

Germany field trip

Over the duration of eight days from 27th of September to 4th of October the Student Chapter visited multiple underground and open pit mining operations spread over the whole of Germany.

On the first day the anhydrite underground mine in Hüttenheim – located 30 km south east of Würzburg – associated with Knauf was visited. This pit with an adit length of roughly 130 km is extended via blasting the anhydrite over an area of 6m*4m with an advance of 3m every blast. During this process pillars with the dimensions of 6m*10m*4m are left standing ensuring the structural stability and creating a loss of 30%. Of the total thickness of 8m only the lower half is mined due to the fact that the upper 4m are too polluted and thus below the cut off grade of 80% anhydrite. The LOM is estimated to be 120 years on the currently approved resources.

The following day, September 28th, the potash mine Merkers of K+S situated near the border of Thüringen and Hessen was visited. In this underground mine with a total area twice the size of Munich the potash – deposited in two layers called Thüringen und Hessen – is also mined by room and pillar mining reaching quantities equaling 80,000 t per day with a cut off grade of 18%. In comparison to Hüttenheim, the pillars equal 75% of the total available Volume. Successive to the mine the processing plant in Unterbreizbach was toured combined with a talk on the processing of potash followed by a talk on environmental safety programs of K+S. The processing of the potash is done by leaching, flotation and through the ESTA-Process. For leaching the mined salt is put into 110°C hot water, dissolving the KCl in the process whilst the NaCl won't dissolve. Following this the solution is cooled down to 95°C and thus precipitating the dissolved Potash. For the flotation the salt is put into water and mixed with an agent which binds to the potash and creates a foam containing the KCl. This foam is decanted and the potash is separated afterwards. In the ESTA-Process the KCl is separated from the salt by electrostatically charging it.

On the September the 29th the mines Grube Samson and Grube Roter Bär – two mines closed in the 1930's - near St. Andreasberg in the Harz were visited. These Underground mines are part of several mines in a local isolated area in devonian host rocks containing approximately 20 dykes consisting of silver minerals, zeolite and calcite with a total silver content of 0.1-0.4%. In the Grube Samson a total of 320-350 t of silver were mined whereas in the Grube Roter Bär iron was mined. All the mines in the district are interconnected and reach a maximum depth of 810m.

The Following two days were spent in the area around Osnabrück during which time two quarries and several smaller stops on historic local mining were made. The first quarry close to the town of Ueffeln is used to produce gravel out of metamorphical overprinted claystone needed for the subbase in road construction whereas the second quarry – the Piesberg – a former coal mine today is used to mine sandstone.

On October the 2nd the Rhenish lignite-mining area situated northwest of Cologne was visited where the softcoal is mined by RWE. First a talk on the geochemical analysis of the brown coal to avoid the accumulation of slag during combustion was heard followed by a tour around the open pit mine *Garzweiler*. The annual production is located at around 100.000.000 tons and is obtained from the three layers *Garzweiler*, *Frimmersdorf* und *Morcken* (top to bottom). The calorific value of the coal increases with increasing depth. The coal of layer *Garzweiler* has a value of roughly 7 kJ, while the coal is at about 8.5 to 8.6 MJ per kg.

In the evening of the same day, the lead mine *Günnersdorf* in the town *Mechernich* was visited which used to mine the largest lead ore body in the whole of Europe.

On the last two days several stops were made in the Eifel including one on the mining of tuff in the roman age.

Special thanks goes to Apl. Prof. Dr.sc.nat. habil. Hans Albert Gilg for organizing the visit to the numerous pits and mines.