

Remediation Program for Karabash City Region

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Working out a Program of Remediation and Development of the City of Karabash by Implementing Technologies for Recovery of Its Technogenic Resources

Tech Area / Field

- ENV-RED: Environment / Remediation and Decontamination
- CHE-IND: Chemistry / Industrial Chemistry and Chemical Process Engineering

Status

1 2 3 4 5 6 7 8 Project underway

Deputy Executive Director

S: Uwe Meyer

Senior Project Manager

Valentina Yakovlevna Rudneva, tel. 7+095+7974762, fax 7+095+7976021,
rudneva@istc.ru

Project Officer/Assistant

Ol'ga Pavlovna Rummyantseva

Project Manager[Barysheva Nina Mikhailovna](#)**Leading Institute**[VNIITF, Snezhinsk, Chelyabinsk reg., Russia](#)**Supporting institutes**

- [Institute of Solid State Chemistry, Ekaterinburg, Sverdlovsk reg., Russia](#)

Collaborators

- [UFZ-Umweltforschungszentrum Leipzig-Halle GmbH, Leipzig, Germany](#)
- [Lawrence Livermore National Laboratory, Livermore, CA, USA](#)

Project Summary

• Projects

The objective of the project is to create an informational, scientific and technological basis for investment projects, aimed at the rehabilitation and development of the city of Karabash by using its internal and external resources and to elaborate a recommendatory program "Karabash Remediation".

In 1996 the city of Karabash was officially recognized as an area of severe environmental trouble in Russia. Over almost 80 years, the Karabash Copper Smeltery has released an estimated 12 million tons of hazardous substances. For many years, from the exploitation of old technologies for treatment of raw materials, about 30 million tons of waste have been dumped in the city. The dumps contain considerable amounts of valuable substances, including copper, zinc, gold, silver, platinoids, rare-earth elements and trace rare metals.

The value of useful components extracted depends on commercial treatment. No metallurgical plant in the Ural region provides integrated cost-effective treatment because of high power and capital demand. However, there are some innovative proposals, demonstrating the feasibility of such treatment, by using technologies of ferrous and non-ferrous metallurgy.

The project proposes to:

- fully investigate all wastes accumulated in Karabash (composition, properties and amounts);
- seek and assess existing and innovative technologies for treating each type of waste;
- experimentally prove that some of them can be used specifically for Karabash deposits.

Consistent criteria will be developed to assess technologies. They will address a diversity of factors, including: performance, easy maintenance, end product marketability, secondary waste generation, risks to public safety and health, damage to environment, regulatory and legal basis, and potential returns, which could be used to fund our Karabash Remediation Program.

The project will essentially use the results of ISTC Project 500-98 "Priority Assessment for Preventing Environmental Contamination in the Middle Urals", specifically:

- cartography data of the Karabash geoinformation system;
- databases on contamination sources and the state of environmental objects and public health;
- methodology of the environmental priority assessment, based on assessment of risks to public health.

On the basis of obtained results:

- a consistent set of technologies will be defined for waste handling and rehabilitation of environment and public health in the city;
- a "Karabash Remediation" model will be developed.

The program to be developed under the project will be oriented towards exploitation of internal resources of the city. It will allow:

- governing bodies of the area to concentrate investments in the most critical activities related to remediation and development of the city;
- local government to promote the development of internal resources of the city rather than to seek external funds;
- demonstration of available resources and their effective use to potential investors;
- local residents to improve their lives.

Outcomes of the project and experience gained in integrated data, science and technology support of the feasibility study of rehabilitation and development by using internal resources could prove to be useful for similar problems in the Urals and Russia.

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E-mail: istcinfo@istc.ru

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