

# THE RIVER VANTAA GYPSUM PROJECT

## SUMMARY OF THE FINAL REPORT



Picture: Ilkka Vuorinen

### Gypsum treatment proves effective in the River Vantaa Gypsum Project

The River Vantaa Gypsum Project, which ran from 2018–2020, achieved its objective: more than 3,600 hectares, or about 10 per cent, of arable land in the River Vantaa catchment area was treated with gypsum during the project. Phosphorus leaching halved in the fields treated with gypsum, which in turn reduced eutrophication in both the River Vantaa and the Baltic Sea. Gypsum treatment proved to be an inexpensive way of protecting bodies of water and will also be required in the future to reduce nutrient loading in the Baltic Sea.

The River Vantaa Gypsum Project was implemented by the John Nurminen Foundation, the Water Protection Association of the River Vantaa and Helsinki Region, the Finnish Environment Institute and the University of Helsinki. The project was funded by the Ministry of the Environment and supporters of the John Nurminen Foundation. Yara donated the recycled gypsum that was used in the project during 2019 and 2020.

### Gypsum treatment yields good results in reducing nutrient leaching

The gypsum treatment carried out during the River Vantaa Gypsum Project halved phosphorus leaching in the parcels of land that were treated. The treatment involved spreading four tons of gypsum per hectare of land. The treatment of a total of 3,615 hectares of arable land is estimated to reduce phosphorus leaching from the River Vantaa catchment area by about 8,500–10,500 kg during 2018–2025. Gypsum does not hinder phosphorus intake in plants or have an adverse effect on crop yields.

The cost of gypsum treatment is highly competitive in comparison to other methods of reducing scattered loading. The price of using mainly donated recycled gypsum from the fertiliser industry was about 57 € per kilo of phosphorus reduced (0% VAT) including the gypsum, its transportation and spreading. If calculated using the market price of gypsum, the price would have been about 80 € per kilo of phosphorus reduced (0% VAT). The project also included a small-scale natural gypsum pilot on about 80 hectares of land. Natural gypsum proved quite difficult to obtain and its quality varied greatly between sources. The per-kilo cost of reducing



phosphorus using natural gypsum was twice that of using the gypsum formed in fertiliser production.

76 farms took part in the gypsum treatment. In addition to private farmers, two cities and one educational establishment were also involved. The impact on run-off water quality was monitored at a measuring station on the River Lepsämä, as approximately 40 per cent (330 hectares) of the upstream fields were treated. The change in phosphorus loading throughout the entire River Vantaa catchment area was assessed on the basis of results obtained from the monitoring area.

### **Water protection measures do not interfere with trout breeding**

A fish stock study (which employed electrofishing and tested buried roe) indicated that gypsum treatment does not weaken fish stocks, and water quality also remains suitable for trout breeding in areas affected by gypsum-treated fields.

### **Ideas for further developing the gypsum treatment concept**

The project consortium actively sought opportunities to further develop the operating model and, for example, acquired gypsum, delivery and spreading services from a single service provider. Having the agricultural trade organise gypsum deliveries and spreading helped to improve information flow in the logistics chain. Several improvements and revisions were also made to the gypsum treatment agreement and guidelines.

The project consortium generated new data by analysing providers of natural gypsum and carrying out a small-scale natural gypsum pilot. The project also examined opportunities for recycling demolition gypsum waste from the construction industry.

The data, practical experiences and document models collected during the project were shared with other gypsum-related projects.

### **Needs for further research**

Gypsum treatment has proven to be an effective method of protecting water in clay soils. However, the project identified a need for further research, particularly with regard to the effectiveness and effectiveness period of gypsum in different types of soils and tillage methods. The combined effect of gypsum with chalk or manure also requires further study.

### **Public funding for gypsum treatment should continue, so that Finland can achieve its Baltic Sea and water protection targets**

Gypsum treatment will be carried out in 2020–2024 as part of the Programme for Improved Water Protection in Southwest Finland. This programme will be funded by the Ministry of the Environment and led by the Centre for Economic Development, Transport and the Environment of Southwest Finland. The aim is to spread gypsum over at least 50,000 hectares in the Archipelago Sea catchment area. In order to reach the targets, set in the Helsinki Convention on the Protection of the Marine Environment of the Baltic Sea Area and other water protection programmes, a larger area of the Archipelago Sea will need to be treated with gypsum.

When the Programme for Improved Water Protection ends, gypsum treatment should be included in the EU Common Agricultural Policy's rural programme subsidies. The correct compensation levels and incentives should be found to ensure that gypsum treatment can continue to be used in the protection of the Baltic Sea and Finnish waterways. When the Programme for Improved Water Protection ends, Finland's post-coronavirus budget will not have the capacity to provide national public funding for gypsum treatment on the scale that will be required to meet water protection targets.

