

INTERIM IMPLEMENTATION PLAN FOR PHASE 2 OF THE MULTILATERAL COOPERATIVE PROJECT FOR PHASE-OUT OF PCB USE, AND MANAGEMENT OF PCB-CONTAMINATED WASTES IN THE RUSSIAN FEDERATION

**Prepared by the PCB Steering Group**

**Taking into account that the administrative structure used for the implementation of Phase 1 has worked very effectively, the basic administrative elements of Phase 1 should be maintained for Phase 2. Specifically, for the administration of Phase 2, the Steering Group notes the need for: (a) Russian and Western expert teams to include experts in feasibility studies, relevant technologies and environmental aspects; and (b) a Russian Performing Entity and a Secretariat with management experience in the above fields. The financial funding for Phase 2 is estimated to be 490.000 USD. The project can be implemented within a 2 year period.**

## **1. Introduction, issues and basic principles of Phase 2 implementation**

At the First Ministerial meeting of the Arctic Council (September 1998), the Ministers welcomed with appreciation and supported the three-part cooperative pilot project for the phase out of PCB use, and management of PCB-contaminated wastes in the Russian Federation as an example of a cooperative project under ACAP, and endorsed Part I of the PCB project, which has received financial and other support from all Arctic States, and from the Netherlands.

According to the Project Proposal approved at the Steering Group Meeting, Moscow, 10 June 1998, it is suggested that the Project Phase 2 ("Feasibility Study") be implemented following presentation of the Final Report from Phase 1. Phase 1 was initiated in May 1999 and the report from Phase 1 was presented in Moscow, September 2000. Based on the results from Phase 1, and in accordance with the guiding principles agreed in 1998, plans for Phase 2 have been developed. In both the development and implementation of Phase 2, the **basic principles** presented in Appendix 1 shall be applied.

## **2. Phase 1 inventory activities - main observations**

Since PCB production was discontinued in 1992, the stocks of PCB are presumably completely used up, and no releases from PCB production or production of PCB-containing equipment are currently anticipated in the Russian Federation. Some emissions from PCB-contaminated production sites ('Orgsteklo' (Dzerzhinsk), 'Orgsintez' (Novomoskovsk), and 'Kondensator' (Serpukhov), or other contaminated areas (e.g. land-fills or illegal disposal sites) may be expected. Such sites will require remediation, and methods for such activities should be addressed. To determine the level of contamination of these sites, special site

surveys should be performed.

To allow the gradual replacement of PCB-containing transformers and capacitors, alternative liquids are required to substitute Sovtol and TCB. Such replacement liquids should have the necessary technical, economic and environmental properties. Replacement liquids have already been developed and even tested in the Russian Federation on a pilot scale. However, to bring these developments into full production, considerable financial resources are required. The amount of financing can be determined from feasibility studies.

Possibilities for the import of non-PCB containing equipment as replacement technology should be taken into consideration, however, it is likely that mass volume replacement technology would prove too expensive.

Analysis of PCB destruction methods existing in the Russian Federation shows that the plants (facilities) most prepared for industrial scale use are those for incineration at combustion temperatures  $>1200^{\circ}\text{C}$ , and with technologically appropriate schemes for quenching reacting gases. The technique of PCB destruction in cement kilns, as used in some Nordic countries might prove a good alternative, but there is no experience with this type of approach in the Russian Federation.

Destruction/incineration is generally preceded by activities involving labeling, collection and storage of the hazardous materials. Such activities are also envisaged as part of any solution to the phase out of PCBs in the Russian Federation.

### **3. Recommendations for phase-out activities**

Recommendations for further work are based on the information gathered in Phase 1 of the project, and the gaps in data or knowledge identified during Phase 1.

During the conduct of Phase 1 of the project, it was recognized that certain basic activities are necessary to provide the foundation for other anticipated activities. These activities are not linked to any one site, Oblast or region, but rather constitute part of a coherent project that is capable of demonstrating actions and procedures for local implementation. The recommendations associated with these basic activities are as follows:

1. ***Assessment of relevant regulations and requirements (preparatory activity)***. In order to implement demonstration projects, existing and necessary additional regulations, at both the central and decentralized level, must be identified; suggestions for co-ordination of relevant regulatory structures must be developed.
2. ***Design of PCB collection and storage schemes***. Regardless of the selected destruction technology, there is an identified need for an adequate information system to document procedures and facilities for the identification, labeling, dismantling, collection, transport and storage of PCBs and PCB-containing materials.
3. ***Preparation of a "least cost" overall Russian PCB phase-out strategy***. Phase-out plans developed at local, regional and central administrative levels should follow a strategy designed to achieve the objective of a cost-beneficial solution for the entire society.
4. ***Selection of alternatives for replacement of PCB, with acceptable environmental characteristics and feasible production***. For the gradual replacement of PCB-containing transformers and capacitors, the production/use of alternative liquids as

substitutes for Sovtol and TCB should be initiated. These substitutes must have acceptable technical, economic and environmental characteristics.

5. ***Construction/retrofit of a prototype facility for production of alternative fluids.***
6. ***Construction/retrofit of a prototype facility for use of non-PCB alternative compounds in a major PCB use sector.***
7. ***Selection/development of environmentally sound technologies for destruction of PCB/containing liquids.*** The available methods for destruction of PCBs (and other hazardous waste), and the choice of stationary and/or mobile facilities must be addressed along with issues of existing facilities and expertise, etc.
8. ***Selection/development of environmentally sound technologies for destruction/decontamination of PCB-contaminated containers, equipment and their sub-components.*** Several methods for cleaning and emptying PCB fluids from used transformers, and for treating scrap metal, etc., are documented. Since re-use (with or without cleaning) is questionable with respect to prolonging the PCB problem, these technologies should be investigated.
9. ***Selection/development of standard/innovative technologies for rehabilitation of PCB-contaminated areas.*** Existing pollution from PCB contaminated sites may be expected, but the extent of contamination of these sites has not been assessed. ***Special site surveys should be performed to determine the level of contamination of these sites.***

#### **4. Suggested regions and territories for Phase 2 activities**

From the viewpoint of the potential negative impact of PCB releases from the Russian Federation on Arctic ecosystems, the following regions (see Figure 1) can be identified as those warranting priority under Phase 2 of the project:

- North-western region;
- Northern region;
- Ural region;
- Western Siberian region;
- Central region.

Within these main regions, specific areas for priority under Phase 2 have been identified (see Table 6 in the PCB Project Phase 1 Report Executive Summary), selected on the basis of the following criteria:

- location within or proximity to the Arctic/sub-Arctic,
- quantity of PCB in PCB-containing equipment within the area
- quantity of PCB in (stored) waste within the area
- PCB release from PCB-containing equipment

If possible, the identified regions should be supplemented with the additional areas where the greatest impacts may be expected to occur.

In relation to remediation, work should focus on sites of production of PCBs and PCB-containing equipment, in particular the Russian cities: Dzerzhinsk, Novomoskovsk and Serpukhov, where potential impacts due to local contamination are to be expected.

#### **5. Administration of Phase 2.**

Taking into account the fact that the administrative structure used in the implementation of Phase 1 of the project functioned very effectively, the basic administrative elements of Phase 1 should be maintained for Phase 2. Specifically, for the administration of Phase 2, the Steering Group notes the need for: (a) Russian and Western expert teams to include experts in feasibility studies, relevant technologies and environmental aspects; and (b) a Russian Performing Entity and a Secretariat with management experience in the above fields.

**6. Preliminary cost estimate for Phase 2 (excluding in-kind contribution from Russia and Western countries and organizations)**

**Preliminary cost estimates for the 9 activities of Phase 2**

The preliminary cost estimates presented below cover only participation of experts from the Russian Federation, preparation and publication of Russian versions of the reports on feasibility studies, but do not include Russian in-kind contribution.

To ensure a continuation of the close cooperation between the Western and Russian experts it is important that sufficient finances are made available to ensure active involvement from the western experts through in-kind contributions.

**(Activities are described in section 3, above)**

Activity 1. 30,000 USD.

Activity 2. 40,000 USD

Activity 3. 35,000 USD

Activity 4. 40,000 USD.

Activity 5. 35,000 USD

Activity 6 50,000 USD

Activity 7 50,000 USD

Activity 8. 60,000 USD

Activity 9 60,000 USD

Total 400,000 USD

Total cost estimate for Russian participation in the Phase 2 - 400,000 USD

Administrative costs - 50,000 USD

Translation - 20,000 USD

Russian entity - 20,000 USD

**Total cost: 490,000 USD**

## **7. Preliminary time frame of Phase 2 implementation.**

It is envisioned that Phase 2 implementation can be completed within 2 years, see attached table. As can be seen from the table, the three main feasibility areas; alternative fluids (activities 2, 3 & 4), destruction of PCB and contaminated wastes (activities 5 & 6) and rehabilitation of PCB contaminated areas (activity 7), are planned to be performed in parallel. In case of inter-relationship of activities, they will be implemented in a manner to ensure availability of outcomes of other activities. However, implementation of demonstration projects (Phase 3), for which feasibility studies are ready, can be started without delay and, if financial sources needed for their implementation (including private investments and Russian contributions) are available, need not wait until the end of the whole Phase 2. A preliminary timetable of Phase 2 activities is presented in Appendix 2.

## **Appendix 1: Basic principles for development and implementation.**

1. Feasibility study should be aimed on preparation of projects ready for implementation during Phase 3, and cover their technical, economic and environmental aspects, based on comparative assessment of alternative options. It should document possible positive and negative environmental effects of proposed demonstration projects.
2. Feasibility studies should not consider technical proposals that have not been developed to the level of experimental construction and testing. The project should not be aimed on fundamental research of new technologies/methods. For example, the Workshop organized by UNEP - Chemicals and CIP in July 1999 in Moscow (Golitsyno) has preliminary determined some of technologies and methods feasible for implementation. The results of this Workshop should be taken into account.
3. It should be taken into account that some projects focused on solving the PCB problem are currently under development in Russia, with technical and financial involvement of a number of large enterprises. This experience should be carefully studied and used in phase 2.
4. Feasibility study should be implemented in close collaboration with the NEFCO PCB Fast Track Project in Northwestern Russia, and main results obtained within its framework can be used. However, it should be taken into account that this project is aimed on fast solving of PCB problems in a limited geographical area, and is not intended to develop large-scale technical solutions and technologies.
5. Taking into account current economic situation in the Russian Federation, feasibility study should prepare, if feasible, a background for optimal utilization of existing facilities and equipment.
6. The activities adopted for Phase 2 include cost/benefit analysis as a specific task. However, in practical implementation of feasibility study this activity should not be considered as a separate task but should be included in each activity and technical solution/technology and



**Figure 1.** Regions of the Russian Federation.