

*Enclosure to Answer from Sweden, 2009-06-08*

**Summary of comments received relating to transboundary environmental impacts of the Nord Stream project. Consultation process: 9 March–25 May 2009.**

**The Swedish Board of Fisheries** finds that the gas-pipeline project may cause transboundary environmental impacts on both fish and fisheries. Transboundary impacts will occur mainly at the time of construction of the pipelines, as a result of increased turbidity and dispersion of sediment. The protective measures indicated for the prevention of damage to the eastern cod stock of the Baltic Sea are not sufficient. Construction work should not be carried out in the Bornholm Depth between May and October, to protect the spawning and growth of cod. The Board stresses the need for a holistic perspective and points out that synergies caused by the construction of the gas pipeline combined with other projects may lead to transboundary impacts.

The Board would like to have information about how the optimisation of the routing of the pipeline justifies the performance of construction work in the Bornholm Depth during the period which is most sensitive from the perspective of fish biology. It calls for the use of dynamically positioned vessels during pipeline laying in the Bornholm Depth.

In the operational phase, impacts on fish may arise as a result of their gathering along the pipeline, which may in turn lead to increased fishing activities there and to over-exploitation. This should be monitored. A monitoring programme must be established in good time before the construction of the first gas pipeline.

Transboundary impacts on fisheries may arise in areas where there are limited possibilities for trawls to pass over the gas pipelines. Such impacts may take the form of damage to fishing gear, a need for fishermen to avoid previously important fishing areas and a probable increase in the accident risk for fishermen.

As the Board has not been given access to the final report on the qualitative assessment of the risk of interaction between fishing gear and pipelines from the perspective of the trawling industry, it cannot make a full assessment of the impacts on the fisheries sector. Preliminary reports, however, support the conclusion that free spans below the pipeline should not be allowed in areas of importance to bottom trawling.

The Board considers it important for the company to inform commercial fishermen about the planned fund. The company should also be responsible for the removal of any fishing gear that has been lost because of the pipelines.

One possible transboundary environmental impact of the project is the spread of alien and/or invasive species. The company must stay up to date with ongoing work on guidelines to reduce the spread of alien/invasive species in the Baltic Sea. Invasive species should be included in the monitoring programme.

**The Geological Survey of Sweden** considers that it has received answers to the questions it has previously asked of the company. The issue of the paving of very loose postglacial clays, including in Finland's exclusive economic zone close to the Swedish zone, has also been addressed by the company, but the Geological Survey lacks the expertise to assess the estimation models used.

**The Swedish Geotechnical Institute** finds, from geotechnical and environmental-geotechnical perspectives, that the project would have mainly local impacts at the construction stage. In the longer term, transboundary environmental impacts cannot be excluded.

**The Swedish Maritime Administration and the Swedish Transport Agency** both present similar comments. These two agencies do not subscribe to Nord Stream's conclusions as regards the need to consider additional measures to further minimise the risk of a deterioration in maritime safety. They are of the opinion that the classification of the Baltic Sea as a particularly sensitive maritime area entails a need to pay more attention to risks and their consequences than would normally be the case in other maritime areas. The proposed routing of the gas pipeline next to shoal areas worthy of protection may entail an increased risk of accidents. The two agencies also elaborate on the issue of how restrictions on vessels' possibilities to cast anchor in emergency situations in the areas around the Hoburg Bank and the Midsjö Banks (in Sweden's exclusive economic zone) may affect shipping and the environment. They further consider that the gas pipeline should be routed perpendicularly to the deep-water channel so as to minimise the exposure of vessels to the gas pipeline.

The two agencies further stress that a complex situation as regards liability in damages may arise if there is an accident involving damage to the gas pipeline or to a vessel. The issue of a possible prohibition against anchoring should be dealt with explicitly.

The Transport Agency also emphasises that it should be possible to continue any fishing activities using bottom gear without jeopardising safety.

**The Swedish Civil Contingencies Agency** considers that Nord Stream's Espoo report contains information indicating that there is a need to take protective action in order to prevent damage to the pipelines leading to the emission of natural gas. For this reason, the permits that the various countries may issue should be conditional upon the pipeline being covered in all strategic stretches where shipping is intensive and where intensive trawling is expected. The Agency finds it particularly important for this type of precautionary action to be taken as regards the pipeline stretch within Finland's exclusive economic zone, given that the company has identified this as the area where the likelihood of damage to the pipeline is greatest. Further, the Agency points out that the risk-acceptance criteria used for risk assessment are very high (compared with those used in Sweden). What is more, certain identified events would result in a very high level of risk, for instance as regards the risk of collision during the laying of the pipeline and the risk to society for the pipeline stretch within Finland.

There is no description of how the company intends to deal with minor damage to the installations causing emissions of gas. The risk of damage to the pipeline from intensive trawling has not yet been analysed.

Laying both pipelines at the same time could be one way to reduce risks during the actual construction period and also to reduce the extent of intervention on the seabed, given that this would make it possible to use a shorter distance between the pipelines. However, this alternative (which may or may not be feasible) has not been analysed.

**The Swedish Meteorological and Hydrological Institute** considers that the documents show that impacts on the ecosystems of the Baltic Sea cannot be excluded. While the identified impacts are minor, they may result in a cumulative impact over time. The conclusions drawn in the consultation report are based on indicative information which, unfortunately, does not rest on a solid factual ground. This is particularly serious considering that the operation of the pipeline system through the Baltic Sea will be of long duration. Given that the information is based on probable but not validated assumptions for the area considered here, it should be supplemented with detailed model-based estimates in the local area and with measurements of currents and stratification in critical areas. The modelling data need to be validated using measurement data to enable more certain conclusions to be drawn.

The Institute does not agree with the conclusion presented to the effect that it has been found that the pipelines will not block the inflow of deep water through the Arkona and Bornholm Basins. The investigation shows that no effect can be identified, but it does not say that it has been established that the pipelines will not affect the inflow.

It is clear from the documents that increased turbulence around the pipeline may increase the mixing of inflowing saltwater. In the Institute's opinion, however, this does not justify the conclusion – drawn in the Espoo report – that increased mixing in the Bornholm Basin will reduce the effects of eutrophication in the Baltic Sea, given that no analysis of this issue is included in the report.

The Institute further considers that the claim that the pipeline's presence on the seabed in the Gulf of Finland may affect physical processes such as the exchange of water at the bottom of the sea because of increased mixing-in of new deep water, etc., is completely incorrect given that this has not been investigated and the consultancy report cannot be applied to flows in the Gulf of Finland.

It is stated in the Espoo report that the halocline strongly reduces the dispersion of resuspended sediment. The Institute wishes to emphasise that the dispersion of sediment in stratified sea water takes place horizontally rather than vertically. Material that erodes away or leaks in conjunction with digging, and chemical substances attached to such material, may spread farther than they would in a non-stratified body of water. There is therefore reason to perform closer studies of dispersion scenarios in areas where the gas pipeline is located in, or passes

through, the halocline – especially where the pipeline also passes close to sensitive areas.

The Institute further considers that the conclusion referred to in the summary description of impacts, to the effect that all potential impacts during the operational phase have been found to be minor and that **no impact** is predicted on physical processes in the Baltic Sea resulting from the physical presence of the pipeline on the seabed, is incorrect in the sense that the consultancy report underpinning that summary description does not exclude such impact. The report estimates that an impact will occur as a result of increased mixing of water in the Bornholm Basin, even though that impact will be weak. In other words, there is in fact an impact, which may exert a cumulative effect over time.

There are reasons to request that monitoring of sediment spills be carried out consistently during the construction period. In the field of environmental monitoring, the Institute would also like to include currents as a parameter for physical environment – water mass.

**The National Board of Housing, Building and Planning** refers to its previous consultation statements in the matter (to Ramböll of 27 February 2007 and to the Ministry of Enterprise, Energy and Communications of 23 February 2009, respectively). From these statements it is clear, among other things, that the Board has stressed the need to produce realistic alternatives to building pipelines on the bottom of the Baltic Sea, so that comparisons can be made in order to determine which option provides the most long-term solution to the supply of natural gas to Northern Europe.

**The Swedish Environmental Protection Agency** (Swedish EPA) finds that final specifications, intended to minimise the risk of negative impacts on sensitive environments and species requiring special concern, to the schedules for construction work on the various parts of the pipeline route need to be determined before the project begins.

The Swedish EPA further considers that the national permit process in Germany relating to the Nord Stream project should take account of various scenarios for future energy consumption in Germany and the risk of emissions of greenhouse gases and air pollutants in conjunction with the distribution and use of the natural gas. Opportunities to increase the efficiency of energy use and the share of renewable sources of energy should also be taken into consideration in the permit process.

The Swedish EPA finds that, in the future national permit processes relating to the gas-pipeline project, conditions should be laid down as regards, among other things, (1) certain protective measures and restrictions on operating periods in conjunction with construction work; (2) mechanisms for the company's monitoring of impacts on the surrounding environment; and (3) financial guarantees for the cost of restoration measures in conjunction with the future discontinuation of operations.

**The National Heritage Board and the National Maritime Museums** cannot see that the parts of the project relating to the territory of other countries will lead to any direct impacts on the maritime cultural heritage located on Swedish territory, and they have no comments in this respect as regards transboundary impacts on the cultural environment.

**The Swedish Defence Research Agency** has replied on the basis of the company's previous reactions to the Agency's comments and questions.

The remaining points of unclarity mentioned by the Agency include the following:

- The environmental impact, at the Russian end, of the release of test water has not been investigated;
- Precautionary measures relating to birds or other marine wildlife are lacking;
- The mechanical effect and consequent environmental impact of, for instance, ploughing on any non-detected dumped chemical munitions have not been investigated;
- It is unclear whether the environmental-monitoring programme includes measurements of components deriving from possible leakages of chemical munitions;
- The Agency would like to see a discussion of the problematic circumstance that mines may move around on the seabed;
- The Agency is of the opinion that it has not been established who will bear responsibility in a situation with a more large-scale and long-term clearance commitment, and that it is also not made clear in the documents who will be responsible for dealing with any dumped war munitions that are found;
- The Agency considers itself unable to assess, based on the documents provided, the correctness of the company's conclusions regarding the assessment of environmental risks associated with dumped chemical munitions;
- Further, the Agency would like to see a description of how the pipelines' impact on currents may affect the transport of sediment and pollutants attached to particles.

**The county administrative boards (CABs) of Stockholm, Gotland, Östergötland, Kalmar and Skåne** have provided separate statements, but to some extent they address the same issues. The below presentation of comments includes no references to the statements of the individual CABs.

The CABs emphasise that a project as large as Nord Stream must be seen in a more strategic context where account is taken of how the project relates to EU climate targets, to the targets set in the HELCOM Baltic Sea Action Plan and to joint EU targets aiming for a good ecological status in all waters, which requires huge efforts. A gas pipeline through the Baltic Sea and continued use of fossil energy will not promote these targets. Use of Russian gas will probably lead to a slower shift to renewable forms of energy. These issues are deemed to belong to the field of international politics, and discussions about the usefulness of the gas pipeline should take place at the international level.

In the assessment of opportunities to minimise the environmental impact of the project, the location of the installation is a key issue. The documents should therefore identify and present all potential reasonable locations. It should also be clear which of these have been found to be technically feasible, and what the main environmental impacts of these routes would be. It cannot be determined on the basis of the documents whether this has been done – for example, whether pipeline-routing alternatives through the Baltic countries and Poland's exclusive economic zone or in the eastern part of the Baltic Sea have been identified and assessed.

The CABs also have reservations about the project's description of the zero alternative given that this alternative is mainly based on assumptions that increased use of coal and oil is the only possible alternative to the construction of the pipeline. Enhanced energy efficiency and greater use of renewable forms of energy are mentioned by the CABs as better tools to achieve security of energy supply in the EU.

Given that the environmental impact of pipe-laying varies across different parts of the route, a comparison of the impacts following from different starting times should be performed so that the overall environmental impact of the project can be minimised. Information should also be provided as to whether it is technically feasible to lay both pipelines at the same time, and what this would mean in terms of changes to the environmental impact compared with the approach presented. The CABs would like to see a description of how the seabed will be affected by anchor handling in conjunction with the laying of pipes. To minimise the impact on the seabed, dynamically positioned pipe-laying vessels should be used to the greatest possible extent.

The estimated phosphorus emissions from the project are highlighted as a key issue, given the present state of the Baltic Sea, and as a common concern of the countries around the Baltic Sea. According to previous studies, bottom water may contain a huge surplus of phosphorus. The impacts that the project may have on the phosphorus balance must be described in greater detail, and supplementary information must be provided: (1) a presentation of the extent to which the project will interfere with stratification (the halocline) on oxygen-free bottoms; (2) an estimate of the size of the possible contribution from phosphorus rising from the bottom water; and (3) an assessment of whether this contribution may cause algal blooms in the Baltic Sea proper.

While the gas pipeline is being laid, commercial fishermen will have limited access to certain areas, including ones north-east of Bornholm, at the same time as the construction work will cause disturbances that will scare off the fish. During the operational phase, the pipeline may exert an impact on fisheries in areas where bottom trawling is used, particularly where there are 'free spans'. These risks can be minimised to some extent by means of various measures. The possibility of burying or embedding relevant parts of the pipeline must be examined, above all in areas of considerable interest to fisheries. The issues of fisheries safety are important and must be thoroughly looked into. If the project leads to long-term impacts on fisheries, Nord Stream will provide compensation

for lost catches. In this context, the company should take the initiatives and assume the costs necessary to make such follow-up possible.

Information should be provided as to the identity and length of the stretches that will be ploughed, particularly in areas with sensitive habitats.

The increased risk of shipping incidents is exemplified in the CABs' responses, and this is highlighted as a transboundary environmental issue requiring special precautionary measures to be taken. To enable assessment of the overall environmental impact of the project, the risk-assessment chapter should be supplemented with a 'worst-case scenario'.

Given the environmental impacts that will be caused by the release of water used in hydrostatic tests, alternative processing approaches – such as purification of the water before releasing it – should be presented and weighed against each other.

If blasted rock or gravel is used, it should be ensured that any residues of explosives have been removed so that emissions of nitrogen compounds to the water can be minimised. It should also be made clear whether there is a risk that stone 'carpets' or supports will be placed in areas where such bottom substrates are undesirable and may alter the ecological conditions.

Considering the extent of the project and its total environmental impact on a maritime area which is already under heavy stress, the CABs are of the opinion that any permits issued must be conditional upon compensatory measures in the form of active support for the development of renewable energy, support to reduce the nutritional load on the Baltic Sea and support for environmental research in the Baltic Sea.

To ensure that restoration will be performed, some form of financial guarantee should have been provided before the pipelines are laid.

**Gotland University** is of the general opinion that the Nord Stream project feels out of place in an era when the entire world must drastically reduce its emissions of CO<sub>2</sub> and other greenhouse gases. The large investments needed for this project should instead be directed towards ecologically sustainable solutions. There is also no alternative route on land even though the project description presents plans to build subterranean storage facilities for natural gas in the eastern parts of Latvia, Lithuania and Poland (project NG5), which in all likelihood indicates an intention to lead gas past those locations.

Gotland University considers that construction work entailing the resuspension of sediment must not be carried out during the spawning periods of commercially important fish species, for example in the shoal areas off the German coast. The impact of the resuspension of various substances in the sediments, such as organic environmental toxins, heavy metals and not least phosphates, must be minimised.

The shipwrecks and Mesolithic remains in the southern part of the Baltic Sea area constitute a common cultural heritage of importance to all countries around the Baltic Sea. The risk of unpredicted impacts on the cultural heritage located on the seabed is too great for it to be justifiable to route the gas pipeline in sensitive areas where there are known remains and where there may be as yet undiscovered wrecks and Mesolithic settlements.

**The Swedish University of Agricultural Sciences/Swedish Species Information Centre** provides comments mainly relating to the Swedish part. It questions the company's conclusions to the effect that no major impacts will occur – several of the conclusions drawn about the seriousness and/or extent of impacts or damage seem to have an inadequate basis in fact and rather tend to play down the risk of impact. The University calls for real risk scenarios as regards the impacts on the very sensitive and protected areas found all along the planned route and in the surrounding waters.

If permits are issued and the pipeline is built, a system should be established to ensure careful monitoring of impacts on ecosystems. It would be appropriate for such a system to be developed in close cooperation with all coastal countries concerned.

**The Coalition Clean Baltic** provides a large number of general proposals for requirements and conditions to be incorporated in decisions with a view to reducing the environmental impacts. These proposals are addressed to all decision-making authorities. The areas specifically concerned are mainly the eastern parts of the Gulf of Finland and the Greifswalder Bodden; however, there are no direct links to impacts on Swedish areas or interests.

**The World Wide Fund for Nature (WWF)** has submitted the same extensive statement to each of the countries concerned. For this reason, the contents of its statement are not summarised here; instead the WWF's own summary is reproduced: **Based upon the evidence presented in this position statement, it is clear to WWF that the EIA prepared by Nord Stream is insufficient. It must be dramatically revised, updated and completed with all of the necessary data (currently missing) in order to ensure that an adequate assessment of the environmental impacts of the pipeline project can be fairly considered. WWF therefore urges all contracting parties to the ESPOO convention, and particularly all Baltic Sea affected countries, to demand that Nord Stream address the issues raised in this document to a sufficient extent in order to assure that informed decisions can be made regarding this project.** Given what we already know about the fragile state of the Baltic Sea environment, moving forward with this project in the absence of clear answers to all of the issues raised in this position statement could be of serious consequence to the environment of the Baltic Sea.

**The Ornithological Society of Gotland** considers that the information used and the conclusions presented in the Environmental Impact Assessment (EIA) as regards potential negative impacts on birdlife are not satisfactory. The EIA should therefore not be approved, and the construction project should not be given a permit since the reasons given for building the installation are out of

proportion to the extent of exploitation of the Baltic Sea involved and the environmental risks associated with the project. The Society would like to see proposals for, and investigations into, alternative routes for the pipeline. Besides the valuable bird areas in the Swedish exclusive economic zone, the Society also refers to the valuable birdlife sites near Danish islands and to the protected natural areas and birdlife sites off the shore-landing site in Germany and in the Gulf of Finland. The Society calls for a description of how bird populations would be affected by accidents occurring in or near a bird area as well as a clearer presentation of the preparatory work undertaken to handle such a situation. It also demands a presentation of the conceivable and acceptable compensatory measures that could be taken in case an exemption is granted (a permit is issued).

**The Väröhus Foundation** does not consider that it has received satisfactory answers to the questions it has previously asked and is therefore of the opinion that the application should not be granted. The Foundation highlights the issue of the chemical composition of the natural gas, above all the risk that the level of PAHs will increase progressively. Given that the Foundation considers it unlikely that there will be no leakages, it expresses concern, among other things, about how the fertility of cod will be affected by the release of large volumes of PAHs into the Baltic Sea.

**The Swedish Gas Association** finds that the project will lead to a reduction of emissions to air and water, and that the proposed pipeline is preferable to the other transport options investigated. The Association also sees opportunities for future use of the pipeline to transport, among other things, methane produced from biocrops and biofuels.

**Mr Francisco M. Hernández** points out that Nord Stream cites obsolete information about EU climate policy: the decided proportion for renewable energy is lower and the proportion for natural gas is higher than the Commission has indicated (2008). Mr Hernández further considers that the project should have been preceded by a strategic environmental assessment (SEA). In the absence of an SEA, a strategic assessment should have been performed of the Nord Stream project to investigate, *inter alia*, how it will affect EU climate policy. Mr Hernández also points out, using various summaries from the documents provided by Nord Stream, that the issue of munitions has not yet been solved and that the effects of the proposed measures for handling munitions will lead to major environmental impacts.

**Mr Rune Overup** claims that Nord Stream's statement that "Natural gas is much lighter than air and therefore will rise quickly" is incorrect and misleading because when gas which is under high pressure expands, it cools down, and the cooled-down gas is heavier than air. Only when the gas has warmed up will it rise rapidly. This fact in relation to cold gas makes the consequences serious and difficult to assess. It should be made clear how various courses of events involving cold gas should be handled and what protective measures should be taken.