

# Mining and Mineral Exploration Projects within the Natura 2000 Area: Case Studies from Northern Finland <sup>†</sup>

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**Abstract:** The Rompas–Prajapat (Au-Co) and Sakatti (Ni-Cu-PGE) mineral deposits are among the only important discoveries of the last few decades in Finland. Both are partially located in Natura 2000 areas, which are among the most sensitive land use contexts in which mining and mineral disputes have emerged in Finland. Consequently, the project holders apply low-impact mineral exploration technologies and practice active stakeholder engagement and communication. In fact, projects seem to be mostly favored by local populations. However, because of their association with protected areas (and uranium in the case of Rompas), projects are opposed by non-governmental organizations, as well as by reindeer herders in the case of Sakatti. Project holders perform feasibility studies and environmental impact assessments. Mining licenses are applied under a new Finnish mining act and the European Union’s Raw Materials acts.

**Keywords:** Finland; Lapland; Sakatti; Rompas–Rajapalot; Natura 2000; mining; mineral exploration; critical raw materials; social license to operate; uranium



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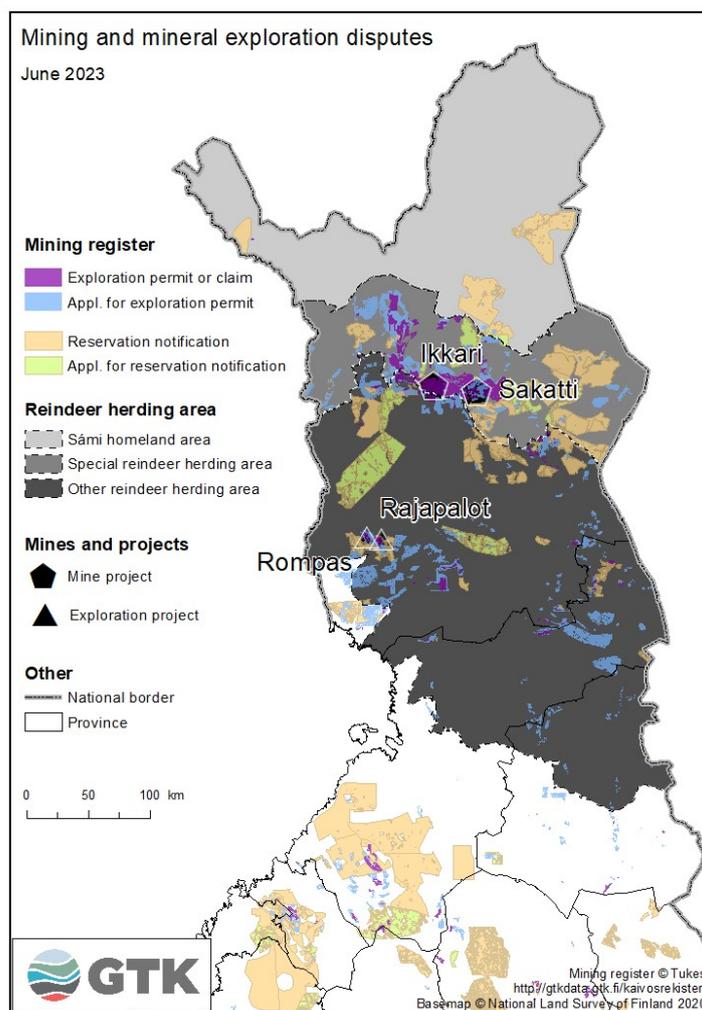


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## 1. Introduction

Despite intense mineral exploration over the last few decades, only three significant mineral deposits have been found in Finland: Rompas–Rajapalot (Au-Co) in Ylitornio-Rovaniemi and Sakatti (Ni-Cu-PGE-Co), and Ikkari (Au) in Sodankylä. All of them are located within the reindeer herding regions of Lapland, northern Finland (Figure 1). In this study, we focus on the Sakatti and Rompas–Rajapalot projects, which are partially located within Natura 2000 areas.

Natura 2000 areas are protected area (PA) units based on the Birds and Habitats Directives (Directive 79/409/EEC and Council Directive 92/43/EEC (<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:01992L0043-20130701>, accessed on 23 June 2023)). These areas form a European network that aims to protect endangered species and maintain or restore their habitats [1]. Such PAs are among the most sensitive land use contexts in which disputes over mineral exploration and mining (DMEM) have emerged in Finland and are important project locations regarding the social license to operate (SLO) in the country [2]. SLO refers to the local community’s acceptance/approval of an activity [3]. Social issues related to Sakatti and mines in Sodankylä have been previously studied by Suopajarvi et al. [4], Tuulentie et al. [5], and Lassila [6], whereas Beland Lindahl et al. [7] focused on the Rompas–Rajapalot. Eerola [8] studied the Rompas–Rajapalot and Sakatti project holders’ online communication based on their low-impact technologies (LIMETs) and topics related to SLO/social license to explore (SLE). Eerola [2] identified both projects as DMEMs and their issues were spatially analyzed from a geosystem service perspective by Eerola [9].



**Figure 1.** Location of the Rompas–Rajapalot, Ikkari, and Sakatti projects.

This article describes these two characteristic cases as examples of important mining and mineral exploration projects related to Natura 2000 areas in northern Finland, especially on strategies adopted by involved companies because of operations in such sensitive contexts and their challenged SLO/SLE situations.

## 2. Materials and Methods

The case and the associated methods applied are described mainly in relation to Eerola's [2] mapping of Finnish DMEMs. We also connected those cases with data collected by Eerola [8] on corporate online communication regarding the use of LIMETs and SLE concepts by the case companies.

Finnish land use planning and legislative aspects were reviewed in Minland (<https://www.minland.eu/database/>, accessed on 23 June 2023) [10] and ongoing CIRAN (<https://ciranproject.eu/>, accessed on 23 June 2023) projects financed by the European Commission's Horizon 2020 and Horizon Europe programs. The study cases are described in Table 1 and the main characteristics of the cases are summarized therein, including the projects, their holders, LIMETs, issues/contexts, and contentious actors.

**Table 1.** The Rompas–Rajapalot and Sakatti projects, and their holders, new low-impact mineral exploration technologies (LIMETs), issues/context, and contentious actors. The data are taken from [2,8,9]. FANC = the Finnish Association for Natural Conservation.

Project and Its Holder	LIMETs	Issues/Context	Contentious Actors
Rompas–Rajapalot Mawson Gold Oy	Drones Snow, soil, and plant sampling Portable drill rig	Natura 2000 area Uranium	The FANC
Sakatti AA Sakatti Mining Oy	Closed-circuit drilling Full tensor gradiometry	Natura 2000 area Recreation Reindeer herding	The FANC The save Viiankiaapa movement, Reindeer herders Extinction Rebellion

### 3. Land Use Aspects of Mining and Mineral Exploration in Natura 2000 Areas

In Finland, land is zoned according to the Ministry of Environment, and the aspects that address the definition of land use plans include PAs and heritage conservation sites under several acts, groundwater areas, as well as sites to prevent chemical accidents [11]. Minerals are only considered in land use plans at the project stage. An exception to this is aggregates, whose areas have been identified to address sustainable aggregate supply considering impacts on groundwater. Extractive activity requires its own land use designation that generally cannot coexist with other land use activities [11].

Natura 2000 areas cover about 15% of the country, and they are included in the Habitats Directive of the EU. In 1998, Finland’s Ministry of the Environment proposed a list of Natura 2000 areas that mainly contained national state-owned PAs established according to the Nature Conservation Act of 1923 and defined by national conservation regulations [11]. The European Commission approved the inclusion of these areas into the Natura 2000, and they were assessed after ten years, focusing on ecological and habitat values. Even though most of the Natura 2000 areas were already PAs in public lands, their establishment caused intense dispute and public debate in the 1990’s [12]; opposing landowners and their representative organizations considered this to be an imposition.

Extractive activities require special procedures when applied in Natura 2000 areas, and the permitting authority may allow activities with provisions. There are guidelines on good practices in mineral exploration in PAs and reindeer herding areas [13,14], but they are not mandatory. Mineral exploration may require operations to be carried out in certain seasons and with the application of LIMETs. Even though mining can be allowed, it should not jeopardize habitat conservation, and the establishment of a mine may require the momentary withdrawal of the site from the Natura 2000 network. This needs to be requested by the government and the decision on it is made by the European Commission.

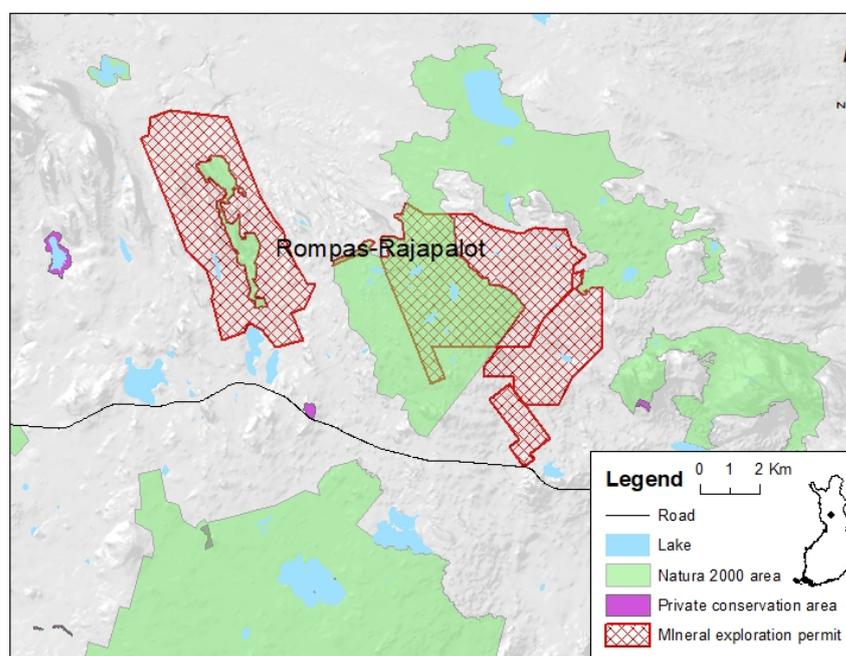
The Sakatti project does not only affect Natura 2000 areas but also reindeer herding and recreation (Table 1) [6]. Therefore, permits in Finland also include consultation. Moreover, the impacts of exploration activity in Natura 2000 areas are cumulative with those caused by other activities. This determines even stricter requirements on the impacts of exploration/extractive activity, and the use of LIMETs may even be requested in such contexts.

## 4. Case Studies

### 4.1. Rompas–Rajapalot

The Rompas gold–cobalt deposit was discovered by French nuclear company Areva in 2008 when it was exploring for uranium (Figure 2). In 2010, Areva sold the deposit to Mawson Oy, which changed its name to Mawson Gold Oy in 2021. Mawson expanded its mineral exploration 10 km to the east where it found another gold–cobalt deposit unassociated with uranium (Rajapalot; Figure 2). Because of its location and association with

uranium mineralization, the Finnish Association for Nature Conservation (FANC) has opposed this project since it started. Consequently, the FANC, Mawson, and environmental and mining authorities have been involved in a long legal battle in courts regarding operations within Natura 2000 areas. The involved parties have also requested successive police investigations on each other regarding environmental impacts on the Natura 2000 area. Company's employees were fined because of such environmental impacts. However, according to Beland Lindahl et al. [7], local populations in Ylitornio and Rovaniemi seem to mostly support the project, whereas the positions of the government, the authorities, and municipalities have been controversial. The Ministry of the Environment has a plan to expand nature conservation in the prospective area, although local municipalities and politicians have supported the project. Meanwhile, Mawson has continued mineral exploration and plans to build an underground mine with a tunnel extending from outside of the Natura 2000 area [15].

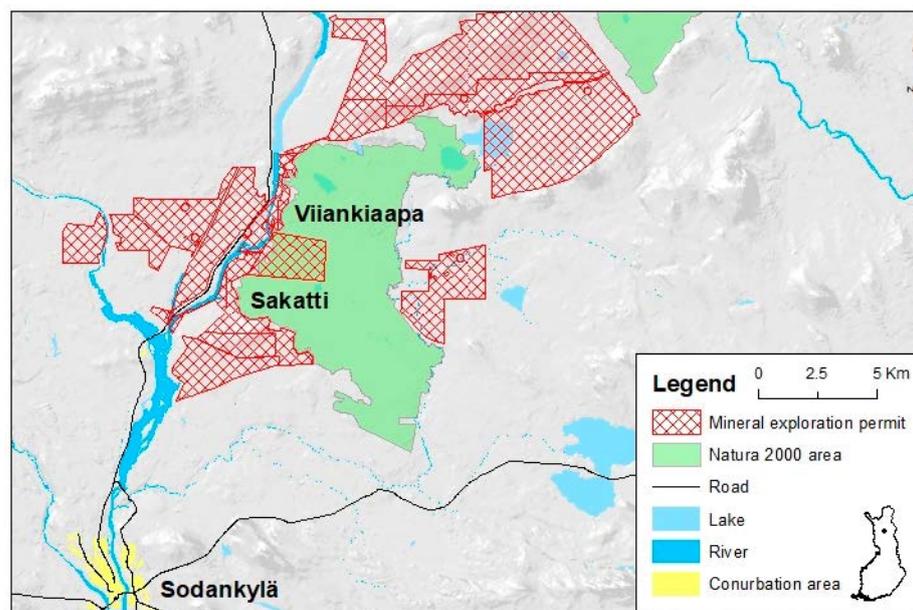


**Figure 2.** The Rompas–Rajapalot prospect in Ylitornio, northern Finland (after [9]).

Mawson recognizes that it operates under sensitive circumstances and communicates about the application of LIMETs in its mineral exploration within such areas to minimize its environmental impact [8]. The mentioned LIMETs are drones, snow, plants, and soil geochemistry, and portable drill rigs (Table 1). The company has also practiced active stakeholder engagement and communication in which their SLE/SLO strategies have been expressed [7,8]. Mawson has also been an active member of the Finnish Network for Sustainable Mining (FNSM) and FinnMin's Mineral Exploration Network (MEN). The FNSM and the MEN are collaborative forums where standards, guidelines, and good practices are developed with stakeholders [16]. Mawson also uses local services and products and hires local people for its activities as much as possible.

#### 4.2. Sakatti

In 2004, Anglo American plc started mineral exploration in the Viiankiaapa area in Sodankylä, Lapland, northern Finland, and discovered the world-class Sakatti nickel–copper–PGE–cobalt deposit in 2011 (Figure 3). The municipality already hosts the Kevitsa Ni-Cu-Co and Pahtavaara Au mines, and the region is a site of intense mineral exploration.



**Figure 3.** The Sakatti project in Sodankylä, Lapland, northern Finland (after [9]).

A subsidiary of Anglo American, AA Sakatti Mining Oy, has developed the Sakatti deposit. This project is located within the Natura 2000 area and the recreational and reindeer herding areas of Viiankiaapa mire (Figure 3). The project has been opposed by the FANC, the local “Save Viiankiaapa” movement, and reindeer herders [6] and more recently by the Extinction Rebellion as well. Anglo American’s sustainability report recognizes its involvement in such a sensitive context and the environmental concerns presented by environmental non-governmental organizations (ENGOS), which is rare [8]. Due to opposition, and to avoid impacts on the Natura 2000 area, the company decided to exploit the mineralization via an underground mine with a tunnel extending from outside of the Natura 2000 area. Even so, the company has also made ecological compensation with the protection of another area. However, the company’s environmental permit application was rejected, and it will require a change in legislation to dismantle the status of the protected mire. There is a fear that an underground mine would affect the mire’s water level and damage its ecosystem.

Regarding LIMETs, the company has announced that it uses closed-circuit drilling, applies full-tensor magnetic gradiometry (FTMG) (Table 1), and operates machineries in winter to reduce the environmental impact of its mineral exploration [8]. The company has also practiced active stakeholder engagement and communication. It sponsors local cultural and sport associations and events, hires local people, and supports local services and products as much as possible. All of this has been reflected in successive polls, revealing that most of the local people in Sodankylä seem to favor the Sakatti project and mining and mineral exploration in general in the municipality [4,5,17]. According to Tuulentie et al. [5], local people have shown more trust towards the company than the municipality and mining authorities. The local community has also pressured the company to provide better economic benefits with the project. The Sodankylä municipality plans to establish a mining forum, agreement, and program, which would be the first in the EU [5,18]. The company has also been an active member of the FNSM and the MEN.

## 5. Discussion

Due to the sensitive circumstances involving uranium and PAs, both projects are opposed by the FANC, which is the most important Finnish ENGO, founded in 1938. It is an umbrella organization for several local- and province-level ENGOS. According to Eerola [19], the FANC had a pro-eminent role in the previous uranium debate (2006–2008) and in the ongoing mining debate, as exemplified by the cases examined herein.

A.A. Sakatti Mining Oy and Mawson Gold Oy have adopted strategies to adapt to the situation and to achieve SLE/SLO. Some of those strategies are active stakeholder engagement, communication, and benefit sharing, as well as the use of and communication surrounding LIMETs and their SLE/SLO strategies. In addition, both companies have planned underground mines with entrances outside of the Natura 2000 area to avoid impact on it, and AA. Sakatti Mining Oy also affirmed it would provide ecological compensation. These strategies have shown themselves to be quite effective, as they are mostly approved by local communities in both localities [4,5,7,17]. Both companies are also active in industry organizations that aim to develop responsible mining and mineral exploration opportunities in Finland.

The companies have applied for mining permits when a new mining act came into force on 1 June 2023. According to the new act, municipalities can decide if they allow mining in their territories. Based on prevailing local attitudes, support from the municipalities and communities of Sodankylä and Ylitornio for the initiation of exploitation is expected.

Both mineral deposits contain critical raw materials (CRMs) that are important for the green energy transition (Ni, Cu, and Co). Therefore, as the EU's Raw Materials Act was approved, projects might be considered as strategic ones to be included in a priority list with an accelerated permit procedure. However, their relationship with Natura 2000 areas may constrain their permit approval process, and the opposition may also be intensified. This was already shown by direct action practiced by the Extinction Rebellion, that interrupted drilling on Viiankiaapa several times in winter 2023–2024 [19] (Table 1). This was the very first time when this climate change movement expanded its activities towards mining issues.

## 6. Conclusions

Two Finnish mine and mineral exploration projects within the Natura 2000 area were examined. Both include CRMs and SRMs but are opposed due to their sensitive contexts. To adapt to a situation, both companies have adopted responsible strategies to minimize their environmental impacts and to achieve SLO.

The projects are in feasibility study, EIA elaboration, and permit application stages. Both applications will occur with a new mining act in force. Despite of opposition, the perspectives seem to be good for both and they have also gained approval from local communities. The options available for underground mines may assist in allowing permits to be approved at the EU level.

The Rompas–Rajapalot project has been the subject of a long legal battle, and Sakatti has continued to generate a high level of public debate. However, resistance towards them may increase now as the EU's Raw Materials Act was approved, and the European Commission may consider the projects to be SRM cases with accelerated permit processes.

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## References

1. European Commission. Natura 2000. 2021. Available online: [https://ec.europa.eu/environment/nature/natura2000/index\\_en.htm](https://ec.europa.eu/environment/nature/natura2000/index_en.htm) (accessed on 31 May 2023).
2. Eerola, T. Corporate conduct, commodity, and place. Ongoing mining and mineral exploration disputes in Finland and their implications for the social license to operate. *Res. Pol.* **2022**, *76*, 102568. [CrossRef]
3. Thomson, I.; Boutilier, R.G. The social license to operate. In *SME Mining and Engineering Handbook*; Darling, P., Ed.; Society for Mining, Metallurgy, and Exploration: Littleton, CO, USA, 2011; pp. 1779–1796.
4. Suopajärvi, L.; Umander, K.; Jungsberg, L. Social license to operate in the frame of social capital exploring local acceptance of mining in two rural municipalities in the European North. *Res. Pol.* **2019**, *64*, 101–498. [CrossRef]
5. Tuulentie, S.; Halseth, G.; Kietäväinen, A.; Ryser, L.; Similä, J. Local community participation in mining in Finnish Lapland and northern British Columbia, Canada—Practical applications of CSR and SLO. *Res. Pol.* **2019**, *61*, 99–107. [CrossRef]
6. Lassila, M.M. The Arctic mineral resource rush and the ontological struggle for the Viiankiaapa peatland in Sodankylä, Finland. *Globalizations* **2020**, *18*, 635–649. [CrossRef]
7. Beland-Lindahl, K.; Suopajärvi, L.; Poelzer, G.; Tulilehto, M.; Eerola, T. Factors affecting local attitudes to mineral exploration and mining: What's within the company's control? *Res. Pol.* **2023**, *84*, 103715. [CrossRef]
8. Eerola, T. New low impact mineral exploration technologies and the social license to explore: Insight from corporate websites. *Clean. Environ. Syst.* **2021**, *3*, 100059. [CrossRef]
9. Eerola, T. Territories of contention: The importance of project location in mining-related disputes in Finland from the geosystem services perspective. *Resources* **2022**, *11*, 109. [CrossRef]
10. MINLAND. Finland. 2023. Available online: <https://www.minland.eu/database/> (accessed on 7 October 2023).
11. Ministry of the Environment of Finland. Land use decisions in the future. *Publ. Minist. Environ.* **2020**, *14*, 64.
12. Mikkonen, M. Bad Administration, or Political Summer Theater? Political Styles in the Dispute over the Natura 2000 Nature Conservation Programme. Master's Thesis, University of Tampere, Department of Political Sciences, Tampere, Finland, 2001; 104p. Available online: <https://trepo.tuni.fi/bitstream/handle/10024/88749/gradu00064.pdf?sequence=1&isAllowed=y> (accessed on 26 June 2023). (In Finnish)
13. Ministry of Employment and Economy. *Guide to Exploration in Protected Areas, Sámi Homeland and the Reindeer Herding Area*; Ministry of Employment and the Economy: Helsinki, Finland, 2014; 54 s. under updating.
14. Kaivosteollisuus ry. *Guide to Mineral Exploration*; Kaivosteollisuus ry: Helsinki, Finland, 2021; 147 s; Available online: <https://www.kaivosteollisuus.fi/sites/kaivosteollisuus/files/2021-12/Malminetsintaopas%202021.pdf> (accessed on 31 May 2023). (In Finnish)
15. Kinnunen, J. Rompas-Rajapalot Gold Exploration Project. Oral Presentation at the Kaivosseminaari, Levi, 6th June 2023. Available online: [https://www.kideve.fi/wp-content/uploads/20230607\\_Rajapalot\\_esitys\\_Kaivosseminaari.pdf](https://www.kideve.fi/wp-content/uploads/20230607_Rajapalot_esitys_Kaivosseminaari.pdf) (accessed on 5 July 2023). (In Finnish)
16. Lesser, P. The road to societal trust: Implementation of Towards Sustainable Mining in Finland and Spain. *Min. Econ.* **2021**, *34*, 175–186. [CrossRef]
17. Tulilehto, M.; Suopajärvi, L. *Experienced Impacts of Mining in Sodankylä. Follow-Up Study*; University of Lapland: Rovaniemi, Finland, 2021; p. 31. Available online: <https://lauda.ulapland.fi/bitstream/handle/10024/64813/Experienced%20Impacts%20of%20Mining%20in%20Sodankyl%C3%A4.pdf?sequence=1&isAllowed=y> (accessed on 31 May 2023).
18. Kotilainen, J.M.; Peltonen, L.; Reinikainen, K. Community benefit agreements in the Nordic mining context: Local opportunities for collaboration in Sodankylä, Finland. *Res. Pol.* **2022**, *79*, 102973. [CrossRef]
19. Eerola, T. The evolution and impacts of the Finnish mining-sceptical movement from the uranium debate to the green energy transition: An environmental protest wave? *Extr. Ind. Soc.* **2024**. *in review*.

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