

Authority Services

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Finland's response to the notification in accordance with Article 3 of the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) regarding uptake of manganese nodules from the sea southeast of Skellefteå in Bothnian Bay, Exclusive Economic Zone of Sweden

The Finnish Environment Institute acknowledges that Finland has received the notification, dated 27 June 2025, and the consultation documents from Sweden in accordance with Article 3 of the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention), regarding the uptake of manganese nodules from the sea southeast of Skellefteå in Bothnian Bay, Exclusive Economic Zone of Sweden.

SOM AB is planning to apply for a permit for uptake of manganese nodules from the seabed within the Exclusive Economic Zone of Sweden in the Bothnian Bay. The actual area is eight square kilometres, and it is located approximately 70 kilometres southeast of Skellefteå in the county of Västerbotten. The area is approximately 12 kilometres from Finland's Exclusive Economic Zone. The area is estimated to contain approximately 450,000 tons of nodules (wet weight). Potential transboundary impacts are dispersion of sediments and turbidity, during the process when nodules are harvested, and water and sediments are transferred back to the seabed.

Consultation in Finland

According to the Finnish Act on Environmental Impact Assessment (252/2017), the Finnish Environment Institute is the competent authority and responsible for information and consultation tasks under the Espoo Convention.

In the notification, the Swedish Environmental Protection Agency requested an indication whether Finland intends to participate in the EIA procedure for the planned uptake of manganese nodules, to provide comments concerning the scope for the assessment of the environmental impacts of the project affecting Finland and submit comments from the public and the authorities in Finland.

The public and the authorities were given the opportunity to comment on the consultation documents from 1 July to 8 September 2025, which were available on the website of Finland's



environmental administration (ymparisto.fi) and a platform by Ministry of Justice in Finland for requesting and submitting statements electronically (lausuntopalvelu.fi).

Remarks received during the consultation

The Finnish Environment Institute received 18 statements. The Finnish Environment Institute has prepared a summary of the original statements in English below. However, the original statements in Finnish or Swedish, which are enclosed to this letter, include important and detailed remarks which need to be examined and taken into consideration in their entirety.

Ministry of Economic Affairs and Employment

The Ministry of Economic Affairs and Employment considers that Finland's participation in the EIA procedure is justified. Without taking a position on the likely significant transboundary environmental impacts of the project, the Ministry of Economic Affairs and Employment considers the project to be an important precedent, as commercial mineral extraction has apparently not been carried out in shallow sea areas.

The Ministry of Economic Affairs and Employment also draws attention to the fact that there is uncertainty in Finland regarding the regulation of similar projects. The regulations applicable to projects depend, among other things, on whether the area in question is a village water area, a general water area or part of Finland's Exclusive Economic Zone.

In assessing the effectiveness of the legislation governing mining activities, it has been found that the areas of application and relationships between the various laws concerning the exploitation of seabed minerals need to be clarified. Interest in the exploitation of seabed minerals is expected to grow, and the Ministry of Economic Affairs and Employment draws attention to the need for investigation presented in this report.

Centre for Economic Development, Transport and the Environment for South Ostrobothnia

Centre for Economic Development, Transport and the Environment for South Ostrobothnia considers that Finland should participate in the EIA procedure for SOM AB's project. Based on the information provided, the significant environmental impacts of the project may extend to Finnish economic and territorial waters.

The most significant environmental impacts of the project are related to sediment-induced turbidity, noise, the spread of harmful substances and damage to benthic fauna. It should also be noted that there is little research data available on the role of manganese nodules in the Baltic Sea ecosystem (e.g. the significance of nodules as a microenvironment or how they affect the nutrient load in the Baltic Sea), so it is not possible to predict all the impacts based on current scientific knowledge.

Endangered animals or economically important fish species in Finnish and Swedish territorial waters may suffer from noise or turbidity caused by the operation if there are fish migration routes or spawning grounds in or near the project area. Sediment plumes and noise may affect the migration behaviour of salmon (*Salmo salar*), for example.

The Centre for Economic Development, Transport and the Environment for South Ostrobothnia estimates that the project's estimated ten years of operation will generate continuous emissions of sediment, phosphorus and harmful substances, which may be transported in significant quantities to Finnish Exclusive Economic Zone and territorial waters. The waters of the



Bothnian Bay generally circulate counterclockwise, and the emissions are expected to move mainly towards the Finnish coast. The project area is also located in the most significant upwelling area of the Bothnian Bay, through which emissions can transfer to surface water, where their impact is greater. Nodular ore and its formation areas may contain high concentrations of heavy metals and phosphorus. Metal emissions may transfer to the food web and food chain of the Bothnian Bay and the Quark, and the plant nutrient phosphorus may contribute to the otherwise accelerating eutrophication of the Bothnian Bay. The project differs from dredging and dumping projects that cause similar emissions because the activity is continuous, and the treated sediments are likely to contain higher than average concentrations of phosphorus and heavy metals. The loss of natural seabed will affect an area of up to eight square kilometres, which is much greater than that affected by a large offshore wind farm.

The programme is generally clear and identifies the most important theoretical problems. In its current form, the research plan is unlikely to provide sufficient information for a reliable assessment of environmental impacts. The Centre for Economic Development, Transport and the Environment for South Ostrobothnia does not share the applicant's view that the project is not expected to have any transboundary impacts. Studies in the Gulf of Finland have shown that sedimentation and the material flow at the interface between sediment and water change after nodule ore mining (Zhamoida et al. 2017).

The research plan mainly consists of literature reviews. The equipment and technology to be used are apparently still under development, but there is no mention in the programme of testing the characteristics and effects of the equipment. The Centre for Economic Development, Transport and the Environment for South Ostrobothnia considers that impact mechanisms, such as the formation of dust clouds and the release of harmful substances, should be studied under natural conditions, either in tests of the equipment being developed or in similar experiments. Models can be found in deep-sea mining studies, e.g. GEOMAR coordinated projects: https://miningimpact.geomar.de/documents/1082101/1463518/MI2_Feb2022_MH_SE.pdf/MI2_Feb2022_MH_SE.pdf.

The EIA programme states that the geochemical conditions in the Baltic Sea and the Gulf of Bothnia differ from those in the ocean. Therefore, the applicability of the external research data used must be verified and, if necessary, own research data must be produced for the conditions in the Gulf of Bothnia. The research data obtained at this stage is incomplete. Of the numerous bottom samples taken in preliminary studies, only two were taken from within the actual project area. Important factors, such as the oxygen profile of the bottom and oxygen consumption potential, have not been studied. Local and wider area flow conditions have not been presented in the programme. A reliable assessment of environmental impacts requires additional bottom sampling and studies from the actual project area. Flows must be studied at permanent measuring stations throughout the year.

The Centre for Economic Development, Transport and Environment for South Ostrobothnia has drawn attention to the lack of alternatives in the EIA programme and proposes that the report also examines the impacts of alternative ore extraction techniques (e.g. deep-sea robots that separate nodules from sediment on the seabed).

The EIA programme states that the concentration of harmful substances on the seabed varies between accumulation and erosion areas in the project area. The Centre for Economic Development, Transport and Environment for South Ostrobothnia considers that the



environmental impacts of mining different types of seabeds should be studied and assessed separately.

Flow conditions have a significant impact on the spread of turbidity and harmful substances, as well as on the functionality of the equipment. Therefore, the environmental impacts must be determined for different flow conditions in order to identify possible restrictions.

The EIA report must clearly state the composition of the pumped water or sludge to be returned to the sea, its oxygen consumption potential, contaminant and phosphorus concentrations, and the dissolution potential of contaminants. The oxygen concentrations and oxygen consumption potential of the modified sediment, as well as the long-term release of contaminants from the bottom or their binding to the bottom, must be investigated and compared with natural conditions. In the case of erosion areas, the erosion potential of the modified bottom must be investigated and, if necessary, mitigation measures must be proposed.

The applicant proposes sediment dispersion modelling. The Centre for Economic Development, Transport and Environment for South Ostrobothnia considers this necessary and emphasises the importance of selecting the correct scale and limit values. In the Bothnian Bay, open sea turbidity rarely exceeds 2 mg/l. The modelling must separately examine the impact of strong currents and consider the maximum flow rate limit values for mining operations. The spread of harmful substances and phosphorus must also be modelled, the impact areas determined, and the total values assessed.

The assessment report must indicate whether chemicals or physical additives are added in connection with nodule ore extraction or marine separation processes that may end up in the sea or increase the leakage of harmful substances from ore or sediments. The use and effects of physical treatments that may promote the release of harmful substances (e.g. crushing or heating of nodules) must also be described. The possibility of pumping water or other liquids leaking into surface water must be assessed.

Regarding cumulative impacts, the Centre for Economic Development, Transport and Environment for South Ostrobothnia notes that offshore wind power projects are being planned for Finnish Exclusive Economic Zone in the potential impact area of this project. The Finnish government intends to auction off wind power rights for the area near this project in 2026. The EIA report for the Laine project, located in the same area, will be announced in Finland and Sweden in the summer of 2025. The impacts of offshore wind power dredging and dumping activities, such as turbidity, emissions and traffic, may occur at the same time and in the same areas as the impacts of the planned mining activities, and a significant cumulative impact is possible.

Centre for Economic Development, Transport and the Environment for North Ostrobothnia

The Centre for Economic Development, Transport and the Environment for North Ostrobothnia considers that Finland needs to participate in the environmental impact assessment procedure for the project. Based on the documentation, the significant environmental impacts of the project may extend to Finnish Exclusive Economic Zone and territorial waters.

The plan identifies the possibility of impacts on Finland. The planned activities are expected to cause water turbidity. According to the document, the possibility of turbidity caused by the spread of seabed sediments occurring on the Finnish side cannot be ruled out. The Centre for Economic Development, Transport and the Environment for North Ostrobothnia considers it



important that flow and sediment modelling be carried out in the EIA procedure to clarify the visibility and impacts of turbidity in Finland. Other possible transboundary impacts relate to migrating animals, such as marine mammals and fish, as well as commercial fishing. Noise may also spread to the Finnish side. The above-mentioned possible impacts should be investigated in the EIA procedure.

The Centre for Economic Development, Transport and the Environment for North Ostrobothnia points out that offshore wind power projects are being planned in the potential impact area of the project, in Finland's exclusive economic zone. For example, the Maanahkiainen offshore wind farm project is located in Finnish territorial waters off the coast of the municipalities of Pyhäjoki and Raahe. The construction phase of offshore wind farms may have simultaneous and significant impacts in conjunction with the planned mining operations. The environmental impacts of the project currently being planned, together with other projects in the impact area, must be assessed as part of the environmental impact assessment.

Centre for Economic Development, Transport and the Environment for Southwest Finland – Fisheries Authority

The lifting of manganese nodules planned by SOM AB may have environmental impacts on fish stocks and the fishing industry, which must be assessed in the EIA report. This also applies to transboundary impacts. For this reason, the Centre for Economic Development, Transport and the Environment for Southwest Finland – Fisheries Authority considers it necessary to participate in the EIA process for the lifting of SOM AB's manganese modules.

Centre for Economic Development, Transport and the Environment for Lapland

The Centre for Economic Development, Transport and the Environment for Lapland considers that Finland does not need to participate in the environmental impact assessment procedure for the project, provided that the nature and extent of the transboundary impacts are studied in the assessment procedure. However, Finland must be informed of the results of the assessment procedure. There is no previous experience of the suction method used to extract manganese nodules from the seabed and its effects in the conditions of the Bothnian Bay.

The possibility of impacts on Finland has been identified in the impact assessment plan. The spreading of seabed sediments caused by the planned activity will cause water turbidity. According to the consultation material, the possibility cannot be ruled out that the turbidity caused by the spreading of seabed sediments will also occur in Finnish waters due to sea currents.

The visibility and settling of turbidity in Finnish waters should be clarified by using current and sediment modelling. It is also possible that noise will reach Finnish waters. The impact of noise should be examined. Although the transboundary impacts are likely to be minor, they may affect animals that move on both sides of the border, such as fish and marine mammals. The project may also have an impact on commercial fishing on the Finnish side.

Regional Council of Lapland

According to the consultation material, the project may have transboundary impacts due to water turbidity caused by the spread of sediments, which may affect fish migrating between Finnish and Swedish waters. In this regard, the Regional Council of Lapland considers that Finland should participate in the environmental impact assessment of the project in question.



The Regional Council of Lapland emphasises that migratory fish stocks, such as those in the Torne River, migrate between Finnish and Swedish waters, and that salmon stocks in particular are in a vulnerable position. Migratory fish are an important part of the identity of the Torne River Valley. Migratory fish, especially salmon, are of great ecological, cultural and economic importance in the Torne River Valley, the Bothnian Bay and, more broadly, the Baltic Sea. In the view of the Regional Council of Lapland, the migration of fish to the Torne River must not be endangered. In this regard, we would also like to point out that the Torne Valley's European whitefish (*Coregonus lavaretus*) dip netting tradition is currently being considered for UNESCO Intangible Cultural Heritage status. The Regional Council of Lapland also notes that efforts to revive migratory fish stocks are not limited to the Torne River. The Simojoki River is part of the Natura 2000 network and is of significant importance to the migratory fish stocks of the Bothnian Bay. In addition, extensive investments are planned for the Kemi River to revive migratory fish stocks, including fishway projects and stocking.

The environmental impact assessment of the project must consider the project's impact on migratory fish in the Bothnian Bay and the possible cumulative effects in conjunction with the development of offshore wind power. In addition, the possible impact on shipping between Nordvalen and Kemi must be assessed.

Natural Resources Institute of Finland (Luke)

The Natural Resources Institute Finland considers that Finland should participate in the EIA procedure, as the project has potential impacts on Finnish marine areas. The impacts can be seen to extend to birdlife, seals and fish stocks exploited by Finland.

Seabed dredging causes acute water turbidity, which is also likely to affect Finland's Exclusive Economic Zone. This turbidity is also expected to affect the biota of the water column, such as zooplankton, fish, seals and diving birds. During the turbidity, their food supply is likely to be disrupted, and they may change their migration routes. Many of these species move over a wide area, including Finland's Exclusive Economic Zone and territorial waters. Dredging causes underwater noise, which disturbs aquatic animals. Underwater noise travels long distances. There is little information on the longer-term impacts, but disturbance of the bottom ecosystem in the relatively shallow Bothnian Bay may affect the food web in the Gulf of Bothnia and, through it, fish stocks that are targeted by fishing, for example. Sediment disturbance also returns sedimented material, possibly including harmful substances, to the water column, where it may re-enter the food web and accumulate in fish used for food, among other things.

A desk study of sediment contaminants that may accumulate in the food chain is unlikely to provide an accurate picture of the harmful substances present in this particular area. Consequently, the effects on fish and fishing are unlikely to be satisfactorily clarified in this respect.

Geological Survey of Finland

Although the report states that environmental impacts extending to Finland's Exclusive Economic Zone cannot be completely ruled out, the impacts are minor from a geological perspective. Significant adverse effects are therefore unlikely in Finland.

The concentrations of metals and other harmful substances in the sediment released from the manganese nodule extraction will correspond to the natural concentrations in the area, and the sediment returned to the seabed will not contain any added substances. However, the operation



will release particles into the water, causing turbidity, which may also affect the environment in Finland's Exclusive Economic Zone.

Turbidity is generated by the suction nozzle, and particularly the return nozzle near the seabed. In addition, surface water turbidity may occur in the vicinity of the vessel during screening, and leaks may form in the pipes, causing particles to be released into the intermediate water. Irregularities in the activity may also cause a temporary significant increase in turbidity.

The distance of the operating area from the Finnish Exclusive Economic Zone is reported to be 12 kilometres. Assuming a moderate flow velocity (10 cm/s) and a suitable flow direction, turbidity can travel to the Finnish Exclusive Economic Zone in approximately 33 hours (1.4 days). The fine-grained sediments in the area can travel long distances in water, so it is likely that turbidity will occasionally reach the Finnish Exclusive Economic Zone. To reliably assess the potential impacts on Finnish marine areas, the activity should be monitored by measuring the turbidity of the water column.

The picture of sediment resuspension presented in the consultation document does not fully correspond to current geological understanding. The document states that particles smaller than 1 millimetre that are returned to the seabed will continue to grow, which seems unlikely in light of geological expertise. Precipitates can only grow on the surface of the sediment, and the material returning to the seabed is mixed. It is likely that only a small proportion of the returned precipitate particles will ultimately remain on the surface of the sediment, where growth would be possible at all. Furthermore, the estimate of the regrowth capacity and growth rate of the particles (0.15–0.2 mm/year) presented in the document appears optimistic and may be overestimated.

Metsähallitus

The European Union has listed critical and strategic raw materials that are of great economic importance to Europe and for which there is a high risk of supply disruption. There is a significant gap between global supply and demand for strategic raw materials. Furthermore, increasing production in the short to medium term is relatively challenging.

The project's activities can promote the EU's self-sufficiency in critical and strategic raw materials in accordance with the provisions of the European Critical Raw Materials Act. Demand for these types of minerals is growing, partly due to the green transition. According to the EU, demand for critical raw materials will grow significantly as societies become more digital, energy-efficient and climate neutral.

Critical minerals are needed, for example, in battery manufacturing, emission-free energy production, digitalisation, defence industry technologies and electric motor manufacturing.

The project's activities will increase valuable research data on seabed mineral deposits and their potential uses. The project will enable the further development of environmentally conscious extraction technology. The project will also provide information and experience that can be utilised in the future in marine spatial planning and the coordination of various marine activities. Metsähallitus is following the progress of the project with great interest.

However, the extraction of manganese nodules is a new type of industrial activity that affects the structure of the seabed and the functioning of benthic communities, and there is no experience of its environmental impacts in an environment such as the Bothnian Bay. The consultation document on environmental impacts, such as turbidity and its spread or impacts on



the functioning of the seabed ecosystem, only presents assumptions, and transboundary environmental impacts cannot be ruled out. For this reason, Metsähallitus considers that Finland should participate in the EIA procedure for the project.

The extraction of manganese nodules may cause turbidity, but its spread has not been modelled. The occurrence of even strong bottom currents cannot be ruled out without research, and it is possible that turbidity and nutrients released from the seabed may spread over a wider area. In an environment such as the open sea, which has few physical barriers and only slight differences in depth, it is possible that particles could also be carried to the Finnish side. Metsähallitus considers that this requires both research into the flow conditions in the area through measurement and related dispersion modelling.

During extraction, large amounts of organic and inorganic material that has sunk to the bottom and bound to sediments are released into the water. There is currently no information available on this behaviour and its effects in the environment in question. Phytoplankton production in the open waters of the Bothnian Bay is phosphorus-limited, and the possible release of phosphate phosphorus may increase algal blooms over a wide area.

The benthic communities of the Bothnian Bay are typically very species-poor, dominated by only a few species such as *Monoporeia affinis* and, nowadays, also *Marenzelleria*. Species poverty is a characteristic feature of the area and does not diminish the value of the communities. Disturbance to individual dominant species can therefore have a major impact on the functioning of the entire ecosystem, as these individual species serve as food for fish and affect the mineralisation of organic matter that settles on the bottom and nutrients, especially phosphorus, binding to sediments and further removal of nutrients from the cycle. Metsähallitus considers that, in the absence of previous experience and research related to the activity, transboundary local impacts cannot be ruled out in these respects either.

Metsähallitus notes that the consultation document now presented only presents assumptions about the environmental impacts of the project and does not present any research results to support them. Metsähallitus considers that the assessment of environmental impacts should take into account the published research results on the effects of dredging in the eastern part of the Gulf of Finland in Vyborg Bay, which show long-term changes in the physical structure and chemical properties of the seabed. There is also a considerable amount of published research data on the unique bottom ecosystem of the Bothnian Bay and its functioning, which should be taken into account in the environmental impact assessment.

Finnish Transport and Communications Agency Traficom

The planned project area is in the immediate vicinity of the most important shipping area in the Bothnian Bay, through which most of the traffic, especially from the northernmost ports of Finland, passes. When defining the planned research area, and particularly the extraction area, it is important to take into account the shipping routes used by maritime transport, even outside the established fairways and routeing systems, so that the operating conditions and safety of international maritime transport are considered in the vicinity of the planned project area.

To ensure general maritime safety and smooth cooperation, it is essential to have a dialogue between the project manager and the maritime authorities (in Finland, Traficom and Fintraffic) on the information exchange required by the project and on possible markings and traffic arrangements.



In Traficom's view, it would be justified for Finland to participate in the EIA procedure for the planned project, as, considering the location of the project area and the maritime traffic areas in its vicinity, the project may have an impact on maritime traffic to and from Finland.

Finnish Heritage Agency

In the experience of the Finnish Heritage Agency, underwater cultural heritage sites associated with construction projects further away from the coast are primarily shipwrecks or parts of wrecks that may have historical connections to different countries. International exchange of information on wrecks and their protection and research is common practice, which is a prerequisite for understanding the background of the sites and beneficial for their protection. However, underwater cultural heritage sites are physical remains located in a specific limited area, and in the opinion of the Finnish Heritage Agency, the mapping, protection and research activities carried out on them do not have any concrete transboundary environmental impacts. The impacts on underwater cultural heritage need to be assessed in connection with the preparation of hydraulic construction projects. This is the responsibility of the cultural environment authorities of each country in their own territorial waters and exclusive economic zones.

From the perspective of underwater cultural heritage, Finland does not need to participate in the environmental impact assessment procedure for the manganese nodule project planned for Sweden's Exclusive Economic Zone.

Finnish Meteorological Institute

The Finnish Meteorological Institute considers that Finland should participate in the EIA procedure for the extraction of manganese nodules planned by SOM AB in order to coordinate the cumulative impacts of similar operations in the Bothnian Bay area.

Regarding physical marine research, the Finnish Meteorological Institute considers that the direct and indirect impacts on Finnish territorial waters are minor.

The EIA report is largely comprehensive in terms of physical marine research. However, section 6.6 does not include the freely drifting Argo buoys operated by the Finnish Meteorological Institute. These buoys may drift into the area, and the Finnish Meteorological Institute wishes that in such a situation, SOM AB will avoid damaging the Finnish Meteorological Institute's equipment.

Furthermore, the Finnish Meteorological Institute considers that the EIA report should model the spread of sediment-laden water near the bottom (e.g. <https://dx.doi.org/10.1017/jfm.2021.654>). Sediment-laden water forms a dense gravity current on the seabed, and it is possible that it flows much further than the planned area. The Finnish Meteorological Institute considers that the slope on the western/southwestern side of the area (the seabed drops from 85 metres to 105 metres over a distance of approximately one kilometre) is a risk area, and based on the modelling carried out in the EIA report, the project developer should consider whether the planned operation should only be carried out in areas with a flat seabed.

Finnish – Swedish Transboundary River Commission

Although the location of the project does not fall within the geographical scope of the Agreement between Finland and Sweden concerning transboundary rivers (91/2010), the project may have impacts that extend to the Torne River through its effects on migratory fish. The Atlantic salmon (*Salmo salar*) in the Torne River migrate as far as the southern parts of the Baltic Sea and may



therefore pass through the project area and suffer from the effects of the operation, for example through sediments or environmental toxins spreading from the seabed. According to the purpose of the Agreement between Finland and Sweden concerning transboundary rivers, special attention must be paid to the protection and sustainable use of fish stocks (Article 2.2.d). On this basis, the Commission concludes that Finland should participate in the environmental impact assessment procedure.

The Federation of Finnish Fisheries Associations

The Federation of Finnish Fisheries Associations considers Finland's participation in the EIA procedure to be necessary.

The Bothnian Bay is a shallow, vulnerable environment and an important area for Finnish fisheries. Any environmental damage on the Swedish side will also be easily visible on the Finnish side. The environmental impacts of manganese nodule extraction are not sufficiently well known, so it is essential to apply the precautionary principle to this new type of industrial activity in the sea.

The Government of Åland

For Åland, there is no need to participate in the environmental impact assessment procedure. No direct environmental impact is expected to arise for Åland due to the considerable distance.

Museum of Torne Valley

The governments of Sweden and Finland have jointly nominated the Torne River dip net fishing culture (Håvning/Lippoaminen) for inclusion in UNESCO's Intangible Cultural Heritage List. The Swedish Institutet för Språk och folkminnen (ISOF) is responsible for coordinating the multinational application. The Museum of Torne Valley – Tornedalens museum is responsible for preparing the application in Finland in cooperation with the Finnish Heritage Agency and relevant organisations. The preservation of migratory fish stocks is a prerequisite for the preservation of fishing culture. The impact of activities in the sea area on migratory fish stocks and their behaviour, possible threats to migration and the risk of spawning rivers being endangered have also been highlighted in the UNESCO nomination and must be taken into consideration, especially as Baltic Sea salmon (*Salmo salar*) and whitefish (*Coregonus lavaretus*) stocks have declined in recent years.

The consultation document notes the findings concerning fish in the area but makes no mention of whitefish. However, the table below notes that whitefish is an important commercial species for commercial fishing in the area. According to the document, the turbidity and underwater noise caused by the planned activity may primarily affect fish, their spawning grounds, eggs and fry.

The impacts of the planned activity may include avoidance of spawning or feeding areas, reduced survival of eggs and fry, or delayed migration times. However, the project area is not considered to be a particularly important spawning or feeding area for fish. The impacts of the planned activity on fish are to be described in the upcoming EIA, and according to the consultation document, the assessments will be based on studies of sediment and underwater noise conducted specifically for the planned activity. The document makes no mention of migratory fish or their routes.

The consultation document states that the Marine Spatial Plan for the manganese nodule extraction area requires special attention to be paid to high cultural heritage values in project planning. The document mentions the cultural environment and marine archaeology but not



living/intangible cultural heritage. In accordance with the UNESCO Convention, other than culture and education (legal and administrative) must take into consideration and implement the importance of the diversity and preservation of living heritage.

The Museum of Torne Valley points out that the lifting of manganese nodules may be an obstacle to the Torne River's dip net fishing culture obtaining UNESCO status and, in particular, to its continued existence in the future, if the preservation of migratory fish stocks and the sustainable development of traditional fishing culture cannot be guaranteed. Maritime spatial planning (MSP) and mining and quarrying projects are measures that affect the protection of natural environments and important sites that are central to the expression of intangible cultural heritage as mentioned in the UNESCO Convention.

The Finnish and Swedish governments have jointly committed to protecting the cultural heritage included in the UNESCO nomination process even after the nomination (December 2026). The need for protection by the governments concerns in particular the preservation of the vitality of fish stocks. In the museum's view, the project may have transboundary impacts on cultural heritage, which both countries are committed to preserving, and therefore Finland also needs to participate in the EIA procedure for the project under consideration.

The consultation document highlights that the activity is expected to cause impacts such as turbidity, sediment dispersion and noise, which may particularly affect sediment, benthic fauna, fish, fishing and marine mammals. (...) The process affects sediment in a manner similar to that which occurs in excavation work, other construction work or bottom trawling, but the handling of sediment cannot be considered to be the disposal of sediment in a manner that would generate waste. The removal of manganese nodules is estimated to take a maximum of ten years. In addition, the plans highlight the environmental impacts of transport, such as noise.

The Museum of Torne Valley points out that the impacts and changes caused by the removal of manganese nodules on fish stocks and fish behaviour in the sea cannot be assessed without comprehensive research data. For example, the time of year (season) when the assessment was carried out is not specified in the assessment of species value. The plan states that no fish sampling was carried out in connection with the assessment and that other studies and sample fishing in the research area form the basis for the assessment of fish in natural biotypes. However, in the opinion of the museum of Torne Valley, studies covering a wider area than just the research area should also be taken into account with regard to migratory fish, as the migration of whitefish has been delayed, and the average size of whitefish has decreased.

The document further states that both the turbidity caused by the activity and underwater noise and their effects will be studied in more detail in the upcoming EIA assessment. In particular, the turbidity of the water caused by the lifting of manganese nodules must be minimised and its impact on the habitat of various fish stocks must be assessed in advance. The environmental impacts of the project threaten the already reduced habitat of migratory fish in the Baltic Sea. As fish stocks also serve as a resource for traditional fishing, this will also have an impact on fishing in both the Torne River and the sea areas.

The Museum of Torne Valley emphasises the importance of assessing the cumulative, i.e. combined, effects of various projects on cultural heritage and fish stocks. The consultation document mentions noise from maritime traffic as the most significant cumulative impact. According to the document, no other cumulative impacts are expected to occur in the area covered by the plan. The document does not highlight the potential combined effects of different projects on migratory fish stocks. Due to the wide range of migratory fish, the museum believes



that cumulative effects may arise from several projects planned for the Bothnian Bay and the entire Baltic Sea basin.

The long-term viability of traditional fishing on the Torne River depends largely on the viability of the fish stocks that are the target of fishing. Therefore, projects and decisions that affect the water quality of the Torne River and the sea area, as well as fish stocks and the sustainability of fishing, have an impact not only on biodiversity but also on the preservation of this intangible cultural heritage.

In addition to the objectives and starting points related to the use of sea areas, the consultation document highlights the reports to be prepared for the extraction of manganese nodules and the planned impact assessment. However, the plan does not clearly indicate what studies will still be carried out during the planning phase; desk studies mentioned include underwater marine mammals, fish, benthic organisms and commercial fishing. The project also fails to identify intangible cultural heritage and the potential impacts and cumulative effects of the project on cultural heritage and its preservation. In the opinion of the Museum of Torne Valley, the potential impacts of the removal of manganese nodules on the Torne River's dip net fishing culture and its future UNESCO status should be assessed as part of the impacts on cultural heritage.

WWF Finland

WWF Finland's general position is that no form of seabed mining should be started in the Baltic Sea before the environmental and climate impacts and socio-economic risks of such activities have been scientifically studied and verified, in accordance with the precautionary principle. We would like to remind you that both Finland and Sweden support a moratorium on deep-sea mining.

Although mining in the Baltic Sea region cannot be directly compared to deep-sea mining, studies conducted in both Finland and Sweden show that we do not have sufficient research data on the environmental impacts of seabed mining and the ecological risks it poses. There are significant risks associated with starting such operations, and it would be contrary to international nature conservation and sustainability goals.

The Baltic Sea is a unique and sensitive sea that has suffered from the pressures of human activity for decades, and its recovery and the maintenance of its biodiversity still require a reduction, not an increase, in the pressures caused by human activity. On a global scale, the minerals in the Baltic Sea seabed constitute a very small mineral reserve, and in our opinion, the risks of exploiting them are too great to the sensitive inland sea environment compared to the benefits.

WWF considers it crucial that Finland participates in the EIA procedure for the project. WWF would like to remind you of the Baltic Sea Action Plan's goal to minimise seabed loss and disturbance across the Baltic Sea, as well as the Action Plan's statement (BSAP, page 40) that "in order to minimise the short- and long-term impacts of seabed mining (with the exception of sand and gravel extraction) minerals should not be exploited until the impacts of seabed mining on the marine environment, biodiversity and human activities have been sufficiently studied."

We would also like to draw attention to measure S65 of the Baltic Sea Action Plan, which aims to establish a common approach to managing and minimising the loss and disturbance of seabed habitats and is scheduled for completion in 2026. At present, the countries of the Baltic



Sea do not have a common, generally accepted approach to managing and minimising seabed loss and disturbance and the adverse effects caused by these pressures.

The EU Marine Strategy Framework Directive (MSFD, Directive 2008/56/EC) requires Member States to define the characteristics of good environmental status (GES) for each marine area or sub-area based on the qualitative indicators listed in Annex I. The qualitative indicators that need to be considered when determining good environmental status and which are relevant to seabed extraction activities include

- Indicator 1) Biological diversity is maintained. The quality and distribution of habitats and the distribution and abundance of species correspond to the prevailing physiographic, geographical and climatic conditions.
- Indicator 6) The integrity of the seabed is such that the structure and functions of ecosystems are protected and there are no adverse impacts on benthic ecosystems.

Projects that significantly alter the seabed, and especially projects that pilot new technology and serve as precedents for entirely new ways of using the marine environment and seabed, require dialogue between the Baltic Sea countries and broader transboundary consultation. It is extremely important to build a common knowledge base on the impacts of activities on seabed habitats and nutrient and carbon cycles before operations commence.

SOM AB (Scandinavian Ocean Minerals) mentions in the consultation document that the activity could potentially be expanded and that there are abundant nodule deposits in the Baltic Sea area. This suggests that the activity will expand, which could have significant impacts on the integrity of the seabed and seabed habitats in the future.

As stated in the consultation document, the activity may also have an impact on Finnish sea areas, either directly through water turbidity or through effects on marine mammals or fish.

WWF Finland does not agree with SOM AB's assessment that the activity would not require a permit under Chapter 9 of the Swedish Environmental Code. This first project involving seabed mining in the Baltic Sea sets a precedent and therefore requires particularly careful consideration.

We do not accept the use of the terms "harvesting" or "extraction" proposed by SOM AB, which are not justified in this context, as the activity cannot in any way be compared to the exploitation of more rapidly renewable resources. We would also ask SOM AB to clearly cite the scientific reference for its estimate that nodules would grow at a rate of 0.15–0.20 mm/year in the area in question. It is concerning that SOM AB mentions that the existence of nodules has been known for a long time, but their formation process is still partly unknown.

As an observation, there is an error in the translation of the assessment programme, where on page 32 of the Finnish material it misleadingly states that no benthic species have been observed in the research or mining area, when in fact it is the absence of benthic flora due to depth conditions.

We consider it important that Sweden and SOM AB keep the parties to the Baltic Marine Environment Protection Commission (HELCOM) informed of the progress of the project and that the content of the environmental impact assessment and the background studies produced during it are presented to the relevant HELCOM working groups (such as WG Sea-based



pressures). As this is a completely new form of seabed exploitation, the assessment process is likely to reveal a need for extensive additional research.

Finnish Safety and Chemicals Agency (Tukes) replied but did not have any comments on the matter.

Participation in the transboundary EIA procedure

Based on the statements received and its own deliberations, the Finnish Environment Institute states in accordance with Article 3(3) of the Espoo Convention that Finland intends to participate in the EIA procedure of uptake of the manganese nodules from the sea southeast of Skellefteå in Bothnian Bay, Exclusive Economic Zone of Sweden.

Conclusions

The Finnish Environment Institute considers it important that all the impacts mentioned in the statements issued in Finland are investigated and assessed. Due to the location of the project, there may be transboundary impacts, such as water turbidity caused by the spread of seabed sediments, underwater noise and effects on benthic fauna and migratory fish. Additionally, the cumulative impact on the environment from transboundary perspective should be assessed.

It appears that the areas of application and the relationships between the various laws relating to the project need to be clarified. As part of the EIA procedure for the project, the Finnish Environment Institute requests that a declaration be made as to which law will govern the activities and what permits will be required.

The EU Marine Strategy Framework Directive (MSFD) requires the assessment of the state of the sea on a regional or sub-regional basis, depending on the criteria being assessed, even though reporting is done on a country-specific basis. Thus, activities taking place in Sweden's Exclusive Economic Zone also have a direct impact on the assessment of the state of Finland's marine areas.

The Finnish Environment Institute points out that the Bothnian Bay is one of the only areas in the Baltic Sea where the condition of the seabed is still considered to be good, but in terms of eutrophication, the Bothnian Bay is in poor condition. The ecosystem of the Bothnian Bay is undergoing change, particularly due to climate change and eutrophication, and for this reason, the additional impacts of manganese nodule mining should be assessed very carefully.

As part of the environmental impact assessment, flow and sediment modelling should be carried out to determine the visibility and effects of turbidity in the Finnish side of the border. Turbidity has impacts on zooplankton, fish, seals, and diving birds, among other things. The release of nutrients from sediments and the resulting impacts should be included in the impact assessment.

Furthermore, the biogeochemical processes of sediment and the impact of mining on them should be assessed. Carbon release and its resulting effects, e.g. on the achievement of climate targets, should be assessed. The impact on sediment biogeochemical processes of returning dead benthic fauna to the seabed should also be taken into consideration.

The EIA of the project must take into consideration the spread and accumulation of harmful substances in the ecosystem. The effects of heavy metals, phosphorus and other harmful substances must be investigated when they dissolve in water, spread regionally, and accumulate in the food web. These substances may be transported in significant quantities to



Finnish Exclusive Economic Zone and territorial waters. The concentrations of harmful substances in sediments must be investigated, and the coverage of samples must be sufficient and justified.

The Finnish Environment Institute considers that the EIA of the project should evaluate how the decline in benthic fauna in the project area may affect fish stocks and how long it is expected to take for benthic fauna to recover. In addition, the impacts of underwater noise to species such as fish, seals and seabirds might be significant and should be assessed.

Additionally, the Finnish Environment Institute notes that the term “uptake”(upptag) is a misleading description of the activity and that term “mining” (utvinning) would more accurately describe the impacts of the activity.

In conclusion, the Finnish Environment Institute requires the EIA documentation to provide a transboundary environmental impact assessment from Finland’s perspective with a specific regard for the provided statements.

Head of Services

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Senior Officer,
 Point of Contact to the Espoo Convention

Julianna Reunanen

This document has been electronically signed. The electronic signatures can be verified from the register office of the Finnish Environment Institute.

Appendices

Statements received in Finland

For information

Ministry for Foreign Affairs
 Ministry of the Environment
 Ministry of Economic Affairs and Employment
 Centre for Economic Development, Transport and the Environment of Lapland
 Centre for Economic Development, Transport and the Environment of South Ostrobothnia
 Centre for Economic Development, Transport and the Environment of North Ostrobothnia
 Centre for Economic Development, Transport and the Environment of Southwest Finland – Fisheries Authority
 Finnish Heritage Agency
 Finnish Meteorological Institute



Finnish Safety and Chemicals Agency
Finnish-Swedish Transboundary River Commission
Regional Council of Lapland
Geological Survey of Finland
Finnish Transport and Communications Agency
Government of Åland
Natural Resources Institute
The Federation of Finnish Fisheries Associations
WWF Finland
The Museum of Tornio Valley
Metsähallitus

