

# ISTC



## Project TJ-2409 – Hydrochemistry monitoring and risk assessment of mining & uranium tailing in transboundary river watershed of CA countries

### TECH AREA / FIELD

ENV-WPC/Water Pollution and Control/Environment

OBS-NAT/Natural Resources and Earth Sciences/Other Basic Sciences

#### Senior Project Manager

Endrullat Burkhard

#### Project Manger

Anvar Kodirov

ISTC  
  
МНТЦ

#### MISSION

To advance global peace and prosperity through cooperative Chemical, Biological, Radiological and Nuclear (CBRN) risk mitigation by supporting civilian science and technology partnerships that address global security threats and advance non-proliferation.



## LEADING INSTITUTE

Institute of water problem, hydropower and ecology  
of the National academy of sciences of Tajikistan

## SUPPORTING INSTITUTES

- Institute of nuclear physics of the National nuclear center of the Republic of Kazakhstan
- Central Asian institute for applied geosciences of the Kyrgyz Republic
- International center for biosaline agriculture for Central Asia and Caucasus, Tashkent sub-office, Uzbekistan
- Institute of Biology and Pedology of the National Academy of Sciences of Kyrgyz Republic

## PROJECT RATIONALE AND OBJECTIVES.

To obtain an improved understanding of the environmental contamination in land-water-ecosystem of the Syr-Darya River and Amy-Darya River basins. In order to assess these contamination, samples of water, bottom.

The main goal of the proposed project is to conduct radio-ecological, hydro-chemical and geochemical investigation of the extent pollution in transboundary areas of Central Asian river Basin (Syr-Darya and Amu-Darya Rivers and its tributaries), where the main uranium, gas and gold mining industries are concentrated. To study the dynamics of changes in contamination by comparing the data obtained in the course of this project with the 15 year old data base of Navruz investigation.



## PROJECT SUMMARY

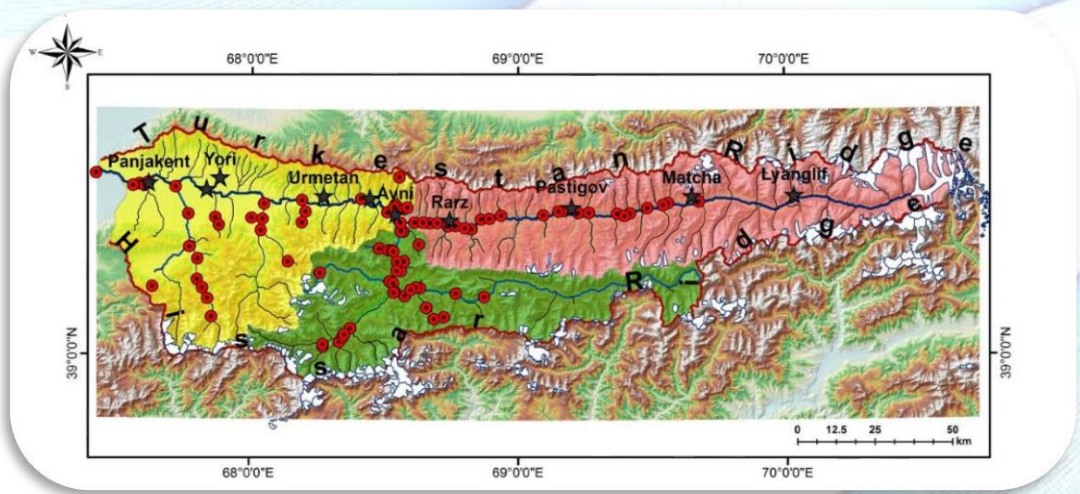
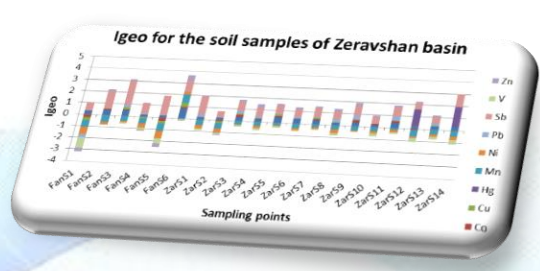
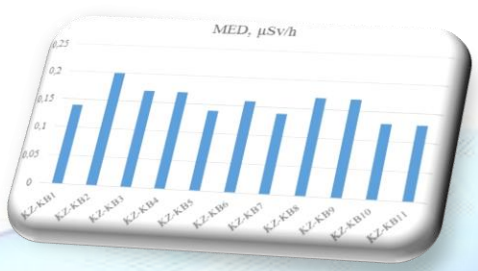
To obtain an improved understanding of the environmental condition of land-water-ecosystem of transboundary Rivers basin, samples of water, aqueous suspensions, soil, bottom sediment and vegetation will be collected from the rivers, lateral inflows and other land sites to analyze concentration of isotope-chemical elements. The samples collected in the field will be processed and analyzed by the X-ray fluorescence analysis (XRF) and by gamma spectrometers in the domestic's laboratories in Dushanbe, Almaty and Bishkek. X percent of the samples processed and distributed into chemically clean jars, will be shipped to Institute of Nuclear Physics at Almaty for the neutron activation analysis (NAA). Both methods, the XRF and NAA will complement each other to analyze the 38 elements-major: Ca, Fe, K, Mn, Na, Ti and trace-elements: As, Au, Ba, Br, Ce, Co, Cr, Cs, Cu, Eu, Ga, Hf, La, Lu, Mo, Nb, Nd, Ni, Rb, Sb, Se, Sr, Sc, Sm, Ta, Th, U, V, Y, Yb, Zn, Zr. The isotopes  $^{137}\text{Cs}$ ,  $^{40}\text{K}$ , decay series of  $^{238}\text{U}$ ,  $^{235}\text{U}$ ,  $^{232}\text{Th}$  will be determined by gamma spectrometers.

The result will be compiled into a database and GIS maps will be created of radionuclide isotopes and geochemical elements within the study areas. One major objective is to identify and highlight the anomalous zones with increased health risks for local residents.

The proposed geochemical and radionuclide study can also identify land, rivers and reservoirs contaminated by heavy metals, other inorganic toxins and isotopes. This study becomes particularly urgent; taking into account former large number of uranium Mountain-metallurgical enterprises, as well as uranium factories located in the up and middle stream of the Syr-Darya and accumulated more than 100 million tons of uranium production wastes.

The staff of the proposed project have sufficient experience in implementing projects of the International Science and Technology Center (ISTC). In frame of regional experiment Navruz (Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan and the United States) monitored for over 10 years (1999-2009) radiation and ecological condition of the Transboundary Rivers and their main feeders.





**Contact information:**  
 Tel.: (+992)938301983;  
 E-mail: [as.kodirov@gmail.com](mailto:as.kodirov@gmail.com)  
**More information about the TJ-2409 ISTC Project:**  
<https://istc.int/en/project/323FBD997CFB78B3462586C300199E07>