

Nuclear energy / uranium mining

Keywords

- > Uranium extraction
- > Nuclear waste storage
- > Tailings

Location and site description

The Kremikovci region (which includes the villages Seslavci, Buhovo, Kremkovci, and Yana) is located at the base of Stara Planina Mountain in Bulgaria. The uranium mines and extraction facilities closed down after 1992, but serious environmental, social and health problems persist. Buhovo is one of the sites in the Kremikovci region, about 22 kilometres (14 miles) from the capital city Sofia.

Buhovo is known as the first uranium extraction site in Bulgaria, established right after WWII. While locals were initially involved in agriculture, the gradual integration to the bigger city of Sofia, uranium ore extraction, and creation of the largest steel factory in the country transformed the town into a symbol of pollution among industry workers. Men were employed in extraction work until the 1970s, when ore was exhausted, after which most people began working at the “Kremikovtzi” Industrial Complex. Employment opportunities attracted thousands of workers from all over the country, creating population flow and temporary migration for several decades.

Brief history of uranium mining in Bulgaria

Uranium extraction in Bulgaria dates to 1946 and was developed in 48 locations. In the period between 1958 and 1975, in Buhovo and Eleshnitsa, two plants were built for uranium processing and production of uranium concentrate (U3O8). In 1992, the Bulgarian government decided to terminate uranium mining, stating it was uncompetitive and harmful to the environment. In most post-mining areas, where mine closure and site re-cultivation has been finalised, environmental conditions have actually worsened. The Kremikovci region is one area where this is easily observable.



Waste rock pile located right behind a fourteenth-century monastery promoted as a tourist site.

Source: CRIIRAD/Za Zemiata

The uranium industry liquidation process: environmental, social and health problems

Initially, the government aimed to finalise the liquidation of the uranium industry within three years, in 1995. A legitimate plan on closing the mine and producing uranium derivatives and concentrates was elaborated.

Buhovo is where the uranium processing plant was situated, and one of the two sites in Bulgaria where a tailings pond was built. After several rehabilitation projects—two of which were financed by EU Phare funding—the ponds are still uncovered. Moreover, in March 2006, the reinforced wall of the pond collapsed, placing the waters in the entire region under the threat of radioactive pollution.

According to documentation provided by the Ministry of Economy and Energy, one of the mine closure activities is maintaining the tailings pond in pre-liquidation state in the period 1998-2006. While this is a highly inefficient and suspicious strategic decision, there are also no plans for the final closure of the pond to eliminate its negative environmental and human health impacts.

The history of the pond dates to 1956, when there was no pond and the highly radioactive wastewaters from the uranium enrichment process were discharged directly into the environment. As a result, the heavy fraction settled into the soil while the liquid fraction was





*The Kremikovci region is known as one of the most polluted places in Bulgaria.
Source: CRIIRAD/Za Zemiata*

carried away to the local Buhovska River, which is an indirect tributary of the longest river in Bulgaria—Iskar—thereby spreading the pollution over a very large area.

Two ponds were built to meet the needs of the processing plant. The waste stored in the ponds has a complex composition of an inert mass, uranium and thorium radionuclide, plumb, zinc, arsenic, copper and other heavy metals, sulphates, carbonates, nitrates and metal salts. At the time of their construction, the bottoms of the ponds were not sealed with a hydro isolation layer; consequently, all radioactive and polluting substances seeped into the groundwater. While there used to be warning signs around the ponds, these have been long removed or stolen. Fences that once prevented people and livestock from entering the pond have also been removed. One of the ponds is dry and there are no aquifers or surface waters in its vicinity. The second pond seems practically eternal. It stores wastes from radioactive ore processing, including uranium isotopes 238 and 235 that have a very long half-life. There are two aquifers at the bottom of the pond, and it is fed by incoming surface waters. As a result, polluted water accumulates in the pond, while its capacity to hold water is limited. If measures to drain and close the pond are not taken, sooner or later it will overflow and runoff will rush to the downstream villages, leaving the region radioactively polluted and the

population exposed to high levels of radiation, causing serious environmental and health risks.

Almost all of the 120 adits of the mines are open, although they were once sealed. The adits are easily accessed, and waste metals left behind in the mines were stolen and sold for scrap.

The waste piles in the region have not been re-cultivated, and the accumulated mass is being exposed to atmospheric weathering, which causes radiation to spread in the nearby areas. In addition, the on-site monitoring system no longer functions since parts of it were stolen.

Health studies

The National Centre for Protection from Radiation assessed the risk exposure to carcinogenic diseases the local population. There are reports available for 2003, 2004 and 2005. The monitoring data are identical for the three consequent years, showing a higher risk of gastrointestinal cancer in settlements exposed to high and relatively high radiation compared to the control village. Mortality in the two locations is higher compared to the control village, although not very different from mortality figures for Bulgaria. The standardised mortality from lung cancer for the two settlements is higher compared to the control village and Bulgaria.



Seslavci waste rock pile. Measurement shows powerful radioactive source reaching the end of the scale of the dosimeter.

Source: Za Zemiata



Mine adit near Kremkovci. The entrance has been opened by people looking for scrap metals. For some Romani people, this is dangerous source of income.

Source: Za Zemiata

Lifestyle changes

By the 1980s, ore had been depleted and some factories closed down. In compensation, production increased at the steel factory that employed thousands of workers.

In 1989, production went into decline with the collapse of socialism and privatisation of the steel factory. Production inefficiencies led to closing down most of the factories, and as a result of growing unemployment, most of the population emigrated. Currently, although the population is one-third of what it used to be, unemployment rates are still high compared to 0 percent unemployment in the 1970s and 1980s.

The conflict

From 1982-1986 (before the Chernobyl accident), people protested individually and complained to mass media outlets. Conflicts regarding uranium ore mining also arose, as it impeded agricultural production and linked to deforestation. The landscape changed, which obstructed the movement of livestock. Some gardens were destroyed. The mortality rate increased among miners, who also experienced higher health risks. Although radiation issues were not debated publicly, residents in regions where the geo-technological method was employed witnessed the use of acids and filed a series of related complaints. Because Bulgaria was a socialist state, protest demonstrations were not organised.

After the 1986 Chernobyl accident, problems related to radiation pollution—especially its relation to water and food—began to be discussed more publicly. A new legislation was passed to distribute individual dosimeters, but this was never actually realised. The first rallies and demonstrations were related to uranium mining practices. Public demands included limiting tailing pond capacity and making uranium

transportation safe, unlike it had been previously.

The political changes in 1989 saw the organisation of a large protest march from Buhovo to Yana, which aimed to address the whole ecological situation in the region. It should also be mentioned that the Kremikovci region is polluted by emissions from the Kremikovci steel complex. After 1992, the protest movement mainly demanded the re-cultivation of the mines and polluted zones.

Current situation of the conflict

Measurements taken in 2011 during a fact-finding mission by the EJOLT team showed that there are still non-liquidated sources of pollution in the region—up to ten times over the norm in certain places, while water coming out of the mines is still contaminated as well. These pose a serious health risk for both the local population, and the tourists that visit the region. During one experimental measurement of radiation in the vicinity of the school at Buhovo, ground contamination was found to be five times over normal gamma radiation levels in certain places. This was followed by a media campaign, informing all local and national authorities. The area was quarantined and entering or leaving it was banned. An investigation was started and the Ministry of Environment and Water published a policy note, ordering the Sofia municipality to clean the region with municipality funds. . The deadline for the clean-up was September 2012. The Sofia Municipality has not taken any action as ordered in the policy note. Za Zemiata together with the citizen's initiative committee is following up with media pressure and letters of notice to the responsible institutions. Local citizens and the school are frustrated, as the image of the school has become intensely negative. The locals are disillusioned and have lost faith in the authorities.

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In some cases, liquidating the uranium mine and re-cultivating the excavated ore-containing rock is difficult and requires a large amount of funds. The Seslavci waste rock pile, for instance, remains close to Seslavci monastery.

Although long-term funding has been secured for projects to re-cultivate polluted areas (including EU-funded projects), the situation in the region had not changed much. Two water purification plants were built, but failed to remedy the situation. Tests conducted by two independent labs (one organised by EJOLT) in 2011 show that contrary to governmental expectations, the radioactivity in the water is not decreasing at predicted rates.

In conclusion, it may be argued that although Bulgaria has reported to the EU that uranium mining has ended, the current situation in the region indicates that the contaminated areas have not yet been fully re-cultivated. The local population still suffers from a lack of solutions to the pollution problems.

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