



YARA Management and Board

NOTE

22.6.2015

Dnro 565/2015

To: Members of the Yara International ASA Board and management

The board of the Reindeer Herders' Association made a statement on 27 May 2015 to the Regional State Administrative Agency of Northern Finland (AVI) regarding the application of environment and water management permission for the Sokli mine area, in Savukoski, Finland.

This issue is crucial in terms of the future of the environment and reindeer herding in the Sokli area and its vicinity. Mining in Sokli will also influence the broader herder community due to the image threat it poses. Hence, the board of the Reindeer Herders' Association decided to send this note to the board of Yara as well as to the company management.

We hope that our statement will clarify the consequences of your planned mining project in Savukoski. Due to the severe risks of the Sokli project, an environment and water management permit should not be granted for Yara Suomi Oy. Sokli project cannot be conducted in a socially sustainable way.

Best regards,

Anne Ollila
Executive Director of the Reindeer Herders' Association

Reindeer Herders' Association is a steering, advisory and expert organization for reindeer husbandry. It represents the reindeer herding profession in Finland.

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SOKLI MINE PROJECT, SAVUKOSKI, FINLAND

Yara Suomi Oy (the “Company”) is applying for an environment and water management permit. If accepted, it would allow the Company to start with preparatory actions prior to the validity of decisions, permissions and zoning related to the Sokli area in Savukoski.

The project is located in the Kemin-Sompio reindeer herding cooperative (the “Cooperative”) area, which is the largest in Finland. The Reindeer Husbandry Act (RHA) (848/1990) is a special law that has to be taken into account in zoning and other operations or land use plans that enable different operations in the reindeer husbandry area. This includes projects such as the Sokli mine and the environment and water management permit that is under consideration here.

The condition for profitable reindeer herding is free grazing right (RHA 3 §). In an area specially intended for reindeer herding the state land cannot be used in a manner that may significantly damage reindeer herding (RHA 2 §).

Kemin-Sompio reindeer herding cooperative is located in an area specially intended for reindeer herding. Beginning mining activities in the area would hinder significantly the possibilities to practice reindeer herding in the area and cause considerable damage. The serious environmental risks of the project would create an extensive, long-term threat to the future of reindeer herding in Finland.

Reindeer herding has long traditions in Savukoski and it is a vital part of the local economy. The cumulative economic effects of reindeer herding reach far. Kemin-Sompio reindeer herding cooperative is a community that is directly depended on the cleanness and diversity of nature. Any effects on the environment will also impact directly to the economical, cultural and social sustainability and continuity of reindeer herding in the area.

Mining in Sokli would cause significant damage to the Kemin-Sompio reindeer herding cooperative. Yet, the Company, municipality of Savukoski or the consultancy companies working on plans and assessments, have not found adequate ways in cooperation with the Cooperative to prevent, erase or minimise the damages in a way that significant disadvantage would not be caused. Therefore, the Sokli mine project is against the Reindeer Husbandry Act and the environment and water management permit cannot be granted to Yara Suomi Oy.

The effects of Sokli mine to reindeer herding

The Reindeer Herders’ Association and Kemin-Sompio reindeer herding cooperative have repeatedly brought up the inadequacies in the planning processes of the Sokli mine in various written and spoken statements, including also the damaging effects of the actual mining operations to the reindeer herding in the area.



The Sokli mine would cause at least the following impacts to the Cooperative:

- 1) impacts on pasture areas (direct and indirect loss or change of pasture areas)
- 2) impacts on reindeer grazing cycle (destruction of the grazing cycle system)
- 3) impacts on the operative structures of reindeer herding and how it is organised
- 4) impacts on the overall profitability of reindeer herding
- 5) impacts on the culture of reindeer herding
- 6) impacts to safety (accidents in the traffic and within the mining area considering both reindeer and herders)
- 7) effects of environmental pollution to the reindeer
- 8) impacts on the image of reindeer herding (affects reindeer herding everywhere)
- 9) effects of traffic
- 10) impacts on social sustainability (including the overall uncertainty of the future of the profession/livelihood, consequently leading to the difficulty to develop the profession and reducing number of young professionals continuing in herding)

The grazing cycle in Kemin-Sompio herding cooperative is very efficient and functional; research confirms that the winter pasture areas are in good condition in the northern parts of the Cooperative. Also, the summer pasture areas in Sokli are in good condition. The reindeer living in that area have bigger slaughter weights than others. Building the mine to Sokli would increase the direct and indirect loss of pasture area caused by other land use in the whole Cooperative. The mining area itself would cause already effects to an area of 60 km². Indirect impacts multiply the size of the affected area. In addition, this will affect other parts of the Cooperative as well.

According to the Finnish Game and Fisheries Research Institute's (FGFRI) reindeer research modelling, reindeer winter pastures are in poor condition in those cooperative areas that have a lot of infrastructure and human operation. When pasture areas get fragmented to smaller sections, the grazing cycle changes and increasing grazing pressure is caused to more peaceful pasture areas. Consequently, these areas will be used more than they would normally be. The researches by FGFRI and Finnish Forest Research Institute (Metla) show that other land use activities effect to the overall profitability of reindeer herding for example through declining food situation and increasing feeding expenses. Feeding reindeer to compensate the losses of the pasture areas in the northern parts of Kemin-Sompio is practically impossible to organise. Distances are too long for feeding to be cost-effective. The herders live in villages located tens of kilometres, most over hundred kilometres from the area.

Beginning the mining project in Sokli would totally confuse the functional grazing cycle that is the core of the Cooperative. The further impacts on the other pasture areas and activities of the Cooperative would be extremely harmful.

The effects of mining in Sokli would focus on reindeer that have always been grazing freely in the nature throughout the year. Kemin-Sompio reindeer are not used to disturbance caused by human activities or busy traffic. Reindeer herders, whose all or most of the reindeer are in the forest throughout the year, cannot take reindeer to fences in the villages without significant extra investments. Taming reindeer to this new approach would take several reindeer generations. Changing herding



practices would also change significantly the forest Sámi reindeer herding culture in Sompio and Keminkylä areas.

In the Sokli area and around it, reindeer live and pasture freely throughout the year. In practise, these reindeer are () wild as they are only in contact with humans twice a year. Hence, they are particularly sensitive for disturbance caused by human actions.

In the spring time, reindeer avoid unnecessary stress and energy consumption, because their energies are low after the winter. Also, the female reindeer will soon give birth to new calves. In that particular time of the year, reindeer move through the Sokli and nearby areas to the calving areas. Mining would drive out the reindeer to other more peaceful areas. Female reindeer with newborn calves are also very likely to avoid mining areas. Due to the mining, calving and summer pasture areas will be lost directly and indirectly causing increasing pressure to the other pasture areas in the Cooperative. Male reindeer are not as sensitive to disturbances and, in the worst case, they will stay in the broad and open mining areas to avoid blood-sucking insects. They would then be more prone to accidents and, on the basis of previous experiences, reindeer have caused problems in the mining areas.

After the refusal of the railway option, an Environmental Impact Assessment (EIA) has not been made regarding the new traffic arrangements. Refusing the railway option and instead choosing to transport everything via roads means a massive growth of heavy traffic in the area. A peaceful wilderness area will change totally due to noise and emissions. The emissions of the mine related traffic will multiply the current emission rates in the area.

According to the research (*Porokolarit ja niiden vähentäminen*, 2011) by the Centre for Economic Development, Transport and the Environment in Lapland (ELY), heavy traffic is involved in more accidents with reindeer in relation to their share of the whole traffic. On the basis of a sampling taken from the accidents involving reindeer, heavy traffic was the cause in 20 % of them. At the same time they present only 10 % of the total amount of road driving. In the Sokli environment permission, it is said that the amount of heavy traffic would be almost 300 lorries per day, which is 100 000 lorries per year. In addition, other car and bus traffic will increase too. Transporting ore would inevitably cause a significant amount of reindeer accidents on the roads. In practice, this transportation option is a security risk for both humans and reindeer. The damages caused for reindeer will focus to the reindeer that pasture in these areas. Hence, the damages will concern specifically individual herders and may prove to be too great for them to endure. In a worst case scenario, the herders whose reindeer pasture in the area, will suffer from such losses that they will not be able to continue with herding. This means, that even if we look at only the change in the traffic conditions we find significant hindrance to the Kemin-Sompio cooperative located in the area specially intended for reindeer herding. And this cannot be enhanced through stricter permit conditions or their control.

The mine would also significantly hinder the reindeer herding work. Adjusting to the impacts of the mine would take years and cause substantial extra costs. There are experiences of this in other cooperatives where mining activities have begun. The possibilities for adjusting are affected by what kind of area the mine would be situated in, what kind of herding culture is prevalent there and what kind of options herding has in the area to rearrange its functions and practices. The total impacts and their extent can only be fully understood afterwards when the project has started.



The Sokli mine and the influenced area includes all the eastern reindeer routes, river crossing spots, an important round up fence, cottage and grazing cycle fence. Hence, the mine would be located to a central area of operations of the Cooperative. The round up fence would no longer be usable, because reindeer could not be lead there through the mining area. Also using the nearby areas would be uncertain due to the effects of the barriers and other disturbances caused by the mining activities (leading reindeer from place to another requires environment with no distractions). Hence, the actions in the area as well as the investments and infrastructure made over the past decades would be destroyed. Natural grazing cycle is used also for herding work: round ups are held in areas where the reindeer gather and pass through naturally. Planning a change to the location of a round up fence is almost impossible before it is seen how the new grazing cycle forms over the years. Until then, the operations of the Cooperative in the area will be haphazard and the working expenses will rise.

Environmental impacts and reindeer herding

The Sokli phosphate and niobium ore consist of radioactive substance, such as uranium and thorium. Even though the current mining plan does not include using the niobium ore, it is very likely that these radioactive ores will be taken to production at some stage. In any case, the phosphorus ore contains varying amounts of radioactive substance (uranium and thorium) and heavy metals that will be handled during the mining activities. Yet, these issues have not been dealt with in the EIA or in the environmental permit application. The representatives of the Yara Suomi Oy and the consultants responsible of the application had no clear knowledge of these issues in the public hearing event organised by Yara in 11th of May, 2015.

Uranium decay chain is said to end after it evaporates to the air from the mine as radon. Bigger problem, however, is caused through the access and spreading of the poisonous daughter nuclides to the nature. The spreading of these daughter nuclides to the surroundings, their impacts to the nature and to the plants reindeer eat for food (such as lichen and mushrooms) have not been dealt with in the application.

Yara gives contradictory information about the radiation dose of the mined phosphorus ores. In the application, the Company gives following numbers: U-238 30 ppm (310Bq/kg) and Th-232 76 ppm (533 Bq/kg). In the evening organised in Savukoski on 11th May 2015, the total uranium content was said to be 347 Bq/kg and thorium 312 Bq/kg. The explanation from Yara was that the ores that radiate most have been marked out of the mining areas.

In this Sokli project, issues related to radiation have been held in the back even though this is an issue that should be clarified openly and profoundly. The local concerns over the radioactive substances have not been taken seriously. The fact that Yara has measured the radioactive content itself and that only average numbers were presented in the event weakens the trust towards Yara. The average result can be easily manipulated to a lower level by taking samples from areas where there is low content of radioactivity.

The Geological Survey of Finland (GTK) has conducted research on the quality of the geochemical soil in Sokli. On those bases, nickel exceeds the limits and norms set in the Act by the government (214/2007) for spoiled soil and purification in almost all samples taken from the mining area, and in



some samples of cobalt and chrome. According to Yara, these numbers describe higher natural contents than average. It is questionable whether this kind of soil with high heavy metal contents is suitable for massive mining. Yara has reported higher contents of nickel, cobalt, iron, barium, calcium, manganese, zinc and phosphorus in the samples taken from the mining area. In the application, Yara maintains that the waters seeping from the tailings area into the topsoil are of relatively good quality, waters in their natural state. This cannot be true considering the contents mentioned earlier.

There are still open questions related to the water management and content of the tailings. Effluent from the mine would be led to the upstream of river Kemijoki, which still remains in its natural state at the moment. What would the heavy metal and radioactive contents be in the tailings pool and overland flow areas in a few years? These areas should be usable for pasturing in the future after the mining activities have finished. Yara Suomi representatives could not answer to these questions in the event in Savukoski.

Sokli area is a high risk area for complete pollution of the soil due to its natural geochemistry. Mining activities in this kind of area would cause multiple significant environmental risks. The image of reindeer meat as a pure, natural product suffers if radioactive content is measured from it. Radioactive ore bodies are a serious risk for the environment and reindeer herding. Deterioration of the image will affect to all reindeer meat production, also elsewhere than in Kemin-Sompio area. The negative impact would influence the whole reindeer herding in Finland and also reindeer meat's image as a pure and healthy product of nature. Image has a big influence in the markets and if it would turn into something negative, it would influence directly to the demand of reindeer meat, and again to the overall profitability of the profession.

Reindeer meat is an exception from other meat production as it is clearly a product where image has an important role. The demand of reindeer meat is solely based on its pureness, naturalness and healthiness. Reindeer meat is not a conventional product, since its demand would collapse if the image would go down. We have experience on this from 1980's after the Chernobyl disaster in Ukraine. Due to the fear of radiation and the fallout in neighbouring countries, people stopped eating reindeer meat and it was left unsold. The effects are still showing in Norwegian reindeer meat market. Also, higher radioactive content is still measured in the reindeer of the southern parts of their herding area during good mushroom years.

Yara Suomi Oy, authorities responsible land use planning and issues related to mining have given the impression in the meetings that the significant hindrance that mining would cause for reindeer herding could be prevented in the more specific planning phase by adjusting activities and in different permits given for the Company. In lot of their responses, Yara has undermined the size of the mine area in comparison to the Cooperative's, saying that the overall consequences cannot be that significant. Some ways to secure the operating conditions of the Cooperative have been suggested, although these have not been agreed with the Cooperative. It is not possible to significantly mitigate the harmful effects to the reindeer herding in Kemin-Sompio through the environmental permit. Sokli mine project would destroy massively the chances to practise herding in the area.

The environmental threats of the project threaten the prerequisites of the reindeer herding in the whole reindeer herding area.



There are severe deficiencies in the Sokli mine project, both in planning and assessment processes. The mine would significantly hinder reindeer herding. This has been clear in the reports and inclusion procedures, but it has not been written down anywhere in these words. One significant problem with industrial projects this large is that there is no holistic assessment. Authorities are passing the responsibility to other authorities and to the “more specific planning phase”.

In its wholeness, the Sokli mine project will cause irreplaceable damage to reindeer herding and to the nature in the area. These damages cannot be eliminated through permission regulation nor can other harm be mitigated enough in more specific planning or with compensations.

There are serious environmental risks involved to this project affecting harmfully also the reindeer herding in the rest of the reindeer husbandry area in Finland. The Sokli project cannot be granted with an environmental permit that would enable the start of the construction.

Reindeer Herders' Association

Anne Ollila

Executive Director

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