

## RESEARCH ESSAY

# Mineral Rights

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*Mineral Rights* consists of the long procedure of acquiring the rights on iron ore deposits underground in order to prevent them being extracted. In 2015 Lara Almarcegui procured the mineral rights of an iron deposit in Tveitvangen, not far from Oslo and later she got another iron deposit in Buchkogel and Thal, near Graz. The mineral rights are exclusive and mineral rights are granted from the subsoil to the center of the earth. Without extracting the iron, the project aims to call attention to the presence of minerals. It reminds us of how the territory is shaped at a geological level and how it is broken down and split into pieces for mine exploitation. While presenting what is below the feet in our contemporary cities and who owns it, the project raises the question of mineral extraction for the production of construction materials and it brings to light questions on land ownership and resources ownership.

## Tveitvangen, Norway

In March 2015 Lara Almarcegui acquired the mineral rights to the Tveitvangen iron ore deposits. The mineral rights extend over an area of one square kilometer, and reach from the subsoil down to the center of the earth.

The magnetite iron ore in the Romerike hills was first discovered in 1600, by German and Swedish prospectors. The magnetite was deposited about 270 million years ago, when quartz precipitated between much older wall rocks, forming veins. The veins traverse layers of gneiss rock that are more than one billion years old.

The forest contains some marshy areas. But most of the terrain is a moraine: material transported and deposited by glaciers.



**Figures 1–4:** Tveitvangen, *Mineral rights*. Credits: Lara Almarcegui.



**Figures 5–8:** Teitvangen, *Mineral rights*. Credits: Lara Almarcegui.

There were some iron and copper mines in the area: Tveitvangen, Myrgruva, Smedstadgruva, Dalsgruva, Mårråtjernfeltet, Kjærstadvangen, Årstadvangen and Trollsnes. The mineshafts run along the north-south axis, following the orientation of the fractures. Ore was extracted by burning timber in the tunnels to heat the rock and then cooling it with water until it cracked. Some shafts reached 120 meters in depth. The mines were closed in 1820, when the owner went bankrupt. Further exploration measured a 60% iron content in the ore. The mines changed hands several times. But later tests determined that iron extraction would not be profitable and mining was never resumed.

In 1960, the Gjerdrum Municipality acquired the ground, incorporating it into 12,000 hectares of forest commons. The state remains the owner of the metal ores beneath, including chromium, manganese, molybdenum, niobium, vanadium, iron, nickel, copper, zinc, silver, gold, cobalt, lead, platinum, tin, zirconium, tungsten, uranium, cadmium, thorium, titanium, arsenic and pyrite.

A mineral exploration permit grants exclusive rights to search for specific minerals, for a period of up to 9 years. Once exploration has concluded, a report must be submitted to the state, with geophysical measurements, geological surveys, geochemical sampling, geochemical anomaly charts, accounts of rock exposures and diamond drill holes. An exploration permit does not allow mining.

### **Thal and Buchkogel, Graz**

In the autumn of 2015, the Austrian Ministry of Science, Research and Economy granted Lara Almarcegui a mineral exploration license for the Thal and Buchkogel iron deposits. An exploration license is valid for up to 9 years, and gives the holder the exclusive right to prospect and claim minerals in a designated area. All the way down to the center of the earth.

The Thal iron deposit is located some meters north of the Thal church, on the Kirchberg mountain. There are still traces of the Ursula mining concession, which was claimed in 1881 by Albert Miller von Hauenfels, a retired geology professor. Limonite iron ore was extracted from two open pits and three tunnels, in the form of lump ore, brown ore-bearing earth, and yellow soil.

Most of the mineral was delivered to the Reininghaus paint factory in nearby Gösting, where it was ground to brown pigments or roasted to a red color, while the most delicate and bright batches were used to produce yellow satin ochre. A total of 8,500 tons of mineral was extracted until the mine appeared to have been exhausted in 1942.

The Buchkogel iron deposit is located under a plateau covered with beech trees on the Buchkogel mountain, in a restricted military area. It is traversed by the Platbusch tunnel – a 10 km long underpass on the A9 highway, used by more than 30,000 cars daily.





**Figures 9–12:** Graz, *Mineral rights*. Credits: Lara Almarcegui.



**Figures 13–16:** Graz, *Mineral rights*. Credits: Lara Almarcegui.

The deposit consists of limonite, formed through the weathering of Devonian limestone, 419 to 358 million years ago. The deposit was heavily mined during the Second World War. The iron ore was extracted at a rate of 5 tons a day. A conveyor system was used to transport the mineral downhill, where it would travel further by rail. Most of it destined for blast furnaces.

A total of 196,000 tons of material was excavated.

### Competing Interests

The author has no competing interests to declare.

### Author Information

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