Mailuu-Suu

State Regulation Center on Environment Protection and Ecological Safety of the State Agency on Environment Protection and Forestry of the Kyrgyz Republic

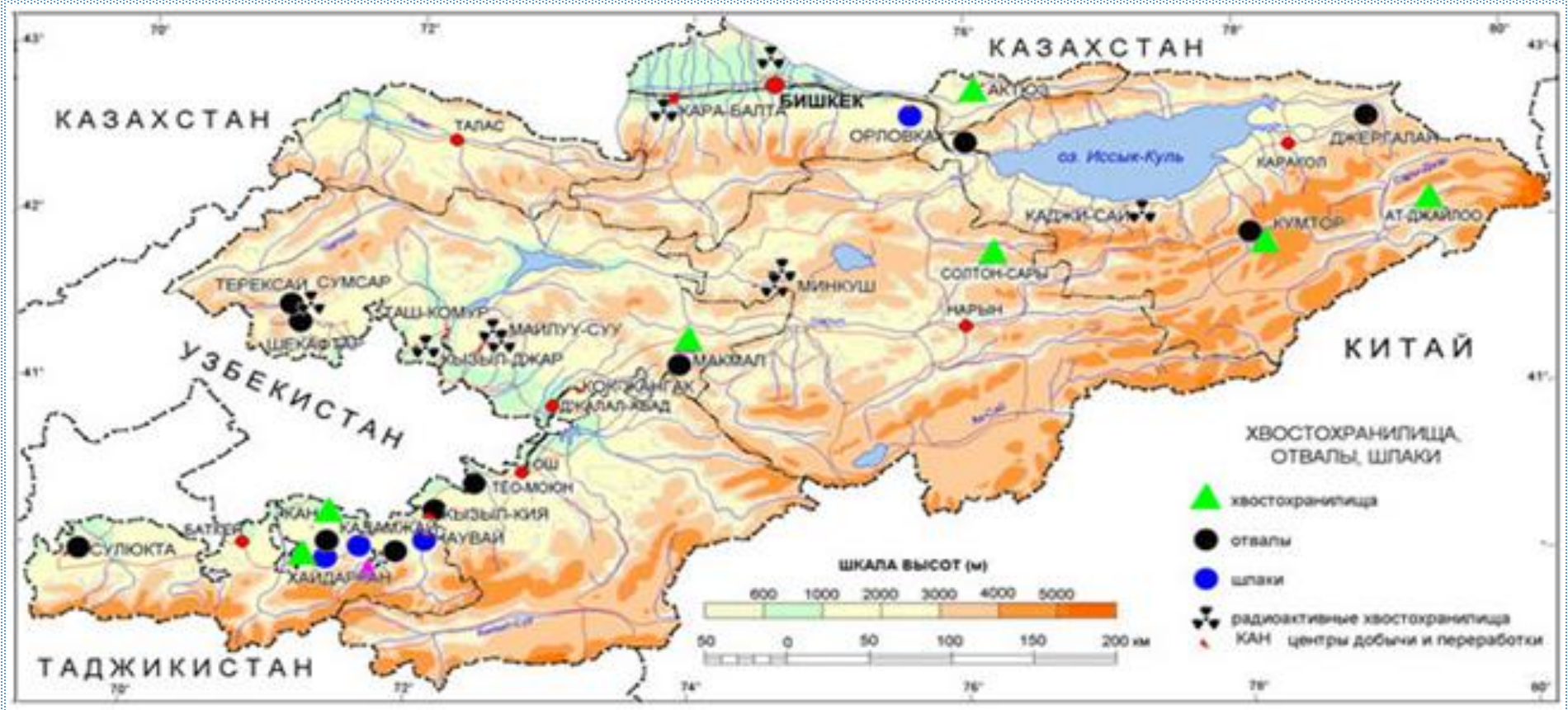
Barcelona, Spain, 01-03.07.2019

Content

- About Kyrgyzstan
- About Mailuu-Suu
- Historical data of Mailuu-Suu
- Finished activities in Mailuu-Suu
- Currently going on activities
- Conclusion: challenges and risks

The map of Kyrgyz Republic

Map of tailings and dumps in Kyrgyzstan



The main objects of regulation

- Kara-Balta mining plant, which is specialized on the production of uranium oxide,
- Uranium legacy sites (radioactive tailings and dumps),
- Radioactive waste storage facility.

Storage facilities of low-level waste from the former uranium industry

6 main waste disposal sites:

- Mailuu-Suu site – 2,845 mln.m^3
- Kadji-Say site – 0,4 mln.m^3
- Min-Kush site – 1,961 mln.m^3
- Ak-Tuz site – 3,35 mln.m^3
- Orlovka site – 3.55 mln.m^3
- Shekaftar site – 0,7 mln.m^3

Altogether, 48.31 mln.m3 (at 35 tailings sites) and 83.582 mln.m3 (in 37 mining dumps) were accumulated along with the Kara-Balta mining plant's site and other small facilities in the country

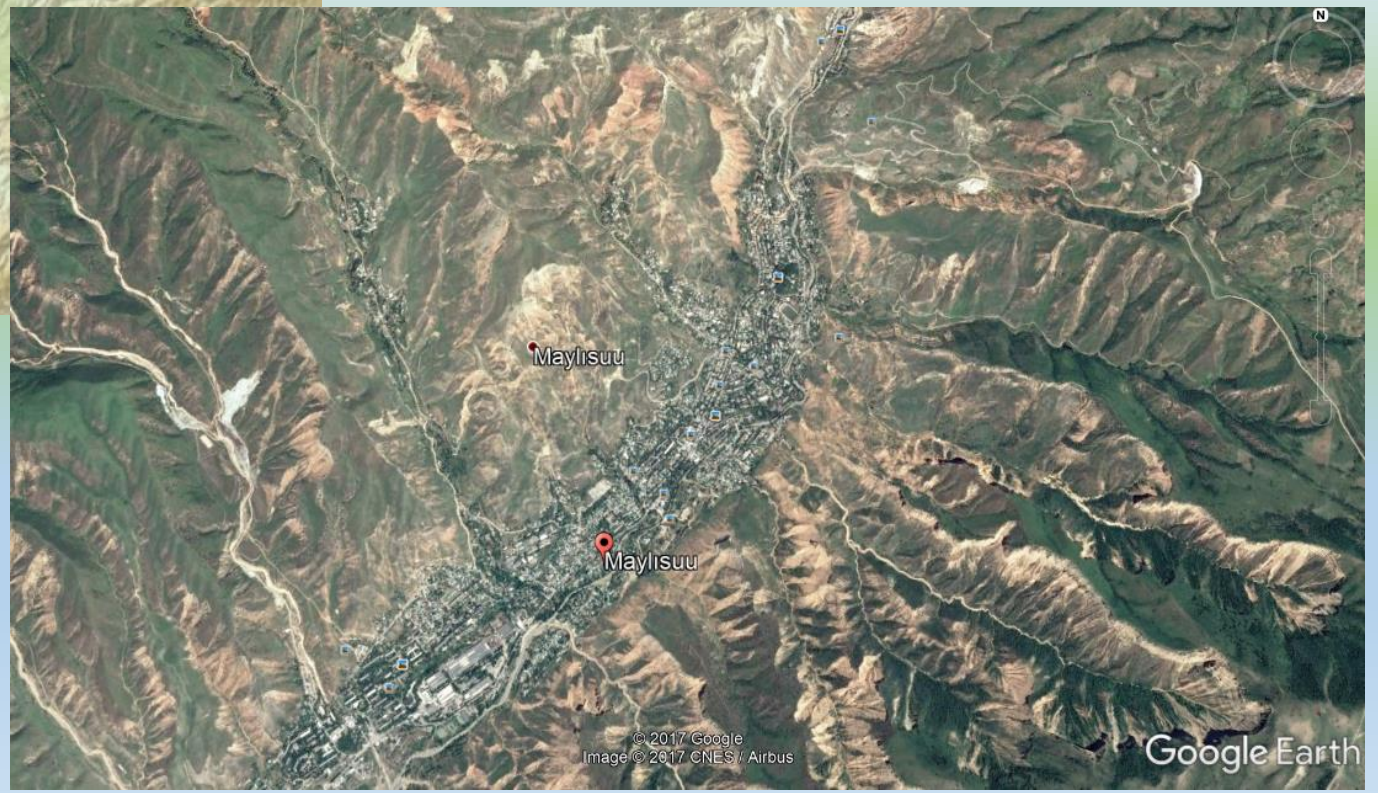
Ministry of Emergency Situations is carrying out to maintain the hydrotechnical and protective structures of these tailings in working condition.

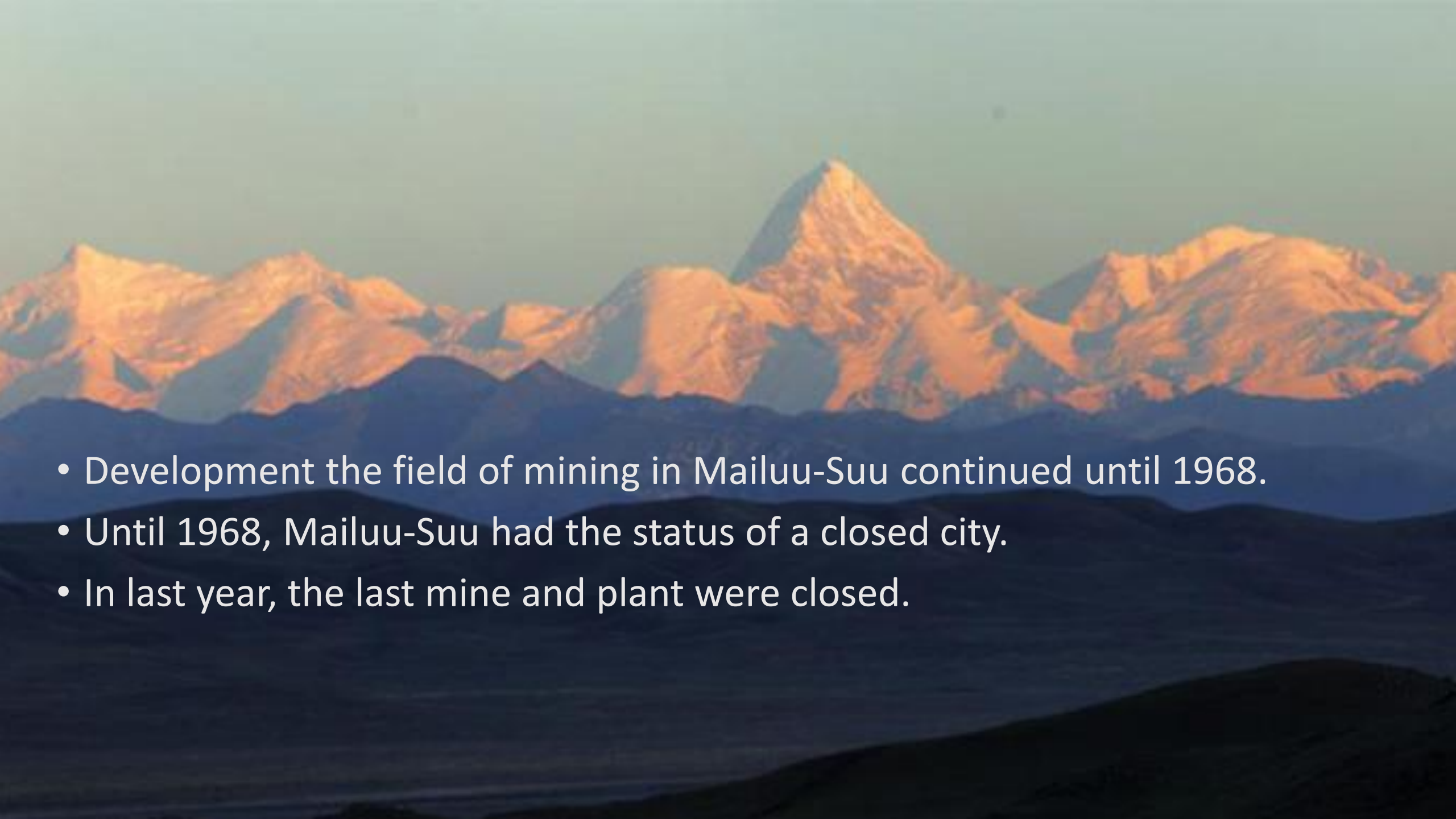
Regulatory framework

The legislative framework of Kyrgyz Republic consists on few main Laws such as:

- Law of Kyrgyz Republic about Radiation Safety of population of Kyrgyz Republic;
- Law of Kyrgyz Republic “Technical Regulation of Radiation Safety”;
- Law of Kyrgyz Republic about tailings and mountain dumps;
- Law of Kyrgyz Republic about environmental protection;
- Law of Kyrgyz Republic about state ecological expertise;
- Law of Kyrgyz Republic about production and consumption wastes;
- Law of Kyrgyz Republic about the health of the population of the Kyrgyz Republic;
- Law of Kyrgyz Republic about licensing system;
- Governmental decree “On approval of the governing documents in the field of radioactive substances and ionizing radiation sources”.

Historical data of Mailuu-Suu

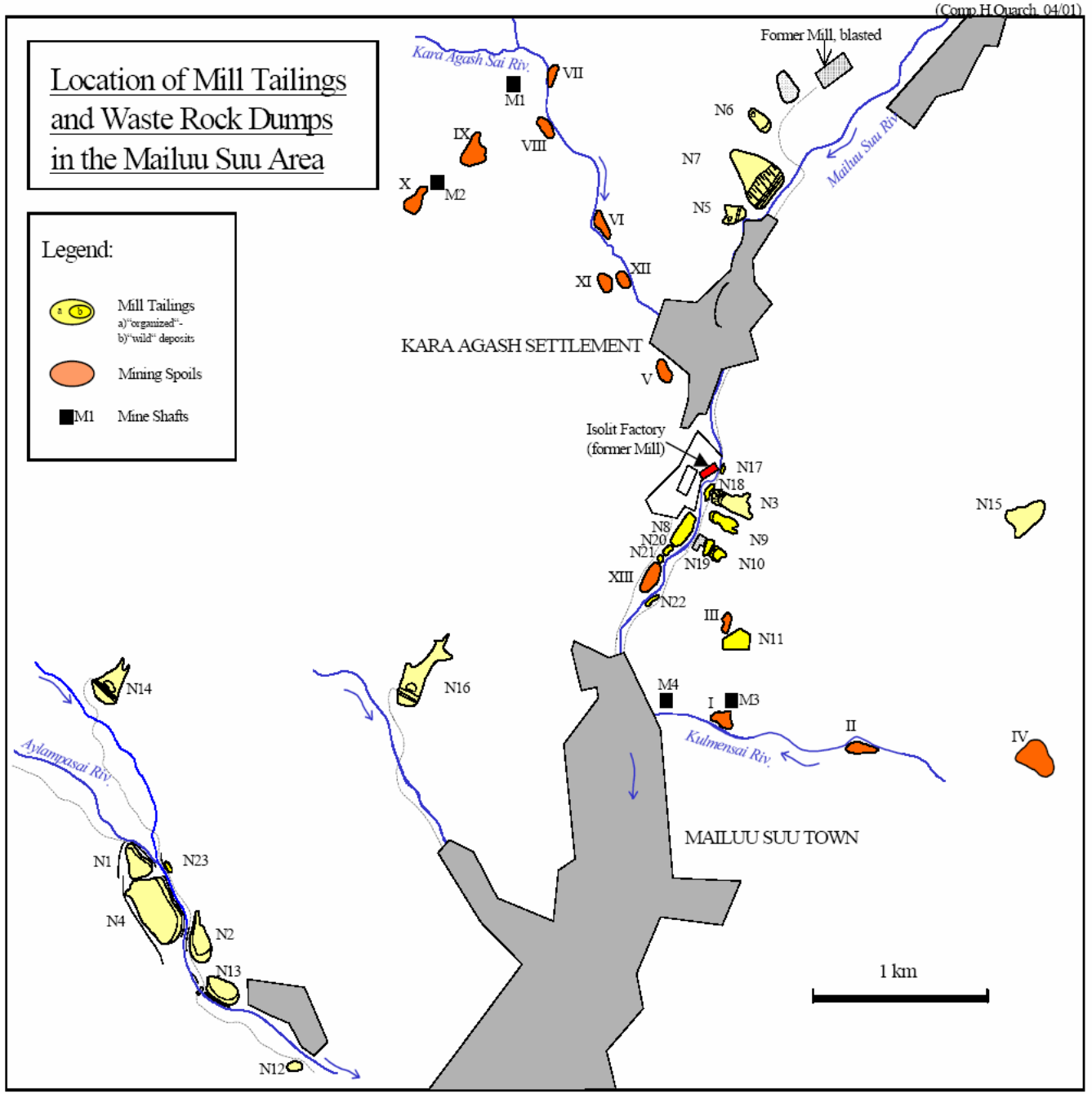




- Development the field of mining in Mailuu-Suu continued until 1968.
- Until 1968, Mailuu-Suu had the status of a closed city.
- In last year, the last mine and plant were closed.

Mailuu-Suu site, pilot rehabilitation project

- The objects of uranium ore mining (spent and closed) to be monitored include 23 tailings and 13 mining dumps with a total area of 1000 sq. M.
- The considered objects are located in the mountainous area around the town of Mailu-Suu, along the Mailu-Suu river and its tributaries the Karaagach, Azbash, Kulmen-Sai and Aylampa-Sai.
- A total of 2.095 million cubic meters of tailing material and 0.868 million cubic meters of empty and poor rocks in the dumps are located at the sites. Depth of waste on average on tailings 5 m and 9 m dumps.
- According to experts, the placement of tailings and mining dumps is not entirely successful, since the following risks arose during the waste storage period: endogenous, exogenous and ecotoxic. The hydrographic system of the region is characterized by constantly recurring floods after heavy rains and snowmelt. The region is also characterized by a large number of landslides, which either have already been activated, or there is a risk of their slipping, and thus there is a possibility of damage to the bodies of dumps and tailings.


(Comp.H.Quarch, 04/01)
Location of Mill Tailings and Waste Rock Dumps in the Mailuu Suu Area
Legend:
Mill Tailings
a)"organized"-
b)"wild" deposits
Mining Spoils
M1 Mine Shafts
Kara Agash Sai Riv.
Former Mill, blasted
Mailuu Suu Riv.
KARA AGASH SETTLEMENT
Isolit Factory
(former Mill)
Aylampasai Riv.
Kulmensai Riv.
MAILUU SUU TOWN
1 km
M1
M2
M3
M4
I
II
III
IV
V
VI
VII
VIII
IX
X
XI
XII
XIII
N1
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N22
N23

Organization of monitoring

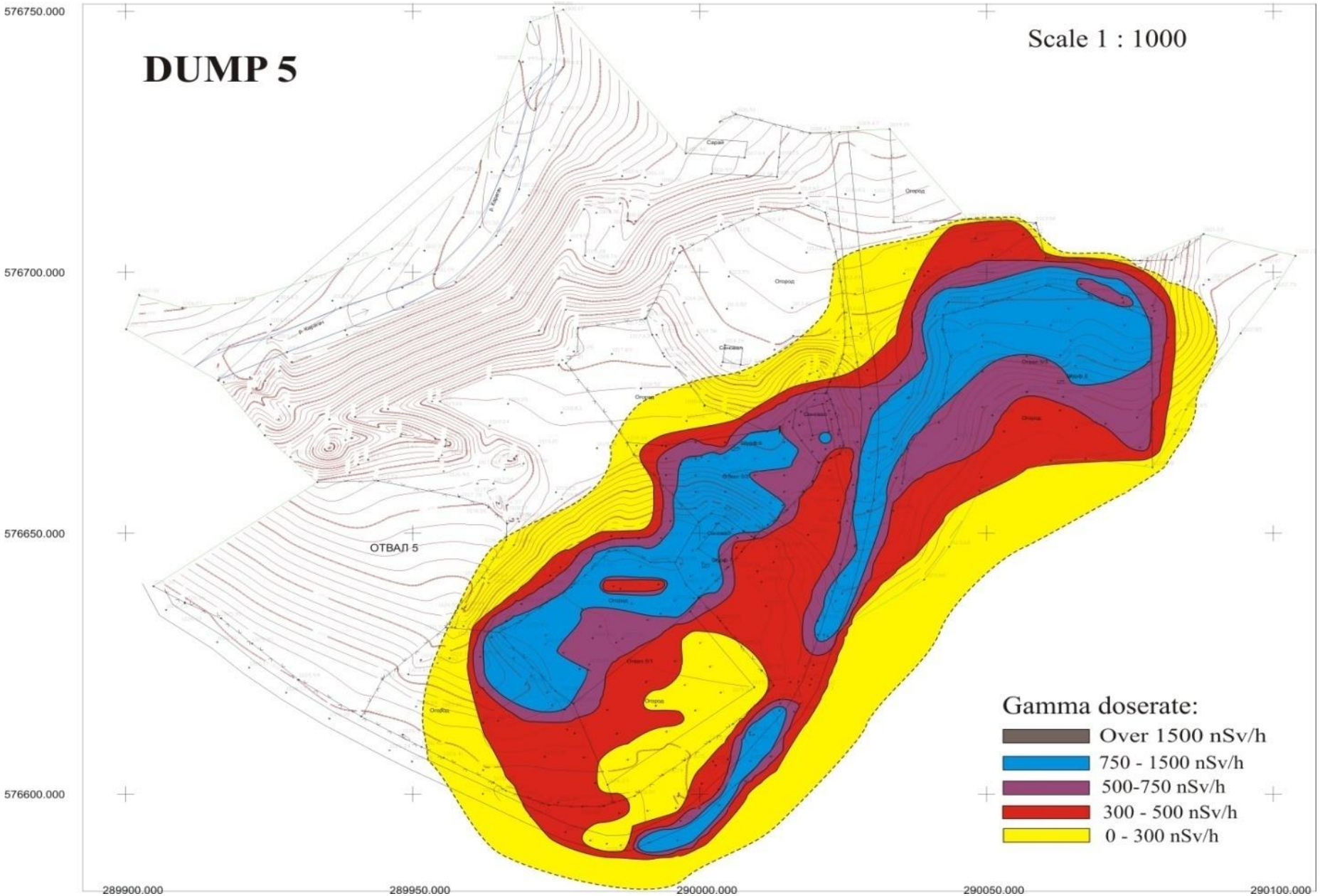
In the works related to the monitoring of radioactive objects and the development of activities from 2000 to 2006 were involved:

- Ministry of Emergency Situations of Kyrgyz Republic
- Consortium SCK-CEN
- Geoconsult-Wisutec
- Chuy Ecological Laboratory
- Alex Stewart Assay and Environmental Laboratories
- Kyrgyz leading engineering survey institute, Osh.

Table of gamma survey results of radiological survey on sites in the area of the town of Mailuu-Suu, 2005

№ п/п	Title of object	Max. value, nSv/h	Min. value, nSv/h	Number of measuring, pcs.	Mean value, nSv/h
1	Отвал №1	3360	18	59	430
2	Отвал №2	1710	150	124	420
3	Отвал №3	1710 1710	290 280	20 18	1050 820
4	Отвал №4 Отвал №4/1 Отвал №4/2 Отвал №4/3	11330 1130 550 3830	250 180 180 240	183 33 24 94	480 380 310 730
5	Отвал №5/1 Отвал №5/2 Отвал №5/3	1180 1260 1110	240 370 370	56 36 35	590 740 750
6	Отвал №6	950	180	80	430
7	Отвал №7	660	150	43	300
8	Отвал №8	1710	370	163	640
9	Отвал №9	1550	270	184	700
10	Отвал №10	1230	240	83	620
11	Отвал №11	7210	420	97	990
12	Отвал №12	2090	260	93	800
13	Отвал №13	600	380	32	490
14	Промплощадка	7490	90	864	250

Gamma survey of dump №5



- The World Bank's Disaster Hazard Mitigation Project supported the remediation of high risk objects at Mailuu-Suu in the period 2004–2013. A geologically unstable tailings facility on the banks of the Mailuu-Suu river was moved to a more secure and stable location, and a waste rock dump on the banks of the Kulmen Say creek was similarly relocated. Another waste rock dump on which homes had been built was also relocated, requiring the resettlement of the residents.
- The total cost of the Project was 12 million US dollars, of which the directly for rehabilitation of tailings in the Mailuu-Suu was 8.4 million US dollars.

Dump №1

Tectonic landslide

Tailing № 3, removing surface layer (December 2010)

Opening and removing of wastes (April 2011)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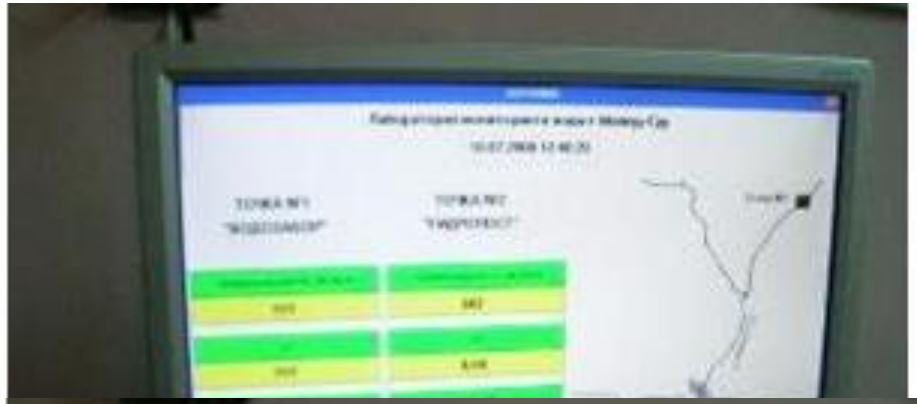
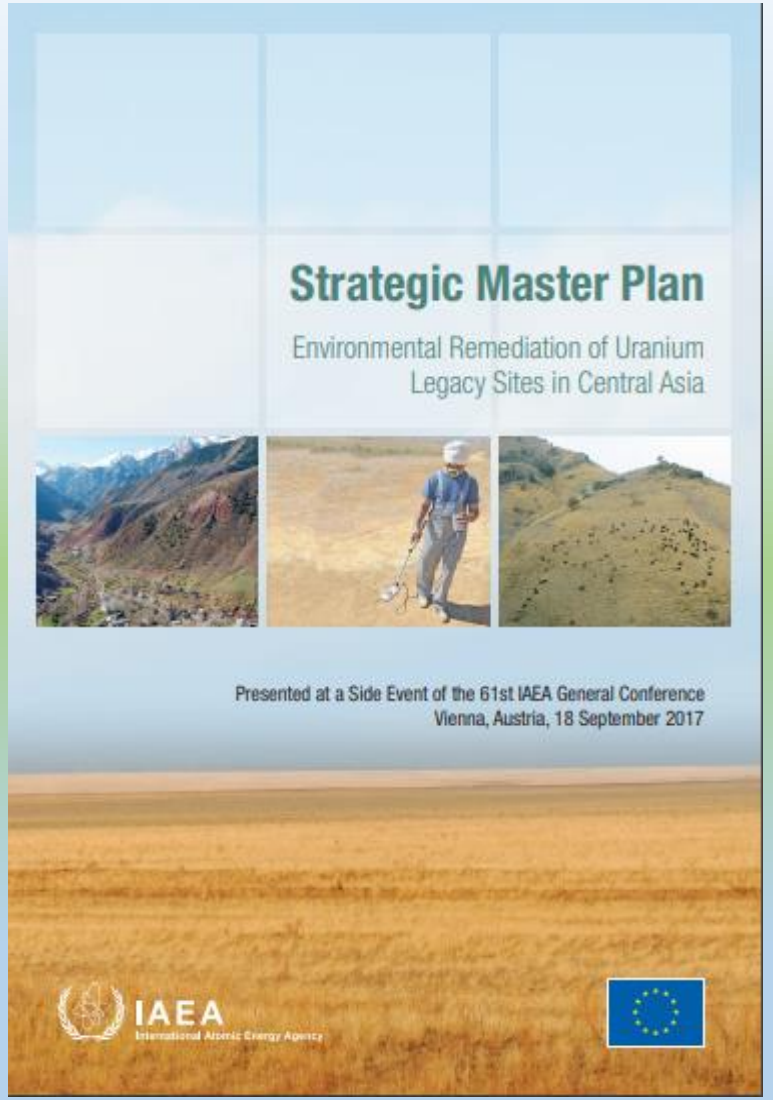


- Currently, Kyrgyzstan does not have sufficient financial and technical capabilities to ensure proper maintenance and rehabilitation of radioactive waste storage facilities, contaminated areas.
- The Government of the Kyrgyz Republic regularly raises this issue to determine as priority at different international meetings and events.
- In this regard, by a core group of the Coordination Group on Uranium Legacy Sites (CGULS) has prepared this Strategic Master Plan for Environmental Remediation of Uranium Legacy Sites in Central Asia and signed on 2017 at General Conference of the IAEA in Vienna.
- The core group comprises representatives of the European Bank for Reconstruction and Development, the European Commission, Kyrgyzstan, the IAEA, the Russian Federation,Tajikistan and Uzbekistan.
- The uranium sites of Mailuu-Suu covered by the Strategic Master Plan and it has high priority to conduct relevant works and events for remediation.



Map of priority in accordance of SMP

Source: Strategic Master Plan for environmental remediation of uranium legacy sites in Central Asia. IAEA 2018.

Current situation

- Currently, with funding from the European Union and the support of the IAEA, in frame of the Strategic Master Plan implementation, at the Mailuu-Suu tailings works is underway to develop the "Environmental Impact Assessment“ and “Feasibility Study” for the safe management and remediation of the uranium legacy complex of Mailuu-Suu by Wisutec, the beneficiary of which is the Ministry of Emergency Situations of the Kyrgyz Republic and Systematic and comprehensive evaluations of the risks and remediation options will be conducted. Above mentioned activities are at the stage of technical study of the options for rehabilitation and negotiation of options with the Beneficiary.

10 tasks of conducting an integrated Environmental Assessment and Feasibility Study

Task 1

Kick-off meeting

Planning, organisation, project management

Task 2

2.A. Preparing Design and Technical Specifications for supply contract

2.B. Providing assistance to DEVCO in the procurement process

2.C. Supervision of the supply and installation

Task 3

Assessment of the current status of the Mailuu Suu site

Task 4

Assessment of the Impacts and Risks of Each Site

Task 5

Identification and selection of remediation strategies

Preliminary Feasibility Study

Task 6

Detailed remediation plans for the Mailuu-Suu site

Final Feasibility Study

Task 7

7.1 Review of the Existing Monitoring Capabilities (assessment of skills / training levels, identification of monitoring needs; acc. to Kyrgyz legislative requirements and best international praxis)

7.2 Preparation of a detailed Environmental Monitoring Plan for the remedial works for the Mailuu Suu site (radiological and chemo-toxic parameters, environmental risks, ...; for environmental media and houses)

7.3 Definition of a detailed Monitoring and Annual Surveillance, Inspection and Maintenance Plan for the post-remedial phase for the site

7.4 Definition of Threshold Values for Intervention of the authorities (in case acceptable parameter values are exceeded)

Task 8

Environmental Impact Assessment

Task 9

Public consultation and participation. Involvement of relevant governmental agencies and local stakeholders

Task 10

Final Report

Dissemination of the project results

Technical meeting of CGULS in Kyrgyzstan

- During the Technical meeting of CGULS in Issyk-Kul, Kyrgyzstan from 17-21 June 2019 was announced that based on landslide monitoring systems, it was shown that the originally proposed remediation option is not a reasonable solution for the long-term security and stability of remediation efforts, therefore remediation options are currently under review. The issues of involving local communities in such decisions were discussed. The issues of taking into account the potential impact of climate change in the multi-criteria assessment of remediation options were also discussed.

Conclusion: challenges and risks

- Challenges

1. Human resources development
2. Involving local communities
3. Adopting the IAEA publications
4. Public awareness

- Risks

The current climate change is accompanied by the exacerbation of dangerous natural phenomenon, in particular mudflows and floods, the development of landslide processes in the areas where radioactive waste storage sites are located, and, accordingly, the threat of their destruction increases with environmental consequences of a transboundary scale.


Thank you for your attention!
Save the world!