



Netherlands Commission for
Environmental Assessment

Quick Scan Review of the EIA Scoping Report 2D Seismic Survey Project in the Keta Delta Block of the Voltaian Basin

Memorandum by the NCEA

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Advice of the Secretariat

To Ghana Environmental Protection Agency (EPA)

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From The Netherlands Commission for Environmental Assessment (NCEA)

Date 19 January 2018

Subject **Quick Scan Review of the EIA Scoping Report 2D Seismic Survey Project in the Keta Delta Block of the Voltaian Basin in Ghana**

By: the Secretariat of the Netherlands Commission for Environmental Assessment – Ms Ineke Steinhauer and Ms Bobbi Schijf, with expert input from Mr Bopp van Dessel

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Photo (cover): map taken from page 35 of the "Scoping Report for the 2D Seismic Survey Project in the Keta Delta Block of the Voltaian Basin".

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Table of contents

1.	Introduction.....	2
2.	Main findings.....	3
2.1	Disbalance in information	3
2.2	Further scoping recommended.....	3
2.3	Essential information still lacking	3
2.4	Not clear which international standards/best practice apply	4
2.5	Technologies for wetland settings need further assessment.....	4
2.6	Realistic planning.....	5
3.	Detailed remarks.....	6

1. Introduction

Late 2017, the Ghanaian Environmental Protection Agency (EPA) received the EIA Scoping report for the 2D seismic survey project in the Keta Delta block of the Voltaian Basin.

In 2014, SWAOCO (Swiss African Oil Company) was awarded the 3,000km² Keta Delta Block. Pet Volta Investments Limited and the Ghana National Petroleum Corporation are participants in this block. Amongst these partners, SWAOCO is the designated operator that spearheads this campaign by carrying out both onshore/offshore seismic surveys in the basin.

The Keta Delta Block is part of the oil and gas development in the Voltaian Basin (for which an SEA is currently being carried out). The Keta Delta Block is located in a vulnerable area: the Keta lagoon is the most important wetland on the coast of Ghana for water-birds and together with the Ada Songor Lagoon constitutes the fourth most important water-birds site on the coasts of the Gulf of Guinea. It is a designated Ramsar Site, part of the Volta River estuary with has a catchment area of 1,280km². It comprises several small islands and a complex of lagoons with varying salinity.

Although 2D seismic surveying is not usually considered a high impact activity, in comparison to exploration and exploitation, the EPA has requested input from the Netherlands Commission for Environmental Assessment (NCEA) because of the vulnerability of the area, but also because it is their first review of a scoping report for an EIA for a (partly) onshore activity of this nature. Due to the applicable legal requirements, the EPA has to submit their comments within 25 days after submission of the scoping report. At this stage, they have almost concluded their review, and have requested the NCEA to do an independent review. The EPA will share their comments after receiving the NCEAs comments for comparison. Given the limited time availability, NCEA has opted to perform a quick scan desk review, against international good/best practice. The NCEA has engaged the input from an oil and gas expert (Mr Bopp van Dessel) for this quick scan. At a later stage (when the full EIA is submitted), a site visit could be considered, with a larger expert group, if requested by the EPA.

Note that experts of the Norwegian Environmental Agency have also reviewed the document under the Oil for Development program. Their (limited) observations have been shared with the NCEA. They will submit her comments to the EPA separately.

2. Main findings

The following paragraphs highlight NCEA's most important findings. Further details are given in Chapter 3. The NCEA recommends to the EPA to either include the NCEA recommendations in EPA's own review findings (if not yet already there) and/or sit together with SWAOCO and its EIA consultant to discuss when and how each of these findings and recommendations should be addressed in the full EIA.

2.1 Disbalance in information

The scoping report is a well-structured document with good, mostly relevant information. For some parts of the document, it is not (made) clear why the information included is relevant, e.g. extensive information on legislation and weather conditions. On other, essential topics, information is too limited, such as on terrain conditions, critical habitats in the RAMSAR area, seismic technology applied in the wetland part of the project, location of settlements relative to the seismic operations and presence of sensitive species like sea mammals.

- The NCEA recommends that in the full EIA the relevance of baseline data presented be clearly explained and that the missing information on relevant baseline parameters is completed. The topics mentioned above are the most important ones on which more information is required. Paragraph 2.3 and Chapter 3 provide further details.

2.2 Further scoping recommended

The objectives of the scoping report are explained (p. 6), but they seem to be very similar to the objectives of a full EIA. The key function of a scoping report seems to be overlooked. A scoping report should identify the impacts of the proposed activity, and prioritise/point out the areas of primary concern/impact and thus the key focus of the full EIA). In the concluding Chapter 9.0 a long list of "major impacts" is presented, without any prioritisation.

- The NCEA recommends that Chapter 9.0 provides more focus and identifies priority impacts. The same chapter should also highlight the necessity for additional study and assessment for the wetland part of the project.

2.3 Essential information still lacking

The key environmental and social concerns related to this Keta Delta block project concern the seismic activities in the wetland parts of the project area (partially the RAMSAR site). Precisely this part of the affected project area is not yet adequately studied and described in the scoping report (nor identified as a priority for the full EIA). Habitat mapping, identification of sensitive species and location of settlements are not yet covered. In addition, the (options for) seismic survey methodologies are not sufficiently addressed.

- The NCEA notices that serious, additional work is required in the full EIA to be able to describe, assess and deal with these potential impacts responsibly and meet international

standards with respect to EIA, as well as industry standards with respect to seismic surveys in wetlands. Specific attention should be given to the impact of the seismic activities on the (geo)hydrology of the (RAMSAR) wetlands. Note that even seemingly marginal changes in water flows (by blocking or opening of water streams, creating small ditches) may lead to significant, lasting ecological impacts.

2.4 Not clear which international standards/best practice apply

There is no mention of the Companies own standards, or CSR policies, and how these would apply to the EIA and to environmental management more generally. Nor is reference made to e.g. IPIECA or other oil and gas sector related (environmental and social) standards and guidelines.

The NCEA notes that IFC Performance Standard 6 (Biodiversity Conservation and Sustainable Management of Living Natural Resources) provides specific guidance on how to deal with activities in sensitive habitats like the Keta Delta. This includes Critical Habitat Mapping: preparation of a detailed map of the sensitive habitats which should be avoided. A map like that is still missing and should be part of the full EIA. Check out the guidance note on IFC-PS 6: https://www.ifc.org/wps/wcm/connect/a359a380498007e9a1b7f3336b93d75f/Updated_GN6-2012.pdf?MOD=AJPERES).

- Although it is not clear whether the EPA will require SWAOCO to meet IFC Performance Standards or any other relevant benchmark, the scoping study refers to them, suggesting that at least the company itself will consider them. The NCEA recommends that the IFC PSs are considered as a benchmark for this EIA, particularly given the sensitivity of the area. In addition, the NCEA recommends that the company elaborates on the application of its own standards or industry best practices.

2.5 Technologies for wetland settings need further assessment

The project description is fairly adequate for the offshore part (seismic vessels with air guns) and the terrestrial part (vibroiseis trucks), but it does not cover the wetland part, which seems to be a significant percentage of the area (and of particular concern because of the RAMSAR designation). Different methodological considerations apply to wetland settings. A vibroseis truck requires roads or at least stable ground to get to its position, and a firm surface to be effective (as it transfers vibrations into the underground). It does not work in (soft) muddy conditions or in marshes, provided it can even reach such locations. A seismic vessel with airguns requires deeper water. It does not work in shallow water or marshes. Wetlands are known to be a challenge for seismic surveys as most of it is neither land nor water, but consists of marshlands, mangrove, mudflats, etc. Drilling shot holes and using dynamite to generate vibrations is an alternative which is possible in wetlands. The (acceptability of) impact depends very much on how the equipment is transported. Based on this description a proper assessment of impacts is not possible yet. And, for sensitive habitats like wetlands, new technologies are available, such as wireless detonator and receiver technology. With this technology, no bore holes are required, far less material needs to be transported into the wetland area and more options are available for careful avoidance of critical habitats. This technology is, amongst others, applied successfully in Uganda, and should definitely be considered for the Keta Delta Block.

- The NCEA recommends to pay careful attention in the full EIA to the assessment and comparison of alternative technologies, particularly in the wetland part of the area. The EPA may even choose to specify specific methodologies that need to be further explored in the EIA.

2.6 Realistic planning

Given the technological and baseline data that is now missing and the time required to gather and assess these to arrive at a responsible project, the reported planning of the project (February 2018) does not seem realistic, as the EIS will not be finalized yet.

- The NCEA recommends that the timeline for the EIA is reconsidered.

3. Detailed remarks

Page	Remark
6	Distinction between offshore and onshore oil & gas is usually made, but the special challenge for this project, from a technology/operations point of view, is that part of the project – the wetland part – falls in neither category. That should be recognised and the consequences addressed.
6	Objectives of the scoping report (1.2) almost completely match the objectives of a full EIA. The key aim for a scoping report, to identify priority areas of concern/impact for the full EIA (objective v.) is mentioned, but does not seem leading in the rest of the report
7	It is difficult to judge if stakeholder consultation at this stage has been adequate. For one thing it would be relevant to know, given the currently inadequate activity/project description (see p. 27) what information has been shared at the stakeholder meetings to explain the activity. It is important to consider if the information shared was sufficient a basis for stakeholders to express their concerns. In addition, it is unclear when stakeholder consultations have taken place exactly. Somewhere in the report it is stated 2015/2016, elsewhere Nov. 2016. The tables in Chapter 6 (p. 58 and further) with the results of stakeholder consultations do not indicate dates. This should be clarified.
13	Many regulations and (international) standards are mentioned. Not all of them are up to date, e.g. IFC performance standards (the 2012 version is the appropriate reference, not the 2006 version), and their relevance is not explained. What will be their role in the EIA and the project?
27	<p>The project description does not cover the wetland part. A vibroseis truck requires roads (as do vehicles, bulldozers, etc.) or at least stable ground to get to its position and a firm surface to be effective (transfer vibrations into the underground). It does not work in (soft) muds or marshes, even if you can get in. A seismic vessel with airguns requires deeper water. It does not work in shallow water or marshes. Wetlands are known to be a challenge for seismic surveys as most of it is land (vehicles) nor water (ships), but consisting of marshlands, mangrove, mudflats, etc. Drilling shot holes and using dynamite to generate vibrations is an alternative which is possible in wetlands, but the (acceptability of) impact depends very much the transportation equipment used in the terrain (e.g. heavy equipment/marsh vehicles, fly boats, bulldozers, labour, ...?). Based on this description a proper assessment of impacts is not possible yet.</p> <p>Moreover, for sensitive habitats like wetlands, new technologies are available like wireless detonator and receiver technology. With this technology, no bore holes are required, far less material should be transported into the wetlands and more flexibility is offered for careful avoidance of critical habitats. Following IFC and RAMSAR-standards, avoidance of critical habitats is strongly advised or even mandatory (depending on whether these standards are looked upon/used for Keta Delta Block project as guidance or as regulatory requirements). This technology is amongst others applied successfully in Uganda and should definitely be considered for the Keta Delta Block. See: https://www.ifc.org/wps/wcm/connect/a359a380498007e9a1b7f3336b93d75f/Updated_GN6-2012.pdf?MOD=AJPERES). See also comments p. 76, 78, 81, 102.</p>

Page	Remark
29/30	<p>What is meant with the seismic corridor of 100 m wide? Is that the search area for the seismic line? This should be explained. Why a seismic line of 3–5 meters wide? Does this also apply for mangrove/forested areas? There is no discussion of option/methods that will have less impact. What is meant by “rolling, raking or scraping”? Is that really necessary?</p> <p>“A number of alternative survey methods” is mentioned for the wetland stretches. In the EIA, these must be described, assessed and compared with respect to environmental, ecological and social impact, and the preferred methodology identified and motivated. In particular, the application of remote detonator and receiver technology should be considered.</p> <p>A crew of 200–300 persons is mentioned, to be partially hired locally. Although this is not a very large seismic crew, given the social, rural situation in the project area, their influence may be significant. Information should be provided where these persons will be: location/size main and fly camps, ways of organising the interaction between crew and local people, ways to hire/organise local labour – in particular whether local labour will be transported to other areas than their own. If not properly managed, these aspects could lead to significant social impacts.</p> <p>A stand by ambulance is mentioned, but how would that work in the wetland parts of the project?</p> <p>Opening up new or improving existing access roads may, on the longer term (when the seismic survey project is long finished), lead to significant and even permanent impacts to the wetland, particularly given the already rather high pressure on this (RAMSAR) wetland from fishing, hunting and fire wood collection. Increasing access must be prevented or properly managed. The report states that the opening of new access roads will be kept to a minimum (p.31). However, the number and routes need to be further specified in the EIA, otherwise the impacts cannot be properly assessed.</p>
36	<p>The conditions of the (wetland) terrain are not described clearly enough (only that most of it is below 30 meters “contour” (= above sea level?)). To be able to assess the impact of project equipment and activities in the field, it is important to know the state of the terrain, including: height (a height map is essential), surface (geo)hydrology, firmness, compactness/compressibility, vegetation (mangrove?). (Geo)hydrology in the top layer characterises a wetland and is the key ecological driver for the system. Changing those parameters (e.g. by creating compressed seismic lines serving as a ditch, dewatering or connecting areas) may cause lasting ecological impact on a (RAMSAR) wetland.</p>
37–39	<p>The description of the wetland part of the project area is not sufficient yet. It seems to be an intricate system of rivers, lagoons, tidal mechanisms, precipitation and evaporation, partially and/or temporarily fresh, brackish or salty. Given the sensitivities described on p 36, the hydrology of the area must be understood and described very well, to be able to identify (and prevent) significant negative ecological impacts. A Critical Habitat Analysis is required, implying detailed mapping of habitats and obligatory avoidance of ‘critical’ ones (see IFC/RAMSAR).</p>

Page	Remark
	Additionally, ecological processes like the combination of offshore foraging and inland/lagoon resting areas are critical factors to determine the value of the area, especially for birds.
39	Rainfall seems to be quite high in May/June. Potential consequences for the seismic operations/impacts should be addressed in the EIA.
49	Particularly in the rural areas of Keta municipality, a significant percentage of the population uses surface waters for drinking water. In the EIA, precautions should be developed to prevent impacts of the seismic activities on surface water, in particularly in these areas (these are not addressed in the scoping report yet). Topics to be addressed include: location and management of base/fly camps, waste and waste water management and prevention of impacts to the wetlands hydrology. The same applies to the other municipalities.
75–78	The potential impacts on (geo)hydrogeology should be highlighted as a priority to be addressed thoroughly in the EIA (see the above).
81	<p>The current description of the terrestrial environment is too superficial for an EIA. The scoping report should therefore recommend an inventory of mangrove areas (and other potential sensitive vegetation/habitat types) in the areas where the seismic lines will be constructed. Cutting of mangrove should be avoided, as it takes decades for mangrove to recover naturally (if at all) from cutting. If, occasionally, mangrove cutting cannot be avoided, restoration measure should be considered in the EIA.</p> <p>The maximum size of >20 cm for trees to be cut to open up seismic lines seems to be high. The seismic lines can be designed around larger trees.</p>
87	<p>The social and socio-economic risks/impacts depend on the way the workforce is organised and managed (see also 29/30 above) and belong to the potentially most significant concerns/impacts with respect to seismic surveys. The EIA should focus on:</p> <ul style="list-style-type: none"> • Organisation of fly camps: size, proximity to fishery settlements, camp rules (open or closed), interactions with local people/settlements; • Process of hiring of local labour: managing expectations on number of jobs, local sourcing procedure, employment of local labour in areas not their own; • The risk of ‘Mobile men with Money’: i.e. the presence of relatively rich men locally impacting the economic (e.g. food, rental prices) and social (prostitution, existing social relations) situation.
93	It is stated that seismic surveys will be undertaken in non-spawning and breeding seasons, but the report does not present any data on spawning or breeding seasons. It is doubtful that, if the spawning and breeding periods for all relevant species would be listed, this approach will turn out to be realistic. The EIA should provide information for sensitive species (e.g. marine mammals for the offshore part of the project, red listed and vulnerable species for the RAMSAR wetland part) and provide adequate mitigation. Currently, for instance, the paragraph on marine environment (5.3. p. 45) does not provide any data /information on sea mammals at all.

Page	Remark
94	The presence of Marine Mammal Observers is mentioned as a mitigation measure. However in the entire report, marine mammals are hardly mentioned. In the EIA, proper attention should be given to the potential presence of marine mammals in the offshore project area (baseline data on species, time, location and ecological function of the area) and adequate mitigation should be identified, if required.
102	The TOR for the full EIA should be made more specific and clear: 8.4 A specific, detailed description should be provided on the precise activities/methods in the wetland parts of the project area. And impact assessment should be conducted on this basis, including discussion/selection of state of the art seismic survey technologies. 8.5 The baseline should pay particular attention to: description of wetland terrain (height, firmness, (geo)hydrology, vegetation,..), critical habitats, distribution of local settlements relative to the seismic activities/crews, marine mammals and sensitive species in RAMSAR area. 8.8 Monitoring program should include monitoring after operations for residual impacts (collapsed shot holes, erosion, unexploded charges, wastes left behind, etc.) and restoration/clean up if required.
107	This is not an appropriate concluding chapter of a scoping report. Here the key points should be highlighted that must/will be addressed in the full EIA, as well as a rationale for prioritisation of issues.
108	Nowhere is any reference made to (information in and recommendations from) the SEAs for off shore oil and gas (undertaken between 2009 and 2013) and the SEA for the Voltaian Basin (started in 2016 and almost finalized). These may contain relevant information to include in the scoping report (e.g. identified key issues and results of stakeholder consultations held in June 2016).
109	Annexes are not included with the scoping report. Therefore it is not clear e.g. what has been put in EPA's public notice of October 2017.