More apparent in area between Larnaca and Paralimni	Stable – slight increases
Invasive species	Affects species diversity/ equilibria	Widespread	Increasing

In addition to the issues associated with activities in Cyprus, the Mediterranean Sea is in a region with numerous pollution sources and other threats to ecological health. A report by Greenpeace (2006) identifies several regional issues including overfishing, aquaculture, offshore hydrocarbon activities, refineries, sand and gravel extraction, spills from tanker traffic, pollution from terrestrial runoff, and climate change.

Conclusions

Potential cumulative effects associated with the hydrocarbon licensing programme were:

- **Air quality -** Minor effects on air quality similar to existing vessel and aircraft traffic in region.
- **Water quality** Turbidity from drilling discharges; elevated nutrients, suspended solids, and biochemical oxygen demand from other effluents.
- **Sediments/geology -** Minor sea floor disturbance due to placement of structures and/or anchors; altered sediment grain size due to drilling discharges.
- **Plankton -** Minor, transient effects due to effluent discharges.
- **Fishes -** Minor, transient effects due to effluent discharges.
- **Deepwater corals -** Potential physical damage due to placement of structures and/or anchors.
- **Chemosynthetic communities -** Potential physical damage due to placement of structures and/or anchors.
- **Soft bottom benthos -** Potential physical damage due to placement of structures and/or anchors; burial and smothering by drilling discharges.
- **Marine mammals -** Disturbance/avoidance due to noise; Potential for vessel strikes; Potential for ingestion of or entanglement with marine debris.
- **Sea turtles -** Disturbance/avoidance due to noise; Potential for vessel strikes; Potential for ingestion of or entanglement with marine debris.
- **Marine and coastal birds -** Disturbance due to noise; Potential for ingestion of or entanglement with marine debris.
- **Coastal habitats -** Little or no effect (depends on need for and location of pipeline landfalls, if any).
- **Protected areas -** Little or no effect (depends on need for and location of pipeline landfalls, if any).
- **Fishing activities -** Possibility of temporary exclusion from certain areas; potential gear damage or entanglement.
- **Shipping activities -** Possibility of temporary exclusion from certain areas.
- **Telecommunications cables -** Assumed to be avoided during placement of structures and anchors.
- **Shipwrecks -** Potential physical damage due to placement of structures and/or anchors.
- **Recreation and tourism -** Little or no effect.
- **Coastal communities -** Little or no effect.

Despite identified important issues the SEA did not recognize any significant cumulative impacts.

Transboundary Effects

The license area is near or adjacent to the EEZ of several countries in the region, including Turkey, Lebanon, Syria, Israel, and Egypt. As discussed in Sections 5.2 through 5.5, most of the effects of offshore hydrocarbon activities are localized within the immediate vicinity of wellsite's, pipelines, or other facility locations and are unlikely to affect neighboring jurisdictions.

Table 5.13 presents an evaluation of the potential for transboundary effects, based on the impact factors for each phase of hydrocarbon activities (prospecting, exploration, and exploitation) as well as accidental events. The evaluation identifies two sources of potentially significant transboundary effects – a crude oil spill from a blowout and a diesel fuel spill. The actual effects of an oil spill could vary substantially depending on spill volume, chemical composition of the spilled oil, oceanographic and meteorological conditions, and the effectiveness of spill response measures.

APPENDIX 2:

The SEA in a nutshell – a quick guide on how to prepare a high-quality SEA in line with EU and international guidelines

THE SEA IN A NUTSHELL

This appendix was prepared based on several EU and international guidance documents with a clear goal in mind – to present the SEA as a tool for participatory planning used to analyze and incorporate environmental and health concerns into proposed policies, plans and programmes.

Given the fact that the current SEA was, in our opinion, not prepared in line with EU and international guidelines we consider this annex to be a constructive support for the renewed SEA process. Its intent is two-sided: on one hand to explain in non-technical language the purpose of the SEA and the SEA process, and on another hand to make sure that the new SEA team fully understands the expected level and quality of the SEA Report and the SEA process.

Thus, this annex will deliver answers to the following questions:

1. What is an SEA and why should it be done?
2. In which cases should an SEA be done?
3. How should an SEA be done in practice?
4. What are key SEA implementation steps?
5. Who should be involved in the SEA process?

1. What is an SEA and why should it be done?

Strategic Environmental Assessment (SEA) is one of the key instruments for integrating environmental concerns and sustainable development principles into strategic planning and decision-making.

It is an internationally recognized tool for participatory planning used to analyze and incorporate environmental and health concerns into proposed policies, plans and programmes. The major international legal documents for SEA are the European Commission's Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (SEA Directive), and SEA Protocol to the UNECE Espoo Convention (SEA Protocol).

The purpose of the SEA can be defined as ensuring that environmental considerations inform and are integrated into strategic decision-making processes in support of environmentally sound and sustainable development.

In particular, the SEA process assists authorities responsible for plans and programmes, as well as decision-makers, to take into account:

- Key environmental trends, potentials and constraints that may affect or may be affected by the plan or programme.

- Environmental objectives and indicators that are relevant to the plan or programme.
- Likely significant environmental effects of proposed options and the implementation of the plan or programme.
- Measures to avoid, reduce or mitigate adverse effects and to enhance positive effects.
- Views and information from relevant authorities, the public and – as and when relevant – potentially affected States.

In general, carrying out the SEA should contribute to better planning results, as well as all-inclusive and transparent decision-making processes.

The purpose of the SEA is ensuring that environmental considerations are integrated into strategic decision-making processes.

2. In which cases should an SEA be done?

Generally, a SEA should be applied for plans, programmes, policies and other documents of strategic nature (including possibly also legal documents). However, not all above documents automatically require a SEA. In principle, a SEA should be carried out for the documents prepared and adopted by public authorities based on the legal provisions in various sectors.

The list of documents a subject of a SEA might include:

- Sector-specific policy, plans and programmes
- Spatial and land-use plans
- Regional development programmes
- Natural resources management strategies
- Legislative and regulatory bills
- Investment and lending activities
- International aid and development assistance
- Structural adjustment fund and operations
- Macro-economic policy
- Budget and fiscal plans
- International trade agreements.

3. How should an SEA be done in practice?

It is essential for any SEA to ensure that the SEA process interacts with preparation of the plan or programme. There are both practical and strategic reasons behind such reasoning:

- **Practical reasons** usually derive from the need for quick and efficient implementation of the SEA like minimizing time delays; saving financial means and human resources by sharing data and information by both SEA and planning experts, joint efforts to identify best possible alternatives, etc.

- **Strategic reasons** derive from the overall aim of any SEA – The overall aim of any SEA process is not to produce a very good SEA Report, but rather to actively contribute to preparation of a better plan or programme. This means that any SEA process should result in the situation when proposals and recommendations given by the SEA are already integrated in the plan or programme during its preparation.

Thus, the chance that the SEA inputs will be properly considered in the plan/programme approval process are much higher, compared to the situation when SEA is conducted only for already drafted document. It is also important to ensure proper communication between SEA team and planning team (i.e. experts drafting the plan or programme) enabling to the SEA team providing inputs in appropriate form and at the right time. Only in this way the SEA can actively and constructively support the planning process.

A good SEA should be:

- **Purpose-oriented:** The main purpose of SEA is not to produce the SEA Report, but to achieve integration of inputs in the plan or programme and its further implementation.

- **Focused** i.e. addressing the key environmental and health problems, as well as likely significant impacts and risks.

- **Transparent:** SEA should be clear, easily understandable and open process, allowing key stakeholders to participate during main stages, with open access to the main report and documents, as well as public records of the decisions taken and related justification.

- **Credible:** SEA should be conducted with professionalism, its conclusions and results have to be objective, unbiased and supported by appropriate evidence as relevant to the nature of the plan/program or project

- **Efficient** and thus presenting no- or minimal burden to the planning process or project preparation, however still delivering expected outcomes.

Application of the SEA – if carried our efficiently – should bring a number of benefits. From those of rather general and long-term nature to specific positive effects in terms of energy or natural resources savings, which can lead to economic incentives.

Proper application of a SEA should therefore:

- **Provide a high level of environmental protection:** SEA should ensure avoidance of irreversible and severe effects on the environment, cultural heritage and human health, safeguard protected areas and sites and maintain critical habitats and other areas important to the conservation of biodiversity.

- **Improve the quality of plan and programme development:** SEA has the potential to improve or reinforce the quality of the plan or programme, leading to better outcomes. It does so in a number of ways but particularly by helping to ensure that the process is focused, rigorous, open to alternatives and considers the full range of potential effects and opportunities for achieving more sustainable forms of development.

- **Increase the efficiency of decision-making:** SEA helps to streamline decision-making by enabling environmental issues to be taken into account consistently at the different stages or tiers of decision-making. Time efficiency (and as a consequence cost effectiveness) is expected to be improved by better and more consistent decision-making at the plan or programme level, leading to fewer appeals and less discussion at the operational or EIA level.

- **Facilitate the identification of new opportunities for development:** SEA facilitates the improved consideration of environmental limits in the formulation of plans and programmes. It helps in considering alternatives and encourages the search for win-win options that open opportunities for new developments within the carrying capacity of ecosystems. SEA thus supports a shift of decision-making towards genuine sustainable development.

- **Help prevent costly mistakes:** SEA provides early-warning signals about environmentally unsustainable development options. A sound application of SEA may therefore limit the risk of costly remediation of avoidable harm or corrective actions, such as relocating or redesigning facilities. SEA also helps in saving human and financial resources in the development of plans and programmes as unsustainable options can be disregarded early on.

- **Strengthen governance:** SEA increases the overall transparency of strategic decision-making and allows the early consideration of the opinions of key stakeholders in the plan- or programme-making process. Properly undertaken and accountable SEA enhances the credibility of plans and programmes. It may mobilize public support for implementation – a plan or programme may be more effective when the values, views, opinions and knowledge of the public have become part of the decision-making process.

- **Facilitate transboundary cooperation:** SEA can provide an important arena for regional cooperation to address difficult issues concerning, for example, shared protected areas, natural resources, waterways, transport connections and transboundary pollution.

4. What are key SEA implementation steps?

Although each SEA should be tailor-made – considering the main features of the plan or programme, characteristics of the area affected by the plan or programme, key environmental and health problems to be addressed within the assessment etc. – there are several common steps which are typically performed within any SEA process.

These usually include:

1. **Screening –** Many human activities may cause environmental and health impacts. However, SEA is supposed to address mainly significant impacts. Thus, the screening identifies and justifies whether or not SEA needs to be applied for a specific plan, programme, or project.

2. **Scoping –** Clear focus of SEA is an important starting point that will influence the rest of the SEA process – well-defined scope of the assessment enables keeping SEA focused on the key problems and thus minimizes personal and time demands. It is important to identify key environmental aspects to be considered in the following SEA steps, however not all environmental aspects have to be addressed in each and every assessment. Scoping should also preliminary outline:

   • Possible alternatives or options which should be addressed within the SEA.
   • Territorial dimension of likely impacts.
   • Analyses and surveys to be conducted, as well as methods and tools to be used
   • Stakeholders to be involved and the level & nature of their involvement in the SEA process.

   As a final stage of the scoping phase environmental goals of the SEA are defined, corresponding to identified key environmental aspects. It is considered good practice to also define a clear set of verifiable environmental indicators. Indicators have to be clearly linked to environmental goals and are a very transparent tool to show how proposed activities will impact key environmental aspects.

3. **Baseline analysis –** Evaluation of likely impacts cannot be conducted without proper understanding of the existing situation for the key issues identified in scoping. Baseline analysis provides a basis for impact assessment, formulation of mitigation measures and monitoring scheme. It builds on the results of scoping and can lead to better specification of the key issues, identification of the key problems relevant to the plan, program or project, and determination of the territory likely to be affected.

4. **Impacts analysis and formulation of mitigation measures** (including monitoring) – Any SEA should analyze the significant adverse, as well as positive effects of the proposed plan/programme. In order to that in a clear and transparent way a verifiable methodology should be prepared, if possible based on environmental indicators.

One of the main benefits of SEA is that it enables the identification of environmental effects for a number of proposals/developments included in the plan/programme. Thus, it can address likely cumulative effects, which can result from individually minor, but collectively significant actions taking place over a period of time.

Following the risks and impacts identified, SEA has to suggest measures to address the likely adverse effects, as well as to enhance positive impacts likely resulting from the plan/programme.

Appropriate monitoring scheme has to be designed to ensure appropriate monitoring of plan/programme implementation, but can be at the same time understood as one type of mitigation measures.

One of the main benefits of SEA is that it can address cumulative effects, which can result from individually minor, but collectively significant actions taking place over a period of time.

- Compiling the SEA Report – The aim of this stage is to prepare a well-readable and understandable SEA Report, which provides all important information and data, conclusions and recommendations in a clear way. This is very important, as it serves as a basis for consultations with relevant authorities, stakeholders and interested public. Optimally, the report should also indicate if (and how) any inputs from SEA have been already accepted and integrated in the draft plan/programme respectively.

- Quality control – SEA provides inputs to decision-making process. However, only assessment providing reliable and objective information should be considered in the decision-making process, otherwise it may lead to counter-productive results – it means decisions are based on misleading and biased conclusions, and thus likely causing environmental and health damages. The quality control should ensure that SEA process provides reliable and objective information to be considered when adopting the plan/programme and communicate this information effectively to all stakeholders and interested public.

Along these analytical steps the activities regarding consultations with stakeholders should also be conducted in certain stages – e.g. scoping, baseline analysis, quality control, etc. – as well as public consultations should be conducted based on the SEA Report.

At the end, the conclusions and recommendations provided by SEA need to be considered in the decision-making i.e. approval of the plan/programme respectively.

5. Who should be involved in the SEA process?

Following key actors are typically involved in the SEA process:

- Planning authorities are authorities responsible for preparation of the plans or programmes, submitting them for adoption and/or for their implementation. Planning authorities should ensure that SEA is carried for plans and programmes and are responsible for its quality and meeting legal provisions. This group usually includes ministries, regional and municipal governments, etc.

- Environmental and health authorities are those governmental and/or public authorities in charge of relevant environmental and health issues. They might include environmental or environmental health inspectorates (national, regional or local level), environmental or health research institutions performing a public task or units in government (national, regional or local) likely to be concerned by, or have expertise in, the effects of implementing the plan or programme in question. Environmental and health authorities should be involved in SEA process and have an opportunity to provide comments on the plan or programme, as well as on the SEA report. In some SEA systems, there is also SEA competent authority, which is in charge of coordination of SEA process and issuing the final SEA statement.

- Decision-makers are governmental and/or public bodies in charge of approving or adopting the plan or programme in accordance with relevant legal provisions and administrative structure. It can be Government or Parliament at the national level, regional and municipal councils etc. In terms of SEA decision-makers should consider findings and conclusions provided by SEA in the decision.

- Public can be defined as one or more physical or legal persons and their associations, organizations or groups. Public should have an early, timely and effective opportunities to participate in SEA process when all options are open and comments provided should be considered in the plan or programme and in the SEA.

- Foreign countries should be involved in SEA process in case that the plan or programme is likely to have transboundary effects i.e. potential environmental and health impacts going beyond the administrative borders of the country, where the plan or programme is prepared. Basically, in such case, the foreign countries likely to be affected, should be informed on likely environmental and health effects and have an opportunity to provide comments on the draft plan or programme and SEA report.

Further reading

We would like to emphasize that there were several good-practice guidelines developed in the last few years, which are based on practical experience from different countries all over the world. These can be easily accessed on web-sites – below you can find few such examples on the following web-sites:

- UNECE web-site – URL: https://www.unece.org/env/eia/sea_protocol.html;
- European Commission web-site – URL: http://ec.europa.eu/environment/eia/sea-legalcontext.htm;
- IAIA web-site - URL: http://www.iaia.org/training-manuals.php.

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