Anglo American und Kupfer Copper Germany

Anglo American's Kupfer Copper Germany GMBH (KCG) is exploring for deep-seated copper deposits in the Permian copper shale in the Löwenstern project in southwestern Thuringia.

Content

Preliminary

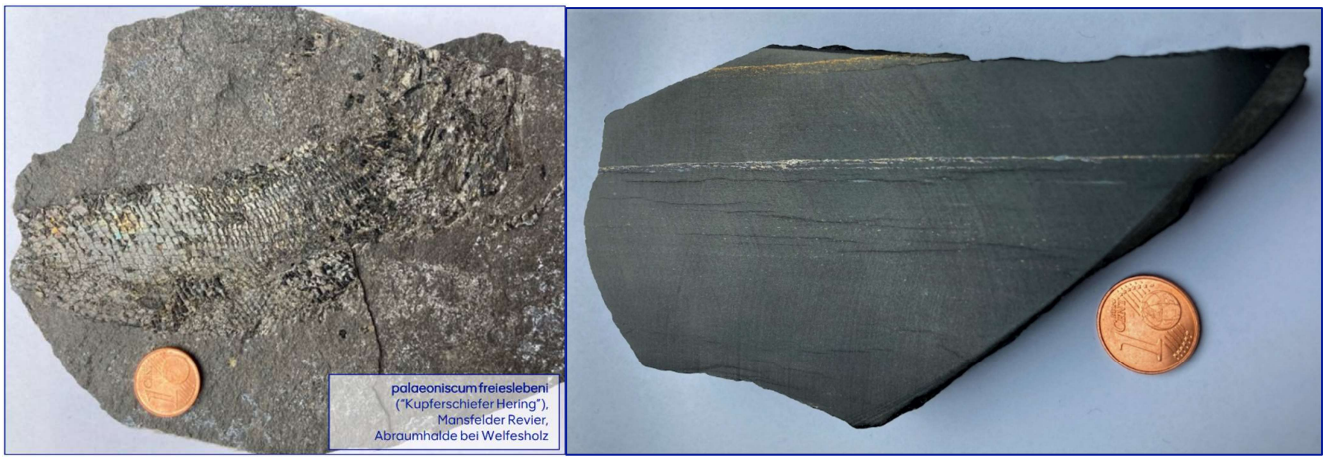
The geoscientific investigations have been underway since spring 2021, initially airborne gravimetric and magnetometric investigations were carried out using an aircraft. These were subsequently supplemented by ground-based vibroseismic measurements. The subsurface was seismically surveyed in detail along five lines using 30 t vibroseis vehicles. The evaluation of these methods has narrowed down target areas for initial drilling. Only through such exploratory drilling can a detailed assessment of the existing rocks and their potential metal guidance be made.

Current status of the project

Drillsite with drilling rig for exploring the copper shale near Unterkatz, southern Thuringia

Since the beginning of 2022, seven holes have been drilled to a depth of up to 800 m in the project area. In several boreholes, relevant and typical copper-silver or lead-zinc concentrations were found in the copper shale and surrounding rocks. In order to further investigate the distribution of metals and the geology, further drilling is planned for 2025 and beyond. Anglo American and Kupfer Copper Germany are investing a further 5 million euros in the project in southwestern Thuringia.

So far, KCG are still in the preliminary stages of investigating if an economic deposit that would be feasible to extract exists within the Löwenstern project.

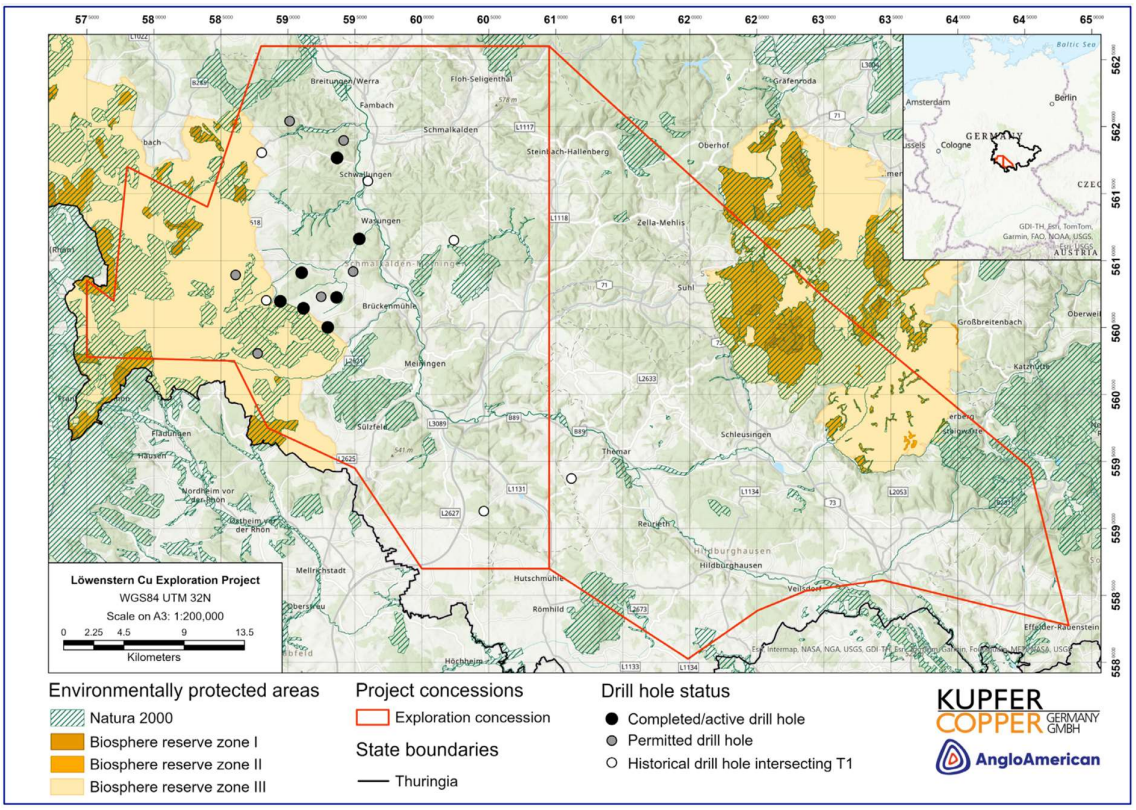


Copper shale rock with fish fossil (left) and ore guide (right)

Impressions from the current drilling campaign. On the left the copper shale directly out of the borehole, on the right steel pipes with drill rig in the background.

The Copper shale is not actually a shale in the geological sense, but rather a black clay-/marlstone that was deposited on the bottom of an oxygen-depleted sea 258 million years ago. Only after being deposited in the sea this layer came into contact with hot brines in some places, which brought with it the metals KCG is now looking for, such as copper or silver. As the copper shale contains a lot of natural carbon and has low permeability, the metals were able to precipitate from the hot brines especially in this layer.

Exploratory drilling – environmental considerations



Map of Werra 1 and Werra 2 exploration licenses, boreholes and protected areas

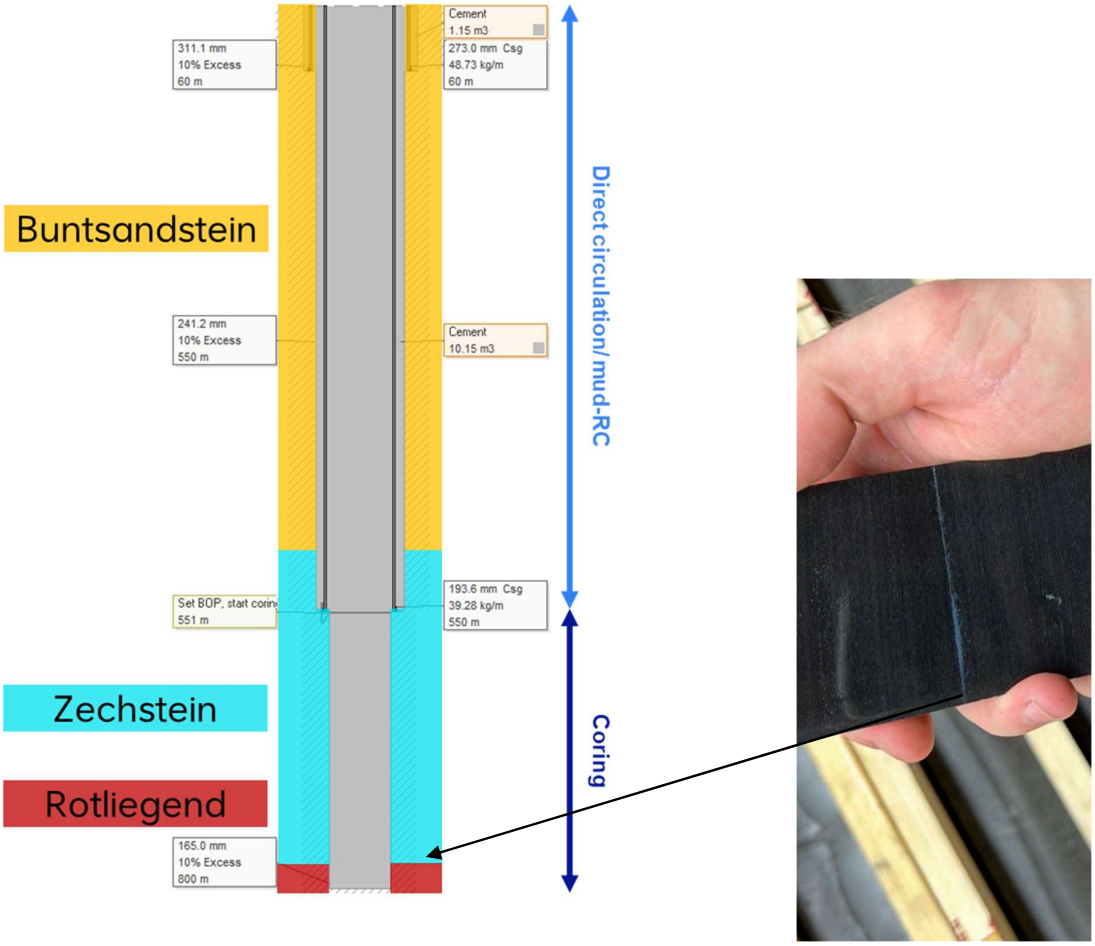
For Anglo American and Kupfer Copper Germany, the focus of the drilling is on consistent compliance with all emission control and environmental requirements. The locations of the boreholes are located on arable land used for agriculture where possible, in order to exclude the ecologically particularly sensitive areas (e.g. Natura 2000, FFH areas). Already during the construction of the drilling site, the surface layers of the natural topsoil and subsoil are removed separately, so that they are reinstalled after drilling in the same way as originally. In this way, the interventions will be professionally dismantled after temporary use, the borehole will be closed and the land used will be made available for agricultural use again (see series of pictures below). The owners and managers of the claimed areas are compensated for their provision and crop losses.

During drilling, the drilling site is protected against leaks and accidents several times by various systems. In addition to water, the additives used in the drilling fluid are cellulose or magnesium-based and do not pose a hazard to the environment. Different expansion stages and piping always consistently protect the groundwater and prevent the mixing of different aquifers. Environmental monitoring ensures that environmental changes are accurately recorded in soil and water samples before, during and after drilling where possible. The hydraulic drilling rig also has a low

noise level, so the noise limits at surrounding settlements are complied with and the residents are protected.

During the ongoing drilling, these and other environmental parameters are regularly checked by the licensing authorities.

Renaturation of the drill site, drilling rig in operation near Unterkatz in May 2023 (left) and the renaturated arable land after the drilling in October 2024 (right)



Planned well design, the Copper shale is located at the bottom of the Zechstein

KCG's collaboration with local communities

Cooperation with the local communities takes place in close dialog with the residents. Since the end of 2021, 13 townhall meetings have been held at various locations for residents, where all matters arising in connection with the Löwenstern exploration project were discussed. These events were mostly in connection with drilling near the respective communities. These townhall meetings are very important for KCG to create an opportunity for open communication and discussion for all interested parties.

In the current exploration phase, Kupfer Copper Germany is creating local revenue for regional / nationwide service providers. Millions are being invested in the current exploration activities, which is leading to an increase in orders for our partners. These partners include Terra Montan from Suhl, Anger's Söhne from Hessisch-Lichtenau and Große Bau from Breitenworbis. KCG and our partners use local services such as hotels, restaurants and stores frequently.

Kupfer Copper Germany is involved in maintaining/building sports facilities and playgrounds in the project area through social contributions and donations. Also KCG supports local clubs and events and is making improvements to the (road) infrastructure.

In a possible later construction/development phase of the operation, jobs will be created on a large scale, major capital investments will be made for service providers and the local infrastructure will be fundamentally modernized. This can contribute to an economic upswing for the entire region, as local services such as hotels, restaurants and stores will also be used on a large scale.

When active mining begins, highly qualified jobs will be created in rural areas over a long period of time. The operation will also generate significant taxes in the local communities. Fundamentally, the region will experience an increase in population and thus local companies will also benefit from a sustainable increase in customers.

Future prospects

In the coming months, drilling will take place near Helmershausen in the Rhön, among other places. If copper-silver is also encountered in relevant quantities in these next holes, systematic drilling will follow to test the dimensions of the deposit.

For a possible operation of a potential copper mine in the southwest of Thuringia, minimally invasive methods and the highest environmental standards are of course used. Active mining would not commence for 10-15 years at the earliest due to the current early phase of this project and complex planning and permitting processes. The preferred mining method would then be underground mining, where shafts and tunnels are dug into the earth. In this way, the approx. 2 m thick ore seam could be broken out of the rock at a depth of approx. 500 m – 750 m. This mining method is environmentally and area-friendly, as no open-cast mining is created. Nowadays, the shaft can also be built underground, which also has less effect on visual impact on the surface. A good example of minimally invasive modern mining (FutureSmart Mining™) is the Woodsmith polyhalite project in England, also operated by Anglo American. There, the superficial geology is very similar to the Löwenstern project.

Planning stages of Anglo American's Woodsmith Polyhalite Project. The visible effects are limited (left), and winding towers are also underground (right)

The processing plants needed for a potential copper shale mine are different than for a polyhalite mine. Therefore, the Woodsmith project can give an initial idea of how the modern mining methods reduce the impact on area and the view of the landscape. Before the detailed planning of the necessary shaft and processing plants in the Löwenstern project, the possible resource and the processing technology must be clearly defined. This step will take more time. Also, the processing and mining techniques will develop in the next years, further reducing the impacts on the local communities and environment.

Anglo American and Kupfer Copper Germany are committed to an open dialogue and the involvement of local and regional stakeholders. Contact us for any questions, inquiries and more information. This is possible either in the contact form (below) or directly under kcg@angloamerican.com.