



Federal Ministry  
for the Environment, Nature Conservation  
and Nuclear Safety

Umwelt  
Bundesamt

---

## Feasibility study on the safety of Tailing Management Facilities (TMFs) in Kyrgyzstan

*(updated November 2020)*

---



Lower flotation tailings management facility of the Altynken mine

(Source: State Committee of Industry, Energy and Subsoil Use of the Kyrgyz Republic)

---

## Summary

---

Over the past years, the problem of environmental protection and sustainable development continues to occupy one of the first places in the list of

*This project was financed by the German Federal Environment Ministry's Advisory Assistance Programme (AAP) for environmental protection in the countries of Central and Eastern Europe, the Caucasus and Central Asia and other countries neighboring the European Union. It was supervised by the German Environment Agency (UBA).*



global priorities of the international community. At the same time, mineral production is expected to skyrocket in the coming decades, including a corresponding increase in the number of TMFs, as smart and advanced technologies will spike demand for certain metals and gold. Thus, society may also face a growing risk of TMFs failures, with potential casualties and environmental damage, if the safety of TMFs is not adequately ensured, i.e. in line with strict requirements and respective measures that consider climate change.

The management of the safety of TMFs remains a huge problem worldwide, which regularly leads to major disasters. Such accidents have in the past also occurred in the Kyrgyz Republic.

The 1958 Mailuu-Suu tailings dam failure in the industrial town of Mailuu-Suu, Jalal-Abad Region, southern Kyrgyzstan, caused the uncontrolled release of 600,000 cubic metres of radioactive waste. The event caused several direct casualties and widespread environmental damage. About 50% of the entire volume of the content of the dam flowed into the Mailuu-Suu River, which is located only 30 metres downhill from the breach. The waste then spread about 40 kilometres downstream across the national border into the heavily populated Fergana Valley in Uzbekistan.

In 1964, during the accident in TMF No. 2 in the area of Ak-Tuz village in Kyrgyzstan 1.5 million cubic meters of radioactive tailings contaminated the transboundary Kichi-Kemin river and the lower part of the Kichi-Kemin valley with thorium, lead, copper, zinc, beryllium and other heavy metals.

In the Kyrgyz Republic all mining enterprises are classified as hazardous production facilities, of which TMFs are the most hazardous to the environment.

Nowadays the development of deposits of various minerals makes a significant contribution to the economic development of the Kyrgyz Republic. Many mines and other facilities in Kyrgyzstan are located within settlements respectively in the basins of the transboundary rivers.

In the past, when designing TMFs, the long-term measures to protect the facilities from hazardous natural processes as well as measures to protect the population, were not envisaged. Also, there is a high probability that a TMF accident could cause transboundary pollution to neighbouring countries.

Therefore, it is important to strengthen the safety of TMFs in Kyrgyzstan in order to prevent the accidental release of hazardous substances into the environment and to limit the risk to the population which may be affected.



Within the framework of former projects of the German Environment Agency (UBA), a TMF-Methodology and TRI-Methodology were developed to support TMF safety. These methodologies comprise an index-based evaluation of the hazard potential, the so-called Tailings Hazard Index (THI) and the so-called Tailings Risk Index (TRI) which assesses hazard and risk for the potentially affected population and environment. These methodologies were used for the preliminary prioritisation of more than 50 TMFs which are located in Kyrgyzstan. A preliminary TMF inventory was developed for Kyrgyzstan based on open access data and official national information. This inventory includes basic data and THI and TRI assessments for each identified TMF. The created database will be used as a tool for updating the cadastre system of TMFs in Kyrgyzstan. The outcomes of the Kyrgyzstan TMF project provide easy to use online and offline maps that help to identify the most dangerous transboundary TMFs in order to improve the cross-border emergency measures in case of a TMF failure.

As part of the project, an analysis of the regulatory and legal framework has been carried out in order to determine the responsibilities of relevant authorities regarding monitoring the status and safety of TMFs. To discuss optimization options and to identify existing problems, a Round Table had been organised, which was attended by representatives of government agencies, NGOs and operators of several TMFs. Based on the discussion, the responsible authorities and ministries decided on the optimal approach regarding the application of the TMF methodology and discussed which opportunities exist for the sustainable transfer of this knowledge to the administrative authorities of Kyrgyzstan.

**Based on the discussions during the Round Table these main conclusions and recommendations were made:**

1. To form a working group for the purpose of improving the safety of TMFs, which will have comprehensive information on all TMFs.
2. To finish the inventory of all TMFs in Kirgizstan according to up to date information,
3. To include THI and TRI in the general information about TMFs.
4. Consider upgrading the existing Cadastre (Register) of TMFs and to define the working group as responsible for the regular updating and maintenance of the register in a uniform form.



5. To analyse the sufficiency of measures taken to improve the safety of TMFs in Kyrgyzstan, including in terms of preventing transboundary industrial accidents, and supplement them if necessary.
6. To support efforts in improving the safety of TMFs by implementing the planned project in 2021 to provide advisory assistance and to conduct training on the basis of the Checklist, THI and TRI methodologies and to take steps for sustainable implementation of these procedures in Kyrgyzstan.
7. To improve the THI methodology further by considering the specifics of recultivated TMFs of Kyrgyzstan.
8. To improve the TRI methodology further by taking into account land use planning aspects.

Based on the recommendations which were made during the Round Table, a list of services was made, which considers the specific needs of Kyrgyzstan. To implement this list of services, it is planned to launch a follow-up project on trainings regarding the safety of tailings management facilities in Kyrgyzstan. The project will build on the results of the project “Feasibility study on the safety of Tailing Management Facilities in Kyrgyzstan”. It will directly utilize the TRI and THI methodologies, which have been developed during other UBA projects in the past. The project will also contribute to upgrading an existing Cadastre (Register) of TMFs and adapting the THI and TRI methodologies to improve TMF safety, to the operating conditions of TMFs operators on the territory of Kyrgyzstan, as well as the requirements of regulatory and supervisory bodies and local authorities, with subsequent implementation into practice.

### **The project will accomplish the following main activities:**

1. promoting and further developing the TMF checklist method, based on the UNECE “Safety Guidelines and Good Practices for TMFs”, to evaluate TMF safety and to recommend measures to improve safety conditions of TMFs in capacity building on TMF safety issues in Kyrgyzstan;
2. organising a national training for trainers (TMF operators, environmental inspectors and competent authority experts) to deepen their knowledge on TMF management and to pass the acquired knowledge onto their staff.
3. providing recommendations for the development of a national training program.



4. improving further the THI and TRI methodology by taking land use planning aspects into account.
5. finalise the inventory of TMFs in Kyrgyzstan and contribute to upgrading of an existing cadastre system.

The follow-up project will help to provide the adaptation and further sustainable use of the TMF checklist, THI and TRI methodologies, which have been developed within the previous UBA projects. It will also strengthen the technical and the management capacity at the concerned facilities and responsible authorities. The planned activities will help to improve cooperation among competent authorities at the national and regional levels and between competent authorities and operators of TMFs. The other goals of the project will be to enhance an existing Cadastre (Register) of TMFs, as well as transboundary emergency preparedness and cooperation between potentially affected neighbouring countries, competent authorities and operators in Kyrgyzstan in case of an accident with transboundary effects.