



## Demonstration project: Environmental Remediation of Decommissioned Military Bases on Franz Josef Land Archipelago (Demo-BASES)

Franz Josef Land (FJL) is an archipelago consisting of around 200 islands situated in northeast of Barents Sea and is the northernmost landmass of Eurasia (N80-82°). The archipelago has no permanent inhabitants. Several military bases and polar station have been established around the FJL archipelago and most of them abandoned in succeeding years. Up to 50,000 tons of petrol and lubricants in steel drums and tanks were left behind on the archipelago including waste oil and several millions of drums with oil and lubricant residuals.

A former Russian military base located on the Alexandra Land – westernmost island of Franz Josef Land archipelago (FJL) was selected for this demo project. Reasons for Alexandra Land Island selection were as following:

- Representativeness of this area from the pollution types point of view, in particular huge amount of drums and tanks with waste oil and lubricants, hydrocarbon spills on soil;
- Accessibility by seaway all-the-year-round without icebreaker assistance;
- Availability of necessary infrastructure for field works.

A bid-winner, a nongovernmental entity “Polar Foundation”, undertook two expeditions to the FJL archipelago in the 2007 and 2008 navigation periods. The following activities have been performed:

- Detailed survey and sites mapping including buildings, warehouses, depots etc., evaluation of quantities of drums and tanks and their conditions, oil and lubricants types and volumes, possible leakage, spills on soil, etc.
- Sampling and analyzing of soil, liquids and waste oil in drums and tanks for oil hydrocarbons, POPs and heavy metals.
- Demonstration of the whole chain of the drum recycling steps with waste oil and lubricants removal of liquids to special tanks, drums cleaning up, pressing the drums followed by removing the waste liquids and pressed drums from the archipelago by seaway and subsequent recycling on special plants in Arkhangelsk region.

Demonstration soil remediation works on the selected sites after the drums removal.



## Results

Geo-environmental survey of existing environmental situation in the decommissioned military bases on Alexandra Land, Hoffman and Graham-Bell islands allows drawing a conclusion about high level of pollution and soil degradation in the studied areas. In Alexandra Land for example 82% of the examined area was littered with metal scrap accompanied with visible degradation of soil-vegetable cover. A level of soil pollution can be considered as from dangerous level to abnormally dangerous.

The results of the demonstration project on cleaning up Arctic terrains from the drums with oil waste testified:

- Cleaning up of the Arctic terrains of the abandoned drums with oil waste by means of pressing with preliminary cleaning and followed by transportation to the mainland for recycling is quite possible;
- More power pressing equipment (25-35 tonnes) should be employed;
- Drums' washing is unpractical in severe Arctic conditions. The better way is burning up the oil waste in the air flow – this technique prevents contamination of the atmosphere;
- Soil on the Alexandra Land island cannot be mechanically cultivated because of huge amount of rocks

Basing on the results of a soil cleaning experiment with the help of commercial biological products (Devoroil and Petro-Treat) the following main conclusions can be made:

- Bio-products should be employed in the sites characterised with high level of oil hydrocarbons in preliminary bounded areas to prevent the bio-products wash-away;
- Bio-products should be introduced into soil in the beginning of warm season.
- Treated soil should be covered with special air-conducting films to achieve maximum favourable temperature conditions in soil;
- It is desirable applying special bio-products adapted to low temperature.

A legal procedure for transferring the cleaned up territories of decommissioned military bases to the civilian sector has been also elaborated. One of the most important outputs of the implemented demo project is attraction of Ministry of Defence of the Russian Federation to the environmental problems in FJL archipelago resulted from former military activities on some of the FJL islands. Ecological Department of the Russian Ministry of Defence designed an ambitious environmental project for cleaning up abandoned military bases in Russian Arctic from drums, tanks and other scraps followed by soil remediation when and where it is possible. The project will be funded mainly at the expense of the Russian Ministry of Defence.



For additional information please visit <http://npa-arctic.ru> or contact project office (Ivan Senchenya, Project Manager, [Senchenya@npaf.ru](mailto:Senchenya@npaf.ru))