



Netherlands Commission for  
Environmental Assessment

# Review of SEA for Oil and Gas

NCEA OS25 – O78/ISBN 978-90-421-3572-7

## Bolivia





Netherlands Commission for  
Environmental Assessment

Viceministerio de Desarrollo Energético  
Ministerio de hidrocarburos y energía  
To: Sr. Viceministro Franklin Molina Ortiz  
La Paz, Bolivia

**your reference**

**your letter**

**our reference**

OS25-O78-review/Sh/jz

**enquiries to**

I.A. Steinhauer

**direct phone number**

(030) 234 76 54

*Date: April 2012*  
*Subject: Review Advice SEA oil and gas*

Dear Mr. Molina,

In April 2009, the Netherlands Commission for Environmental Assessment (NCEA) advised on Terms of Reference for a Strategic Environmental Assessment (SEA) for oil and gas in Bolivia, in particular for the protected areas Aguaragüe and Madidi/Pilon Lajas.

In your letter of February 23 2012, you requested the NCEA to review the quality of the SEA that has been prepared for the Aguaragüe area. You also indicated that NCEA's comments and observations could be used to complement/improve the final SEA report, which will then also contain the information on the Madidi/Pilon Lajas area.

It is my pleasure to submit herewith this review report prepared by a working group of the Commission. I would like to draw your attention to the following:

First of all, I would like to express my appreciation for taking the Aguaragüe National Park and surrounding areas as a pilot for an SEA for oil and gas exploration and exploitation in areas with protected status and indigenous territory. This is commendable considering its complexity.

The SEA contains a lot of valuable and relevant information. However, the NCEA is of the opinion that the SEA report does not yet contain all essential information (on environmental and other impacts and on options/alternatives to deal with these) that is needed for decision making on the specific planning processes in the Bolivian oil and gas sector and specifically when they take place in protected areas.

The Commission has noted six main shortcomings:

- 1) The SEA lacks to a large extent the link with planning and decision making and is as such not (yet) a 'real' SEA;
- 2) The SEA lacks focus, caused by the fact that the SEA for the hydrocarbons sector (by your Ministry) has been merged with the SEA for regional development (by APG/SERNAP) and because the document is a mix of an SEA report and SEA guidelines;
- 3) Although a wealth of information has been gathered in the SEA, there is an essential omission, being an impact assessment and comparison of alternatives. Maps are not presented in a way that they can serve planning and decision making.
- 4) Stakeholder participation was largely lacking in this SEA but is essential in a situation of mistrust and one of the three basic principles of good SEA (together with good quality information and transparency).
- 5) Water pollution and related health problems require further attention.
- 6) The SEA does not elaborate on the tasks and responsibilities of specific stakeholders in the hydrocarbons sector (government, oil and gas companies, affected people etc.) in the implementation of SEA recommendations.

As I have learned from your letter, you are still working on the SEA, which offers an excellent opportunity to include the recommendations by the Commission to remedy the above mentioned shortcomings. These recommendations are summarized in the boxes throughout the text.

In general, the Commission has the impression that the SEA consultants team is on the right track, but some extra effort is needed to come up with a good quality SEA to be of use for effective and well balanced decision making in the hydrocarbons sector in general and Aguaragüe in particular. This also holds true for the proposed SEA guidelines, which are currently rather general and short, and can be greatly enriched with the recommendations and lessons learned from the Aguaragüe SEA and even better, be further adapted and finalized once also the Madidi/Pilon Lajas SEA report is ready.

I would appreciate to be kept informed on how you will use this advisory review report and wish to express once more our availability and offer to continue co-operation with your Vice Ministry in the next stages of this SEA.

Yours sincerely,



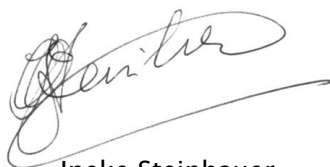
Rudy Rabbinge  
Chairman of the Working Group on SEA oil and gas, Bolivia

cc. Netherlands Embassy  
Mr. Rob van den Boom, Ms. Janette Trujillo

Review of SEA for Oil and Gas  
–Bolivia–

Advice submitted to the Ministerio de Hidrocarburos y Energía,  
by a working group of the Commission for Environmental Assessment in the  
Netherlands.

the technical secretary



Ineke Steinhauer

the chairman



Rudy Rabbinge

Utrecht, April 2012

# Contents

<b>CONTENTS.....</b>	<b>1</b>
<b>1. INTRODUCTION.....</b>	<b>2</b>
1.1 Involvement of the NCEA .....	2
1.2 Approach taken the NCEA.....	3
<b>2. MAIN REVIEW FINDINGS.....</b>	<b>4</b>
<b>3. ESSENTIAL SHORTCOMINGS TO REMEDY.....</b>	<b>6</b>
3.1 SEA link with planning and decision making.....	6
3.1.1 Economic viewpoint.....	6
3.1.2 Environmental viewpoint .....	8
3.1.3 Social viewpoint .....	9
3.1.4 Institutional and governance strengthening viewpoint.....	12
3.2 Scope and focus in the SEA .....	12
3.3 Adequate information at adequate scales.....	14
3.3.1 Impact assessment and comparison of alternatives.....	14
3.3.2 Maps.....	14
3.3.3 Static information.....	15
3.4 Stakeholder participation.....	15
3.5 Water pollution and health related problems .....	16
3.6 Roles and responsibilities of specific stakeholders .....	17
<b>4. OTHER OBSERVATIONS.....</b>	<b>17</b>
4.1 Miscellaneous.....	17

## Appendices

1. Letter of Request
2. Project Information and Composition of the Commission's Working Group

# 1. Introduction

The Ministry of Hydrocarbons and Energy (MHE) is the competent authority in Bolivia for the formulation and enforcement of development policies and resulting activities in the hydrocarbon and energy sector. At the same time, the Ministry is responsible for formulation, evaluation and compliance control of the National Policy for Hydrocarbons and Energy Planning.

Articles 32 and 132 of the Hydrocarbons Law no. 3058, state that hydrocarbon activities are exceptionally allowed in protected areas, forest reserves, permanent forestry production areas or private natural heritage sites in cases when a Strategic Environmental Impact Assessment study establishes their viability and when conservation objectives, environmental services, genetic resources, archaeological and cultural sites are not put at risk in terms of sustainable development.

Hydrocarbon activities in Bolivia take place in 'traditional' and 'non-traditional' areas: 'traditional' being those areas where hydrocarbon activities have taken place for some time already, and 'non-traditional' areas implying new areas where hydrocarbon potential is expected but where no interventions have taken place before, and where no or scarce information is available.

The MHE has taken the initiative to start a Strategic Environmental Assessment (SEA) in two areas. The first one is a traditional area, Aguaragüe national park in Tarija Department and the second one is a non-traditional area, the protected areas of Madidi/Pilón Lajas in La Paz and Beni department.

## 1.1 Involvement of the NCEA

Upon the request of the MHE, the Netherlands Commission for Environmental Assessment (NCEA) advised on Terms of Reference (ToR) for this SEA<sup>1</sup> in 2009. Through a letter by the MHE in February 2012 (see appendix 1), the NCEA has now been asked to review the quality of the SEA that has been prepared for the Aguaragüe area. NCEA's comments and observations can be used to complement/improve the final SEA report, which will then also contain the information on the Madidi/Pilon Lajas area.

The NCEA will not perform a site visit again, nor will there be a consultation with stakeholders. The NCEA review therefore is to be regarded as a technical desk review. The main implication is that there will be some uncertainty in the conclusions of the NCEA. This refers most of all to aspects which are difficult to assess by a desk study, like the quality of the public consultation process.

---

<sup>1</sup> Advice on Terms of Reference Oil and Gas, Bolivia, 17 April 2009

The reference framework for review is the advisory report on ToR, that the NCEA has drafted in 2009. These ToR have been used by the SEA consultants team as a basis for the SEA. For the review, the NCEA invited the same working group members that were also involved in drafting the ToR. Their names are listed in appendix 2.

## 1.2 Approach taken the NCEA

In general, reviewing is the step in the SEA process that determines whether the SEA report:

- is an adequate assessment of the environmental and social impacts and options/alternatives for dealing with these impacts;
- is of sufficient relevance and quality for decision-making;
- complies with existing plans, policies and standards;
- and whether the SEA process comply with the Terms of Reference;
- has taken into account stakeholder opinions about the quality of the SEA contents and the process that was used
- is easily accessible and contains a clear summary.

The aim of this review is quality control. On the one hand, the NCEA has checked whether the SEA report contains the information it should, in conformance with the regulations and the advisory guidelines. But at the same time, NCEA looked at whether the SEA report contains the information (on environmental and other impacts and on options/alternatives to deal with these) that is needed for decision making on the specific planning processes in the Bolivian oil and gas sector. The NCEA has restricted its observations to the Aguara Güe area only.

The NCEA has verified whether the SEA contains adequate, accurate and sufficient information to enable the full integration in decision making of environmental considerations, and their linkage to socio-economic issues. In the case of serious shortcomings, the consequences for decision making will be assessed and recommendations will be given for supplementary information to deal with a lack of information or other shortcomings.



## 2. Main review findings

The NCEA is of the opinion that the SEA report is in general well written. Especially Annex 1, base line, contains a wealth of information on environmental, socio-cultural, economic and productive and political/institutional aspects. The NCEA has the impression that the effort to collect and assemble all this information is the first of its kind in the Aguaragüe area. The NCEA also notes that Annex 2 of the SEA largely follows the approach of problem analysis, alternative options and consistency analysis, as recommended in NCEA's advisory ToR of 2009. A good attempt has been made to develop a proposal for a guideline for SEA implementation in the hydrocarbons sector, which was one of the objectives of the MHE at the start of the SEA.

Nevertheless, the NCEA is of the opinion that the SEA still falls short on **six** main issues essential for decision making:

- **Link SEA and planning:** The SEA lacks to a large extent the link with planning and decision making and is as such not (yet) a 'real' SEA. NCEA's ToR had identified different options and recommendations for such decisions at strategic level. Section 3.1 systematically checks whether and to which extent these recommendations have been addressed by the SEA
- **Scope and focus:** The title and contents of the document are generating confusion. Whereas the document is named "Propuesta de Guía" (guideline proposal), the main body of the document has the appearance of a first draft SEA. Due to this ambiguity, the document lacks scope and focus, both as a proposed guideline and as a draft SEA. This lack of focus is even aggravated by the fact that the SEA for the hydrocarbons sector (by MHE) has been merged with the SEA for regional development (by APG/SERNAP). Also the geographical scope is not clearly defined. Section 3.2 further elaborates on these issues.
- **Information:** The SEA lacks the right information for planning and decision making. The most important omission is, that although problems and their alternative solutions have been described, the impacts of different alternatives have not been assessed, nor has a comparison of impacts of alternative options been made. Section 3.3. deals with this aspect and also elaborates on the presentation of information such as the maps being used.
- **Stakeholder participation:** Consultation and participation of stakeholders in the SEA process of hydrocarbon plans and projects in areas with protected areas and indigenous territories is extremely sensitive and may be susceptible to unwanted and unnecessary political and social upheaval. The acceptance and consensus on proposed oil and gas exploration plans and projects depend to a large extent on how stakeholders have been involved. The SEA has not paid sufficient attention to this issue as Section 3.4 further explains.
- **Water pollution and health related problems:** These have been addressed by the SEA, but lack appropriate measures. See Section 3.5
- **SEA implementation:** The SEA does not elaborate on the tasks and responsibilities of specific stakeholders in the hydrocarbons sector (government, oil and gas companies, affected people etc.) in the implementation of SEA recommendations ('who should manage what?'. See also Section 3.6.



Chapter 3 discusses these issues in more detail. The NCEA recommends to remedy these shortcomings by adding this information to the SEA report before finalization. This information is a necessary condition for good quality SEA to be of use for effective and well balanced decision making in the hydrocarbons sector in general and Aguaragüe in particular.

Furthermore, the NCEA is of the opinion that the following issues – although not essential for decision making at this stage – are not yet sufficiently dealt with in the SEA report :

- Geology
- Environmental problems,
- Tourism,
- Health problems and bad health services
- Loss of traditional culture
- Institutional measures such as re-categorization of the Aguaragüe park and licensing by the competent authority (MHE) itself.

Chapter 4 discusses these issues in more detail. The NCEA recommends to remedy these shortcomings either before the finalization of the SEA report, or during implementation.

### 3. Essential shortcomings to remedy

In this chapter, the NCEA gives recommendations to provide additional information on a number of relevant issues to remedy in the SEA report before finalization.

#### 3.1 SEA link with planning and decision making

The NCEA is of the opinion that Annex 2 gives a thorough overview of problems and (alternative) solutions to these problems. These problems have been summarized in table 1, and have been categorized into environmental, social, economic and institutional problems. The problems as being recognized in a first scoping effort by the NCEA in its advisory ToR of 2009, have been supplemented with problems as identified by the APG/SERNAP SEA and the ones by the MHE SEA team. Table 1 can therefore be expected to give an overall and complete view.

Based on table 1, an attempt has been made to present the interrelationship between these problems in Figure 1 to identify priority problems, now and in future. Unfortunately the chart is unreadable (i.e. letters in coloured boxes not legible), and therefore it is not possible to understand positive and negative impacts and their interaction. Therefore, the table and chart do provide a long list of problems, but do not give insight or draw conclusions on which problems need strategic decision making urgently and which problems can be tackled later. Nor do they give an insight in which problem should be dealt with by which plan (and on which level).

In Section 3.1.6 of its advisory ToR, the NCEA gave recommendations for the SEA to develop alternatives for strategic planning and decision making from different viewpoints (economic, environmental, social and institutional), based on identified problems. These recommendations are summarized again below and NCEA has assessed whether these have been sufficiently addressed by the SEA. If yes, this is stated in a short conclusion by the NCEA, if not, the NCEA gives recommendations for supplementary information to deal with identified shortcomings<sup>2</sup>.

##### 3.1.1 Economic viewpoint

###### **NCEA recommendation 2009**

*'Include a short, medium and long term scenario which is concerned with the energy needs of Bolivia and the surrounding markets. All sources of energy should be considered in such scenarios (oil, gas, hydropower, coal, bio-fuels, solar, wind)'.*

---

<sup>2</sup> In total, NCEA gave 11 recommendations: 2 have been addressed sufficiently in the SEA, and should therefore in fact not be mentioned in this chapter, 'essential shortcomings'. NCEA included them for reasons of completeness and to wanted to also highlight what has been done well.

**Assessment**

The SEA contains an elaborate description of this so-called 'Need and necessity' justification for further exploration and development of oil and gas in Chapter. 2.3. It describes, amongst others, the present situation of fossil fuel consumption and export in the country. From the figures one can conclude that additional exploration and development of oil and gas is needed to fulfil present contract obligations with Argentina and Brazil and provide sufficient supply for internal consumption of gas and oil. Plans for the year 2015, with an increase of 30 million m<sup>3</sup>/day of natural gas and 64 thousand barrels of oil per day, are not substantiated with data. The chapter continues to describe plans and scenarios to fill the future demand including the environmental obstacles one has to face and come to terms with, a boost in refinery capacity and the reduction of subsidies on imported diesel. Alternative resources such as solar, wind, biomass and hydroelectric have been given attention and are part of the desired solutions, but appear extremely expensive compared with the fossil hydrocarbons.

**Conclusion:**

The NCEA finds this description sufficiently informative and conclusive to act as a basis for all relevant stakeholders to form a consensus on their mutual way forward.

**NCEA recommendation 2009**

*'Develop a phased (pace and place) approach in the seismic acquisition and drilling campaigns, starting in the least vulnerable areas first, to gain experience with the most friendly operation techniques and proceed with the lessons learned in ever more vulnerable areas if so desired and still required'.*

**Assessment**

Not yet addressed in the SEA at country scale when for instance concessions are granted

**Recommendation:**

See recommendation below under 3.1.2, suggested approach for Aguaragüe area

**NCEA recommendation 2009**

*'Investigate alternative scenarios to arrive at a fair distribution of oil and gas revenues amongst affected parties'.*

**Assessment**

Chapter 2.3.3.2 deals with this issue and suggests different mechanisms (par. c)) to arrive at a more equitable and efficient use and distribution of revenues.

**Conclusion:**

The NCEA finds this information adequate and sufficient for strategic decision making

**NCEA recommendation 2009**

*'Particularly in the case of Madidi, include different transport scenarios: will the oil/gas be transported to national and international markets via La Paz, Cochabamba or Santa Cruz?'*

Not applicable for the Agauragüe part of the SEA

### 3.1.2 Environmental viewpoint

#### **NCEA recommendation 2009**

*'Investigate how areas of future oil and gas activities can be subdivided into vulnerability categories each with a defining set of sensitivity parameters. Activities could then be planned in the least vulnerable areas first and perhaps avoided in others'.*

#### **Assessment**

In Chapter 2.1.2, the NCEA has noted the recognition of the existence of various degrees of vulnerability in Aguaragüe National Park. Map no. 7 shows the accumulated environmental vulnerability (overlay of 6 maps on geology, soil, steepness, water etc.), but is hardly readable (picture rather than map). Table no. 12 states that 38% of the area is very or extremely vulnerable. Although Annex 1 contains a lot of information on flora and fauna, this is not dealt with anymore in Annex 2. The SEA report does not explain why these aspects are not part of the accumulated environmental vulnerability map. The 'alternative options' mention the recommendation to start activities in the least vulnerable areas of Aguaragüe first using the most environmentally friendly technologies. Also Chapter 2.4.1. contains an alternative option which speaks about zoning of uses in the Aguaragüe national park.

#### **Recommendation:**

The NCEA support these recommendations but is of the opinion that strategic planning is still missing to implement this approach in these least vulnerable areas. An inventory and classification of these areas is missing as well.

The NCEA recommends to further elaborate such classification (subdivision into vulnerability categories) including location of very fragile areas, and decide what can be allowed where? Protected, most valuable, vulnerable and threatened ecosystems should be included as well in the accumulation map in order to be able to decide where oil and gas companies should definitely not go.

#### **NCEA recommendation 2009**

*'Include a preliminary list of oil and gas activities and develop alternatives that may be more environmentally friendly, cost effective or safer. This could include biodiversity offsets (compensation in terms or protecting adjacent areas or in terms of setting aside a budget for protection measures)'.*

### Assessment

The SEA report has made an overview of some techniques that are more environmentally friendly (2.1.2.2. c)) and also stresses the importance of including the analysis of alternatives at the level of EIA (2.1.2.2 a)). However, the SEA does not present an overview of oil and gas activities from beginning to end, that is from early exploration techniques such as seismic acquisition along traverses, to site and access road construction, exploratory drilling, followed by testing and in case of success, development drilling and testing, building of treatment facilities, transport lines and exploitation of the oil and gas during the lifetime of the field, finishing off with decommissioning and site restoration activities. For each activity, a variety of more or less environmental friendly alternatives exists, which however can also not be found in the SEA report, nor their expected impact reduction.

The SEA does not cover the items that need to be addressed on a local scale by the eventual sight-specific EIAs, which was also one of the expected results of the SEA at its start.

### Recommendation

The NCEA recommends that, before the finalization of the SEA report, the following has been done:

- Develop a more detailed map with vulnerability categories (see recommendation previous page 3.1.2);
- Make the overview of oil and gas activities and their alternatives;
- Select the most suitable type of activity in a given location or category;
- Develop options for strategic decision making such as (i) applying the greenest operation procedures to all environments and ban the conventional techniques and materiel or (ii) applying less expensive options in areas where nature and society are not at risk, as the most expensive (greenest) option is not necessarily the most adequate one. A realistic consideration of cost and environmental reward helps to select the best alternative
- Develop general conditions and guidelines for subsequent EIAs for an activity at a certain location on a more local and detailed level. This will improve efficiency in the procedures, avoid duplication of analytical steps for each subsequent EIA and if widely published, become a transparent tool for various legislative government bodies, nature conservation agencies and local people. Moreover, the most sensitive issues are dealt with early in the process and once consensus has been reached, future procedures are expected to follow a smoother ride

### 3.1.3 Social viewpoint

#### NCEA recommendation 2009

*'The NCEA advises to propose in the SEA a program of repair of leaking oil and gas wells, as well as clean up and sanitation of polluted soils in the immediate surroundings, streams and affected valleys, to gain trust from the affected people and local representatives organizations'.*

### Assessment

A start has been made with the clean-up and abandonment of leaking oil wells and infrastructure in Aguaragüe and the SEA report makes mention of the intention to finance a clean-up campaign. Also good practice principles have been listed (2.1.1.2) for future clean up

activities. However, trust building among stakeholders is still rudimentary, as only two (out of 29) old wells have been cleaned up and two are currently being cleaned up. It remains unclear however whether these are situated in the most vulnerable areas and on basis of what kind of criteria these were selected to start with. The SEA has made an inventory of the sensitivity of each of the wells with regard to their accumulative and synergic impacts (medium, high, extreme), but lacks an evaluation of the magnitude, location and extension of the environmental impacts that each of the wells generates. A priority in clean up is also lacking.

#### **Recommendation**

The NCEA recommends that, as part of the SEA report, the following should be included:

- Analyse the level and impact of contamination of each well. Contamination from oil spills can easily be monitored using radar remote sensing, as this sensor has been very effective in locating areas affected or polluted by such contaminant.
- Develop a results-based action plan with clear time frames for treatment of polluting wells including alternatives such as (i) methods of clean up, (ii) who pays, (iii) which old wells will have to be cleaned by which existing or future concessionaire, (iv) priority in clean up and (v) keep it like it is (no clean up) and (vi) who monitors the cleaning process?. The impacts of each of these alternatives should be assessed and compared.

#### **NCEA recommendation 2009**

*'The NCEA recommends to consider in the SEA different forms of conflict resolution, appropriate for the specific circumstances and acceptable for the stakeholders. Conflict resolution should be undertaken before the conflicts escalate. In many circumstances this implies the need to create independent outside mediation and arbitration opportunities with mediators (generally 'outsiders') who are trusted and accepted by all stakeholders. This also implies mechanisms of mutual respect: how different organizations and institutions should deal with each other and maintain the integrity of each other's institutions'.*

#### **Assessment**

The Asamblea del Pueblo Guaraní (APG) and SERNAP took the lead in the elaboration of an SEA as an instrument to look for integral solutions for a series of threats to water resources and biodiversity in Aguaragüe as a result of hydrocarbon, forestry and infrastructure activities. This SEA is planned to lead to an Integral Strategic Plan for the area. This 'SEA' took a bottom-up approach, took the region/area as a point of departure and worked closely together with social actors. The intention by MHE to seek synergy, complementarity and alignment as much as possible between the two initiatives, is a good attempt of dealing with the mistrust against the MHE and as such a way to seek conflict resolution.

Section 2.2.1.2 gives some options to reduce the mistrust against the hydrocarbon sector through:

- 1) a monitoring system by the State to monitor agreements and promises made by the oil and gas companies and
- 2) through the improvement of communication skills of staff of MHE.

These measures could lead to fewer conflicts in future. Up to now, monitoring by the State has not worked and the NCEA finds no evidence that this would improve in future. The SEA discusses land tenure issues including (feasible) options to speed up and finalize the process of land titling (Chapter 2.2.2). Clarity about land tenure (or title) is key in conflict sensitive areas, such as Aguaragüe, where indigenous land overlaps with hydrocarbon activities.

### **Recommendation**

The NCEA recommends that, before the finalization of the SEA report, the following options have been explored as part of a conflict resolution mechanism:

- Monitoring by local communities after capacity building or training on the job or monitoring by a University or research institutes ('outsiders' perspective);
- Put in place provisions that warrant neutrality: e.g. the team in charge of the SEA should work with all stakeholders to avoid conflicts and have an open attitude to gain trust;
- The employment of modern GPS systems to register and demarcate which land belongs to whom (cadastral maps) and overlay the result in a map. This type of information can be draped on top of a detailed topographical map (to give locational as well as height information). In a GIS system, this type of information can be uploaded to include all other maps (e.g., land use, forestry, geology, soil, hazard of any kind, etc.). The importance of such an exercise is that the various dataset layers created can be compared, integrated and modelled. Sub-windows extracted from any of the 1:750000 scale maps presented in the SEA report can be zoomed and populated with detailed information to support any claim that the report wants to highlight. One can even go to quantify the results and build scenarios (what if .....?). An important element of the GIS is that the datasets can be updated anytime.

### **NCEA recommendation 2009**

*'The NCEA advises to develop a (or different alternatives for a) compensation system in the SEA, taking into consideration ideas that are already being developed on compensation (among others within the MHE), e.g. (i) in case of damage, negative impacts, (ii) in general: division of benefits, once they are there, between government, companies, communities and citizens and (iii) division of benefits within one stakeholder: money or in kind, towards persons (leaders) or organizations, towards lower and/or higher levels in the organization, investment for the short term or the long term, buildings or for improving welfare, capacities, education etc'.*

### **Assessment**

The SEA report makes mention in Chapter 2.2.3 of the lack of clarity about all available compensation funds from the gas companies. The use of these funds leads to a number of scattered activities without a strategy. The SEA report recommends as an alternative option to establish strategic guidelines to ensure that available funds (4 funding mechanisms have been identified) will be used to address the priorities that have been/will be identified in the SEA. Although a relevant recommendation, it remains unclear how these funds relate to gas drilling and whether more precise compensation mechanisms have been developed or are in place (such as the ones mentioned by NCEA above).

### **Recommendation**

The SEA report already suggests that the State and oil companies should further investigate expropriation of land for hydrocarbon activities being done on the basis of fair compensation with other land of bigger size and better quality. The NCEA recommends that this study would be accompanied by further specification of such compensation mechanisms and include the results thereof into the final SEA report.



### 3.1.4 Institutional and governance strengthening viewpoint

#### **NCEA recommendation 2009**

*'The NCEA advises to include in the SEA an investigation of the available level of skills and know-how concerned with oil and gas activities, especially in vulnerable areas. The SEA should also come up with proposals for capacity building of different groups of stakeholders affected by activities in the hydrocarbon sector'.*

#### **Assessment**

The SEA report has recognized that plans need to be put in place for technical training and education for the affected local youth if local communities are to benefit from the hydrocarbon activities. The installation of a corps of social environmental inspectors by the Government of Tarija is one such example. State support is needed to give this initiative technical and legal backing to make their work effective.

#### **Recommendation**

The NCEA recommends to give more attention in the SEA to the elaboration of training plans and transfer of skills to local people,. Negotiation techniques and communication skills could be added to these plans.

#### **NCEA recommendation 2009**

*'The NCEA also recommends including several environmental monitoring scenarios in the SEA, for example (i) monitoring by the local municipalities and regional governments (as required by law), (ii) the Ministry itself, (iii) a specialized organization or (iv) jointly by social and environmental stakeholders. This includes a description of what will be required for each alternative'*

#### **Assessment**

The SEA report has elaborated different monitoring options for socio-environmental monitoring: with funds from the oil and gas companies, by Tarija Departmental and municipal authorities and integrated with ongoing monitoring by the Sectoral Competent Authority (MHE) and Environmental Competent Authority (Ministry of Water and Environment).

#### **Recommendation**

The NCEA suggests to include another option in which local communities are seriously involved in this participatory monitoring. Also an independent scientific party could play a role in this situation of mistrust and this option should be studied as part of the final SEA report.

## 3.2 Scope and focus in the SEA

The SEA report shifts from one thought to the other and back. On the one hand there is the SEA by the MHE, dealing with the oil and gas sector and touching upon issues at national and regional level. On the other hand there is the APG/SERNAP Aguara Güe SEA which is more of a

base line inventory and analysis to develop an Integral Strategic development plan for the Aguaragüe area only. Finally the SEA report contains a proposal for SEA guidelines for the oil and gas sector.

This is confusing, because some problems and corresponding (alternative) solutions can only be dealt with at national level and within the sector only (e.g. law adjustments, national plans, coordination e.g. in licensing). Other problems and solutions need planning and decision making at the regional level (block/Aguaragüe) and are not always directly or clearly related with/caused by oil and gas activities (such as high incidence of poverty, health problems and bad health services and loss of traditional culture).

The alternative options range from first ideas to very elaborate recommendations and are as such a mix of green and mature issues, which require different forms/instruments of follow-up at different levels of planning and decision making with different urgency of action. This sifting of problems and alternative options and attaching these to the right level still needs attention in the final SEA report.

Chapter 4 of Annex 1 contains an overview of all relevant policies, plans and programmes at national, departmental, regional and local level. Chapter 3 of Annex 2, Consistency Analysis, contains a table with of a selection (6) of these policies, plans and programmes:

- 3 Municipal development plans (Villamontes, Caraparí and Yacuiba)
- National Development Plan
- Energy Development Plan
- Strategic Plan for the integral development of Aguaragüe protected area and Ancestral Territory of the Guaraní (the APG/SERNAP 'SEA').

It is not clear why the Departmental and Municipal territorial plans have not been included in this overview. The table has summarized for each alternative option, whether and how this issue has been dealt with in each of the six plans mentioned above. This is a good first step as it shows that many of the identified problems can be tackled in a coordinated and integrated way and several even within the context of existing plans and policies. However, it is restricted to an assessment only. What is still needed is an analysis of which policies/plans/programs provide the most suitable platform to follow-up on the recommendations as identified in the SEA report for strategic decision making and who is responsible for this (see also 3.4 of this review advice).

#### **Recommendation**

The NCEA recommends to better explain the character of the SEA report: is it a guidelines document (as the title suggests), is it a sector SEA for hydrocarbon activities or an SEA for a regional development plan? Chapter 4 of Annex 2 explains that the SEA report can be used as an input for the Integral Strategic Plan for Aguaragüe, but at the same time at macro level within the hydrocarbons sector in areas where acreage with hydrocarbon potential overlaps with protected areas.

The SEA report would greatly improve in quality and enhance effective planning and decision making if the numerous recommendations and alternative options could be presented according to urgency, scale and level of decision making and in easy accessible sets or packages of options for relevant decision makers.

It is impossible to solve all problems at once, therefore the NCEA recommends to clearly focus on issues that this SEA will address and clearly indicate which issues will fall outside the scope of this SEA.

Regarding the geographical scope of the SEA, the **NCEA recommended in 2009**:

*‘For the SEA in this traditional hydrocarbon area, the NCEA recommends not only to consider the area of the Aguaragüe park itself, but instead the concession areas of all of the Aguaragüe serranía and footfills, including the concessions located in the park and in the Guaraní TCO’*

#### **Assessment**

The document refers to the ‘Aguaragüe traditional area’ as the SEA study area, this being the Aguaragüe PN (national park) and ANMI (natural area with an integrated management). The diagnosis and base-line cover however a much larger area. Also most of the present oil and gas wells and exploration sites are found outside the PN and ANMI areas. It is not clear if all the exploration areas and all the traditional indigenous territories in the region are covered by the SEA study.

#### **Recommendation**

The NCEA recommends to make clear which criteria have been used to determine the study area. Proper geographical scoping and focusing based on clear criteria will clarify the doubt and enhance the usefulness of the SEA.

### **3.3 Adequate information at adequate scales**

#### **3.3.1 Impact assessment and comparison of alternatives**

In Annex 2, problems are described and their solutions. However impacts of different alternatives are not described, nor the aggregated impacts and effects and how they are related. Therefore, also a comparison of impacts of alternative plans has not been made.

Impact assessment and comparing alternatives is a key issue in SEA. The idea of alternatives is that there are different ways of achieving plan objectives or addressing problems. Alternatives should also be sufficiently distinct in order to highlight the different environmental and social implications of each, so that meaningful comparisons can be made at a strategic level.

#### **Recommendation**

The NCEA recommends to include in the SEA an impact evaluation of each of the alternative (sets of) option. Demonstrating that there are choices to be made is an effective way of engaging decision makers (and other stakeholders) in the SEA process

#### **3.3.2 Maps**

The information in the SEA report is difficult to visualize as the maps presented as Figures (scale 1:750.000) do not support the names of towns and rivers given in the text. As a result,

at least one map should include all the names of towns and rivers to make it understandable to the reader. At times, different colors and symbols are used to explain the various themes in the report (e.g., forest area, geology, etc.). Moreover, in all figures, the legend is hardly readable and one cannot make sensible interpretation out of it. In Arc GIS software, from where all maps shown in the report are assumed to have been derived, it would be easier to include the names and insert a legible legend. Maps seem to have been aggregated too quickly: not all available information has been used and maps do not have the right scale and therefore cannot serve the purpose of illustration. Not a single map can be found which describes the current land use or split between e.g. agricultural land and land for gas concessions. The result of this set up of the SEA report is that the maps do not facilitate decision making.

**Recommendation**

The NCEA recommends to make the information in the SEA report available on maps with a scale of 1:200.000 – 1:125.000 or larger (A3 format) depending on the subject and available information. See also recommendation in 3.1.3. above regarding maps and GIS. When maps with oil and gas resources and related activities are projected upon maps with land, water and natural resources and maps indicating human land occupation and land tenure, it will improve understanding of what is what, where the affected areas are and where one expects problems to occur.

### 3.3.3 Static information

The SEA contains extensive baseline information on the existing situation. Although in some parts of the SEA report an attempt has been made to show future development (e.g. in relation to deforestation), in general information on the expected environmental and socio-economic situation in case no new hydrocarbon development takes place, is lacking (so-called autonomous development).

**Recommendation**

The NCEA recommends to include a description of the autonomous development, such as planned road development, planned agricultural activities, growth of (illegal) timber extraction and planned eco-tourism activities to assess impacts and interrelations of future developments with development of hydrocarbon activities, as accumulation of activities may threaten the sustainable development of Aguaragüe area. On the other hand, effects may result to turn out less severe, because the autonomous development may already affect certain values.

### 3.4 Stakeholder participation

Apparently, consultations have been difficult to organize due to conflicts in timing, coordination problems with social organization, and faltering relationships (influenced by the TIPNIS events). However, arguments such as lack of time, coordination problems or conflicting pri-

orities are not acceptable, from neither side. In general it is better to deal with resistance during a thorough process of public participation instead of ignoring these objections.

Stakeholder participation is essential in a situation of mistrust and one of the three basic principles of good SEA (together with good quality information and transparency).

The SEA report contains many positive suggestions and options which can be shared with the public as a start of thorough and genuine consultation: To mention some of these:

- The installation of a corps of social environmental inspectors by the government of Tarija to monitor and evaluate impact of activities and allow improvements at the next location.
- Clean-up and proper abandonment leaking oil wells
- The intention to finance a clean-up campaign
- The intention to compensate for use of private land by oil companies
- Desired clarity about ownership of private land
- Commitment by oil companies to protect the environment
- Realisation by oil companies that social acceptance is conditional for the "License to Operate"
- Realisation by oil companies that the Guaraní people cannot generate enough production from 1–2 ha. per family, which on top of that is contaminated with oil and/or has been irrigated with contaminated water.

**Recommendation**

The NCEA recommends to take due account of the part of the NCEA ToR of 2009, which provide guidelines on stakeholder participation in chapter 2.2. and Annex 7.

### 3.5 Water pollution and health related problems

An inventory has been made of water quality in rivers and sources in Aguaragüe. This reveals that both drinking water and water used for irrigation purposes have been contaminated by oil and pose a risk to human health. A report, dating from 2003 on the theme, is mentioned in the SEA report, but the clear conclusion is not reproduced i.e.: all drinking water on the eastern slopes of Aguaragüe, where 80% of the population lives, is not suitable for human consumption due to oil contamination.

**Recommendation**

The NCEA recommends to follow a watershed approach to monitor and clean the pollution. This involves the delineation and mapping of the many (about 30) small watersheds flowing east and westwards from the Aguaragüe mountain range, plotting all present and abandoned leaking wells as well as the intake sites of the drinking and irrigation waters on the maps of each of these small watersheds. Entering the maps in the GIS system discussed earlier will facilitate monitoring the preparation of an integrated watershed environmental management and cleaning plan, involving all sectors depending on the water resources in these watersheds.

### 3.6 Roles and responsibilities of specific stakeholders

The Vice Minister in his letter of request for NCEA involvement, and also Chapter 4 of Annex 2 mention that further coordination with all main stakeholders is required after finalization of the SEA report to implement alternative options and recommendations. This is very relevant, because the SEA report has identified for instance the deficient inter-institutional coordination during the definition of gas sector policies as problematic. Also the un-coordinated way of environmental licensing in protected areas is illustrative: different ministries and agencies go their own way. The SEA report already contains many useful alternative proposals to deal with this subject.

#### **Recommendation**

The NCEA recommends to already draft, as part of the SEA report, a schedule of main partners in the implementation of different plans, such as the MHE, Ministry of Water and Environment, Ministry of Planning, Regional and local governments, SERNAP, YFPB, Oil companies, APG, the SEA consultants team etc. This implementation should preferably take place at the lowest possible and effective organizational level, striving towards maximum local ownership. Also required is a mechanism to coordinate and monitor implementation.

## 4. Other observations

In this chapter, the NCEA gives recommendations to pay further attention to a number of issues either before finalization of the SEA report or during implementation or follow-up.

### 4.1 Miscellaneous

#### **Geology**

The basic geological information is not sufficient to allow an independent assessment of the geological risks drilling activities may pose. This becomes particularly relevant at project (EIA) level. Bolivia is located in one of the most seismically active regions in the world. The complicated nature of the Andes geology, needs good data gathering and a professional assessment to unravel the subsurface configuration of the folded and faulted rock formations. Some formations have been deeply buried and subsequently uplifted, broken up and buried again. Some of the pressures that occur at great depths have been encapsulated in certain layers that have been uplifted and now contain pressures one would not expect at these shallower depths. These so-called overpressured intervals may pose serious drilling hazards. If encountered by the well but not predicted, it could possibly lead to an uncontrolled return of drilling mud or even escalating into a blow-out of hydrocarbons. Safety then becomes a serious issue for drilling personnel, local residents and the physical environment.

### **Environmental problems**

Section 1.2.8 of the SEA extensively deals with problems of erosion, landslide, mudslide and the rainfall saturating the capacity of the soil to cause slippage but these environmental issues are not dealt in Table 1. It is possible to use existing aerial photographs to delineate these hazards and integrate them with field data.

Also in table 1, one of the bullets on environmental problems sighted by the APG/SERNAP SEA include how seismic work affects the watersheds. There is a difference between seismic activity (from earthquakes for example) and seismic works. The latter means that someone is running electric rods along a traverse to create artificial seismic waves to determine underlying geological units, faults and hidden oil reserves. Uplift and subsidence as a result of seismic (earthquake) activities can result in changing the morphology. As Bolivia is situated in the most seismically active region of the world, this could lead to a change in the watershed.

### **Tourism**

The tourism facility was established but not appreciated by the indigenous people. So why was it constructed? Moreover, is tourism still an alternative if more gas wells are drilled? Under what conditions would it be an alternative and where?

### **Health problems and bad health services**

Apart from quality of drinking water, there is hardly any direct relation with gas drilling. Capacity building on traditional medicines, community health programs and food safety campaigns therefore seem to be outside the scope of this SEA, unless gas drilling might decrease possibilities to collect traditional medicines? If this is not the case, then these concerns would belong in a regional development plan. One of the connections between such a regional development plan and the SEA could be that part of the compensation funds for drilling might go to a health plan.

### **Loss of the traditional culture**

The relationship between loss of cultural heritage and gas drilling is described. Alternatives to establish protection policies for the cultural heritage and bilingual programs are sound. However, they appear (useful) mitigation measures rather than alternatives.

### **Institutional measures such as re-categorization of the Aguaragüe park and licensing by the competent authority (MHE) itself**

These alternatives require careful further analysis and comparison with other alternatives, as they may pose a risk to protecting and enhancing environmental values, especially because the current gas fields are expected to become exhausted and the MHE will explore the possibilities for future gas drilling within the boundaries of the protected area of Aguaragüe park.



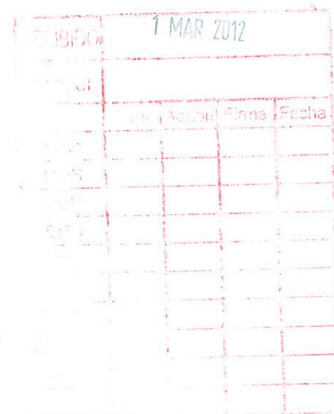
## APPENDICES

With the Review of SEA for Oil and Gas  
– Bolivia –

(Appendices 1 to 2)

## APPENDIX 1

### Letter of Request



La Paz, 23 de febrero de 2012  
**MHE-01491-VMDE-00090**

Señora  
Ineke Steinhauer  
**SECRETARIA TÉCNICA DE COOPERACIÓN INTERNACIONAL**  
Postbus 2345  
3500 GH UTRECHT  
Arthur van Schendelstraat 800  
3511 ML UTRECHT  
The Netherlands

Ref.: Remito documento de resultados de Evaluación Ambiental  
Estratégica

De mi consideración:

Mediante la presente, remito a usted el documento de resultados del proyecto de Evaluación Ambiental Estratégica que fue ejecutado por la Dirección General de Gestión Socio Ambiental (DGGSA) dependiente del Viceministerio de Desarrollo Energético del Ministerio de Hidrocarburos y Energía durante la gestión 2011, con fondos de financiamiento de la Embajada del Reino de los Países Bajos.

Dicho proyecto logro concretar alrededor de un 75% de avances físico, faltando un 25% aproximadamente a desarrollar en las áreas protegidas Madidi y Pilon Lajas.

El documento adjunto en sus anexos 1 y 2 refleja los resultados de la evaluación que fue desarrollada en base de los TDRs y las recomendaciones de la comisión MER aunque con variaciones posteriores en virtud a las condiciones en que dicho proyecto se fue ejecutó.

En la tapa posterior del documento encontrará un DVD conteniendo información digital correspondiente al proyecto EAE. Con toda esta información, agradeceremos que pueda desarrollar una evaluación técnica sobre los contenidos del documento y pueda pronunciarse respecto a la calidad técnica del trabajo. Esto a fin de retroalimentar el trabajo desarrollado y complementarlo con los aportes y observaciones que la comisión MER nos indique.

Es importante indicar que la evaluación desarrollada en el Aguaragüe no es una EAE propiamente dicha y más bien es parte de una EAE mas integral que se desarrolla por las organizaciones indígenas con apoyo del Servicio Nacional de Áreas Protegidas, por lo que el Plan de Acción Estratégico se desarrollará en etapas posteriores por medio del trabajo coordinado con esos actores.

Con este motivo, reciba usted un cordial saludo,

FMO/MCA/JCS/mcc  
Adj: lo indicado  
Cc: archivo

**Lic. Franklin Molina Ortiz**  
VICEMINISTRO DE DESARROLLO ENERGÉTICO  
MINISTERIO DE HIDROCARBUROS Y ENERGÍA

## APPENDIX 2

### Project information and composition of the Commission's working group

**Proposed activity:** The Ministry of Hydrocarbons and Energy (MHE) is the competent authority for the formulation and enforcement of development policies in the hydrocarbons and energy sector including the resulting activities. At the same time, the Ministry is responsible for formulation, evaluation and compliance control of the National Policy for Hydrocarbons and Energy Planning.

Articles 32 and 132 of the Hydrocarbons Law no. 3058, state that exceptionally hydrocarbon activities are allowed in protected areas, forest reserves, permanent forestry production areas or private natural heritage sites in cases when a Strategic Environmental Assessment (SEA) establishes their viability and when conservation objectives, environmental services, genetic resources, archaeological and cultural sites are not put at risk in terms of sustainable development.

At the moment, hydrocarbon activities take place in 'traditional' and 'non-traditional' areas: 'traditional' being those areas where hydrocarbon activities are taking place for some time already, and 'non-traditional' areas implying new areas where there is hydrocarbon potential for but where no interventions took place before, and where there is no or scarce information available.

The MHE has taken the initiative to start an SEA in two areas. The first one is a traditional area, Parque Nacional y Area de Manejo Integrado Serranía de Aguara Güe in Tarija Department and the second one is a non-traditional area, the protected areas of Madidi/Pilón Lajas in La Paz and Beni department.

**Categories:** oil/gas production DAC/CRS 21400, oil and gas pipelines, DAC/CRS 71400

**Project numbers:** Netherlands Commission for EA (NCEA): 078

**Procedural information:**

Receipt request for Advice	: February 2009
Site visit to Bolivia by the Working Group	: 23–28 March 2009
Submission of Final Draft Advisory ToR	: 17 April 2009
Letter with request for review advice	: 23 February 2012
Review advice submitted	: 25 April 2012

**Composition of the working group of the Commission for EA:**

Mr. Bert van Barneveld  
Mr. Maarten Jan Brolsma  
Mr. Arend Jan van Bodegom  
Mr. Rudy Rabbinge (chairman)  
Mr. Tsehaie Woldai

**Technical secretary:**

Ms. Ineke Steinhauer