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Høringsvar "Offentlig høring af miljøvurdering (EIA) vedrørende indsamling af 2D seismiske data inkl. data om tyngdekraft og magnetisme fra det af eneretstilladelse nr. 2011/11 (Qamut) omfattede område, Nordvestgrønland"

10. maj 2012
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Forslaget omhandler udførelsen af 2D seismisk data i Blok 2 (Qamut), licensnummer 2011/11 med samtlige indsamling af data om tyngdekraft og magnetisme. Licensområdet ligger i den nordøstlige del af Baffinbugten på kontinentalsoklen, syd for Savissivik og sydvest for Melvillebugtens reservat. Det foreslåede tidspunkt for undersøgelsen er fra 1. august 2012 til 15. september 2012 med mulighed for forlængelse til midten af oktober.

Projektet benytter sig af en kombination af single og 2 luftkanons opstilling (alt i alt 32 luftkanoner i opstillingen) som energikilde med et maksimum kildestyrke af 262.4 dB re 1 μ Pa (pp). Der vil være 3 skibe i alt og disse skibe vil genere yderligere støj.

ConocoPhillips pointerer i sin rapport at havpattedyres tendens til at undgå støjkluder kan betragtes som et positivt resultat idet det vil minimere sandsynlighed for fysiske skader på dyr, f.eks. skader på hørelse og kollision med skibe. APNN er delvis enig, men vil gerne pointere at ændringer i havpattedyres adfærd på grund af undgåelse af forstyrrende kilder har et stort betydning for dyrenes naturlige adfærd og for fangstmuligheder af disse dyr og skal dermed betragtes som et alvorligt problem. Endvidere bruger havpattedyr lyd til at orientere sig, finde bytte samt til kommunikation så maskingeffekt af støjen kan have nogle store konsekvenser for dyrene.

APNN finder følgende punkter kritisabelt:

- Licensområdet og det foreslåede tidspunkt for udførelsen af projektet overlapper med NPZ I (Narwhal protection zone I) hvor narhvalerne opholder sig fra starten af juni til midt oktober og hvidhvalerne fra starten af oktober og fremover (Kyhn et al. 2011). Melville Bugt bestanden og Melville Bugt området er vigtige for fangsten af narhvaler og det planlagte projekt vil forstyrre hvalerne og dermed også forstyrre fangerne. Det skal dog noteres at fangst af hvidhvaler i Melville Bugt er forbudt.
- Den mindste kanon i opstillingen (kaldt mitigation gun) kan i følge bedste procedure i Kyhn et al. 2011 bruges som et afbødning/mitigation værktøj når havpattedyr bliver observeret i 200 m zone fra skibet. Hvad er kildestyrken af de pulser produceret med denne mitigation kanon som ifølge figur 3.1-3 har en volumen af 50 in³? Denne information findes ikke i dokumenterne.

Indstillinger

- Undersøgelsen bør ikke have mulighed for forlængelse efter den 15. september til midten af oktober for at sikre mest mulig ro for områdets dyreliv. Dette er især vigtigt taget i betragtning af den yderligere aktivitet i området i de andre licensblokke.
- Et maksimum grænse for lydtryksniveau og kildestyrke for afbødning/mitigation kanon skal sættes. Dette niveau skal være væsentlig lavere end de niveauer, dokumenteret til at være skadeligt for dyr. Selvom tab af et enkelt individ ikke er skadeligt for et sundt population af dyr, bruge af høj lydstyrke og trykniveauer i afbødning/mitigation praksis er ikke hensynsmæssig.
- PAM (Passiv Akustisk Monitering) skal bruges konstant sammen med visuelle observatør for at maksimere sandsynligheden at lokalisere havpattedyr i området og dermed sikre en fungerende mitigation praksis. Havis, isskoser og isfjelde kan forhindre visuel observation af havpattedyr, også om dagen i godt vejr.

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Med venlig hilsen



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Modtager(e): Bureau of Minerals and Petroleum

NOTAT

Regarding: EIA from ConocoPhillips on "ConocoPhillips Global NVE Greenland LTD. 2012 Program Block 2 (Qamut)"

Line Anker Kyhn
Jakob Tougaard
David Boertmann

Dato: 03. maj 2012

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The bureau of Minerals and Petroleum has asked DCE to evaluate the EIA by ConocoPhillips regarding their 2012 Program Block 2 (Qamut) 2D-Seismic Survey.

The EIA concerns 3,047 line-kilometres of high quality 2D-seismic reflection data, as well as marine gravity and magnetic data. ConocoPhillips will use this data to conduct a detailed geological and geophysical evaluation of the license area.

The survey is expected to be carried out from early August to September, with a potential extension into October depending on occurring delays. It is expected to last four to six weeks.

It is also stipulated in an appendix, but not directly suggested, that the survey could start earlier, i.e. in July.

The suggested source level of the airgun array is 262.4 dB re 1 μ Pa (peak-peak)

Major parts of this EIA appears copied from the EIA from Maersk (or vice versa). As long as the content is the same this may be reasonable, however it gives both EIAs a rather superficial appearance. Also a large number of errors are apparent in this EIA, which may be the reason for the points raised below.

It is somewhat unclear exactly what activities are proposed for the program. In the EIA a 2D seismic survey is described in section 3. However in Appendix I page 4, also a hydrographic survey is mentioned where a single airgun will be towed behind the hydrographic survey vessel. For this hydrographic survey the safety zone for marine mammals is said to be 50 m, but there is no infor-



mation about source level etc in the EIA and DCE can therefore not evaluate this part of the project.

In order to evaluate potential consequences of the activities planned by ConocoPhillips DCE would like to obtain all the information relevant to this survey as according to the BMP guidelines (Kyhn et al. 2011).

It is mentioned that marine gravity and magnetic data will be collected, but this is also not described in the EIA.

The plan for the marine gravity and magnetic data collection is not clear. Please provide all relevant information pertaining to this survey.

Regarding the narwhal protection zone:

The guidelines pertaining to seismic surveys (Kyhn et al. 2011) states that “In zone I seismic activities shall be avoided or of limited extend (a few widely spaced (>10 km) lines)”. However ConocoPhillips have *not* chosen to decrease the line spacing within NPZ-I, while still referring to the guidelines on this matter page 11. Please provide an updated map with the appropriate minimum 10 km spacing between survey lines within the NPZ-I zone or explicitly explain why smaller line spacing has been chosen.

Regarding the noise model and mitigation:

A consideration of possible/likely population consequences of behavioural disturbance is lacking. It is not clear why so few conclusions have been drawn from the cumulative noise model of the combined four seismic surveys and the shallow core drillings. Behavioural effects are considered moderate in table 7.4-1, yet in the text it is stated that no population level effects are anticipated. It is completely unclear how such a conclusion can be reached. The narwhals over-summer for a reason in Baffin Bay and even if we do not know the reason behind this, it still means that displacement from this area could displace animals from an essential resource.

The model is a means to evaluate potential effects on a larger scale combining several activities and to suggest the mitigation required to reduce the potential cumulative effects. No suggestions are really made in chapter “7.4.1 Identification of Mitigation Measures” p 64, and at the same time it is not written that there are no ways to mitigate. *The risk of cumulative exposure to narwhals and belugas* are considered moderate (on the scale: negligible, low, moderate and severe). And still no mitigation measures are suggested. Why is that? What mitigation measures are possible? Instead the Simultaneous Operations Plan (SimOP) is mentioned as a mitigation plan, despite the fact that it is common knowledge that the purpose of a SimOP is to ensure proper data collection when multiple surveys are operating in the same area. This is not satisfactory.

Also the results of the models are not really used. It is not assessed what it actually means for a narwhal or a ringed seal that the cSEL is up to 180 dB re 1



$\mu\text{Pa}^2\text{s}$ over 24 hours within the Melville Bay Nature Reserve? What does that translate into over the course of the proposed seismic survey?

A clear statement on potential mitigation measure suggestions from ConocoPhillips should be requested with respect to cumulative effects of the four proposed seismic surveys. How would ConocoPhillips suggest mitigating potential effects to marine mammals?

The consequences of hearing damages to the considered odontocetes are considered moderate. The primary hearing sense of toothed whales is their hearing, which they use for finding and capturing prey, navigation, mother-calf behaviour etc. DCE therefore does not agree that hearing damages in general should be considered moderate. They will depend on frequency range and degree of damage (TTS/PTS).

DCE further does not understand how the conclusion of negligible effects to narwhals and belugas can be justified when no studies exist on physical or physiological effects of seismic surveys on narwhals and as long as no actual mitigation has been suggested for the four combined surveys. The conclusion needs to be further justified.

DCE acknowledges the planned project specific training of MMSOs before start with class room exercises and practical exercises. Great initiative! It is important to ensure that the data can be collected as outlined in the NERI data collection guidelines, and that the data can be transferred to DCE following the surveys.

Appendices J-K and I have many errors pertaining to mitigation methodology. Please provide a single document stating exactly which guidelines will be followed. If discrepancies from the BMP guidelines are necessary please justify why.

The number of appendixes is very large and to some degree there is overlap between both appendixes and EIA. This makes the reading and corrections very cumbersome. Especially the described mitigation actions underway are confusing and repeated with errors between appendix I and J.

Below is a number of questions that arose during the reading of the EIA that DCE suggests ConocoPhillips to respond to.

Questions/Comments:

In the EIA table 3.1-2 it is stated that the airgun array consists of three sub arrays that will fire alternating. However, the modelling by Jasco is based on simultaneous firing of the three sub-arrays (App. D1, p 15).



Which method will be used?

Where exactly will the hydrophone for the PAM system be deployed in relation to the airgun array?

P 7. What is the frequency of fog in August and September?

p41 “The extent of fish displacement is; however, considered to fall within the normal geographic range of the species.”

What does this mean?

P42. The local narwhal summer hunt appears not to have been included here. How is it expected to be affected by the increased sound pressure levels from the multiple surveys that will have high levels in the area where the hunt will take place?

P42. “Extensive research efforts have been undertaken by the oil and gas industry, governments and other research institutions to understand the possible effects of seismic exploration activities on marine mammals”

Please include the relevant results and references here.

P43. “5) the scale of the sound disturbance needs to be considered.”

What is meant by that sentence?

P 45. “Sounds are less likely to disturb or injure animals if they are at frequencies where the animal has low hearing sensitivity”

What references do you have to back up this statement? At least harbour porpoises react strongly to sounds much below their own echolocation frequency and they have been shown to acquire TTS at the lowest measured levels for any marine mammal from airgun sounds (Lucke et al. 2009) despite of their echolocation being at 130 kHz.

p 45.” Seismic surveys introduce high-amplitude sound into the marine environment (200 to 250 dB re 1 μ Pa at 1 m)”.

Without a reference to peak-peak, zero-peak or rms this statement does not make any sense. Despite the applied survey has a source level of 263 dB re 1 μ Pa (pp), which makes it an understatement.

p45 “Most of the sound produced from seismic surveys consists of low frequency pulses at frequencies below 250 Hz with the strongest energies centred in the 10 to 120 Hz range (Goold and Fish 1998)”

Here it would be relevant to include the studies by DeRuiter et al. 2006 and Madsen et al. 2006 that shows that there is also energy at frequencies much



above what is used by the industry, especially in the low sound velocity surface duct.

p45 “This falls below the sensitive hearing range for beluga and narwhal, but is within the sensitive hearing range for bowhead whales, seals, and walrus (Richardson et al. 1995)”

This is not correct, belugas can hear frequencies down to at least 80 Hz (see Klishin et al. 2000).

p46 “There is no direct evidence of sound from seismic surveys resulting in acute physical damage to marine mammals in their natural marine setting.”

This is not correct. Please consult and refer to the stranded beaked whales (Malakov 2002), and humpback whales (Engels et al. 2004) in response to seismic surveys and injury to dolphins (Gray and Waerenbeek, 2011).

p 46. “To date, there is no record of either of these effects occurring in marine mammals as a consequence of exposure to airgun pulses under realistic field conditions.”

This is not correct. Please refer to Lucke et al. 2009 and the studies mentioned above

p 46 “While the biological importance of behavioural changes is not well understood, the consequences will likely not cause measurable effects under most circumstances”

It would be more correct to state that effects may be close to impossible to measure on wild marine mammals, but this does not imply that effects are not significant. Absence of evidence does not equal evidence of absence!

p 47 ” During the summer feeding season, bowhead whales appear to be less sensitive to seismic sound”

It is not possible to conclude whether animals remaining in a disturbed area are less sensitive. It may as well be that the more hungry animals remain in the area, while the more fit animals leave the disturbed area. See Beale and Monaghan 2004.

p 47 ” In addition, audibility between pulses does not seem to be compromised when marine mammals are exposed to pulsive sound sources such as seismic sounds (Abgrall 2008)”

& ” However, masking effects are thought to be minimal due to the potential for sound detection between airgun pulse intervals (Abgrall 2008”.

With a new airgun shot every ten seconds (considering one seismic survey only), reflections and interference between reflections, airgun pulses are dragged out in time and are unlikely to disappear from the background noise



level before arrival of the next pulse. A recent, and so far unpublished, study from Alaska by LGL (Blackwell et al. 2011) shows that bowhead whales begins to stop vocalising when the background noise level increases to a certain threshold 127 dB $1 \mu\text{Pa}^2\text{s}$ (summed over 15 mins) in vicinity of airgun arrays. And this is including the short periods between the pulses. Koski et al 2011 showed that the background noise level in between airgun pulses arose with 20 dB for a single seismic survey. It is therefore highly likely that airgun arrays, and especially from multiple airgun arrays, will cause masking of baleen whale hearing.

p47 “The frequencies contained in seismic pulses overlap with those used by pinnipeds, but as discussed above for baleen whales, the discontinuous, short duration of the pulses is expected to result in limited communication masking in these animals; therefore, acoustic masking is not assessed further”
It is noted, this sentence is all the EIA report mentions about masking of pinnipids. This is very superficial and ignores potential effects that need to be assessed. The results of the LGL study mentioned above also apply to pinnipids.

p 48 “This extended safety zone is put in place to lessen the behavioural effects of seismic activities to whales from ConocoPhillips operations.”
How will an extended safety zone limit behavioural effects?

p 49 “... and most of the sound energy will be emitted outside the sensitive frequency range for both species. ”

Please refer to the studies that conclude that cetaceans should react more to sound of their own emitted frequency than to other frequencies. There is one study on reaction of belugas to seismics clearly showing that they react strongly by displacing themselves 20-30 km from the survey ship. How can that be interpreted as if they are less prone to react behaviourally?

p 49 “The overall impact significance rating for behavioural effects from seismic noise on narwhal and beluga is predicted to be low”.

The assumptions leading to this conclusion are not correct (see comment above). There are no studies on how narwhals react to seismic noise. However, there is a study on how they react to icebreaker noise (Finley et al. 1990). If they can be expected to react equally strong to airgun pulses avoidance reactions are likely to be expected. Secondly, narwhals are nursing calves during the time of the proposed seismic activity, which may make them more vulnerable to disturbances.

p 49

Why are there no conclusions for masking of baleen whales in general?



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p 50 “Many toothed whales show considerable tolerance of ship traffic. There is no available evidence of toothed whales”

This does not include narwhals, which is the much likely occurring toothed whale in the area (Finley et al 1990)

p51 “Based on results from the literature, marine mammals will either habituate to vessel sounds generated during the Project and remain in the Qamut Block, or leave the Qamut Block temporality and return once the seismic and hydrographic program is completed. No effects at the population level are anticipated.”

Please provide arguments and valid references to justify this conclusion. The animals are in the area for a reason and even if we do not know this reason, it may still mean that the fitness of animals is affected by displacement.

p 51 Table 6.3-3.

How can the effects of vessel noise be considered regional, when the effects of airgun pulses - of much higher source level - is considered local?

How are MMSOs considered used?

P 55. When will the Ballast Water Management Plan be available for DCE/GN review?

Page59 Table 6.7-2

The overall impact for seabirds of an oil spill is concluded to be low. This is based on likelihood. However, such evaluation should consider worst case scenarios.

p 62 ” In addition to ConocoPhillips applying these know and effective mitigation measures during its operations in Qamut Block, the three operators have agreed to discuss preparation of a Simultaneous Operations Plan related to multiple seismic surveys that occur at the same time in northeast Baffin Bay. Part of this Plan may include measures to further reduce the extent of potential cumulative effects on marine mammals.”

How will this plan provide mitigation? What measures will be taken. Normally such plans *only* cover issues relating to insuring proper data collection by the different companies operating in the same area.

p 62 “Table 7.4-1 summarizes the impact rating classifications for the cumulative effects of seismic sound on fish and marine mammals in Northeast Baffin Bay. These impact ratings are considered conservative, as the assessment was based on a multiple operations scenario where all proposed seismic programs are assumed to take place in a simultaneous fashion.”

How can this be considered conservative? What is expected to be different in reality?

p 62 Table 7.3-1

It is a very large area within which the injury threshold is exceeded for pinnipids, and it is very likely that many seals will be present within this area.

How do you intend to mitigate this?



The size of the total area exceeding the threshold for pinnipids in all blocks varies between ConocoPhillips and Maersk - why?

p 63 Table 7.4-1

- 1) The MMSOs can not mitigate behavioural changes.
- 2) Why is it considered unlikely that pinnipids will be masked?

p 64 "The overall impact significance rating for behavioural effects from cumulative sound exposures from seismic sound sources is predicted to be moderate (3) for beluga and narwhal."

It is not known how narwhals react to airgun pulses. It is known how they react at great ranges to icebreaker noise (Finley 1990). Based on this it should be expected that they may be displaced at low received levels. Whether they quickly habituate and return is not known. What this means to nursing females is also not known.

p 64

What is the conclusion for other baleen whales than bowheads?

p 65 " Although the frequencies emitted by cumulative seismic pulses overlap with those used by pinnipeds and walrus for communication, the short duration of these pulses is not expected to result in communication masking, as these animals will be able to emit and receive sounds between airgun pulses (Davis et al. 1988)"

See remark above on results from the LGL studies. Silence or normal background noise levels can not be expected between pulses. Especially not with four simultaneous surveys in the area. Masking is to be expected for baleen whales, pinnipids and the walrus given they are in the area.

p 68 Regarding the simultaneous operation plan.

Normally such plans are concerned only with ensuring proper seismic data collection. DCE very much welcomes initiatives here concerning mitigation of cumulative effects.

Such could include planning to minimise the total exposed area and thereby number of exposed animals, by keeping the four airgun vessels as close together as possible considering the data collection. Rather than keeping the four vessels as separate as possible as this would increase the size of the exposed area and thus number of exposed animals. Modelling of such scenarios was especially called for at the meeting on 20th January in Copenhagen, but has not been included in the cumulative modelling scenarios. In fact no mitigation has been suggested for the combined four seismic surveys.

p 69 " Operations will be suspended if marine mammals are sighted within 500 m of the airgun array. Marine mammal observations will occur during all



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daylight hours and include all marine wildlife, including pinnipeds, birds, and cetaceans”

In another chapter it is argued and stated that a safety zone of 800 m will be imposed. It is assumed that the 800 m zone applies?

p 70 ” ...visual monitoring) at night, during periods of darkness, and during sea states greater than Beaufort 3.”

Periods of reduced visibility where PAM should be used also include fog that precludes monitoring of the safety zone.

p 70 Regarding the PAM system

Where will the hydrophones be deployed in relation to the airguns?

p 85

On what dates were the salinity profiles obtained?

Appendix D

Page 11: How have Jasco accounted for the increased background noise level between individual pulses in the calculations of the “cumulative exposure levels cSEL? If this hasn’t been accounted for, can the estimated levels be regarded as minimum cSELS?

Page 11: “ConocoPhillips’ proposed seismic airgun survey is not the only survey planned for the regional study area in the summer of 2012; Shell and Maersk are also proposing activities. Separate underwater sound modelling studies in which cSEL (Section 2.1) was calculated over 24 hours of seismic surveying for each operator were conducted for ConocoPhillips (Austin et al., 2012) and for Shell (Matthews, 2012)”

We suppose the sentence should have included Maersk here? If not, why is the survey by Maersk not included?

Page 13. “Sound emissions from the surveys planned by ConocoPhillips and Shell were also included in the aggregate sound propagation modelling in the regional study area.”

They must mean Maersk here? Copied from the Maersk EIA?

Page “The airgun array is composed of three subarrays/strings towed in parallel, with a 7 m separation. Each sub-array is 14 m long and contains 10 airguns. The individual airguns are fired simultaneously at 2000 psi.”

In the EIA it is stated that they will fire alternating? What will it mean for the modelling results if that is the case?

Appendix E-J



Page 3 “ (5) Mitigation for potential effects of underwater noise on fish were accommodated at the design stage by increasing the number of hydrophone receivers required for each survey line which will reduce the total number of seismic lines required and consequently reduce the duration and extent of the potential noise effects.”

This does not seem to fit with a 2D survey? This is not described in the EIA. Please explain what is meant here.

Page 3 “ There is no evidence of fish mortality as a result of seismic activity, except at close range, the effects of seismic sound sources on fish are thought to be transitory..”

What is ‘close range’?

Page 4 “ (12) A Project specific 50 m safety zone will be established for the hydrographic survey program based on acoustic impact criteria established by NMFS. As the hydrographic”

What is this hydrographic survey? It is not described in the EIA.

Page 4 “(13) A MMSO program will also be conducted onboard the hydrographic survey vessel whereby a minimum of two qualified MMSOs will be onboard the vessel, with one MMSO providing continuous monitoring for marine mammals during all periods of daylight, and good visibility.”

Will the two observers taken out of the four MMSOs that are mentioned to be conducting the observations during the 2D survey on the *Princess*? Please explain.

Page 8 “(9) Conoco Phillips is proposing to include early entry into the block (early July). This would allow completion of part of the program prior to entry from other operators, effectively reducing the amount of time all operators are in the area concurrently. All three operators have agreed to develop simultaneous operations planning”

An early entry into the block is not mentioned in the EIA itself? Please provide more information about this proposal and its potential environmental impacts.

Page 9 “The source/receiver ratio has been increased to reduce the number of source shots transmitted per survey line, as well as the total number of seismic lines required (provides for a reduction or a reduction in the duration and extent of potential noise effects)”

Again this is not mentioned in the EIA and seems to be an error in this appendix. Otherwise please explain how 1 shot per 10 seconds can be considered a reduction when other surveys can fire once per 15 seconds? Also the increase in streamers is not explained in the EIA and must be an error. Otherwise please elaborate.



Page 10 " ... smallest airgun in the array providing a constant increase in output that slowly increases over a **minimum** ramp-up period of 20 minutes, thus providing adequate time for marine mammals to leave the area ..."

Ramp up should not be conducted over a minimum of 20 min, but with a duration of about 20 min, not longer, not shorter.

Page 10 " (where possible, ramp-ups will be planned so that they commence during daylight hours)"

It is always possible to begin during daylight, the question is whether you are willing to.

Page 10 " Implementation of pre-shooting searches to determine that no marine mammals are present with the 800 m safety zone (completed by MMSO or an acoustic scan of the areas by the PAM operator)"

Remember here that the duration of the pre-shooting search depends on the depth at the site.

<200m: 30 min search

>200m: 60 min search

Page 10 "• If shooting of the airguns has stopped and not restarted for at least 10 minutes, then a pre-shooting search and 20 minute ramp-up will be completed. If the break is less than 10 minutes the MMSO will visually scan within the 800 m safety zone"

If the airguns have been off for a period of **less than 5 minutes** (not 10) they can be restarted at full speed. For longer periods with the airguns off, a pre-shooting search and ramp up has to be conducted.

Page 10 " Firing of airguns will be terminated at the end of each survey line and a full 20 minute soft-start will be undertaken prior to starting the next survey line, providing that the line change time is less than 20 minutes."

A pre-shooting search shall also be conducted before start at the next line if the airguns have been off.

Page 11 "Seismic activities will be avoided in the Melville Bay Reserve and the designated narwhal protection zones (NPZ-IV - summer habitat near Qaanaaq and NPZ- I and II) during the designated protection periods **where practical. If avoidance is not possible, then seismic lines occurring in the protection zones will be limited to more widely spaced lines (>10 km).**"

But this does not appear to be planned for here. If you look at figure 3.1-1 in the EIA it is very clear that the distance between the lines is reduced, not increased, within the NPZ-I. Please explain whether or not ConocoPhillips intend to increase the distance between the survey lines within the NPZ-I.



Page 12 "Project vessels will avoid rapid acceleration, and will keep speeds as low as practical within specified Project guidelines (speed reduced to less than 14 knots when within 300 m and avoid abrupt course changes)"
Within 300 m of what?

Page 12 "100 m to any whale and will reduce speed and cautiously move way from whales if they approach within 100 m"
How will ConocoPhillips stop a vessel running 14 knots within 100m of a whale? This is very hypothetical.

Appendix J

Page 2 "The source/receiver ratio (i.e., number of hydrophone streamers per airgun array) has been increased to reduce the number of source shots and seismic lines required to complete the survey."
This is not described in the EIA. Seems not possible for 2D surveys, or? By how much has this reduced the number of survey lines?

Page 2 Regarding MMSO data collection.
The NERI protocols shall be used for data collection.

Page 5. Regarding number of MMSOs and PAM operators.
As many observers and as short 'on-duty periods' as possible are preferable, since observer concentration drastically falls off during an observation period. Summertime in high arctic Greenland provides daylight conditions almost 24 hours at least in the beginning of the survey period.

Page 6 Regarding training of MMSOs
It is very much acknowledged to have project specific training of MMSOs before start! Great initiative!
Further:
"Review of, and classroom practice with, data recording and data entry systems, including procedures for recording data on marine mammal sightings, monitoring operations, environmental conditions, data entry error control, and reporting requirements. These procedures will be implemented through use of a customized electronic database called Pendragon installed on laptop computers. Section 3.2 provides details on these systems."
and "MMSO Manual"
The class room practice and the MMSO manual should be based specifically on the DCE 2012 guidelines for seismic surveys, the NERI/BMP MMSO data collection and data entry forms. Neither shall build on the JNCC guidelines or data entry forms.

Page 7 "The airgun operator will contact the MMSO or PAM operator (as applicable) at least 20 minutes prior to the start of any airgun activity to allow for the pre-shooting search."
The length of the pre-shooting search depends on the depth at the site:
<200m: 30 min search



>200m: 60 min search

In no instances is a warning 20 min prior to airgun activity enough. The observers need time to sharpen up before the soft start commences. Please make sure this is changed and that the BMP 2011 Guidelines for seismic surveys are followed (Kyhn et al. 2011)

Page 7 "After each 20 minute pre-shooting search has been completed to allow for the start of ramp-up"

Again a 20 min search is not enough before ramp up.

The length of the pre-shooting search depends on the depth at the site:

<200m: 30 min search

>200m: 60 min search

Page 8 Regarding ramp-up "Individual airguns will be started up sequentially in uniform stages to provide a constant increase in output that slowly increases over a minimum ramp-up period of 20 minutes (and no more than 40 minutes),"

The soft start or ramp-up should last 20 min, not minimum 20 and maximum 40 min. Please confirm that the BMP Guidelines for seismic surveys 2011 will be adhered to.

Page 8 "Where possible, ramp-ups will be planned so that they commence during daylight hours."

This is a matter of priority. DCE advises that ramp up always begin during periods of good visibility under daylight conditions.

Page 8 "If marine mammals are spotted within the 800 m safety zone during the pre-shooting search, the ramp-up procedure will be delayed 20 minutes from the time the marine mammal was observed leaving the safety zone, or 20 minutes from the time the marine mammal was last detected inside the safety zone."

In this instance use of the mitigation gun is recommended to encourage the animals to leave the area.

Page 9 Regarding breaks in airgun firings "For breaks less than 10 minutes..."

If breaks are **less than 5 minutes** duration the airgun array can be restarted without ramp-up and pre-shooting search.

Page 9 "For breaks greater than 10 minutes"

The duration of the pre-shooting search will depend on the depth at the site. See above.

Page 10 "MMSOs will maintain a watch as outlined in the pre-shooting search procedure before any instances of gun testing."

Again the duration of this pre-shooting search shall depend on the water depth at the site.

Frederik Lyng

Fra: Mads Nedergaard
Sendt: 14. maj 2012 10:12
Til: Frederik Lyng
Cc: Outi Tervo
Emne: Høring af miljøvurderinger om planer for kulbrinteaktiviteter i Baffin Bugt [1 vedhæftet fil]
Vedhæftede filer: Høring af miljøvurderinger om planer for kulbrinteaktiviteter i Baffin Bugt [1 vedhæftet fil] [DOK868246].HTM

Hej Frederik,

GFLK har ikke noget at bemærke til efterforskningen 2012 I BLOK 2 (QAMUT) 2D-SEISMISK UNDERSØGELSE idet der ikke herfra er registreret noget erhvervsmæssigt fiskeri der kan konflikte med aktiviteten.

Vh

Mads Trolle Nedergaard
Head of GFLK



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Inuit Circumpolar Council, Greenland

Hørings svar vedrørende Vurderinger af Virkninger på Miljøet (EIA) for ansøgte 2D seismiske indsamling samt tyngdedata og magnetismedata i Nordvestgrønland af ConocoPhillips

Nuuk den 14. maj 2012

Inuit Circumpolar Council (ICC) har gennemgået den fremsendte Vurdering af Virkninger på Miljøet (VVM) af 2D seismiske undersøgelser samt data om tyngdekraft og magnetisme i Blok 2 (Qamut), licensnummer 2011/11, Nordvestgrønland. Ansøgningen er indsendt af ConocoPhillips Global NVE Greenland Ltd., og dækker et areal på ca. 3.047 linje-km og forventes at have en varighed på ca. 4-6 uger fra starten af august.

GENERELLE BEMÆRKNINGER

ICC finder det positivt at Råstofdirektoratet har forlænget den offentlige høringsfrist til 8 uger, som er helt i tråd med ICC Grønlands tidligere anbefalinger. Det samme gælder for selskabernes frist til at indsende projektbeskrivelse senest 1. februar i det pågældende år. Særligt når der, som i år, er tale om 7 foreslåede olieefterforskningsprogrammer er det af afgørende betydning at der er tid til en grundig gennemgang af programmerne, således bliver det også lettere at få et overblik over mulige kumulative effekter af forskellige projekter.

SPECIFIKKE KOMMENTARER

I EIA'en nævnes at ConocoPhillips ønsker at udvide deres efterforskningslicens med en supplerende licens i et lille område nord for Qamut-blokken, som strækker sig ind i en del af narhvalens beskyttelseszone (NPZ-I). Hvorvidt der er givet eller vil blive givet tilladelse til denne licens fremgår ikke tydeligt. ICC Grønland er klar over at en beskyttelseszone ikke er lig med en fredningszone, og at der er mulighed for at lave begrænsede seismiske aktiviteter i zonen mellem den 1. juni og 15. oktober - Så længe aktiviteterne kan godkendes af Råstofdirektoratet og i øvrigt vil være begrænset til få linjer med >10 km afstand i mellem dem, samt suppleres med studier af virkningerne på narhvaler. Dog mener ICC Grønland at det først og fremmest er vigtigst at beskytte de levende ressourcer, som er essentielle for Grønlands nuværende økonomi og i øvrigt er tæt knyttet til kultur og samfundsstruktur i Grønland. Og narhvaler er vandedyr med foretrukne områder, så forstyrrelser vil have en endnu større effekt på dem end andre havpattedyr. Derfor ser ICC Grønland helst at der slet ikke laves aktiviteter indenfor nævnte beskyttelseszone, og at forsigtighedsprincippet benyttes i større udstrækning end sædvanligt, hvis der endeligt kommer aktiviteter. Forskerne har anerkendt at der er store videnshuller i forhold til havpattedyrenes bevægelser og adfærd, og foreløbige resultater indikerer at de nuværende beskyttelseszoner og beskyttelsesperioder ligefrem bør udvides, ikke reduceres. I det tilfælde vil ICC Grønland hellere prioritere beskyttelseszonen fremfor efterforskningsaktiviteter. I det hele taget foretrækker ICC Grønland at der for fremtiden ikke kommer til at foregå efterforskningsboringer i beskyttelseszonen, så længe der ikke er større viden om de mulige negative effekter på narhvalsbestanden. Dog er det en god ting at der i forbindelse med sommerens aktiviteter vil være supplerende undersøgelser udført af DCE og Grønlands Naturinstitut i løbet af sommeren og efteråret, som kan være med til at belyse nogle af disse problemstillinger nærmere.

I forbindelse med dette års seismiske aktiviteter har JASCO Applied Sciences fået udarbejdet en rapport med modellering af lydets udbredelse i farvandene omkring Baffin Bugt. Rapporten giver et bedre overblik over mulige kumulative effekter af flere seismiske projekter i området. Det lader dog til 12 at der ikke nævnes noget om skygge- og konvergenzoner. Dette er ellers blevet fremhævet af Madsen et al. (2006), da de arktiske farvande har stærkere lagdeling, der kan skabe særlige konvergenzoner, selv mange km væk fra selve lydkilden (op til 12 km), hvor lydtryks-niveauet pludseligt forstærkes og med højere frekvenser end planlagt. Dette kan igen have en effekt, ikke kun på bardehvaler, men også tandhvaler længere fra lydkilden. Hvorvidt modelleringen tager højde for disse mulige konvergenzoner fremgår ikke klart.

ICC anbefaler at mulige effekter af efterforskningsaktiviteter generelt, så vidt muligt undersøges hos vilde dyr i deres naturlige miljø.

Såfremt der refereres til undersøgelser hvor effekter er undersøgt med forsøg foretaget på dyr i fangskab, bør der tages forbehold for dette og disse forbehold bør nævnes i EIA rapporter.

Det nævnes kort i EIA'en og i det ikke-tekniske resumé at de tre fartøjer er is-klassificerede. IMO's retningslinjer for skibe, der opererer i polære farvande (*IMO Guidelines for Ships Operating in Polar Waters 2009*) anbefaler netop at fartøjer som minimum bør være af is- eller polar-klasse. Selvom retningslinjerne er frivillige, betragter ICC Grønland dem som udtryk for best practice, og sætter pris på at ConocoPhillips har valgt at følge dem. Det nævnes også kort at fartøjerne følger SOLAS 1974 regler, BMP og DCE og andre relevante retningslinjer. Dog er oplysningerne om fartøjerne i øvrigt mangelfulde, da det ikke fremgår hvilken is-klasse de har, og der i øvrigt ikke er en oversigt over andre fartøjsdata, som har været tilfældet i en del andre EIA'er. Det vil gøre det lettere at få et hurtigere overblik hvis sådan en oversigt indsættes.

ICC anbefaler i øvrigt at oplysningerne om fartøjernes sikkerheds-miljøforanstaltninger verificeres af relevante uafhængige søfartssagkyndige.

I EIA'en beskrives hvorledes ConocoPhillips vil tage frivillige ekstra forholdsregler under ramp-up proceduren, således at sikkerhedszonen udvides fra 500 m til 800 m. Dette finder ICC Grønland positivt, da ethvert tiltag som sikrer beskyttelsen af vores levende ressourcer bedst muligt kun kan være til det bedre.

ICC Grønland vil gerne meddele, at dette høringssvar gerne må offentliggøres på Selvstyrets hjemmeside. ICC Grønland lægger også høringssvaret ud på sin egen hjemmeside www.inuit.org under Aktiviteter → Offentlige høringer i Grønland.

ICC takker for fortsat at være høringspart, og ser frem til fortsat samarbejde.

Referencer

Madsen, P T et al. "Quantitative measures of air-gun pulses recorded on sperm whales (*Physeter macrocephalus*) using acoustic tags during controlled exposure experiments." *Journal of the Acoustical Society of America* 120.4 (2006) : 2366-2379.



Råstofdirektoratet
Frederik Lyngø
3900 Nuuk

IAANs svar til høring vedr. indsamling af seismiske data

Infrastrukturkontoret skal gøre opmærksom på, at operatører, der ønsker at foretage charterflyvninger til godkendte flyvepladser i Grønland, skal have en tilladelse fra Trafikstyrelsen. Operatører, der ønsker at foretage cabotageflyvning i Grønland, uden at have en forudgående tilladelse, skal have en beflyvningstilladelse fra Trafikstyrelsen og Grønlands Selvstyre i henhold til IAANs og Trafikstyrelsens procedurer herfor.

Infrastrukturkontoret har ikke yderligere kommentarer til høringen, da det er IAANs forståelse, at

- projektet ikke involverer etablering af infrastrukturanlæg på land
- de aktiviteter, der søges om, vil blive reguleret i henhold til international og national søfartslovgivning

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Med venlig hilsen

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Grønlands Selvstyre
Råstofdirektoratet
bmp@nanoq.gl

Ulloq/Dato: 14-05-2012
J. nr.: 74.00

Att. Frederik Lyngø

**Samlet høringsvar vedr. ansøgninger om seismiske undersøgelser under licenserne 2011/11, 2011/12, 2011/14 og 2011/15 fra
Conoco Phillips Global NVE Greenland Ltd., Licens nr. 2011/11 Qaamut-feltet om
godkendelse af indsamling af 2D seismik.
Maersk Oil Kalaallit Nunaat A/S Licens 2011/15, Tooq feltet, 3D seismik
Shell Kanumas A/S Licens 2011/12 Anu feltet og Licens 2011/14 Napu-feltet, 3D seismik**

Kommunernes fælles råstofgruppe har gennemgået høringsmaterialet vedr. de ansøgte aktiviteter og har følgende kommentarer:

Kommunernes fælles råstofgruppe noterer sig at ansøgningerne er fremsendt af de enkelte licenshavere, men at der tillige er fremsendt VVM for den akkumulerede påvirkning af aktiviteterne. Høringsvaret vil derfor vedrøre den samlede påvirkning og i mindre grad vedrøre den enkelte licenshavers ansøgning.

Kommunerne skal bemærke at der tidligere har været gennemført både 2-D og 3-D seismik i Baffinbugten og er derfor glade for, at der fremsendes materiale i forbindelse med de kommende aktiviteter.

I forbindelse med aktiviteterne i Baffinbugten fremgår det af det fremsendte materiale, at der både kan være lokale og regionale forstyrrelser både i forhold til fisk og havpattedyr. Vurderingen af aktiviteterne er, at der vil være en forstyrrelse og at disse begrænser sig til den periode, hvor aktiviteterne pågår. Det fremgår ligeledes at det vurderes at både fisk og havpattedyr returnerer til områderne efter aktiviteterne ophører og at forstyrrelserne dermed har en kortsigtet indvirkning på dyrelivet.

I den forbindelse er det derfor meget vigtigt at de anbefalede forholdsregler følges for dermed at minimere påvirkningen. Qaasuitsup Kommunian skal dog bemærke, at nogle af aktiviteterne forventes udført i umiddelbar nærhed af narhvalsreservatet i Melvillebugten. I den forbindelse vil det være hensigtsmæssigt at de seismiske undersøgelser gennemføres på en sådan måde, at man udover sikkerhedszonen på 800 meter tillige sikrer, at der ikke er narhvaler i en større radius end den angivne.

Kommunerne skal bemærke, at det af høringsmaterialet ikke fremgår, at der i forbindelse med aktiviteterne i Baffinbugten tillige vil blive gennemført videnskabelige undersøgelser med henblik på en monitorering af påvirkningen af aktiviteterne. Det ville have været hensigtsmæssigt, at disse planer var vedlagt høringsmaterialet.



KANUKOKA

Kalaallit Nunaanni Kommunit Kattuffiat • De Grønlandske Kommuners Landsforening

Kommunerne har forstået at der vil blive gennemført tællinger af narhvaler og hvidhvaler forud for aktiviteterne, under gennemførelsen af aktiviteterne samt efter aktiviteterens ophør. Det er samtidig oplyst, at der tillige vil være en monitoring af eventuelle adfærdsændringer i forbindelse med jagten af narhvaler i Melvillebugten og at disse gennemføres i samarbejde med de lokale fangere.

Kommunerne finder det meget positivt, at der gennemføres en monitoring af påvirkningerne, da undersøgelserne er uafhængige af licenshaverne og gennemføres af DCE og Naturinstituttet. Det skal dog bemærkes, at det i den forbindelse ville være hensigtsmæssigt at der laves tilsvarende undersøgelser af andre lydkilder i havet, eksempelvis fra trawleraktiviteterne, da dette vil kunne give en baseline og reference i forhold til de øgede lydpåvirkninger i forbindelse med en stigende efterforskningsaktivitet.

Kommunerne har ikke yderligere kommentarer til det fremsendte høringsmateriale udover, at det forventes at resultaterne fra monitoringen fremsendes til kommunen til orientering.

Kommunerne vil i øvrigt bifalde den indsats licenshaverne i området har gjort for at oplyse borgerne om de kommende aktiviteter.

Med venlig hilsen

På vegne af Kommunernes fælles råstofgruppe

Zenica Gosvig Larsen
Specialkonsulent.

Frederik Lynge

Fra: Martin Schjøtz-Christensen <Martin@business.gl>
Sendt: 9. maj 2012 11:10
Til: Frederik Lyngé
Cc: Marie Fleischer; Kaare Winther Hansen; Anne Sofie Hardenberg; Inger Christiansen
Emne: FW: VS: VS: Offentlig høring af miljøvurderinger om planer for kulbrinteaktiviteter i Baffin Bugt

Kære Frederik Lyngé,

Behandling af disse 4 høringer er i Kommuneqarfik Sermersooq henlagt til administrativ besvarelse, via Sermersooq Erhvervsråd (SBC)
SBC har inntet at bemærke i denne forbindelse. Selv om samtlige høringer vedrører områder uden for Sermersooq, sætter vi pris på orienteringen.

Inuulluaqqusillunga // Med venlig hilsen // Best Regards
Martin Schjøtz-Christensen
Projektleder, Sermersooq Erhvervsråd

Project Manager, Sermersooq Business Council
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Fra: Frederik Lyngé [<mailto:FRL@nanoq.gl>]
Sendt: 19. marts 2012 20:04
Til: Jørgen T. Hammeken-Holm
Emne: Offentlig høring af miljøvurderinger om planer for kulbrinteaktiviteter i Baffin Bugt

Kære alle

Råstofdirektoratet har i dag bragt nedenstående 4 miljøvurderinger af planer for kulbrinteaktiviteter i Baffin Bugt, Nordvestgrønland, i offentlig høring via høringsportalen www.nanoq.gl. I tilfælde af hel eller delvis imødekommelse af aktivitetsplanerne, vil disse blive sat i værk i løbet af sommeren/efteråret 2012.

Høringsfristen udløber mandag den 14. maj 2012 kl. 12.00.

1. ConocoPhillips Global NVE Greenland Ltd., operatør på eneretstilladelse nr. 2011/11 (Qamut), har ansøgt om godkendelse af plan om indsamling af 2D seismiske data fra det af tilladelsen omfattede område. Selskabet har udarbejdet en miljøvurdering, på engelsk kaldet Environmental Impact Assessment ("EIA"), som kan findes på følgende link: <http://dk.nanoq.gl/Service/Hoeringsportal/Miljovurderinger/2012/ConocoPhillips.aspx>.
2. Shell Kanumas A/S, operatør på eneretstilladelse nr. 2011/12 (Anu) og 2011/14 (Napu), har ansøgt om godkendelse af plan om indsamling af 3D seismiske data fra det af tilladelse omfattede område. Det planlagte indsamlingsområde rækker delvist ind over det af eneretstilladelse nr. 2011/11 (Qamut) omfattede område. Shell Kanumas A/S har udarbejdet en EIA, som kan findes på følgende link: <http://dk.nanoq.gl/Service/Hoeringsportal/Miljovurderinger/2012/Shell.aspx>.
3. Maersk Oil Kalaallit Nunaat A/S, operatør på eneretstilladelse nr. 2011/15 (Tooq), har ansøgt om godkendelse af plan om indsamling af 3D seismiske data inklusive en hydrografisk undersøgelse og indsamling af havbundsprøver fra det af tilladelsen omfattede område. Selskabet har udarbejdet en EIA, som kan findes på følgende link: <http://dk.nanoq.gl/Service/Hoeringsportal/Miljovurderinger/2012/Maersk%20Oil%20Kalaallit%20Nunaat.aspx>.
4. Shell Kanumas A/S, operatør på forundersøgelsestilladelse nr. 2011/60, har ansøgt om godkendelse af plan for udførelse af stratigrafiske borer med udtagelse af 11 borekerner fra 7 forskellige lokaliteter i Baffin Bugt. Selskabet har udarbejdet en EIA, som kan findes på følgende link: <http://dk.nanoq.gl/Service/Hoeringsportal/Miljovurderinger/2012/Borekonsortiet.aspx>.

Interessenterne bedes være opmærksomme på, at høringsmaterialet kan findes i både den grønlandske og den danske del af høringsportalen.

Hvis høringsanmodningen giver anledning til spørgsmål, kan disse rettes til Råstofdirektoratet.

Venlige hilsener

Frederik

Inussiarnersumik inuulluaqqusillunga / Med venlig hilsen

Frederik Lyngø

Sulianik ingerlatsisoq, Aatsitassanut immikkoortortaarfik /
Sagsbehandler, Mineralafdelingen, Oliesektionen

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Råstofdirektoratet

NNPANs høringssvar vedr. ansøgning om udførelse af 2D seismic ved Qamut Blokken under licens 2011/11

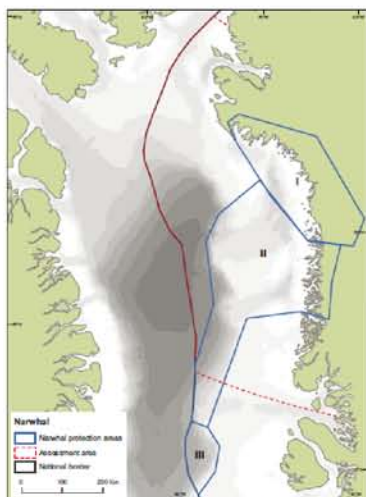
Departementet for Indenrigsanliggender, Natur og Miljø (NNPAN) modtog den 28. marts 2012 høring vedr. ConocoPhillips ansøgning om udførelse af 2D seismic ved Qamut Blokken (2011/11).

Det ansøgte område er beliggende i Baffin Bugten, Nordvestgrønland.

Forventet periode for undersøgelserne er i august-september (evt. til oktober) 2012. Det står ikke helt klar hvorvidt den angivne periode dækker alle aktiviteterne (herunder sejllads til og fra licensområdet) eller om det kun er for de seismiske aktiviteter.

Beskyttede områder

Dele af det område hvor der ansøges om at udføre seismiske undersøgelser er inden for et beskyttet område for narhval samt sårbare områder for hvidhval og grønlandshval. I rapporten *Eastern Baffin Bay – A strategic environmental impact assessment of hydrocarbon activities*¹ fremhæves de beskyttelsesområder for narhval, se figur 1. I det såkaldte område NPZ-1, der er et sommerlevested anbefales det i rapporten at man undgår eller begrænser seismisk aktiviteter i perioden 15. juli til 25. oktober. I det såkaldte område 2, som er migrationskorridor anbefales det, at seismiske aktiviteter begrænses i perioden fra 15. oktober til 1. december. I det såkaldte område 3, der er et vinterlevested pointeres det i rapporten, at seismiske aktiviteter slet ikke bør foretages.



Melville Bugten er på grund af sin fjerne beliggenhed og status som beskyttet område² med henblik på at begrænse forstyrrelsen af narhvalerne et vigtigt kerneområde for narhvalen. Dette er af stor betydning for den grønlandske narhvalbestand, da en stor del af bestanden opholder sig i Melville Bugten om sommeren³. Det vil sige, at de seismiske aktiviteter potentielt ikke kun har en lokal effekt på arten, men kan have en effekt på hele grønlandske bestand.

Figur 1: Beskyttede områder for narhvalen⁴.

¹ DCEs Videnskabelig rapport nr. 9 fra 2011 (<http://www2.dmu.dk/Pub/SR9.pdf>).

² Hjemmestyrets bekendtgørelse nr. 21 af 17. maj 1989 om naturreservatet i Melville Bugt

³ Grønlands vinterhvaler – hvidhvalen, narhvalen og grønlandshvalen 2006, side 89

⁴ DCEs Videnskabelig rapport nr. 9 fra 2011 (<http://www2.dmu.dk/Pub/SR9.pdf>), side 148.

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NNPAN noterer, at den angivne aktivitetsperiode ligger inden for den sårbare periode for narhval. NNPAN henstiller til, at man følger anbefalingerne i rapporten *Eastern Baffin Bay – A strategic environmental impact assessment of hydrocarbon activities* for at undgå unødigt forstyrrelse af de arter, der befinder sig i området.

Kumulative effekter

NNPAN anbefaler, at man under beskrivelse af de kumulative effekter endvidere behandler effekten af eventuelle yderligere aktiviteter i de kommende år. Det vil sige, at det bør vurderes hvilke konsekvenser, der kan opstå, hvis der i de kommende år bliver udført yderligere råstofaktiviteter (herunder seismiske aktiviteter) i og nær de sårbare områder og at arterne derved oplever gentagende forstyrrelser indenfor deres kerneområde.

Seismiske aktiviteters effekt på adfærd

I EIAen er der kun i begrænset omfang redegjort for de seismiske aktiviteters effekt på narhvalernes adfærd. Hovedfokus er på hvilke fysiske effekter de seismiske aktiviteter kan have på arterne, herunder specielt på nært afstand. Det oplyses i EIAen, at der er manglende viden om de adfærdsmæssige effekter. NNPAN anbefaler, at der udføres flere undersøgelser på hvilke konsekvenser, der kan være på arternes adfærd ved udførelse af seismiske aktiviteter, herunder særligt hvilken effekt de seismiske aktiviteter kan have på narhvalerne i deres sommerområde i Melville Bugten.

Forsigtighedsprincippet

Forsigtighedsprincippet anvendes når der ikke er tilstrækkelig viden om hvilke konsekvenser en aktivitet kan have på eksempelvis arter eller økosystemer. Indledningsvist i EIAen redegør selskabet selv for, at de arbejder ud for forsigtighedsprincippet, hvilket NNPAN noterer sig.

Inussiarnersumik inuulluaqqusillunga

Med venlig hilsen

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