

Report “Offshore pipelines through the Baltic Sea. Environmental Field Survey Finland 2009. July, 2009. Nord Stream G-PE-PER-REP-100-03240000-A”.

Statement of the aims

“The aim of this additional field survey was to complement earlier field surveys undertaken by PeterGaz (2005 and 2006) and the Finnish Institute of Marine Research (FIMR, 2007 and 2008). Because dioxins were not included in the earlier surveys, dioxins have been included in this survey to improved a baseline for these substances along the pipeline route. Secondly, the purpose of the 2009 environmental field survey in Finland was to update the description of contaminants and nutrients in the sediment.”

Dioxins

New dioxin data

The environmental field study carried out by Nord Stream in summer 2009 describes dioxin cores from about 20 sites. The dioxin contents were given for dry weight in WHO-TEQ of 2005.

In some cores, three samples from different levels are reported: a surface layer, middle layer and bottom layer. The depths and thicknesses varied in different cores. The method is more robust than that of Isosaari (2004), but it is believed that, in the context of previous more detailed studies, it may give a reasonable proxy for understanding general trends.

However, most relevant data are almost unusable due to inadequate documentation of the sampling intervals.

“The highest dioxin concentration was 64 pg/g, in the middle sample from Rock 1 Mid station. Almost half (48%) of the toxicity equivalent was comprised of 1,2,3,4,6,7,8-heptaCDF, which indicates the impact of the River Kymijoki sediment. Organic carbon content in the whole core sample was 5.4%. In that case, the 0-12 cm layer dioxin concentration was 23 pg/g; in the bottom sample it was about 4 pg/g. In the whole core (0-30 cm) sample, the dioxin concentration was 33 pg/g.”(p. 60).

Unfortunately, the thickness and the exact interval of the middle layer with the highest concentration (64 pg/g) cannot be found anywhere in the study.

The highest concentrations of mercury are also found in the same, Rock 1 Mid site (Table 5, p. 34) - 0.13 mg/kg in the surface layer and 0.24 mg/kg in the middle layer., and in the surface layer of the nearby Rock 1 South station 0.15 mg/kg.

In a study of dioxins and Hg in Kymijoki, a very strong correlation between those two toxicants was found, so that for the areas where dioxin analyses were not available, the approximate values of dioxins were calculated from the Hg values. Thus, high concentrations of dioxins originating from the Kymijoki River may indicate that high concentrations of Hg can also be expected.

Using of statistical parameters

Quantitative spatial data analysis appears to be a serious gap in the used methodology. Throughout the report, simple statistical parameters, such as average and median, are misused. Any further calculations based on these values, are not meaningful.

Assumptions and interpretations in health risk analysis

The effect of the re-mobilisation of toxicants as a new source of pollution will not cause a separate impulse of contamination, but will add its load to the already existing toxicity in the Gulf of Finland. For this reason, EVIRA has pointed out in its statement concerning the Nord Stream EIA that the Baltic Sea is already at the most critical state, and a gas pipe as a potential new source of pollution would have devastating effects.

It is stated on p. 59 of the report:

“7.2.3. **Results of health risk assessment.** Using the risk assessment method presented in **Appendix E**, the dissolved dioxin concentration in water was calculated to be 2.2×10^{-2} pg/l. The corresponding concentration in fish is 0.72 pg/g fw (WHO-TEQ). The calculated intake was 3.6×10^{-2} pg/kg/d. Using the WHO tolerable daily intake (TDI) of 1-4 pg TEQ/kg/d (see Appendix E), a hazard quotient (HQ) in the range of 0.009-0.036 was calculated.”

According to appendix E, the following parameters are used

CR = ingestion rate , 37 g/d

ABS = absorbed fraction, 1

EF = exposure frequency, 30/365 d

BW = body weight, 60 kg

And, using *TDI* = tolerable daily intake, $1-4 \times 10^{-6}$ µg TEQ/kg,

The dioxin concentrates in the breast milk, and the dioxin intake of the children of the breast-feeding mothers will be 50 times higher, with the corresponding hazard quotient 0.45-1.8.

It should be also pointed out that current fish consumption in Estonia is likely up to 5-10 times higher than assumed in the parameters for the Finnish consumers, and most of the local fish consumed is not from fish farms.

RELEVANT INFORMATION

Patandin, S. et al. 1999. Dietary exposure to polychlorinated biphenyls from infancy until adulthood: a comparison between breast-feeding, toddler and long-term exposure. Environmental health perspectives, 107(1), 45-51.

Breast-feeding for 6 months contributed to the cumulative PCB/dioxin TEQ intake until 25 years of age, 12% in boys and 14% in girls. **The daily TEQ intake per kilogram body weight is 50 times higher in breast-fed infants and three times higher in toddlers than in adults.** Long-term dietary exposure to PCBs and dioxins in men and women is partly due to breast-feeding (12 and 14%, respectively). After weaning, dairy products, processed foods, and meat are major contributors of PCB and dioxin accumulation until reproductive

age. Instead of discouraging breast-feeding, maternal transfer of PCBs and dioxins to the next generation must be avoided by enforcement of strict regulations for PCB and dioxin discharge and by reducing consumption of animal products and processed foods in all ages.”

In conclusion, due to (1) ill-defined sampling intervals and (2) inadequate use of statistical parameters, this report cannot be trusted in evaluating environmental impacts and risks to human health.

AN UNFINISHED DOCUMENT ON MUNITIONS MONITORING PROGRAMME

A scripture on the “Munitions monitoring programme, Finnish EEZ” – “subject to consultation with Finnish Authorities” indicates that part of the information is missing or will be changed.

The document should be completed and the final version presented to the Finnish authorities for consulting with the Estonian authorities. No activities should be started before the final version of this document will pass the expertise.

Because the monitoring programme is a complex issue that was not included to the Espoo EIA, negotiations between the Finnish and Estonian authorities involving experts are necessary.

AN INCOMPLETE DOCUMENT

“Sediments and contaminants spreading on Munition by Munition basis”

The information provided in this incomplete document is fragmentary and provided only for a small part of the 27 munitions. All the 27 munitions have trans-boundary effects via impacts to the fish and sea mammals and each case involves specific risks.

THE SHIPPING DOCUMENT

The shipping issue is of a wider scope than trans-boundary environmental impact assessment, and should be co-ordinated beforehand with the corresponding Estonian authorities.

MUNITIONS CLEARANCE DOCUMENTS

“Environmental impacts on Munition by Munition basis”

The competence of the environmental experts does not extend to the knowledge of conventional and chemical munitions. However, the greatest environmental concern is the correct identification of the types and contents of the munitions.

It is strongly recommended that before any further steps, the direct contact will be made with the Ministry of Defence of Estonia. Evaluation of the environmental impact will be possible only after the Estonian experts confirm the safety of the munition clearance process.

CONCLUDING REMARKS

1. The documentation presented includes draft versions and incomplete documents that need more work before presentation to the experts.
2. On these grounds, Estonia recommends that dealing with the application of the water permission by Nord Stream should be postponed until the documents will be finished and satisfactory answers to all the open questions will be received.
3. Questions that must be resolved are related to compensation to be paid in case of accidents and for the project's negative impacts on fishing and recreational use of the area, and to the future responsibilities for the decommissioning of the pipelines.