

# Hazards of burial site in Armenia

*Significant contamination has been found in soil around a site where 500 tonnes of obsolete pesticides were buried. Elena Manvelyan, L. Simonyan and E. Anakhasyan report on the situation and actions taken.*

The Republic of Armenia is a mountainous, land-locked country located in the southern part of the Caucasus region. It was the smallest republic of the former Soviet Union covering only 29,800 sq km. Out of a population of 3.2 million, 66.6% are classified as urban and 33.4% as rural. Armenia has always had highly developed industrial and agricultural sectors with pesticide usage widespread both in agriculture and in public health for malaria control. At the end of the 1980s about 400-500 thousand tonnes of pesticides, including organochlorines, were used annually.

Before the collapse of the Soviet Union pesticides were imported into the republic under the centralized control of the Ministry of Agriculture. Each year a Committee of Chemical Development in Agriculture (with relevant organisations represented) adopted a list of pesticides permitted for use with instructions on dose, frequency of usage, and date of expiration. Pesticides were imported mainly from Russia (about 90%) with the rest from India and elsewhere. They were received at a central stockpile, and later distributed to rural storehouses.

In 1972 the use of DDT was officially banned in Armenia. Stockpiles of banned or expired pesticides gradually built up. In 1982 a pesticide mopping up campaign was conducted. All obsolete pesticides, including DDT remains, were collected and buried in the Artashat region, near Yerevan, the capital of

Armenia. A clay lock (2-2.5 meters deep) was specially constructed for the purpose and more than 500 tonnes of pesticides buried including DDT, granzon (a mercury containing pesticide), HCH (hexachlorocyclohexan), pentachlorophenyl. More than 60% were persistent organochlorines. Up until 1989 soil samples were regularly taken from the site to test for possible contamination of the surrounding region.

In 1991 after the collapse of the Soviet Union Armenia gained its independence. This political transition and the long socio-economic crisis in Armenia changed the situation dramatically. Regular investigation of the soil around the burial place was stopped. In addition, almost all relevant documentation was lost, along with information about the location of the burial site.

In 2001 the NGO Armenian Women for Health and a Healthy Environment (AWHHE) undertook to locate the site. It was eventually found and lacked any measures to discourage public entry, such as security guards or barbed wire. AWHHE specialists conducted a preliminary investigation of the soil in the area. Out of 11 samples four contained DDT, DDE, HCH at average concentrations of 4.29 mg/kg, about 40 times the national maximum permissible concentration (MPC) of 0.1 mg/kg in soil. In two of the samples pesticides residues exceeded the MPC by several hundred fold (23.9 and 54.55 mg/kg). AWHHE continued

monitoring the site during 2001 and 2002.

Deep cracks were found in the soil around the site. The integrity of the burial site is further complicated by its location in a landslide area on the top of the hill and only 800 metres from residential sites. In addition, the system of drains and pipes around the burial site had been demolished and there is now a real threat that pesticides will leak into groundwater and the surrounding environment.

The threat posed by obsolete pesticides is now one of the most important and urgent environmental problems in Armenia. With support from the International HCH and Pesticides Association, AWHHE have collaborated with ECOGLOBE to raise the issue of pesticide burial at the highest political levels in Armenia. As a result this issue was presented during hearings in the European Parliament in Brussels in spring 2003. Further investigations of the burial site were supported by UNIDO and UNEP through the International POPs Elimination Network (IPEN) and the International POPs Elimination Program (IPEP), USAID and PAN Europe.

AWHHE have conducted extensive information and education campaigns among the rural community in the Ararat region. They have also successfully lobbied policy makers both directly and through the media resulting in the creation of an Inter-Departmental Commission focusing on the problem. This resulted in a governmental resolution on ensuring the security of the buried pesticides on 24 April 2004. A fence has now been installed and the drainage is restored.

However, despite the government resolution and the measures already undertaken, the burial site is still not fully secure. AWHHE still detects high concentrations of organochlorines both at the burial site and 50 meters beyond the edge of the site.

The activities of AWHHE and the measures taken by the Armenian government's Emergency Department have increased security around the site reducing the risk of people and animals entering the area. However, the area is still considered an active landslide zone.

This site is not the only one in Armenia. A full inventory has not been carried out but according to information obtained from the Ministries of Agriculture and Nature Protection, there are about 200 tonnes (in addition to the 500 tonnes in Artashat) of obsolete and expired pesticides in different regions mainly located in previous regional centralized stores. Constructive actions need to be undertaken to ensure safe treatment and disposal of the obsolete pesticides at these sites.

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lites in groundwater under the Klatovy – Luby site. Although these levels had decreased compared with levels measured in 1995 they still exceeded amounts the Czech government list as being able to adversely impact human health and the environment. Some other pesticides, including several triazine pesticides were found at several parts per billion.

## Food supply contaminated

In June and August 2003 Arnika also organised an analysis of eggs from hens reared in the area. Levels of DDT were highest reaching 255 microgrammes per kg (parts per million) and exceeding legal limits in the Czech Republic by up to 60-fold.

## Other sites in Czech Republic

Klatovy – Luby is not the only contaminated site in the Czech Republic. Indeed several

other places are likely more contaminated. Other examples are shown in table 1. Additional to these sites are those contaminated by non-POPs pesticides.

NGOs and local authorities in the Czech Republic are lobbying the Czech Ministry of Agriculture to publicly identify and state a list of former organochlorine pesticide storage facilities and their locations. They are also lobbying to ensure that POPs contaminated sites are cleaned using technologies that prevent the formation of additional POPs or the contamination of other sites.

### References

1. *POPs pesticides in the Czech Republic, Miroslav Beranek and Jindrick Petrlik.*

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