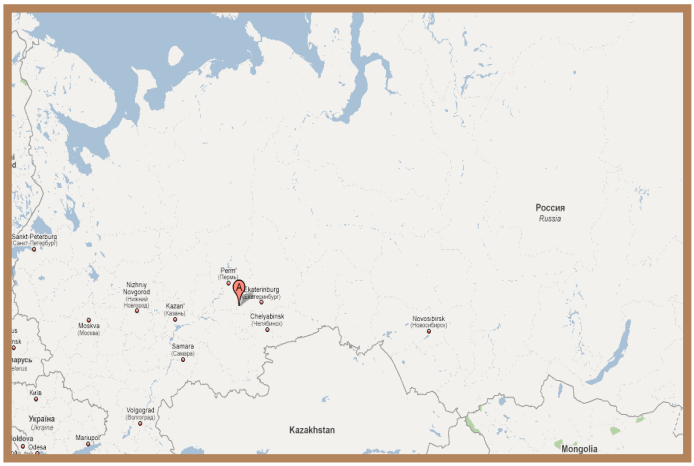
Project Completion Report:
Krasnoufimsk Radioactive Waste Removal

- **Project Details:**

Location:	Krasnoufimsk, Sverdlovsk, Russia
Project Duration:	September 2005 – November 2006
Project Cost:	
	Blacksmith: $8000
Implementing Partners	The Ural Ecological Union



- **Background and Scope:**

  Krasnoufimsk is located in Sverdlovsk Oblast (Yekaterinburg) in the Central Urals. 82,000 tons of radioactive monazite concentrate have been stored here since the sixties. Exposure to monazite is linked to increased risk of cancer and is most dangerous when inhaled.

  There is a very high incidence of cancer in the Krasnoufimsk district. As of late 2004 there were 990 cases of cancer among district residents (more than double that of other districts). More than half the children suffer from developmental problems. Illnesses of the musculoskeletal system, thyroid gland, and reproductive systems are also common.

  The main goal of the project was to raise awareness about the problem and lobby the government for a safe removal of the monazites pollution in the Krasnoufimsk District. Blacksmith funded the local partner NGO raise awareness about the problem and lobby the government for its safe removal.

  The monazite was initially obtained because it contains thorium, which can be used to make nuclear weapons. Interest in monazite raw material declined once the uranium-plutonium nuclear fuel cycle began to be adopted.

  The monazite is packed in three-layered paper bags of 50 kg, which are stored in wooden boxes. Those are stocked in 23 warehouses (19 made of wooden and 4 made of metal), which were built in the early forties by the Central Administrative Board of Material Reserves (GUMR) of the USSR and initially used for the storage of strategic food stocks. The storage site's total area is approximately 20 hectares.

  Content of thorium in monazite is approx. 5% and content of uranium approx. 0.2%. Thus approximately 4000t tons of thorium (thorium-232) and 160t of uranium (uranium-238) are stored at the area, which represent total radioactive activity of $2.886 \cdot 10^{14}$ Bq (7800 Ci).

- **Solution Implemented:**

  In March 2004, the Sverdlovsk Oblast government approved a measure that provided 63 million rubles for remediation work over the years 2004-2007.

  Closed metal hangars were constructed on the most critical warehouses in 2005, and on four more warehouses in 2006. The hangars will protect the shabby old wooden warehouse from dangers such as fire, natural influences, and other potential failures. The wooden fence that surrounded the area was replaced by a new one constructed of ferroconcrete panels. As of 2005, 1 out of 2.4 kilometers of fence had been replaced.

  A new target program for the years 2007- 2009, containing some 280 million rubles, has been providing further support to construct metal hangars at the remaining 13 warehouses (2009: 4; 2008: 4; 2009: 5) and this work has been done.

  Monitoring is implemented on radiation, the hydro-geologically and socially-epidemiologically condition.

It is necessary to consider that in the foreseeable future (10-15 years) the economic conjuncture will not leave prospects for a safe monazites processing, so the only possible decision is to guarantee a safe intermediate term (30-50) storage of the monazites. But we also think that the final solution should be repackaging this monazite to special containers and its removal for storage to the specialized enterprises of the Ministry for Nuclear Energy.

- **Project Metrics and Results:**

The purpose of the project was to create and promote a plan to eliminate monazite pollution in the Krasnoufimsk district. To achieve this goal, the project incorporates the following elements: a compilation of expert reports, educational seminars, progress reports, and lobbying at the regional and federal levels.

The specialists of the Ural Ecological Union established the Expert Council to deal with the monazite pollution. It included the most prominent experts on human health, radiation safety and regional environmental factors. They came to the following conclusions:

1. The warehousing of concentrated monazite in this region does not meet radiation safety requirements.

2. Medical statistics show a noticeably elevated rate of cancer incidence when compared with other towns in the region. This increasing cancer incidence combined with immunodeficiency-related illnesses is cause for alarm.

3. Processing monazite was not authorized and has no economic substantiation. Processing it will create more socio-ecological problems than currently exist.

The Expert Council produced a report entitled, "The Problem and Possible Solution of Monazite Concentration in the Krasnoufimsk District." It recommended, first, that security surrounding the facility be dramatically enhanced. Second, it suggested that the regulations controlling storage of moderately radioactive substances be strictly adhered to. Third, it recommended that extensive research be conducted regarding the health of the local population. Finally, the report recommended that all conclusions drawn about the suitability of the storage facility to house such materials be published.

- ## Outcomes and Follow-up:

The Ural Ecological Union established the Expert Council to deal with the monazite pollution. It included the most prominent experts on human health, radiation safety and the regional environment. The council concluded that the current storage of the monazites concentrate does not adhere to the safety standards for storing open radioactive substances, but the offered alternatives of processing monazite will create more socio-ecological problems than there are at present.

Following the council's recommendation, the warehouse premises were reinforced with more reliable buildings to minimize the potential of natural accidents or terrorist acts.

- **Additional Resources:**
  - Information on monazite storage in Krasnofimsk *(Russian)*: http://www.monazite.ru/