

# UNECE's work on mine tailings safety in the UNECE region & beyond

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ICOLD 2023 – 91<sup>st</sup> Annual Meeting (Gothenburg, Sweden, 9-15 June 2023)

Short Course 4: Fundamental Tailings Dam Safety & ICOLD Bulletin 194 (Gothenburg and online, 14 June 2023)

# United Nations Economic Commission for Europe

As a regional commission with global reach UNECE offers:

- Global frameworks to address sustainable mineral resources governance
  - ⇒ **Classification and Reporting of Resources (UNFC)**
  - ⇒ **Resource Management System (UNRMS)**
- Legal instruments to strengthen mine tailings safety and reduce risk of water pollution
  - ⇒ **Industrial Accidents Convention (42 Parties)**
  - ⇒ **Water Convention (global; 47 Parties, plus ~20 in accession process)**
- Assessments and recommendations to improve environmental policies
  - ⇒ **Environmental Performance Reviews (incl. beyond the UNECE region, e.g. EPR for Mongolia)**



# UNECE Convention on the Transboundary Effects of Industrial Accidents

- **Adopted in 1992, in force since 2000**
- **42 Parties** in the UNECE region
- Designed to protect **people and the environment** against industrial accidents
- Focus on **transboundary cooperation**
- Active international cooperation between Parties before, during and after an accident
- Covers **mine tailings** and **NATECH** (natural-hazard triggered technological) **events**



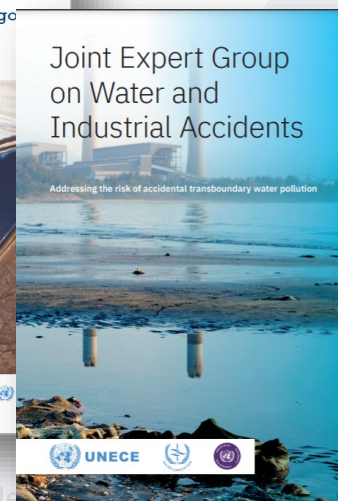
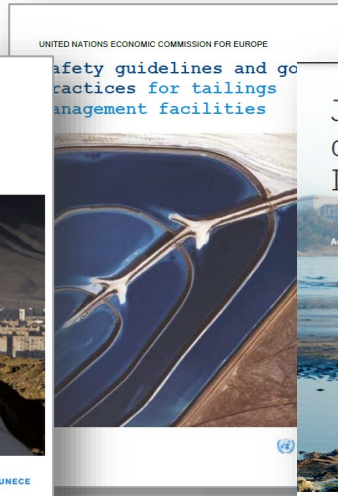
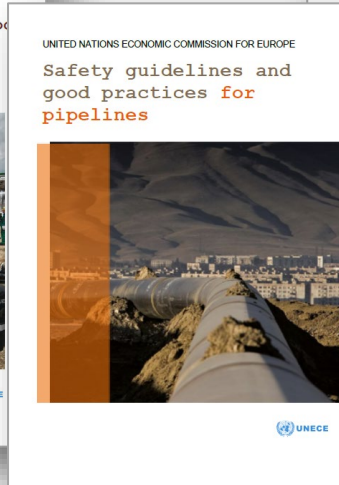
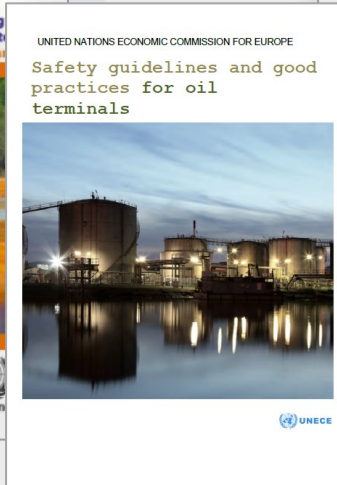
# Joint Expert Group on Water and Industrial Accidents (JEG)

UNECE Water Convention

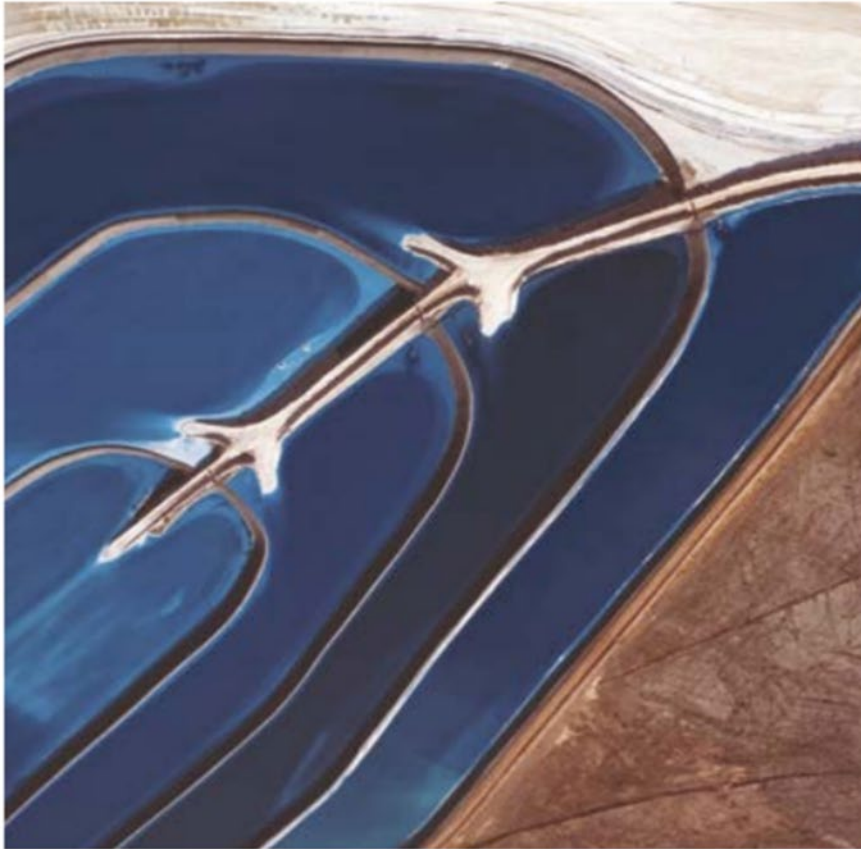
UNECE Industrial Accidents Convention

JEG

- Established in 1998
- Focus on prevention of accidental water pollution and its consequences
- Linking integrated water resources management to industrial safety



## Safety guidelines and good practices for tailings management facilities



- Developed by the Joint Expert Group on Water and Industrial Accidents (JEG)
- Endorsed at Industrial Accidents Convention CoP-5 (2008) and Water Convention MoP-5 (2009)
- Aim to reduce frequency and severity of TMF failures
- Provides safety principles and recommendations for:
  - Governments
  - Competent authorities
  - TMF operators
- Applies life-cycle approach and includes aspects related to:
  - Pre-construction and construction
  - Operation and management
  - Facility inspections
  - Identification, assessment, management of abandoned sites
  - Emergency planning



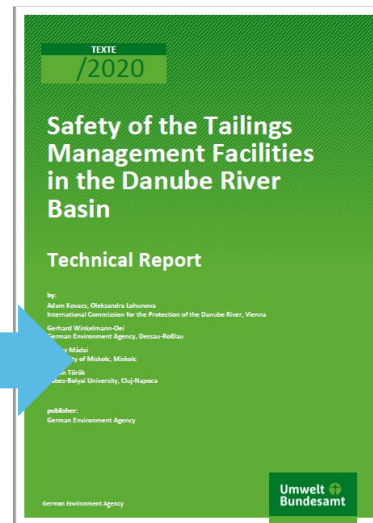
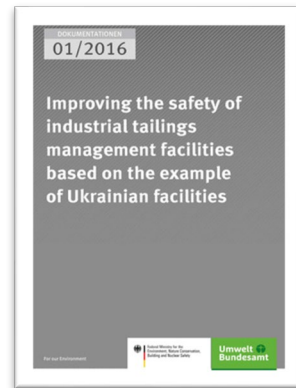
**To support countries in the practical application of the guidelines, a related methodology was developed**

# UNECE Safety Guidelines and Good Practices for TMFs and a related [Methodology](#)



## Tailings Hazard/Risk Index (THI/TRI) Method

- Ranking TMFs according to their hazard/risk
- Basic data needed (volume, toxicity...)

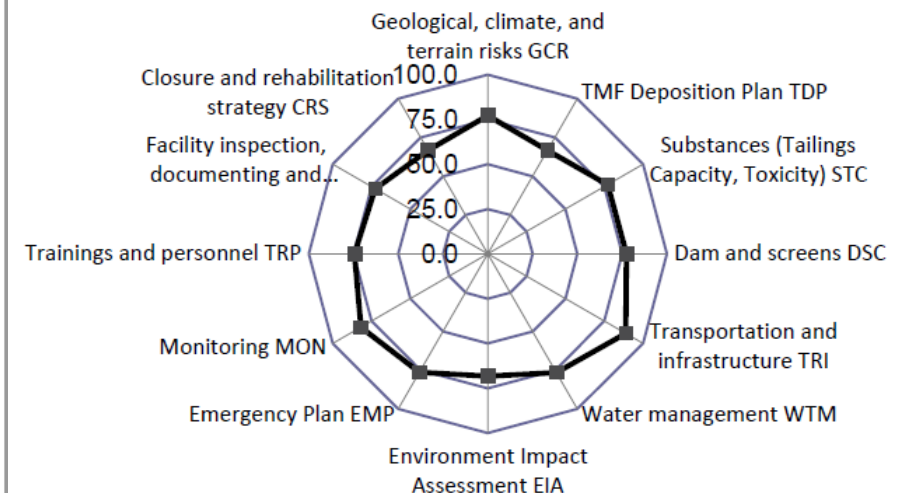


Updated in 2020

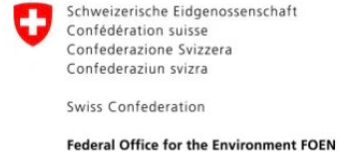
## TMF Checklist

- Questionnaire
- Evaluation Matrix for the TMF safety level

## Measure Catalogue



# Projects to strengthen the safety of tailings and prevent accidental water pollution



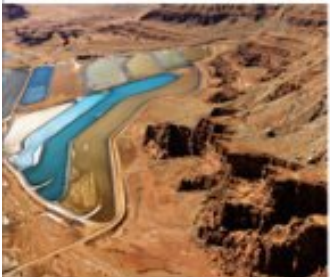
ЕВРОПЕЙСКАЯ ЭКОНОМИЧЕСКАЯ КОМИССИЯ ООН  
Проект по укреплению безопасности горнодобывающих операций, в частности хвостохранилищ, в Казахстане и за его пределами в Центральной Азии



ЕВРОПЕЙСКАЯ ЭКОНОМИЧЕСКАЯ КОМИССИЯ ООН  
Проект по укреплению безопасности горнодобывающих операций, в частности хвостохранилищ, в Таджикистане и Центральной Азии



ЕВРОПЕЙСКАЯ ЭКОНОМИЧЕСКАЯ КОМИССИЯ ООН  
Проект по оказанию поддержки странам Центральной Азии по укреплению безопасности хвостохранилищ



ЕВРОПЕЙСКАЯ ЭКОНОМИЧЕСКАЯ КОМИССИЯ ООН  
Проект по усилению безопасности хвостохранилищ и предотвращению аварийного загрязнения воды в Узбекистане и за его пределами в Центральной Азии

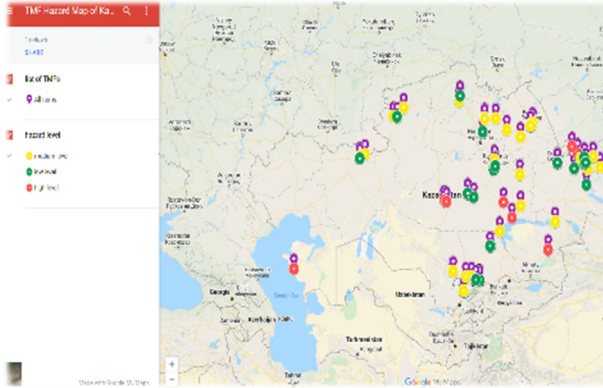


- ✓ UNECE Projects on Strengthening the Safety of Mine Tailings Facilities in [Kazakhstan](#) (2018-19), [Tajikistan](#) (2019-21), [Uzbekistan](#) (since 2021) and [Central Asia](#) (2020-23)
- ✓ Projects under the auspices of the German Environment Agency (UBA) to improve tailings safety in [Ukraine](#) (2013-15&2016-17), the [Caucasus](#) (2016-17&2017-19) and [Kyrgyzstan](#) (2020-21)
- ✓ ICPDR/UBA Project to improve safety conditions of tailings management facilities in the [Danube River Basin](#) (2019–20)
- ✓ UNECE Project on National Dialogues on Industrial Safety in [Central Asia](#) (Phase 1: Launch) (2020-2022)
- ✓ Project on “Development of joint measures for the prevention and response to pollution of the [Syr Darya river](#) in emergency situations”(2021-2023)

# 237 Tailings management facilities (TMFs) in Central Asia

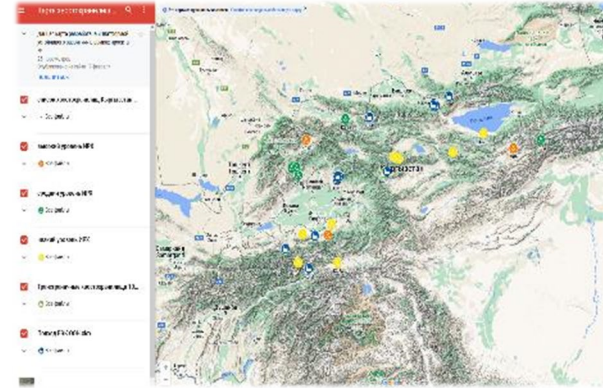
Mapped under the UNECE Industrial Accidents Convention thanks to projects funded by Switzerland, Germany and the EU

## TMF mapping in Kazakhstan



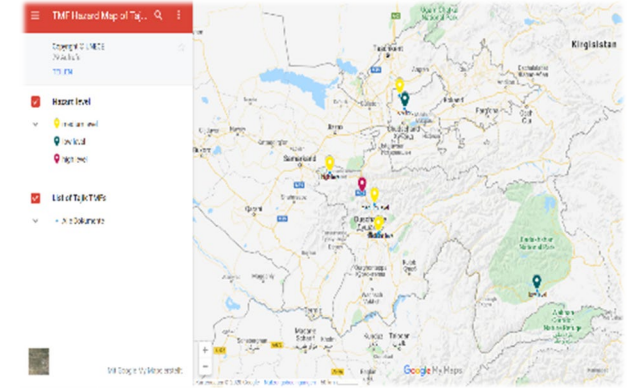
✓ Inventory and mapping of **121 TMFs**, incl. **7 with transb. effects**

## TMF mapping in Kyrgyzstan



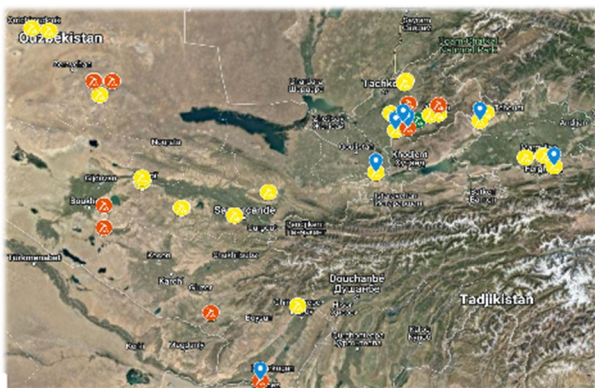
✓ Inventory and mapping of **62 TMFs**, incl. **38 with transb. effects**

## TMF mapping in Tajikistan



✓ Inventory and mapping of **13 TMFs**, incl. **4 with transb. effects**

## TMF mapping in Uzbekistan



✓ Inventory and mapping of **41 TMFs**, incl. **10 with transb. effects**

All TMFs were assessed using the TMF [Methodology](#), incl. Tailings Hazard (THI) and Tailings Risk (TRI) Indexes

**59 out of 237 TMFs may have potential transboundary effects → 25%**

## TMF mapping in Syr Darya river basin



✓ Inventory and mapping of **61 TMFs**, incl. **33 with transb. effects**



# «Development of joint measures to prevent and respond to pollution of the Syr Darya River in emergency situations»



UNECE



## General Information

Beneficiary Countries:

- Kyrgyzstan, Kazakhstan, Tajikistan and Uzbekistan

Duration:

- June 2021 – February 2023

## Objectives

- Development of joint measures for the prevention and response to pollution

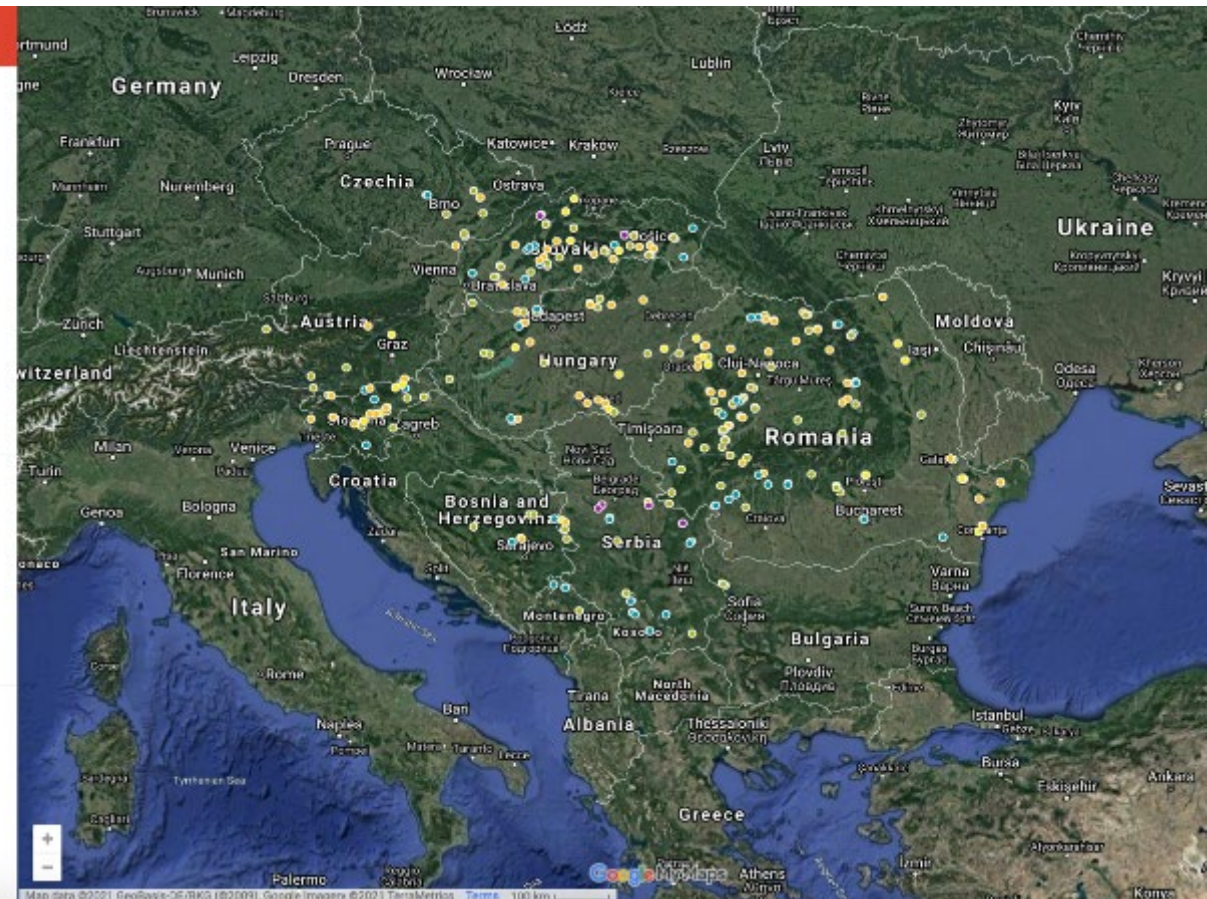
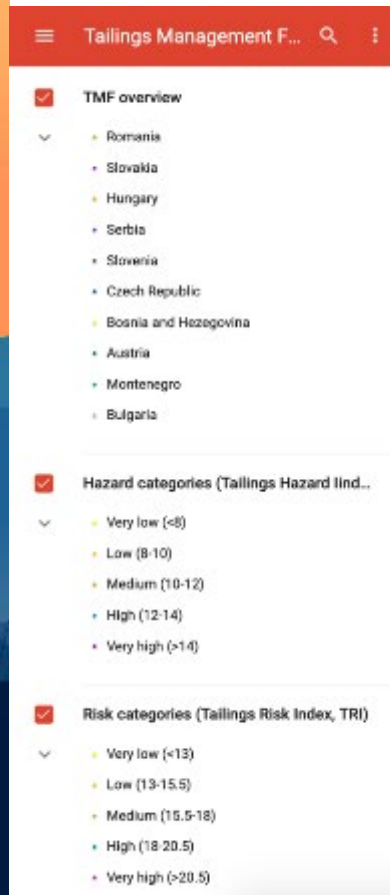
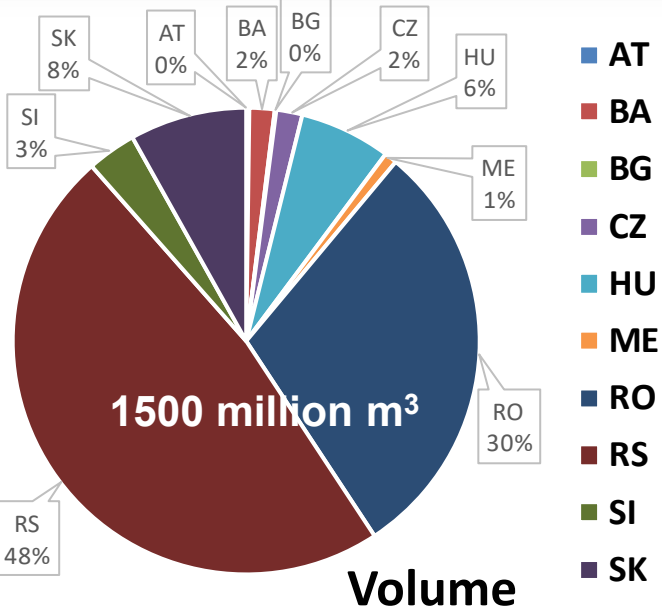
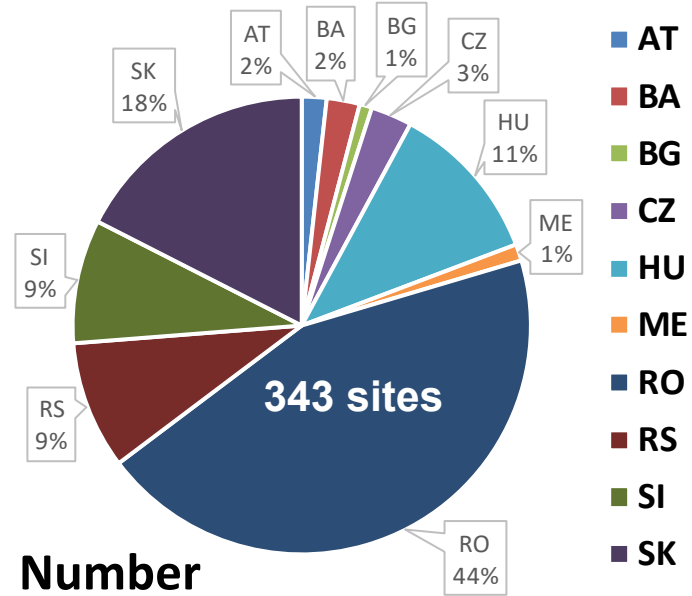
## Results

- An **in-depth report** examining the state of water resources, water quality issues, issues related to policies and institutions in the field of water management, industrial safety and prevention of accidental water pollution. **It contains specific recommendations to be implemented by riparian countries**
- Inventory and mapping of 61 tailings and 133 other hazardous enterprises in the Syr Darya River Basin
- Infographic and Executive Summary with key takeaways



# 343 TMFs in the Danube River Basin

Mapped under the Project “Capacity development to improve safety conditions of tailings management facilities in the Danube River Basin – Phase I: North-Eastern Danube countries” carried out by the International Commission for the Protection of the Danube River (ICPDR) and financed by the German Environment Agency.



# Capacity-building to understand risks

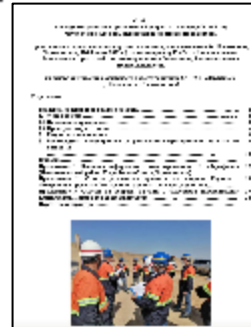
## On-site training in Kazakhstan (2019)

- Held in Kokshetau 11-13 June together with Kyrgyzstan and Tajikistan
- On-site training report was prepared based on safety evaluation of «Altyntau Kokshetau» TMF

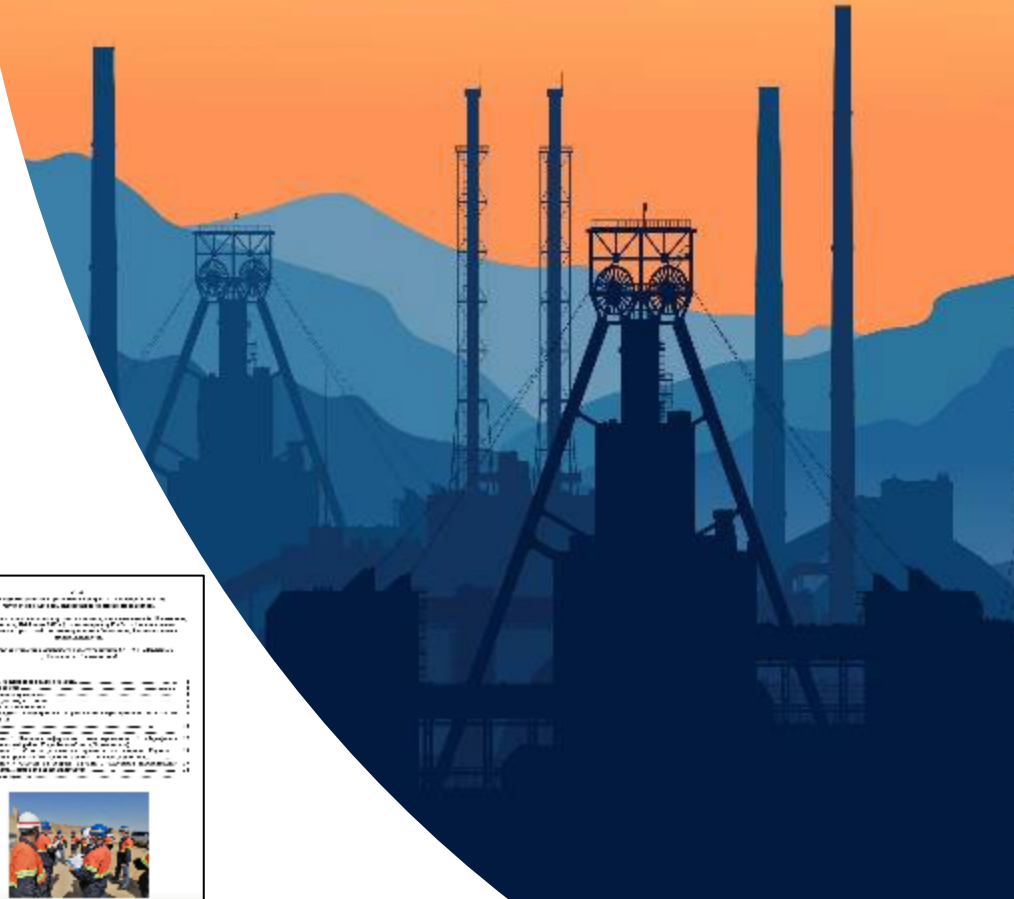


## On-site training in Tajikistan (2021)

- 23 April – technical/preparatory meeting
- 2-4 June – on-site training in Penjikent and online evaluation workshop
- On-site training report was prepared based on safety evaluation of «Zarafshon» TMF
- E.g: short-term recommended measure: "Develop an action and monitoring plan for TMF closure"

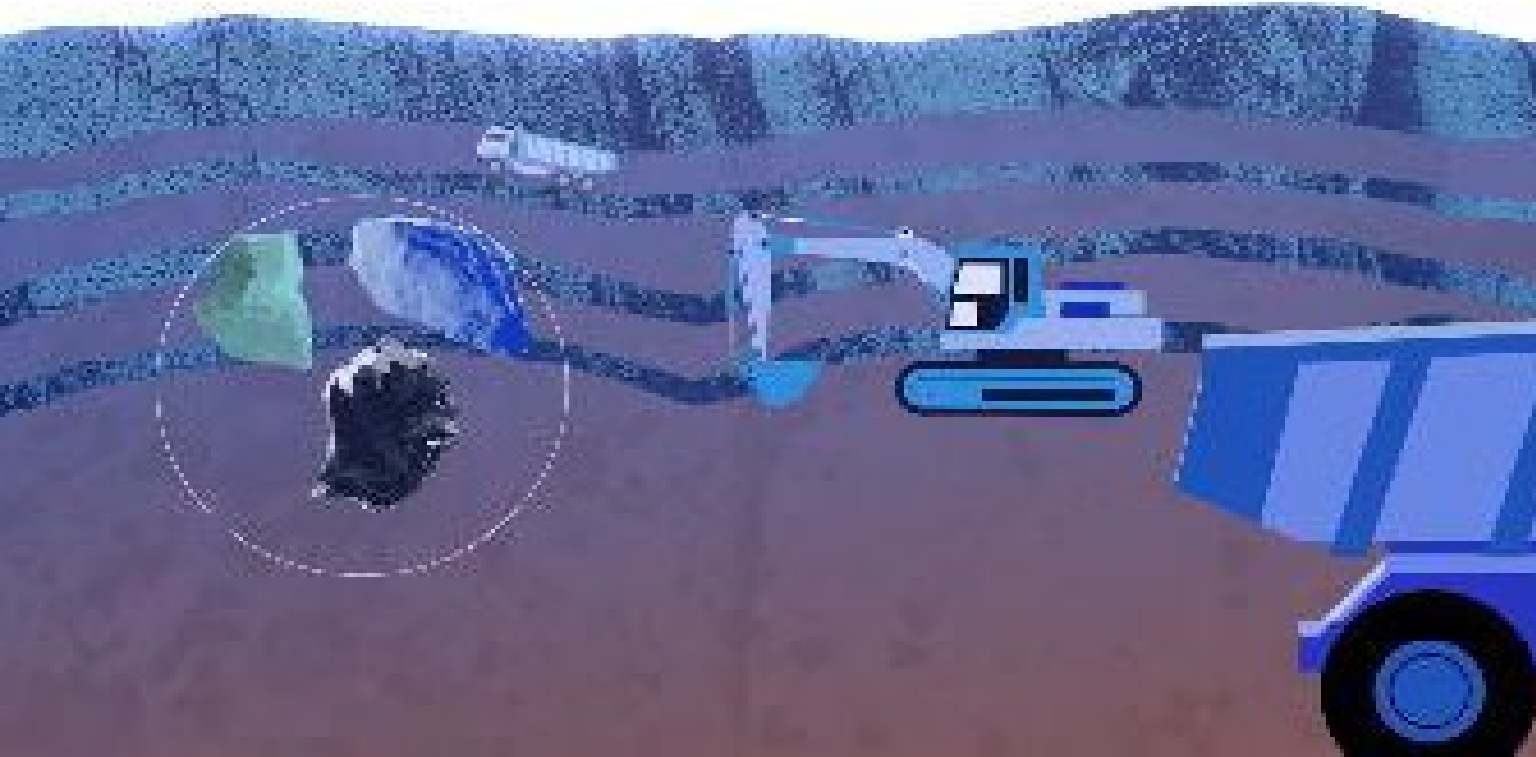


Reports contain the results of TMF Methodology application and recommendations for operators and competent authorities to improve TMF safety



# Online Toolkit and Training for Strengthening Mine Tailings Safety

- To assist countries in strengthening TMF safety and management practices an [online toolkit](#) was developed
- Contributes to improved knowledge on TMF safety through online training on application of relevant safety guidelines and methodology
- Consists of
  - Background information on TMF safety
  - **3-step practical training (including a video in [ENG](#) and [RUS](#))**
  - Summary of UNECE TMF-related work and partners
  - Further reading (key reports and references)



# UNECE [Online seminar](#) and [Decision 2020/1](#) on strengthening mine tailings safety

- **Online seminar** – 43 countries, 115 participants, 37 organizations, 12 speakers
- Preparedness and response are important, but prevention is key
- Mine tailings safety is a regional issue, not just a national matter

- **Decision** – adopted at CoP-11 (Industrial Accidents Convention; 7-9 Dec 2020);
- **Contains invitation** to other UN(ECE) member states to take action
- **Agreed actions**, e.g.:

Use the Safety guidelines and good practices for TMFs to achieve harmonized application

Improve inter-institutional and stakeholder coordination

Review legislation and policies on mine tailings against int. GP, e.g. the SG

Increase efforts to strengthen tailings safety and prevent failures, in view of more extreme weather events due to climate change

Include TMFs in the identification and notification of hazardous activities



*Decision 2020/1, above all, stresses the commitment of countries to prevent TMF accidents, recommends countries in the UNECE region and invites those beyond it to apply UNECE Safety Guidelines for TMFs and the relevant Methodology*

# Inter-institutional Working Group on Tailings Safety and the Prevention of Accidental Water Pollution (IIWGs)



- IIWG aims to enhance tailings governance, preventing accidental water pollution and addressing existing legislative and administrative gaps
- IIWG – Platform for cooperation and policy dialogue, exchange of knowledge and good practices among competent authorities, operators, academia, NGOs and other stakeholders

## Kazakhstan



- **15 March 2023**
  - Second meeting of the IIWG
- **11 February 2022**
  - First meeting of the IIWG
- January 2022
  - IIWG was officially established by decree of the Ministry of Emergency Situations

## Tajikistan




- **04 April 2023**
  - Second Meeting of the IIWG
- **21 October 2022**
  - IIWG officially established under the Government
- **02 December 2021**
  - Inaugural meeting of the IIWG

## Uzbekistan



- Consideration on the establishment of IIWG ongoing
- **27 April 2023**
  - Inception meeting on the establishment of the IIWG
- **1<sup>st</sup> quarter 2023**
  - Development of draft terms of reference



# 2030 UNECE Road Map for Action on Tailings Safety



United Nations

**Economic and Social Council**



**UNECE** ECE/CP/TEIA/2022

Distr.: General  
15 September 2022

Original: English

## **Economic Commission for Europe**

**Conference of the Parties to the Convention on the  
Transboundary Effects of Industrial Accidents**

**Meeting**

November–1 December 2022

provisional agenda

**Item 1: Action to strengthen**

**mine tailings safety within and beyond the**

**United Nations Economic Commission for Europe region**

### **Road map for action to strengthen mine tailings safety within and beyond the United Nations Economic Commission for Europe region**

**Prepared by the Bureau of the Convention**

The safe management of mine tailings is a major concern within the United Nations Economic Commission for Europe region and beyond. At its eleventh meeting (Geneva (hybrid), 7–9 December 2020), the Conference of the Parties to the Convention on the Transboundary Effects of Industrial Accidents discussed past and future work to address mine tailings safety under the Convention. It took note of the conclusions and recommendations of the preceding Seminar on mine tailings safety in the United Nations Economic Commission for Europe region and beyond (online, 1 December 2020), which was organized by Bureau members and the secretariat. Furthermore, it adopted decision 2020/1 on strengthening mine tailings safety in the United Nations Economic Commission for Europe region and beyond (ECE/CP.TEIA/42/Add.1). Through the decision, the Conference of the Parties requested the Bureau to prepare an orientation paper for consideration at its twelfth meeting.

The present document, prepared by the Bureau, in particular its small group on tailings safety, in cooperation with the secretariat, outlines key objectives to further strengthen mine tailings safety and calls upon Parties and member States within the United Nations Economic Commission for Europe region and beyond to take specific actions until 2030 to do so. The road map supports progress towards the Convention's long-term strategy for 2030, which contains actions to strengthen implementation, address industrial safety hotspots and continuously work to prevent accidental water pollution. <sup>a</sup> Parties will be invited to express their views on the present road map, endorse it and thereby set the agenda for strengthening mine tailings safety with the proposed actions over the next eight years, including through activities under the Convention in future workplans.

<sup>a</sup> See ECE/CP.TEIA/38/Add.1, section III (1).



# 2030 Road Map for action to strengthen mine tailings safety within and beyond the UNECE region

## Contains 5 key objectives:

A. **Understanding** TMF-related risks within and across national borders

B. **Addressing** TMF risks through policy and governance

C. **Prevention and preparedness for accidental water pollution from TMFs** to ensure water quality

D. **Prevention of natural hazard-triggered industrial accidents** (Natech events) and adaptation to climate change

E. **Exchange of information** and knowledge and capacity-building

## → For each objective:


- Objective summary
- Proposed approach to achieve objective
- **Actions for Parties and MS within the ECE region and beyond**
- Actions by ECE-secretariat
- Joint or complementary actions by ECE secretariat and other international organizations

→ Road Map available in [ENG](#), [FRE](#) and [RUS](#).





# Actions to be taken by Parties and MS (overview)

- ✓ A: Collect and provide data on TMFs when reporting on hazardous activities; regularly review and update TMF data
  - ✓ B: Establish / further develop national coordination mechanisms (e.g. IIWGs) to cooperate on managing TMF risks, covering also transboundary context
  - ✓ C: Develop internal and external contingency plans, including joint or harmonized plans for TMFs with neighbouring and riparian countries
  - ✓ D: Review existing risk assessment methodologies and update them to include Natech risks and compounding risks from CC
  - ✓ E: Foster regular exchange of information and knowledge about good practices, lessons learned and innovations for TMF safety (among competent authorities, international organizations, NGOs, TMF operators, academia and experts)
- 

# 2030 Road Map for action to strengthen mine tailings safety within and beyond the UNECE region



## Next steps

### 2023–2024

- Advance understanding of TMF risks
- Review and update existing policies and legislation**
- Use existing or set up new working groups and national coordination mechanisms
- Report on TMFs as part of the hazardous activities (10th reporting round)

- Prepare overview of: TMFs in the ECE region, possibly existing hazards, risks and hotspots
- Improve joint understanding and governance of the risks among countries
- Facilitate a multi-stakeholder dialogue on strengths and challenges across the UNECE region**

### 2025–2026



Subregional workshop on tailings safety in Central Asia  
(Dushanbe, Tajikistan, 25-26 May 2023)

# Key workshop conclusions (draft)

- Transboundary cooperation among Central Asian (CA) countries key to building resilience and preventing industrial/ tailings accidents and water pollution
- Importance of sharing good practices and knowledge between all CA countries on tailings safety was highlighted
- Kazakhstan suggested establishing a joint working group (at a technical level) on monitoring/control of the transboundary TMFs in CA
- Tajikistan suggested setting up a coordination council (at the political level) between CA countries to explore the risks related to tailings facilities
- Suggestion to launch a pilot project on assessing climate change impacts on tailings facilities/safety in CA
- Importance and need to develop joint contingency plans in CA, notably in river basins (such as the Syr Darya River Basin)
- Further needs were highlighted (e.g. additional inspections/ controls at the TMFs, capacity-building of staff and enhancement of the legislation)

# Key knowledge gaps / needs

- Lack of knowledge of TMFs across countries, regions and the globe; need to know the number of TMFs, their location, state, condition and possible of transboundary effects to understand and address hazards and risks
- Effective management of TMF risks to prevent accidents; international instruments, frameworks and guidelines support the development of national policies and platforms for policy coherence and governance
- Preventing accidental water pollution from TMF failures and preparedness to mitigate possible effects, including in cooperation with neighbouring and riparian countries and through river basin commissions
- Ensuring adaptation to climate change encompasses TMFs and the possible effects of climate change are considered in TMF safety (risk assessment, safety measures, contingency plans, etc.)
- Ensuring the public has access to information on TMFs, effective public participation in decision-making on TMFs and access to justice, including across borders for transboundary aspects
- Regular exchanges of information and knowledge across countries and regions and capacity-building activities incl. to address TMF safety against climate change, cybersecurity, public health emergencies, war
- Integration of the hazards and risks of TMFs (including Natech risks) into laws, policies and strategies at the national, local, river basin commissions levels, and measures to address them
- Enhancing national coordination and working with all stakeholders to address TMF risks; essential for authorities to coordinate across borders and prepare joint and harmonized preparedness and response measures in case of transboundary effects

# Upcoming events:



On-site training  
at a TMF in  
Uzbekistan  
(autumn 2023)



IIWG Meetings  
in Kazakhstan,  
Tajikistan and  
Uzbekistan  
(2024)



JEG workshop  
on early  
warning and the  
prevention of  
accidental water  
pollution  
(Bratislava,  
Slovakia, mid-  
2024)\*



13<sup>th</sup> Meeting of  
the Conference  
of the Parties to  
the Industrial  
Accidents  
Convention  
(Nov/Dec 2024)

\* [Follow-up to 2022 JEG seminar](#) on emerging risks in accidental water pollution: focus on Natech risks



# Thank you for your attention!

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For more information, please consult UNECE webpage:

[www.unece.org/env/teia](http://www.unece.org/env/teia)

[https://unece.org/environment-policy/industrial-accidents/online-toolkit-and-training-strengthening-mine-tailings#accordion\\_1](https://unece.org/environment-policy/industrial-accidents/online-toolkit-and-training-strengthening-mine-tailings#accordion_1)

<https://unece.org/environment-policy/publications/safety-guidelines-and-good-practices-tailings-management-facilities>

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