- ФЕДЕРАЛЬНАЯ СЛУЖБА ПО НАДЗОРУ В СФЕРЕ ЗАЩИТЫ ПРАВ ПОТРЕБИТЕЛЕЙ И БЛАГОПОЛУЧИЯ ЧЕЛОВЕКА

The Federal Inspection Service for Protecting Consumer Rights and General Public Health in the Republic of Buryatia

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Report from a working meeting

on issues related to establishing a cause-and-effect relationship between the health of local inhabitants and impacts from tailings and waste piles at the Dzhidinski Mine Site.

The impacts on humans from metals contained within the Dzhidinski Mining Site
(? = unstudied or unconfirmed)

Metal	Skin resorptive	Embryo-tropic impacts	Gonado-tropic impacts	Terato-genic impacts	Muta-genic	Sensiti-zing	Carcino-genic
Cadmium	?	Yes	Yes	Yes	Yes	Yes	Carcinogen
Lead	No	Yes	Yes	Yes	Yes	Yes	Carcinogen
Arsenic	Yes	Yes	Yes	Yes	Yes	?	Carcinogen
Chromium	No	?	?	?	?	?	Carcinogen
Nickel	No	Yes	?	?	Yes	Yes	Carcinogen
Cobalt	No	?	?	?	Yes	Yes	Carcinogen
Molybdenum	No	Yes	Yes	?	Yes	Yes	Strong
Copper	No	Yes	Yes	?	Yes	Yes	Weak
Manganese	?	Yes	?	?	?	Yes	Moderate
Vanadium	No	?	?	?	?	?	Moderate
Tungsten	No	?	?	?	?	?	Moderate
Zinc	No	Yes	Yes	?	Yes	Yes	Moderate
Silver	No	?	?	?	?	Yes	Weak
Antimony	No	Yes	Yes	?	Yes	?	Moderate
Tin	?	?	?	Yes	?	?	Weak
Zirconium	No	?	?	?	?	?	Weak
Niobium	No	?	?	?	?	?	Weak
Strontium	No	?	?	?	?	?	Moderate
Barium	No	Yes	Yes	?	Yes	?	Moderate
Lithium	No	?	?	?	?	?	Moderate
Bismuth							

Rates of increase in the morbidity & sickness of town residents in Zakamensk from 1998-2013

	Zakamensk	County (*raion*)	Buryatia
Abnormal growths	**31.9**	**7.7**	**1.6**
Blood disorders	**5.8**	**3.0**	**1.6**
Nervous system disorders	**19.4**	**10.9**	**2.5**
Diseases of the musculo-skeletal system	**2.5**	**2.1**	**1.6**
Diseases of the urinary tract and reproductive organs	**3.9**	**1.7**	**1.4**
Pregnancy complications	**2.9**	**2.1**	**1.2**

Morbidity and sickness in children undergoing medical testing

Code	Name of disease	Relative Risk
	Number of children	
	Number of children subject to medical testing	
	Total incidents of psychiatric disorders	1.9
	Total incidents of disorders to the nervous system	1.5
	Total incidents of ear/mouth/throat disorders	2.3
	Allergic rhinitis & other unspecified inflammatory diseases	1.6
	Systemic lesions to the ears, mouth, or throat	1.7
	Total incidents of congenital anomalies (birth defects)	4.0

Overall plan to conduct a pilot investigation into: "Detecting, enumerating, and proving a connection between the deteriorating public health of local residents in Zakamensk and various environmental impacts from the Dzhidinski Tungsten-Molybdenum Mill Site"

The Federal Scientific Center for Health Protection and Managing Risks to General Public Health

Issues to be tested and resolved:

—evaluating the overall conditions of the environment around the town of Zakamensk, based on generalized analyses of data related to chemical substances and their impacts from the Dzhidinski Tungsten and Molybdenum Mine Site;

—evaluating the risks to public health through simultaneous observations of local environmental conditions along with surveys of the overall health of local residents living in and around Zakamensk;

—analyses of the distribution of disease and other medical disorders amongst the local populace in Zakamensk (through examining the condition of critical internal organs and other body systems, as well as the condition of the respiratory and other systems that are more prone to exposure);

—identifying actual connections between environmental conditions and the health of local residents;

—more in-depth investigations into the health of local Zakamensk residents, esp. in the area around the waste sites of the Dzhidinski mining area (to prove direct impacts on public health);

—final determination of the presence (or absence) of any direct impacts that the mine site may have had on the health of individuals and groups in and around the Dzhidinski Mine Site of Zakamensk.

- Using findings from epidemiological analyses we can Identify cause and effect relationships between contamination in the environment and the health of populations that have been exposed to this contamination.
- Methods to be used:
- – cluster analyses (using cross-sectional maps of the region);
- – sliding-window-based methods, correlation and regression analysis;
- – probability relationships (in comparison to unaffected “control” site)

- 4.1. Final assessment of public health impacts through in-depth research and analyses:
  - 4.1.1 Clinical testing of both children and adults in Zakamensk.
  - 4.1.2 Overall clinical testing of population groups.
- 4.2 Identifying chemical impurities in the bio-tissues of the Zakamensk populace.
- 4.3. Assessing the immunological status of local residents.
- 4.4. Performing laboratory diagnostics on the research done on these local residents.

- 5. Creating a systematic way to prove negative impacts on public health by researching all factors of influence in the environment.
- 5.1 Adjunct processing of all chemical and other clinical/laboratory analyses, using parametric methods of analyzing the resulting data and by comparing these parameters (i.e., mathematical probabilities, dispersion analysis, etc.) for every data set.
- Mathematical modeling and inter-dependency analyses:

-exposure, and markers of exposure (markers of exposure — the percentage content of contaminant substances detected in bio-matter)

-markers of exposure and markers of response (markers of response come from a full set of lab tests and other analyses showing health impacts)

-markers of response.