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Measurements from the Kola coast show alarming increase in radioactivity levels

Recent measurements from areas surrounding the submarine bases at the Kola peninsula show significant increases in sediment radioactivity levels. The most alarming contamination was detected outside the Northern Fleet's main storage facility for spent nuclear fuel in Andreeva Bay, close to the Norwegian border. In this area, the top sediments layer contains up to 114 Bq/kg of cesium-137. According to the Bellona Foundation, the contamination is caused by the increased leakage from three aging storage tanks for spent nuclear fuel, situated only 200 meters from the sea. The Bellona Foundation has raised concern about leakage from this storage facility.

The measurements indicate that the uppermost 5 centimeters of the sediments in Andreeva Bay are most heavily contaminated with cesium-137. Cesium-137-levels are 12 times higher than background rates. The measurements indicate that leakage has increased over recent years, most probably due to lack of maintenance of the nuclear storage containers.

The Murmansk Marinebiological Institute collected the sediment samples. The reputable V.G. Khlopin Radium Institute and the Kusnetsov Laboratories in St. Petersburg have performed the analyses. A total of over 100 samples were collected in locations ranging from the Murmanskfjord in the east to the Petsjengafjord in the west. The samples were analyzed for the isotopes cesium-137, cobalt-60 and plutonium-239/240.

The data were made available to the Bellona Foundation. These are the first ever to be made publicly available measurements of radioactive contamination from the areas outside the naval bases of the Northern Fleet. Since 1995, the Norwegian authorities have been denied permission to perform scientific investigations of radioactive contamination along the Kola coast several times.

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In addition to the increased rate of radioactive contamination in Andreeva Bay, the rate of cobalt-60 in the sediments outside the naval shipyard Shkval in Poljarny is alarming. Poljarny is situated at the western shore of the Murmanskfjord. Measurements of sediments taken in the period between 1995 and 1997 show an increase from below 10 Bq/kg to above 80 Bq/kg during this 3-year period. The reasons for this explosive increase are as yet unknown. One potential source is the naval shipyard Shkval 7, where obsolete nuclear submarines are situated. One of them, the Echo-II, had a meltdown in one of the reactors in 1989. Maintenance of second and third generation nuclear submarines is performed at Shkval.

Following are the results of the measurements:

The Litsafjord

Cesium-137:

The mean cesium-137 content in the upper sediment layer in Andreeva Bay is 81,4 Bq/kg. The highest value (114 Bq/kg) was measured in the top 5 cm. Further down in the sediments (6-12 cm), the radioactivity is lower, from 35,4 to 8,3 Bq/kg. This indicates that the exposure to cesium-137 has increased in the most recent period. Further out in the Litsafjord, the mean value is 53,5 Bq/kg.

Cobalt-60:

Most of the measurements are below the detection limits. The sediment samples taken in the layer between 6 cm and 7 cm deep, however, showed cobalt-60 levels of 5,8 Bq/kg. The reason for this increase can be explained with leakage from Building No. 5 in the period between 1982 to 1987. Building No. 5 was the former wet storage facility for spent nuclear fuel in Andreeva Bay.

Plutonium-239, 240:

The maximum values are from the sediment layer at 3 cm to 4 cm, where two of the samples show values of 8,7 Bq/kg and 5,4 Bq/kg. In the layer above, the plutonium readings are half this rate.

Olenya Bay

Cesium-137:

The cesium-137 values are between 20-40 Bq/kg in the bottom sediments. Fourteen obsolete nuclear submarines are situated in Olenya Bay. Radioactive waste is also stored here in bad conditions.

Plutonium-239, 240:

Up to 6 Bq/kg of plutonium 239/240 are measured in the sediments. This is the only site outside of Andreeva Bay with heightened levels of plutonium.

Pala Bay, Naval shipyard Shkval at Poljarny

Pala Bay, Naval shipyard Shkval at Poljarny

Elevated concentrations of cesium-137 are found in the sediment samples here. Even more alarming is the increase in cobalt-60 contamination. Measurements from 1996 show maximum values at 50 Bq/kg. In 1996 the values have increased to 80 Bq/kg. In 1995 the concentration of cobalt-60 was below 10 Bq/kg.

Other naval bases

With the exception of some measurements from the Murmanskfjord, the samples from other naval bases show levels consistent with background radiation. Sediment samples from the Petsjengafjord, where no nuclear activities have taken place in the past, show a cesium-137 concentration of 26 Bq/kg. The reason for these values are fallout from the nuclear testing in the 50'ies and 60'ies and are consistent with other measurements in the Barents Sea.

Measurements from the Motovskfjord outside the Litsafjord indicate a cesium-137 concentration below 10 Bq/kg. This indicates that there is no radioactive contamination leaking out from the Litsafjord. This is in accordance with analyses performed by the Bellona Foundation, which show that probable releases of radioactive materials from the Litsafjord could affect the fishing ground in the Barents Sea.

The recent increase in radioactivity levels in Andreeva Bay points to increased leakage from nuclear storage tanks in Andreeva Bay. Lack of proper maintenance last autumn allowed the winter frost to do more damage than in other years. During the spring thaw, it can be expected that significant quantities of contaminated water will leak out into Andreeva Bay. For more details on this problem see Bellona's fact-sheet about nuclear storage in Andreeva Bay.

For further information on storage of nuclear waste in the Northern Fleet and obsolete nuclear submarines, visit the Bellona web-site (<http://www.bellona.no>). This site also contains photographs of various storage sites.

Read More

- [The Russian Northern Fleet - Sources of Radioactive Contamination](#) Bellona Report 2:1996

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