



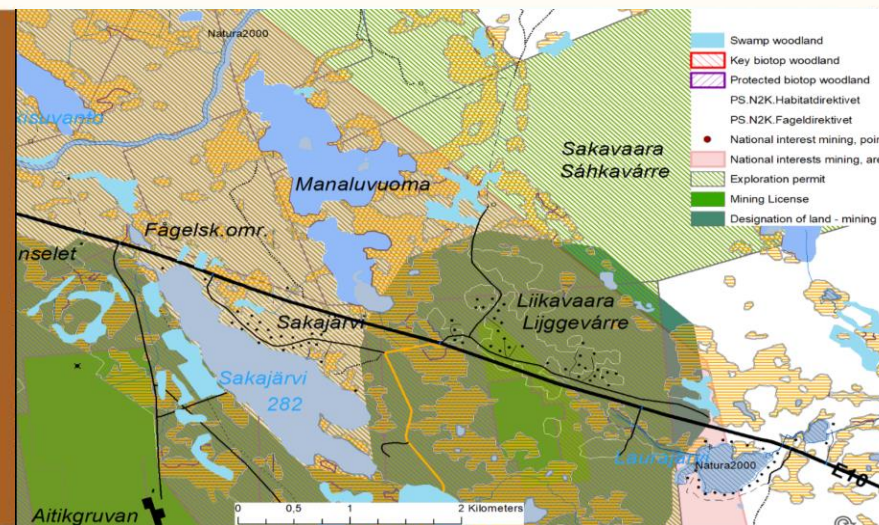
CIRAN



Massive Open Online Course (MOOC)

LECTURE 5 - PERMITTING IN PROTECTED AREAS: A SWEDISH CASE

by Ronald Arvidsson



FREE ACCESS

www.ciranproject.eu/mooc/



Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Health and Digital Executive Agency. Neither the European Union nor the granting authority can be held responsible for them. This project has been funded by the European Health and Digital Executive Agency (HaDEA) under Grant Agreement N°101091483



@ciran-project-eu



@CIRAN_EU



@CIRANProjectEU



License

This work is licensed under CC BY-SA 4.0. To view a copy of this license, visit <https://creativecommons.org/licenses/by-sa/4.0/>

On one hand we have the EU protection of the environment and on the other hand extraction of raw materials (critical raw materials).

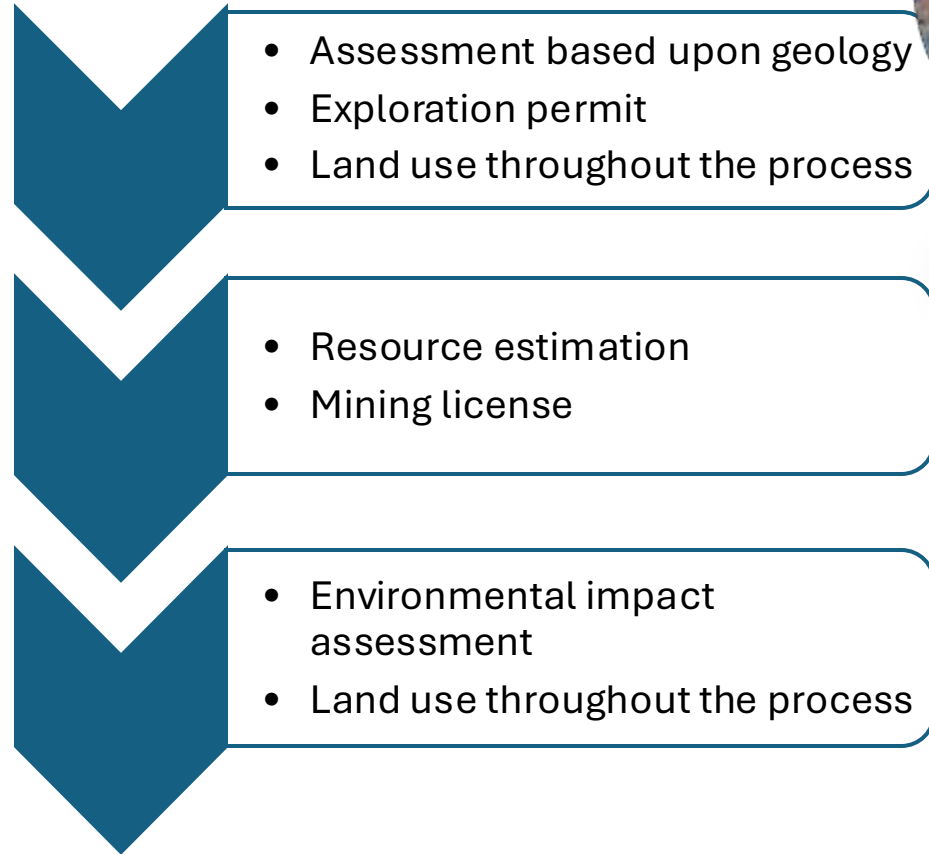
There are at least two mining permits needed to be processed (member state legislation)

As a first step the mining company apply for an exploration license – if the mineral is not a concession mineral an agreement with the landowner usually is necessary

Once the company developed the resource so that a resource can be estimated then there is a decision to either stop or apply for a Mining license

Next, depending upon member state, at least an environmental permit with an EIA need to be applied and approved – there may be other permit or land use that need to be adressed.

Land use rights – are often given through the other permits but may be necessary in some member states or are a part of the permitting process



In many cases extraction of raw materials will not be permitted when mining infringe upon the protected nature.

There are though recommendations for solutions of mining in and near areas of protected areas – otherwise we have no EU produced raw materials from domestic mining

To think about. Impact upon Natura 2000. Impact of different EU directives like the water frame work directive

EU – recommendations regarding good practice mitigation and compensation measures for infringement are published in [Guidance document on non-energy mineral extraction and Natura 2000](#) - Publications Office of the EU

Mining will not be permitted through the EIA if not a remediation plan including safety of the area around the mine. No toxic substances above given limits are allowed. The limits are rigorous and should not be confused with activity 50-100 years ago.

The remediation must further be secured by either

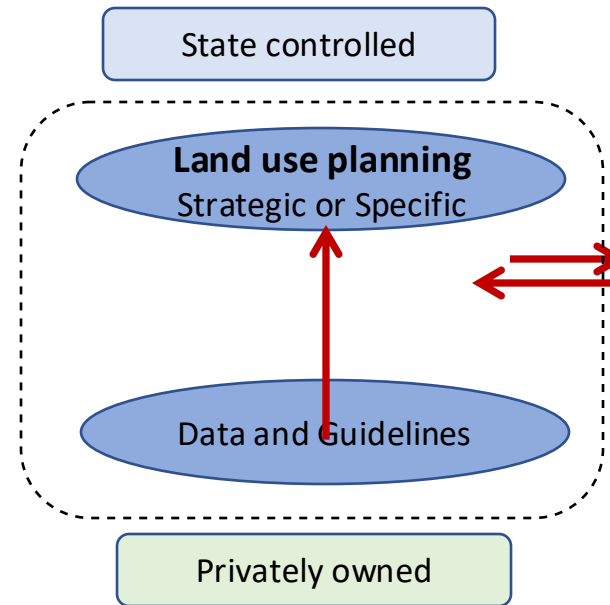


Drilling is the most important part of establishing the value of the deposit. Samples from the drill holes are used for resource assement. Drilling has very little or no impact if managed well. Photo Ronald Arvidsson

Permitting of raw materials have two pathways

1. Minerals controlled/owned by the state. Often referred to as concession minerals. Most metals and Critical Raw Materials
2. Minerals that belong to the landowner. Usually no permitting under the mining law. Therefore, no mining license but EIA and other permits are necessary

Observe there may be differences since member state/federal state specific legislation



What legal grounds are there allowing extraction?

Mining law – what is the status in your country?

EU legislation like the EU's Environmental Impact Assessment (EIA) Directive ([2011/92/EU](#) as amended by [2014/52/EU](#))

The Birds Directive (Directive 79/409/EEC) was adopted in 1979. It is one of the first pieces of environmental legislation to be adopted by the EU. It was amended in 2009 ([Directive 2009/147/EC](#))

The Habitats Directive ([Council Directive 92/43/EEC](#)) was adopted in 1992, thirteen years after the Birds Directive.

Together, the two directives have also created [the Natura 2000 network](#) – which is now the largest coordinated network of protected areas in the world.

Member state national and federal/regional/local legislation. There are often protected areas not under EU legislation.

The water framework directive

<https://eur-lex.europa.eu/eli/dir/2000/60/oj>

Since 2000, the WFD has been the main law for water protection in Europe. It applies to inland, transitional and coastal surface waters as well as groundwaters

The extractive waste directive – manage waste from extractive industries

[Directive - 2006/21 - EN - EUR-Lex](#)

In addition there are also heritage areas. The impact upon permitting for new mines is governed by member state legislation and influenced by e.g. UNESCO heritage sites.



Within this section we will present how environmental permits are handled and also will allow mining. The here presented case is Sweden with four different areas all with a different type of suite of commodities and different environmental challenges:

Iron ore mining

Cu mining

Cu-Zn-Pb-Au-Ag sulphide advanced exploration

Au mining

Fe-apatite Mertainen – 150 Mt, 34% Fe, .02%P

- Nearby Natura and watershed to protected river

Cu – Liikavaara about 58Mt (2018) 0.25%Cu, 2 ppm Ag and .26 ppm Au and also Mo.

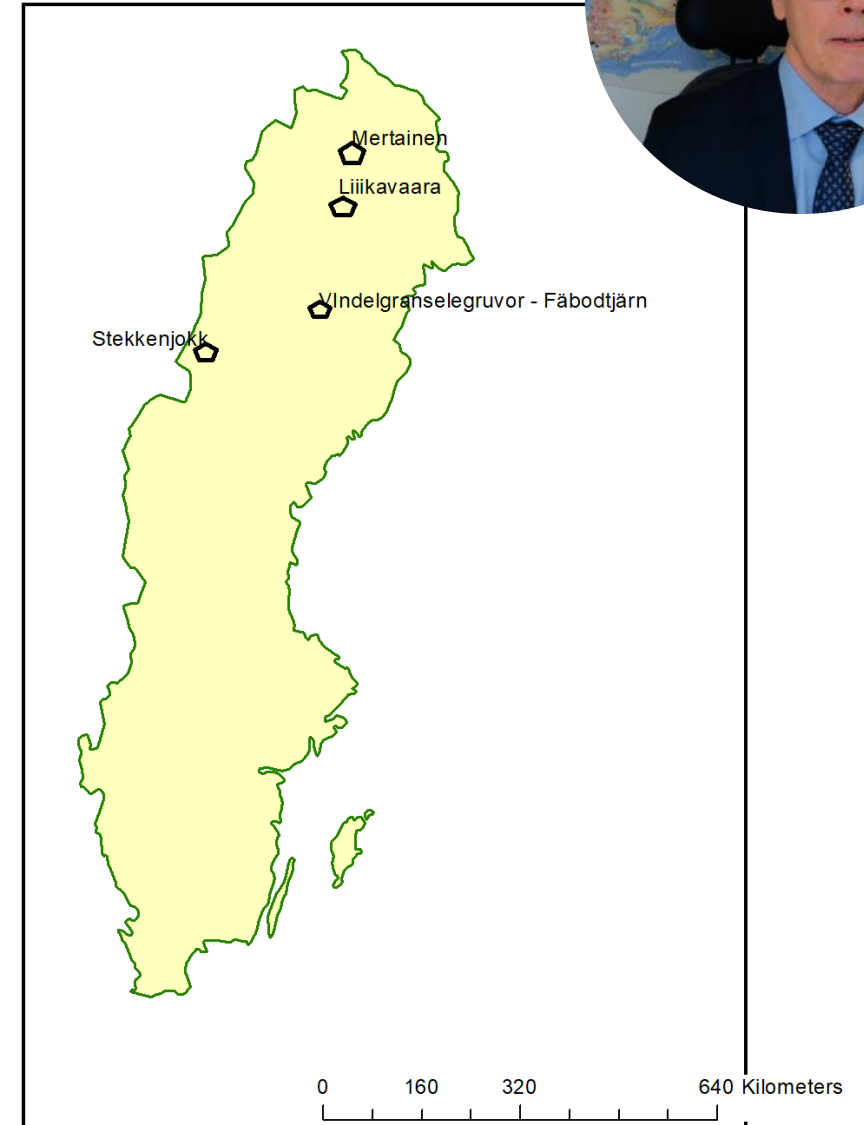
- watershed to protected river

Cu-Zn-Pb-Ag-Au – Stekkenjokk 6.7Mt .9% Cu, 2.7%Zn och 5.1 Mt 1%Cu, 1.5%Zn

- Protected area

Au- Vindelgransele mines 172kt 7.56 ppm Au, ore body – open at depth

- Watershed to protected area

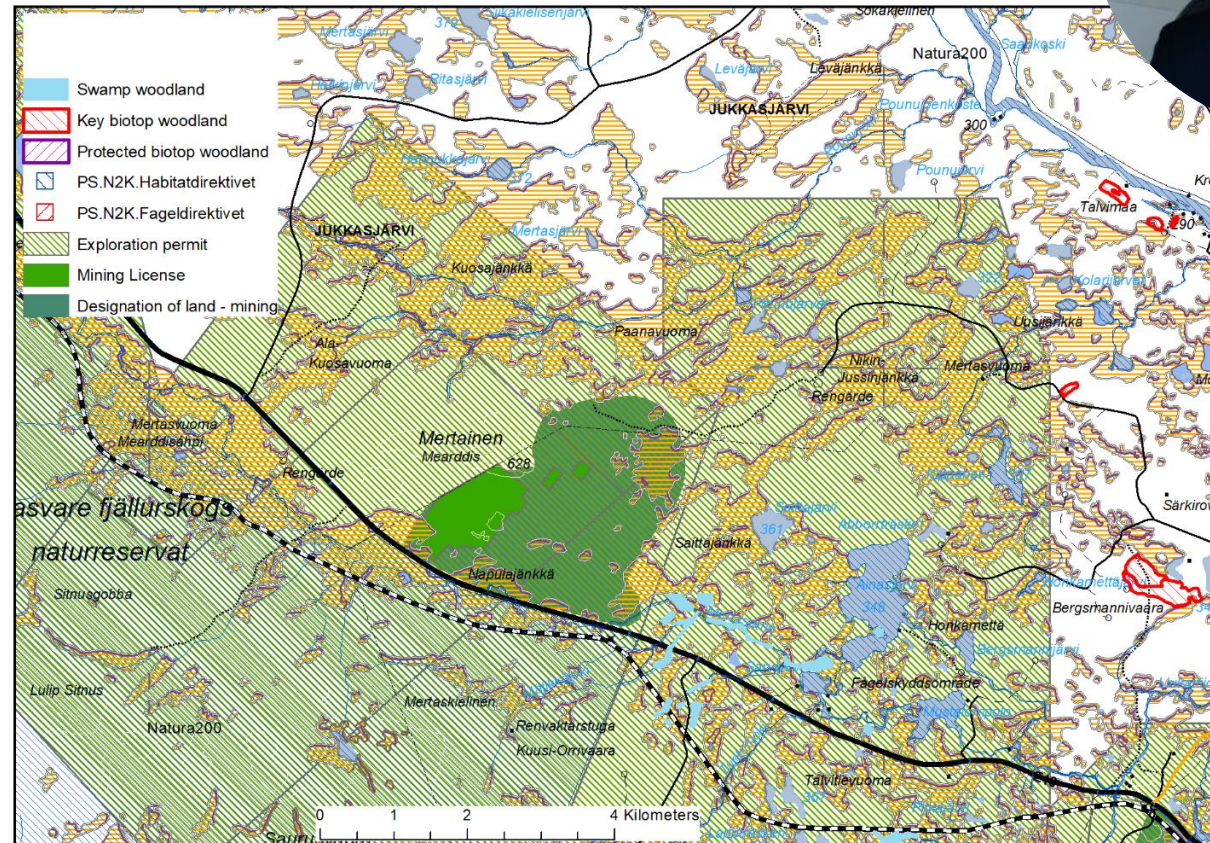




Fe-apatite mine

All permits granted – started but currently on hold – Environmental permit based on among other aspects:

- Nearby Natura and watershed to protected river
- Compensation measures – protecting equal or larger amount of nature impacted by mine
- Modeling of impact of water from mining site (this type of ore should be mentioned is rather clean) – necessary to show that no toxic substances transported to protected area



Map over mining area and surroundings – SGU figure.

Compensation measures due to infringement upon nature

The mining operations at Mertainen will use approximately 720 hectares of land for an industrial area, storehouses and auxiliary operations, but also impact wetlands, coniferous forests and mixed forests in the surroundings. Following the Land and Environment Courts approval of LKAB's compensation plan for its operations at the Mertainen mine, the company will be required to compensate for its impact on the nature values identified in an area located to the north of the mine. The ruling states that LKAB has signed an agreement to protect an area at least equal in size to the impacted area of 1220 hectares. The company's compensation plan includes restoration, protection and management measures for forest land and wetlands in an area which, without formal protection, risks being used for forestry purposes.

In order to achieve approval of the final environmental permit the EIA the company needed to compensate for infringement upon areas of high natural values



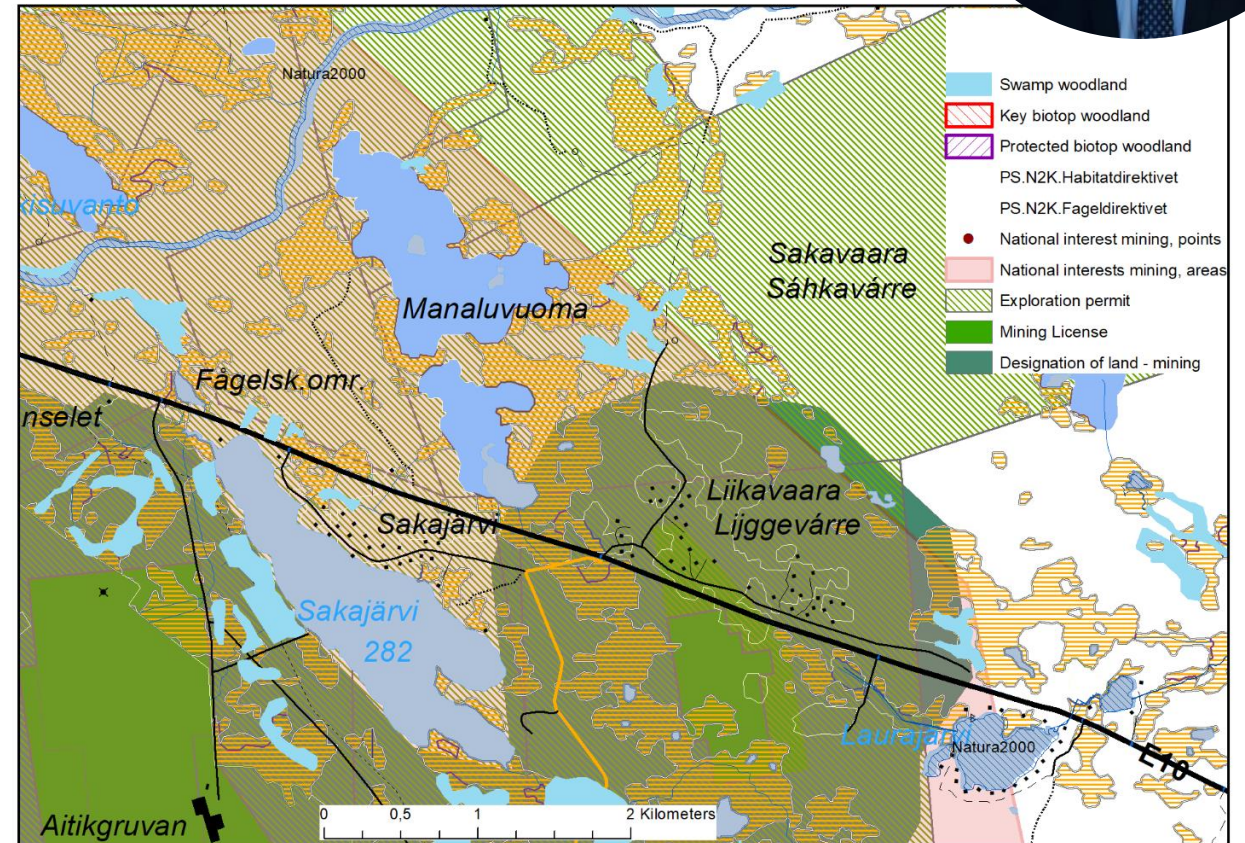


Liikavaara CU – porphyry copper deposit

All permits granted – mining started 2024

Modeling and design of mine to prohibit release of toxic substances – some key aspects in the environmental permit

- Nearby Natura and watershed to protected river
- Compensation measures
- Modeling of impact of water from mining site – necessary to show that no toxic substances exceeding limit values are transported to protected areas
- Modeling and analysis was done for all protected (red listed) species where potential impact could be suspected – design of mine and cleaning of surface waters need to be done to meet standards for status of water not these affecting species negatively
- Includes traps for contaminated water and cleaning before infiltration, includes pumping of water to site designed for cleaning of water
- Includes storage of waste rock with potential of acid leakage at safe site designed for the purpose



Map over mining area and surroundings – SGU figure.

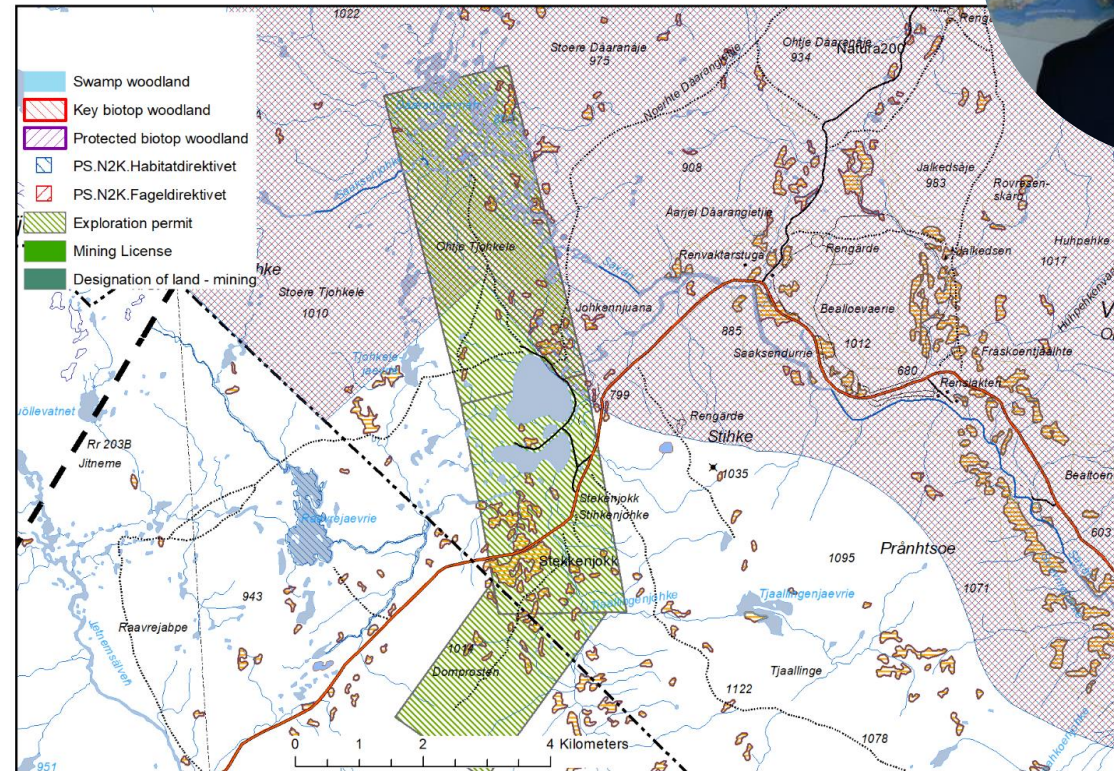
Cu, Zn, Ag advanced exploration project

Environmental permit needed for mining license with following key aspects

- Nearby Natura

In order to not impact sensitive nature and reindeer husbandry

- Mining during the frozen period of the year
- all work done underground
- Processing in nearby Joma – Norway
- Impact on nearby waterbodies and river has been determined from measurements through from closure of mine and from modeling. Necessary to show that no release of toxic substances exceeding limit values.



Map over mining area and surroundings – SGU figure.



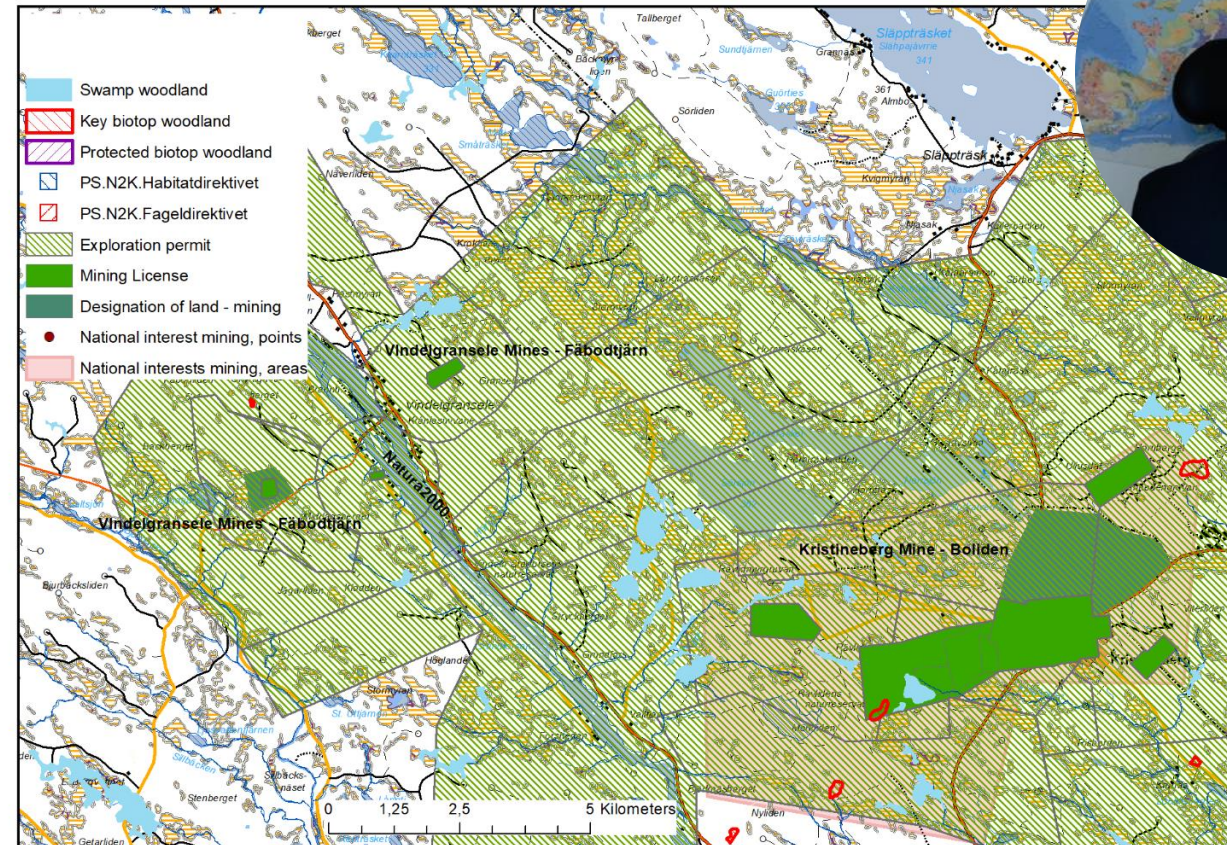
Au- Vindelgransele

Watershed to protected river

Permit builds upon:

- Field data – water transport
- Modeling of impact of harmful substances – need to show that toxic substances do not exceed limit values
- Construction of the mining site - minimizing impact of substances

Stakeholder meetings – from early stage



Map over mining area and surroundings – SGU figure.

What are the necessary permits in your country/region/federal state that are necessary before exploration can start and before mining can start?

In order to achieve an environmental permit can compensation due to infringement on protected nature be a solution?

Is it possible to compensate for infringement of mining upon protected nature in order to make extraction possible

Can mining be made such that the release of toxic substances to the environment is at or below the limit values?

What is necessary in order to show that release of toxic substances are below limit values?



Environmental permit – it is either a specific permit for doing investigation in areas of protected nature or the permit associated with the environmental impact assessment often called EIA

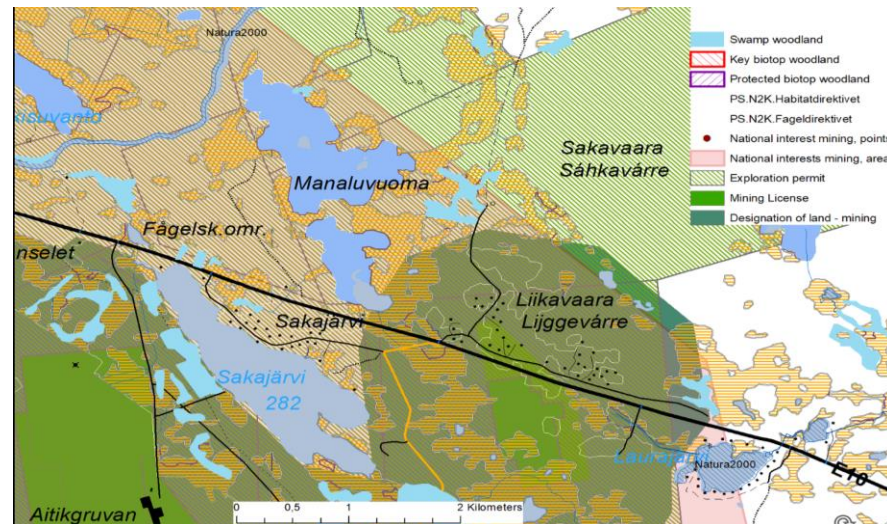
Concession minerals/metals – these are the minerals/metals controlled/owned by the country. Rights to explore and mine are given through the exploration license and the mining license

Land owner minerals/metals – these are the minerals/metals that are owned and controlled by the land owner. Rights to explore and mine are given by the land owner

Exploration license – the permit necessary to obtain in order to investigate a specified area for valuable raw materials – particularly concession minerals

Mining license – the permit necessary to obtain to assure the right to mine particular so called concession minerals

Thank you





**Funded by
the European Union**



Visit our website



info@ciranproject.eu • www.ciranproject.eu