6.2 BASELINE ACTIVITIES

The following section presents a summary of the existing programmatic baseline for addressing the Level 1 pesticides. The activities discussed include those that are part of EPA's current ongoing programs addressing Level 1 pesticides, as well as relevant ongoing activities maintained by states and other non-EPA entities.

6.2.1 Products

Current Pesticide Collection Programs

Many states and counties have addressed the problem of old accumulated stocks of agricultural pesticides by establishing waste pesticide collection and disposal programs, commonly called "Clean Sweeps."

These programs provide a simple way for farmers and other pesticide users to properly dispose of unwanted pesticides at little or no cost to the participants. Clean Sweep programs generally accept all unwanted pesticides; the Level 1 pesticides are only a subset of the targeted pesticides. All Clean Sweep programs accept pesticides from farmers. In addition, many programs also accept pesticides from other people and businesses, such as commercial pesticide applicators, golf courses, pesticide retailers, highway and railway maintenance departments, and households. Although those who still possess old stocks of many of the Level 1 pesticide products may be under the purview of RCRA Hazardous Waste Generator rules, some states provide participants limited amnesty from prosecution under hazardous waste regulations.

Households and some small businesses may also be able to dispose of unwanted pesticides at locally-run household hazardous waste (HHW) programs, which target all kinds of hazardous chemicals and products used by households, including pesticides. A third type of collection program is the hazardous waste management system established by the Department of Defense. These three types programs are discussed below.

State Clean Sweep Programs

Because each state or local government which has implemented a Clean Sweep program has designed its program to fit its own needs and funding sources, there is no single "typical" Clean Sweep program. Some of the variations include:

- **Format:** The pesticides may be collected by holding single-day collection events where participants bring their pesticides to a centrally located site, by picking up pesticides from individual farms and facilities, or by establishing permanent collection sites.

- **Type of waste collected:** Some Clean Sweep programs accept only agricultural pesticides. Other agricultural waste pesticide collections may be combined with

household hazardous waste programs, collecting both waste types at a single site but handling them separately.

- **Organizer:** Most Clean Sweep programs are run by the state Departments of Agriculture, which usually work closely with the state's agricultural extension service. A few Clean Sweep programs are organized by a different state agency, such as the state environmental agency, and in some states, counties run the Clean Sweep programs.

- **Funding source:** Clean Sweep programs have overwhelmingly been initiated, run, and, for the most part, funded by state or local governments. EPA has partially funded some programs through several kinds of grants. However, the amount of money contributed by EPA is minimal compared to the amount of money provided by the States. In addition, EPA's funding sources have been limited and available only intermittently, which makes it difficult for states to plan and carry out consistent programs. The states with comprehensive, long-term programs have found other funding sources, such as using a portion of the state pesticide registration fees, receiving a specific appropriation from the legislature, incorporating the program into an agency's budget, or assessing fees to participants.

- **Participants:** Because most Clean Sweep programs target agricultural pesticides, all of the programs accept waste pesticides from farmers. However, many programs allow other businesses or individuals to participate, including commercial applicators, golf courses, agrichemical dealers, other pesticide retail outlets, highway and railway maintenance departments and even households. A number of Clean Sweep programs are looking to expand the allowable participants, in response to requests from these other businesses that often have similar stocks of pesticides to be disposed, and to provide a service to rural communities. Occasionally, waste pesticide collection and disposal programs have focused on non-agricultural pesticide users. For example, Illinois collected about 19,000 pounds of unwanted pesticides from 63 structural pest control operator companies in 1998.

- **Disposal methods:** The vast majority of pesticides collected through Clean Sweep programs – including the Level 1 pesticides – are disposed of in permitted hazardous waste incinerators, although a small percentage require a different disposal method. For example, inorganic pesticides such as lead arsenate cannot be incinerated and are disposed of in permitted hazardous waste landfills. In addition, some pesticides (such as 2,4,5-T and Silvex) contain or potentially contain dioxin and therefore must be disposed of in an incinerator specifically permitted for dioxin.

- **Accomplishments (all pesticides):** Clean Sweep programs have been successful in removing all kinds of agricultural pesticides (not only PBT pesticides) from the environment and ensuring the proper management of these materials. Based on the

available results of these programs from 1988 through 1998 (with some 1999 data), the accomplishments of Clean Sweep programs in the United States include:

- Clean Sweep programs have collected and disposed of more than 18 million pounds of *all* pesticides.
- All but five states have collected and disposed of some agricultural pesticides.
- Almost half of the states have had continuous Clean Sweep programs since 1995 or earlier.

- **Accomplishments (Level 1 pesticides):** The Level 1 PBT pesticides are regularly collected by Clean Sweep programs, although EPA does not have enough data to fully characterize the quantities of these pesticides collected so far. However, the amounts of the Level 1 pesticides collected in Minnesota from the late 1980's through 1998 – the most comprehensive data currently available on the quantities of specific pesticides collected by a state Clean Sweep program – provide an indication of the potential magnitude of PBT pesticides that might have been collected nationwide. Multiplying the percent of the total pounds of pesticides collected in Minnesota (6.16 % as shown in Table 6-1) by the nationwide total for all pesticides collected (approximately 18 million pounds) would yield a preliminary estimate of about 1.1 million pounds of Level 1 PBT pesticides collected nationwide so far. While this approach assumes that the percentage of Level 1 pesticides collected in Minnesota is representative of the entire country, and the accuracy of this assumption is debatable, the Minnesota data is the most comprehensive, long-term information available on the amounts of individual Level 1 pesticides collected. In addition, because the Minnesota collections were conducted over a period of time, the effect of fluctuations in quantities of Level 1 pesticides collected from event to event on the overall estimate is minimized. Therefore, until better data becomes available, an estimate of the amount of Level 1 pesticides that may have been collected across the U.S. was made using Minnesota collection data for all PBT pesticides. Additional data on the Minnesota collection program are provided in Appendix D.

Currently in the U.S., a total of 21 states have on-going, permanently funded, continuous Clean Sweep programs. There are 17 other states which also have continuous program, but which are not permanently funded. Thirteen states have intermittent, and 4 states have held one Clean Sweep event. To date, there are 5 states which have never held a Clean Sweep event.

Table 6-1. The Percentage of Level 1 Pesticides Collected by Clean Sweep Programs in Minnesota through 1998

Pesticide [1]	Percentage of Total Pesticides Collected in Minnesota (%) [2]
DDT	3.42
chlordane	1.26
toxaphene	1.01
aldrin	0.27
dieldrin	0.20
All PBT pesticides	6.16

[1] No data were reported for mirex.
[2] This column represents the percent of the total represented by each pesticide collected in Minnesota from the late 1980s through 1998. It was calculated using the total amount (pounds) of the individual pesticide collected through 1998 and the total amount (pounds) of all pesticides collected through 1998.

Household Hazardous Waste Collection Programs

Clean Sweep programs focus on the collection and disposal of agricultural pesticides. However, many pesticides are used in and around homes, so there are also stocks of household pesticides that require disposal. According to federal waste regulations, household wastes are not hazardous wastes and can be disposed as regular household trash regardless of their composition. Another option, however, is for household pesticide users to dispose of waste pesticides at one of the growing number of household hazardous waste (HHW) collection programs. In 1997, there were over 3,300 HHW collection programs nationwide, including more than 440 permanent HHW programs.

As with Clean Sweeps, HHW programs vary in structure. Most accept a wide range of materials, including paint, motor oil, antifreeze, batteries, pesticides, and other unwanted chemicals products. Some programs accept materials only from households, while others accept materials from small businesses including farmers.

While data to estimate the total amount of pesticides collected at HHW programs is lacking, a review of reports from several states and the District of Columbia indicates that pesticides (not just Level 1 pesticides) typically account for 5% to 10% of the total amount of material collected by programs limited to households. The only information we have about the amounts of Level 1 pesticides comes from New Jersey, which maintains a data base with the amounts of hazardous wastes shipped from county waste collection programs. Some of the counties accept waste from businesses and some are limited to households. Table 6-2 presents

the quantities of the Level 1 pesticides that were shipped for disposal from New Jersey county waste collections.

Table 6-2. Amounts (in pounds) of Level 1 Pesticides[1] from County Waste Collection Programs Disposed in New Jersey

Pesticide[1]	1997 Quantity (lb)	1998 Quantity (lb)	Total Quantity (lb)
aldrin	1,020	10,421	11,441
dieldrin	6,054	0	6,054
chlordane	29,488	15,844	45,332
DDD	583	0	583
DDT	24,649	4,310	28,959
All PBT pesticides	61,794	30,575	92,369

[1] Because mirex is not classified as a hazardous waste, no data were available. No toxaphene was listed as being disposed.

Current EPA Activities Supporting Clean Sweeps

EPA has supported Clean Sweep programs in several ways, which are listed below. However, the actual level of EPA support (both direct financial support as well as work products or information exchange) is minimal compared to the contributions from the states and counties which run the programs.

- EPA has partially funded some Clean Sweep programs through several kinds of grants, normally distributed by the EPA Regional offices.

- Over the past several years, EPA has collected and consolidated information provided by program managers about Clean Sweep programs in general and specifically about the quantities of pesticides collected per year by each program.

- Using this information on the quantities of pesticides collected, EPA is currently preparing a report on the status and success of Clean Sweep programs nationwide. The report is intended to present the status of Clean Sweep programs nationwide and to independently promote these programs by publicizing their success and providing information on the many different ways to start, operate, and fund them.

- In FY1999-2000, EPA funded several pilot projects to facilitate the collection of data on the quantities of specific pesticides, including Level 1 pesticides, collected in Clean

Sweep programs. Historically, most Clean Sweep programs have only monitored the total quantity of all pesticides collected.

Department of Defense (DOD) Hazardous Waste Management System

The Defense Reutilization and Marketing Service (DRMS) in the DOD handles the majority of offsite disposal of hazardous wastes for DOD. DRMS has developed a disposal system that includes a network of regional service contracts for hazardous waste disposal, systematic monitoring and review of the facilities used on these contracts, and tracking the items disposed. Currently, DRMS is establishing a procedure to allow non-DOD Federal agencies to use this disposal system for their own disposal needs on a reimbursable basis. This could facilitate the disposal of PBT pesticides that may currently be stored at Federal facilities at a reasonable cost by using an existing system.

Current International Efforts to Control Level 1 Pesticide Products

At the international level, the U.S. is involved in various activities and negotiations to reduce and/or eliminate the use of Persistent Organic Pollutants (POPs), including the Level 1 pesticides. For example, the U.S. is supporting the work of the World Health Organization to assist developing countries in phasing-out the use of DDT for malaria control under the Rollback Malaria Program. In addition, EPA is working on a regional basis to eliminate the use and production of DDT in Mexico and Central America. Key global and regional activities related to Level 1 pesticide products are summarized below. For additional information on these and other international efforts, refer to the EPA Office of Pesticides Programs homepage at http://www.epa.gov/oppfead1/international/. This homepage contains Internet links to other important sites. In addition, key global and regional activities related to transboundary air pollution, which in many cases overlap with the international activities related to products described below, are summarized in section 6.2.3 of this report.

- **UNEP Global Treaty on Persistent Organic Pollutants (POPs)**. In July 1998, the United Nations Environment Program (UNEP) convened the Intergovernmental Negotiating Committee (INC) in Montreal, Canada, to prepare a legally-binding instrument for implementing international action on an initial list of twelve POPs, including the Level 1 pesticides: aldrin, chlordane, DDT, dieldrin, mirex, and toxaphene. The INC consists of representatives from over 100 countries, observers from multilateral organizations and NGOs and is facilitated and supported by UNEP. Since 1998, negotiators have met at four INCs to develop draft treaty language that eliminates the production and use of POPs pesticides, though several country-specific exemptions are currently requested for some of them. There is fairly wide agreement that the continued use of DDT restricted only to disease vector control should be allowed. It is expected that the negotiations will be completed in December 2000 in South Africa.

  Also under the auspices of the global POPs treaty, EPA is working with UNEP to implement an Obsolete Pesticides Project in the Russian Federation. As part of this

project, UNEP workshops in 4 to 6 regions are being held this year that include training for conducting inventories followed by inventory development exercises in each region. In addition, UNEP Chemicals and EPA are conducting pilot projects in 4 African countries (Tanzania, Côte d'Ivoire, Mali and Nigeria) to provide internet access and training to chemicals management officials and managers in Africa. Depending on the success of the pilots and future funding, the project may be expanded to provide internet connectivity to chemicals managers lacking such access in the rest of the developing nations.

UNEP has a POPs Home Page with more information at http://irptc.unep.ch/pops/.

- **UNEP/FAO Prior Informed Consent (PIC) Procedure**. In September 1998, under the auspices of the United Nations Environment Program (UNEP) and United Nations Food and Agriculture Organization (FAO), a global international agreement on a Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade was signed by approximately 60 countries. This agreement builds on an earlier voluntary program that involved 150 countries. Once ratified by 50 countries, the PIC establishes international obligations for export controls of listed substances, notifications for export of banned and severely restricted substances, development of chemical profiles on the listed substances, and exchange of information. It is intended to encourage informed decision making about import and use of the listed substances and will build capacity for chemicals management in developing countries around the world. At the time of its signing, the Agreement included 17 banned pesticides (including aldrin, chlordane, dieldrin, and DDT), five hazardous pesticide formulations, and five industrial chemicals. At the first meeting of the International Negotiating Committee after signature, it was agreed to add two pesticides, toxaphene and binapacryl, to the procedure.

- **UN FAO International Obsolete Pesticides Program**. As many developing countries have neither the capacity or facilities for disposal nor the financial resources to properly dispose of obsolete pesticides, in 1994 the United Nations Food and Agriculture Organization (FAO) initiated the development of a international obsolete pesticides program in three pilot countries. This effort is intended to provide assistance to developing countries with problems related to obsolete pesticide stocks. FAO Activities to date have included the establishment of a foundation with multi-donor involvement to provide financial assistance; development of guidelines and training manuals on accumulation prevention, best disposal, and stock management; and providing disposal assistance through the end of 1999. U.S. EPA currently supports this international effort in an advisory and technical capacity.

- **Coordinating Group on Obsolete Stocks.** UNEP Chemicals together with the Food and Agricultural Organization, the Secretariat of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, the

World Health Organization, and the Organization of Economic Cooperation and Development have formed a Coordinating Group on Obsolete Stocks. It will function under the auspices of the Interagency Organization for the Management of Chemicals. Its objectives are to raise awareness about the disposal problem, develop and propose effective responses, and ensure the limited resources are coordinated for maximum result. Initial steps will include a baseline study describing the nature and extent of the problem, possible solutions, and current activities, with release expected in late 2000.

- **International workshop on obsolete pesticides**. A Workshop on Obsolete Pesticides is being planned by the Organization for Economic Cooperation and Development (OECD), FAO and UNEP, for September 2000 in Alexandria, Virginia. The U.S. EPA is helping with the planning stages and will host the workshop with assistance from the Danish Environmental Protection Agency and the Polish Plant Protection Institute. The purpose of the workshop is to draw attention to, and inspire a concerted international effort to solve the problem of obsolete pesticides.

- **FAO/UNEP Expert Group on Termite Biology.** Alternative ways of controlling termites is the focus of an expert group established by FAOs Global Integrated Pest Management Facility, and UNEP Chemicals as the result of a recent joint expert workshop (February 2000). Heptachlor and two PBT pesticides, chlordane and mirex, are still being used to control termites to protect agricultural crops and in building construction.

- **Training Course: Pesticide Disposal in Developing Countries.** EPA has developed a training course on pesticide disposal in developing countries. This is one of several of the international training modules offered by EPA (more information at: http://www.epa.gov/oia/modules.htm). The course, which is designed to be delivered on a regional basis, suggests decision-making techniques for countries and regions faced with the disposal of large quantities of obsolete or unwanted pesticides. The course teaches participants to: conduct and evaluate pesticide inventories; select management and disposal options for bulk quantities; dispose of empty containers; protect workers entering storage sites; stabilize and clean up storage sites; develop a communication strategy; and prevent the build-up of unwanted stocks in the future.

- **Regional Environmental Program for Central America - Pesticide Project.** In cooperation with USAID, EPA conducted training, assisted in assessing national pesticide regulatory systems and developed a regional plan for the safe disposal of obsolete pesticides.

- **USAID African Pesticide Disposal Initiatives.** USAID has been supporting obsolete pesticide disposal initiatives in a number of African countries. For example, USAID has provided technical assistance and capacity building to develop disposal programs (Ethiopia and other countries), assess the problem of stockpiles (Mali)

dispose of stockpiles (Niger), and conduct pesticide management training (Uganda, Guinea or Ghana).

- **NAFTA Technical Working Group on Pesticides.** In 1996, under the North American Free Trade Agreement (NAFTA), the U.S., Canada, and Mexico formed a Technical Working Group (TWG) on pesticides to harmonize regulatory systems and address potential trade problems caused by differing regulatory practices. This work focuses on specific trade irritants, often caused by national differences in Maximum Residue Limits (or tolerances), and seeks to develop a better understanding of each regulatory agency's assessment practices in order to harmonize each country's procedures and requirements. Several projects are supported by the TWG which involve the joint review of pesticides, coordinated programs on integrated pest management, and regulatory capacity building. The TWG also works with stakeholders and encourages pesticide registrants (product owners) and growers to coordinate activities on a regional level.

- **CEC Tri-lateral North American Regional Action Plans for Chlordane and DDT.** In June 1998, Canada, Mexico, and the U.S. published North American Regional Action Plans (NARAPs) for chlordane and DDT under the Sound Management of Chemicals (SMOC) Program administered by the Commission for Environmental Cooperation (CEC). The objectives of the NARAP for Chlordane is to reduce exposure to chlordane through the phase-out of existing registered uses. As of May 1999, chlordane is no longer registered for use in any of the three countries and is no longer manufactured in North America. For DDT and its metabolites, the NARAP objectives are to reduce exposure through the phased reduction (80% by 2001), leading to the eventual elimination, of DDT used for malaria control in Mexico, as well as the elimination of illegal uses of DDT. The NARAP for the Phase-Out of DDT supports a holistic approach to malaria control, bringing together an integrated pest control management strategy for the vector as well as the full spectrum of related public health activities and services. It also calls for a regional perspective that encourages the sharing of experiences with other Latin American and Caribbean countries to ensure that malaria continues to be controlled throughout the Region. The three countries are working together in identifying potential sources of funding. Mexico has indicated that $1.5 million will be needed in the next 2 years to test and evaluate alternatives and to address the needs of the health services sector. Much of the needed funds will be provided by the CEC and the International Development Research Center (IDRC) in Canada. In addition, the Global Environment Facility (GEF) is funding a multi-million dollar project to phase-out the use of DDT in Central America, building on the experience in Mexico. To date, a 50% reduction in the use of DDT has been achieved in Mexico, indicating that the reduction goal of 80% by 2001 is on schedule.

  In response to the lack of regional-level monitoring data on suspected regional transport pathways and the transfer of toxic pollutants between Mexico, the U.S., and

Canada, the FY99-01 action plan of the CEC calls for several strategic initiatives in support of the SMOC Program, such as monitoring, modeling, and assessing the status and trends of chemicals in the North American Environment in conjunction with the CEC air program.

- **WHO Efforts to Reduce Reliance on DDT for the Control of Malaria.** In conjunction with the negotiations of the INC to reduce/eliminate the use of POPs, the U.S. is coordinating with the World Health Organization's DDT Panel of Experts to develop a global WHO Action Plan for the gradual phase-out of DDT used for public health purposes such as malaria vector control. WHO is engaged in a broad based effort to assist countries in controlling malaria, utilizing integrated strategies based on the promotion of health services. Roll Back Malaria (RBM), a partnership led by WHO with private and public sector institutions (i.e., World Bank, UNICEF), provides a diverse network for mobilizing action toward strengthening malaria control programs worldwide. Through the RBM program, WHO has the capability to integrate DDT reduction efforts into the broader framework of the international negotiations on Persistent Organic Pollutants (POPs). Coordination with Member States (including the U.S.), the UN Environment Programme (UNEP), and the UN Food and Agriculture Organization (FAO) will help promote the sound management of POPs in general, and will leverage support for needed activities to address DDT and the development of environmentally sound and safe alternatives.

  In June 1999, the World Health Organization (WHO) convened an expert consultation to draft a framework for action to reduce reliance on DDT for public health. This activity was organized on the basis of the World Health Assembly Resolution WHA50.13. The Resolution calls upon Member States to take steps to reduce reliance on insecticides for control of vector-borne diseases in accordance with WHO guidelines and through support for the development and adaptation of viable alternative methods of disease vector control. The Resolution also calls upon Member States to ensure that the use of DDT is restricted to public health programs that take an integrated approach, while taking steps to prevent diversion of DDT for use outside of the health sector.

  Currently, WHO is in the process of finalizing the "Action Plan for the Reduction of Reliance on DDT" as well as a Workplan that identifies and prioritizes specific implementation activities. WHO intends to use their Action Plan and Workplan as a framework for technical assistance to its Member States and an instrument in support of the intergovernmental negotiations on the reduction and/or elimination of DDT use for public health purposes. This framework will ensure that public health concerns are fully considered and no opportunities are lost to maximize the public health benefits that may be derived from the transition from DDT to alternatives for vector control.

6.2.2 Land

Because of their hydrophobic nature, Level 1 pesticides in the environment often tend to be associated with soils and sediments. In terrestrial environments, this includes widespread contamination of agricultural lands, as well as more concentrated contamination of soils at former pesticide manufacturing, mix/load, and dealer/storage sites. Some contaminated agricultural lands may be converted into residential areas through development, although the extent of this potential exposure issue is unknown. Because there are few cost-effective options for reducing diffuse contamination of agricultural soils, the primary focus of Agency efforts regarding contaminated soils has been on Superfund activities under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Corrective Action under the Resource Conservation and Recovery Act (RCRA).

Superfund was enacted to establish clean up requirements for uncontrolled, abandoned hazardous waste sites and to address future releases of hazardous substances into the environment. Superfund is a federally run program that was primarily designed to remedy the mistakes in hazardous waste management made in the past at sites that have been abandoned or where a sole responsible party cannot be identified. Cleanup at Superfund sites is primarily paid for by the Superfund Trust Fund with money derived mainly from taxes on the chemical and petroleum industries.

RCRA Corrective Action is a state-based program whose primary driver is the "clean-up" of permitted (RCRA Part B) sites that have been contaminated with hazardous chemicals. The RCRA Corrective Action Program is different than Superfund because it deals with sites that have viable operators and on-going operations. The Corrective Action Program encompasses active, or soon to be active facilities, that are permitted or seek a permit to treat, store, or dispose of hazardous waste. As a condition for obtaining a RCRA operating permit, these active facilities are required to clean up contaminants that are released or have been released in the past. RCRA facilities must pay for the cleanup at their site. In general, RCRA establishes a regulatory structure for the handling, storage, treatment, and disposal of materials defined as solid and hazardous wastes, which may include certain contaminated soils and sediments. Under RCRA, a soil material may be required to be managed as a hazardous waste if it is contaminated by a listed hazardous waste, or if it exhibits a hazardous waste characteristic. Required clean-up activities vary from region to region and state to state, although in general, the treatment standard for contaminated soil is based on the contaminant, the technology needed, and the level of clean up required. New soil treatment standards have been designed to encourage more cost-effective cleanup of hazardous contaminated soils subject to Land Disposal Restrictions (LDRs). Before these standards were developed, soils subject to LDRs were required to comply with traditional technology-based treatment standards at 40 CFR 268.40 developed for industrial hazardous waste. These treatment standards sometime proved to be inappropriate (e.g., not cost effective), or unachievable (e.g., did not account for heterogeneous soil matrices) when applied to hazardous constituents present in soil. Therefore, newer soil treatment standards provide for more flexible treatment requirements that consider the unique characteristics of soils and applicable treatment technologies, and are achievable using a variety of non-combustion treatment alternatives.

The highest concentrations of Level 1 pesticides in soils are primarily found at

contaminated industrial sites (e.g., former manufacturing facilities) and contaminated dealer/storage sites. As discussed in section 5.2.2 and Appendix C, some pesticide manufacturing, formulating, handling or disposal facilities are on the Superfund National Priorities List and are managed under the Superfund program. However, the vast majority of sites that are contaminated as a result of pesticide storage, handling, or mixing/loading practices are not on the National Priorities List. Additionally, these pesticide-related sites are not treatment, storage, or disposal facilities under RCRA, so they are not managed under the RCRA corrective action program. Therefore, most pesticide storage, handling, or mixing/loading sites that are contaminated are managed under the authority of a state's statutes and regulatory programs. For example, the Minnesota Department of Agriculture has the authority to investigate and manage agricultural chemical contamination under the Minnesota Environmental Response and Liability Act, the Minnesota "Superfund". However, only a few states, including Minnesota, Wisconsin and Illinois, have comprehensive programs for managing pesticide-contaminated storage, handling and mixing/loading sites. Most states manage this type of contamination on a case-by-case basis.

6.2.3 Air

Current International Efforts to Reduce Long-Range Transport (LRT)

Although the U.S. has long banned the use of the six Level 1 pesticides, some countries still allow their use. Because these pesticides are prone to long-range atmospheric transport and deposition, the U.S. may be subject to exposure from international sources. In response, the U.S. has become involved in various international fora to protect the U.S. and the global commons from certain PBT chemicals, including the Level 1 pesticides. These substances cannot be completely controlled through national programs, but warrant regional and/or global action to control their production and use. The work at the global level builds on several existing regional agreements, with the overall intent of providing assistance to developing countries as they phase out the use of commercially produced chemicals, and to assist them with the safe disposal of current stocks of POPs and other unwanted pesticides.

Key global and regional activities related to transboundary air pollution are summarized below. For additional information on these and other international efforts, refer to EPA's Office of Pesticides Programs homepage at http://www.epa.gov/oppfead1/international/. This homepage contains Internet links to other important sites. In addition, key global and regional activities related to products, which in many cases overlap with the international activities related to transboundary air pollution described below, are summarized in section 6.2.1 of this report.

- **Regional Protocol Negotiated under LRTAP POPs.** In February 1998, members of the United Nations Economic Commission for Europe (UN-ECE) completed negotiations on a regional legally-binding protocol on Persistent Organic Pollutants (POPs) under the Convention on Long-Range Transboundary Air Pollution (LRTAP) Convention. The UN-ECE region covers the Russian Federation, the Newly Independent States, Central and Eastern Europe, Western Europe, Canada, and the United States. The protocol was signed in June 1998 in Aarhus, Denmark and will

enter into force once it has been ratified by 16 parties. The objective of the LRTAP protocol is to control, reduce, or eliminate discharges, emissions, and losses of certain persistent organic pollutants. It will regulate sixteen compounds, and will specifically ban the production and use of the pesticides: aldrin, chlordane, dieldrin, mirex, and toxaphene. The protocol will also ban production and limit uses DDT. Additional information on the LRTAP protocol is available on the internet at http://www.unece.org/env/lrtap/protocol/98pop.htm

- **UNEP Global Treaty on Persistent Organic Pollutants (POPs)**. As described in section 6.2.1 above, in July 1998, the United Nations Environment Program (UNEP) convened the Intergovernmental Negotiating Committee (INC) to prepare a Global Treaty to implement international actions on 12 POPs, including the Level 1 pesticides: aldrin, chlordane, DDT, dieldrin, mirex, and toxaphene. As the ultimate goal of the treaty will be to "reduce and/or eliminate releases of POPs", international efforts under the global POPs treaty will contribute to a reduction in long-range transport.

- **Binational Toxics Strategy (BNS).** In April 1997, the U.S. EPA and Environment Canada agreed to a plan to protect public health by working towards a goal of virtual elimination of persistent toxic substances from the Great Lakes Basin. The agreement, the Canada-United States Strategy for the Virtual Elimination of Persistent Toxic Substances in the Great Lakes Basin (also known as the Great Lakes Binational Toxics Strategy (BNS)), provides an established process for engaging stakeholders and seeking voluntary reduction efforts. A major challenge of the Binational Toxics Strategy is to assess atmospheric inputs of persistent toxic substances to the Great Lakes and, if long-range sources are confirmed, to work within international frameworks to reduce releases of such substances. With regard to pesticides, the plan seeks confirmation that there are no releases of six bioaccumulative pesticides: chlordane, aldrin, dieldrin, DDT, mirex and toxaphene. In December 1998, EPA's Great Lakes National Program Office (GLNPO) released a draft report entitled, *Draft Pesticides Report in Response to the Great Lakes Binational Toxics Strategy*. A final report will be released in 2000. The report presents and analyzes data on the environmental presence of chlordane, aldrin/dieldrin, DDT, mirex, toxaphene in the Great Lakes, along with probable and suspected sources. The report fulfills a "challenge" created by the Binational Toxics Strategy for EPA to confirm by 1998 the elimination of uses and releases of the pesticides from sources that enter the Great Lakes. Additional information on the BNS is available on the internet at http://www.epa.gov/docs/grtlakes/bns/.

Air Monitoring and Research

- **Integrated Atmospheric Deposition Network (IADN).** IADN conducts research to determine the atmospheric loadings of toxic substances to the Great Lakes system and define temporal (over time since 1990) and spacial trends. Among other toxic chemicals, IADN currently monitors the atmospheric deposition of aldrin, chlordane, DDT/DDE, dieldrin, mirex, and toxaphene. Additional information on the

IADN programs is available on the internet at: www.epa.gov/glnpo/iadn.

- **Arctic Monitoring and Assessment Program (AMAP) Air Research.** AMAP was established in 1991 to implement components of the Arctic Environmental Protection Strategy (AEPS) adopted by eight Arctic countries including the United States. The program was given responsibility to monitor levels and assess the effects of selected anthropogenic pollutants in all compartments of the Arctic. In 1998, the AMAP Assessment Report: *Arctic Pollution Issues* was published, that indicated that sources exist outside the Arctic for a number of POPs. Over much of the Arctic, the levels of POPs cannot be related to known use and/or releases from potential sources within the Arctic and can only be explained by long-range transport from lower latitudes. Among the main contaminants of concern are organochlorine pesticides and their metabolites from agricultural activities, industrial chemicals (e.g., PCBs), and anthropogenic and natural combustion products. Additional non-air AMAP research is discussed in sections 6.2.5 and 6.2.6 below. Further information on the AMAP program is available on the internet at http://www.grida.no/amap/ .

6.2.4 Water and Sediments

Current Programs

The Clean Water Act (CWA) regulates discharges of pollutants to surface waters with the overall goal to restore and maintain the chemical, physical, and biological integrity of the nation's surface waters. To address the risk of contaminated runoff, storm water permits are required for any storm water discharge associated with industrial activity, a large or medium municipal storm sewer system, or a discharge which EPA or the State determines to contribute to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States. All of the Level 1 pesticides, except mirex, are considered toxic and/or priority pollutants under the CWA and may be regulated in these programs. Several other current programs which address pesticides in water and sediments are described below.

- **State Lists of Impaired Waters.** The Clean Water Act (Section 303(d)) requires States to develop lists of impaired and threatened waters and submit them to EPA every two years, and to establish “total maximum daily loads” (TMDLs) for listed waters. These lists can be used to target geographic areas for outreach and remediation efforts.

- **SDWA / CCL.** As required by the Safe Drinking Water Act (SDWA), EPA has recently released the final Drinking Water Contaminant Candidate List (CCL). EPA is required to publish this list of contaminants which, at the time of publication, are not subject to any proposed or promulgated national primary drinking water regulation (NPDWR), that are known or anticipated to occur in public water systems, and which may require regulations under the SDWA [section 1412(b)(1)]. At this time the CCL identifies 49 chemical and 10 microbiological contaminants/contaminant groups which

will be subject to further evaluation, including aldrin, dieldrin, and DDE. By the year 2001, five or more of these contaminants may be chosen for potential regulation. Although the CCL contaminants are currently only in the evaluation and analysis stages, determinations will be made on which substances to prioritize for future actions. If chosen, contaminants may be subject to extensive future actions under the Agency's drinking water program that would be expected to significantly reduce drinking water exposure to the chosen pesticides, including drinking water research, occurrence monitoring, guidance development, health advisory development, and future drinking water regulations.

- **Contaminated Sediment Management Strategy.** Numerous federal statutes give EPA the authority to address contaminated sediments, including: the National Environmental Policy Act (NEPA); the Clean Air Act (CAA); the Clean Water Act (CWA), the Coastal Zone Management Act (CZMA); the Marine Protection, Research, and Sanctuaries Act (MPRSA); the Resource Conservation Recovery Act (RCRA); the Toxic Substances Control Act (TSCA); and the Comprehensive Environmental Response and Compensation Act (CERCLA). However, implementation of sediment management under the different regulatory programs, as well as implementation of substance-specific regulatory approaches, has increased the potential for conflicts, inconsistencies, and inefficiencies in procedures for assessing risks associated with contaminated sediments, research efforts, technology development, and field activities. To address these conflicts, EPA's Contaminated Sediment Management Strategy was developed. This strategy summarizes EPA's current knowledge of sediment contamination and provides a cross-program policy framework necessary to bring about reduction of risks posed by contaminated sediments. The strategy advocates cross-program coordination, as well as a watershed approach, to prevent and remediate existing sediment contamination and to prevent future contamination. Actions required to manage contaminated sediment sites include source control, pollution prevention, and remediation. EPA has established four goals to guide future efforts to manage contaminated sediment: 1) prevent the volume of contaminated sediment from increasing; 2) reduce the volume of existing contaminated sediment; 3) ensure that sediment dredging and dredged material disposal are managed in an environmentally sound manner; and, 4) develop scientifically sound sediment management methods. EPA's Contaminated Sediment Management Strategy (EPA-823-R-98-001), published in April 1998 to help the nation achieve these goals, is available on the internet at http://www.epa.gov/OST/cs/strategy.pdf
- **CERCLA Guidance Document.** Superfund is currently developing a guidance document to aid regional remedial project managers (RPMs) in decision-making when remediating contaminated sediments. This guidance document works from the assumption that risk already exists when looking at the feasibility study. The overall effort is to establish an endpoint of acceptable criteria to manage risk.

Water and Sediments Monitoring and Research

- **National Water Quality Assessment Program.** The National Water Quality

Assessment (NAWQA) Program, administered by the USGS, involves monitoring and sampling of water, sediments, and fish in the waters of the U.S.. Samples are analyzed for a variety of organic and inorganic constituents, including DDT and metabolites, three principal components of technical chlordane, and dieldrin. The program is divided into 59 study areas. More information on the NAWQA is available on the internet at http://water.usgs.gov/pubs/circ/circ1225/**.**

- **National Sediments Database.** The Office of Water (OW) and the Office of Science and Technology (OST) have a national sediment database. However, this database does not specifically track the progress of clean-up regarding the removal of contaminated sediments. In response to the Water Resources Development Act of 1992, which directed EPA to prepare a report to Congress on the environmental health of sediments in the nation's waterways, the *National Sediment Quality Survey Report to Congress* is prepared biennially. This report includes data on several of the Level 1 pesticides, including chlordane, dieldrin, and DDT, in sediments nationwide. It is prepared in conjunction with NOAA, the Army Corps of Engineers, and other federal, state, and local agencies. The next National Sediment Quality Survey Report to Congress is scheduled for completion in 2001. More information on the National sediments database is available on the internet at http://www.epa.gov/OST/cs/congress.html.

Current and planned EPA research on sediment remediation and exposure pathways includes:

- Evaluation of environmental dredging. In particular, information on the effectiveness of dredging (both long-term effectiveness in meeting cleanup goals, and short-term effectiveness concerns about particle resuspension).

- Confined disposal facility (CDF) treatment zones and caps. This research area focuses primarily on evaluation of enhancements to CDFs, including chemical addition, chemical barriers, and physical barriers to minimize contaminant transport.

- Depth of sediment-water-biota interaction zones. The determination of the depth below which contaminants are effectively sequestered from interaction with the ecosystem is an important research issue. Potentially Responsible Parties (PRPs) contend it is only the top few millimeters or centimeters that are important.
- Development of cost estimation techniques for the various remedial alternatives.

- Development of protocols for long-term monitoring at sediment sites.

- Development of a better understanding of the bioavailability of contaminants in sediments.

- Assessment of bioaccumulative chemicals (e.g., developing laboratory and field methods for assessing bioaccumulation, selecting species for bioaccumulation testing,

and dose-response relationships for bioaccumulative contaminants).

- Further assessment of the effects of bioaccumulative chemicals by evaluating food routes of exposure, bioaccumulation, wildlife and human health endpoints of concern.

- Sampling and monitoring protocols for sediment contaminants.

6.2.5 Exposure Reduction

Current Programs

The Agency currently provides the public with information on the risks of exposure and current data on the levels of the Level 1 pesticides in fish in the ongoing programs described below.

- **Fish Consumption Advisory Program.** As promised in the President's Clean Water Action Plan (EPA 840-R-98-001), EPA is currently working to have all States and Tribes establish comprehensive monitoring programs and risk-based fish consumption advisories. Specific activities include:

  Working with State, Federal, and Tribal Agencies to Ensure Adoption of Consistent Methods for Developing and Communicating Fish Consumption Advisories. EPA has issued a multi-volume National Guidance for States and Tribes on all aspects of how to establish a fully-protective fish consumption advisory program – from sampling and analysis to what works as effective communication. In 1998, EPA requested that States and Tribes review existing fish advisory program approaches and methodologies and compare them with recommendations in EPA's National Guidance. Areas of particular interest included monitoring strategies, risk assessment methods, communication strategies, and overall level of effort. In October of 1999 , EPA sponsored a national meeting to provide each State and Tribe an opportunity to present their advisory programs, identify any inconsistencies with the National Guidance, and discuss how inconsistencies can be rectified. As a result of the national meeting, the American Fisheries Society is publishing a report on State and Tribal advisory program consistency with EPA's national guidance. The National Guidance is routinely updated. Revised fish sampling and analysis and risk assessment guidance will be published in 2000. EPA is supporting research that will help improve the effectiveness of recommended methods of risk communication. EPA has also begun planning a national risk communication workshop to be held in March, 2001. Workshop participants will identify and develop risk communication methods most effective in reaching ethnically and economically diverse populations.

  Outreach Brochures for Fish Consumption Advisories. EPA and the Agency for Toxic Substances and Disease Registry (ATSDR) have sponsored a nationwide effort to inform health professionals and their patients about the dangers of eating fish

harvested from contaminated waters. Through a letter to 100,000 pediatricians, obstetricians/gynecologists and family physicians across the nation, doctors were asked to advise their patients to pay attention to local fish consumption advisories. Doctors also received brochures aimed at the general public, written in English, Spanish, and Hmong (an Asian language), that describe how to safely consume fish and minimize exposure to contaminated fish. Copies of these brochures were sent in late 1998 to state and tribal environmental and public health professionals. EPA is currently working with ATSDR to develop and distribute a tool kit for health providers. The tool kit will provide additional information for nurses and physicians to use when talking to patients about the risks associated with contaminants in fish.

User-Friendly National Fish and Wildlife Consumption Advisories. The 1998 update for the National Listing of Fish and Wildlife Advisories (NLFWA) database is available from the U.S. Environmental Protection Agency (EPA) on the internet at http://www.epa.gov/OST/fish/. A 1999 update will also soon be available. This database includes all available information describing State-, Tribal-, and federally issued fish and wildlife consumption advisories in the United States for the 50 states, the District of Columbia and four U.S. territories, and has been expanded to include the 12 Canadian provinces and territories. The database contains information provided to EPA by the States, Tribes, and Canada as of December 1998. It has been made "user-friendly," and can be accessed by pointing and clicking on a map, by identifying a state, or by choosing water body or chemical name.

Exposure and Effects Research

The Agency is currently conducting research, including those for sensitive populations, to better understand exposure pathways for PBT substances. For example, this research includes studies of ethnic populations in large urban areas, and research on children's exposures due to indoor air contamination. Important exposure and effects studies currently underway or planned are:

- **Children's Total Exposure to Persistent Pesticides and Other Persistent Organic Pollutants (CTEPP).** As young children are hypothesized to have greater exposures, as well as greater sensitivities, to persistent organic pollutants than older children or adults, the National Exposure Research Laboratory of EPA's Office of Research and Development (ORD) is beginning a three-year pilot study to investigate the exposures and risks to young children from these pollutants. The pilot study will involve about 260 preschool children (between 18 months and 5 years of age) in North Carolina and Ohio. Persistent pesticides, including: aldrin, dieldrin, α- and γ-chlordane, and DDT/DDE, will be measured in food and beverages consumed by the child, indoor and outdoor air, urine and hand-wipe samples from the child and adult caregiver, and samples of dust and play area soil. The data, collection of which are scheduled to begin in summer 2000 in North Carolina and in 2001 in Ohio, will be used to characterize children's exposure, understand pathways, and refine exposure

models.

- **Umbilical Cord Blood Sampling in Alaska.** As contaminants of concern are known to be transported long-distance to U.S. territories and sensitive populations by air, water, and through the food chain, EPA's Office of International Activities (OIA), in partnership with the National Center for Environmental Health, the Indian Health Service and other Alaska organizations, is supporting a project to investigate the relationship between contaminant exposure in native women in Alaska and infant health. The program under the Arctic Environmental Protection Strategy (AEPS) was developed in response to Alaska Native concerns about the effects of organic and heavy metal contaminants, particularly from non-U.S. sources such as the Russian Federation, that are accumulating in subsistence foods species in the circumpolar north and their effects on the health of mothers and infants. The project involves monitoring levels of selected persistent organic pollutants (POPs), including chlordane, DDT and DDE, and toxaphene, in umbilical cord blood and maternal blood from individuals representing primary indigenous groups in northern Alaska. A total of 180 specimen pairs will be collected and analyzed. A yearly report that incorporates data from dietary surveys and measured contaminant levels from the cord blood study will be developed for distribution to collaborating agencies and Alaska natives. The report will also include an examination of significant relationships between any pollutant, or combination of pollutants, and maternal age, diet, obstetric history, complications of pregnancy, newborn measurements, abnormal infant development, malformations or serious infections points. The results are expected to (1) help native populations devise strategies to maintain their traditional diet while reducing exposure, (2) help monitor spatial and temporal pollutant accumulation, and (3) improve understanding of maternal-infant health effects of contaminants.

- **OECD Project on Risk Assessment Associated with Low Dose Exposure to PBT Pesticides.** In 1998, the Organization for Economic Cooperation and Development (OECD) initiated a Canadian-led project to assess the risks of low doses to persistent, bioaccumulative and toxic pesticides. The first phase, starting in mid-1999, was to send all member countries a questionnaire to obtain a clear understanding of the data and information that are used to evaluate the hazards associated with low-dose exposure to PBT pesticides. The information obtained from the questionnaire will be used to determine how the data are used by pesticide regulators on a routine basis. The next phase of this project is to determine the differences and similarities in how exposure and toxicity data are combined in preparing national risk assessments. A case study of a pesticide will be used to provide sample environmental data and information on the use pattern. Each respondent will be requested to complete a risk assessment based on the case study of this product. The results will be used to compare the method for using the endpoints derived from the data, terrestrial and aquatic risk scenarios, safety factors, and mitigative measures.

6.2.6 Monitoring

Monitoring programs (related specifically to air, water, and land) were discussed in sections 6.2.1 through 6.2.4. Other current monitoring program include:

Monitoring of Biota / Biological Indicators

- **NOAA's National Status and Trends Program (Mussel Watch Project, Benthic Surveillance Program)**. The National Oceanic and Atmospheric Administration's (NOAA) Mussel Watch Project has been using measurements of contaminants in mussel and oyster tissues since 1986 (and in fish livers and surface sediments since 1984) to evaluate the status and trends in contaminant levels in the nation's Great Lakes, estuaries, and marine waters. Sites are visited approximately biennially for collection of animals to be analyzed for a suite of over 70 contaminants, including aldrin, dieldrin, cis-chlordane, mirex, and DDT and metabolites. More information on the NOAA National Status and Trends Program is available on the internet at http://state-of-coast.noaa.gov/bulletins/html/ccom_05/ccom.html.

- **National Study of Chemical Residues in Fish**. EPA's Office of Water has begun work on a new study to provide information about persistent, bioaccumulative, and toxic chemicals in fish tissue. The objective of the study is to estimate the national distribution of the mean levels of about 274 analytes (including the Level 1 pesticides and breakdown products) in fish tissue from lakes and reservoirs of the continental United States. The lakes and reservoirs to be sampled were selected according to a probability design that is stratified into 6 lake size categories. Sampling will be conducted for 4 years at a total of 500 locations or about 125 lakes and reservoirs annually. Planning for the study began in 1998 and fish sampling and tissue analysis is being conducted from 1999 through 2002. The National Study of Chemical Residues in Fish does not currently include Alaska or Hawaii. More information on the fish tissue survey is available on the internet at http://www.epa.gov/ostwater/ or http://www.epa.gov/ostwater/pc/wqnews/spring99.html#16a

Food Monitoring

- **FDA Monitoring Data for Pesticides on Food and Feed Commodities.** The Food and Drug Administration (FDA) monitors the concentrations of several organochlorine pesticides, including aldrin, dieldrin, chlordane, DDT, mirex, and toxaphene in domestic and imported food and feed commodities. The FDA has established action levels as a means of monitoring for occurrences that may be the result of something other than persistence in the environment.

- **U.S. Department of Agriculture's (USDA) Pesticide Data Program (PDP)**

and Food Safety Inspection Service (FSIS). Under the PDP, USDA has been monitoring various pesticides, including DDT, aldrin/dieldrin and chlordane, on a variety of raw and processed fruits and vegetables and milk of domestic and imported origin for about seven years. USDA's FSIS also monitors several of the Level 1 pesticides on meat and eggs.

Monitoring of Human Body Burdens

- **National Health and Nutrition Examination Surveys (NHANES)**. Conducted by the Centers for Disease Control and Prevention's (CDC's) National Center for Health Statistics, NHANES traces the health and nutritional status of U.S. civilians. The NHANES surveys beginning in 1999 will be used as a primary measure of human exposure to the Level 1 pesticides, including aldrin, dieldrin, α- and γ-chlordane, mirex, and DDT/DDE/DDD.

- **Arctic Monitoring Assessment Program (AMAP) Monitoring of Human Body Burdens.** AMAP was established in 1991 to implement components of the Arctic Environmental Protection Strategy (AEPS) adopted by eight Arctic countries including the United States. Primary components of this strategy include monitoring of the levels of, and assessing the effects of, anthropogenic pollutants in all compartments of the Arctic environment, including humans. Currently, DDT, DDE, and chlordane are included in the human monitoring program. Although the U.S. is a AMAP member country and participates in the AMAP Working Group, data collection on human body burdens is currently still in the planning phase in U.S. territories. However, in support of AMAP recommendations to assess health impacts of POPs and heavy metals in the Arctic, EPA and the National Center for Environmental Health are jointly funding the Alaskan Native Cord Blood Monitoring Program, as discussed in Section 6.2.5 "Exposure Reduction Research" above. Additional information on the AMAP program is available on the internet at http://www.grida.no/amap/ .

- **EPA's National Human Exposure Assessment Survey (NHEXAS).** NHEXAS was developed by EPA's Office of Research and Development (ORD) early in the 1990s to provide critical information about multipathway, multimedia population exposure distribution to chemical classes and to test the feasibility of conducting a national survey to provide estimates on the status of human exposure to potentially high-risk chemicals. NHEXAS was also designed to measure "total exposure" (i.e., the levels of chemicals participants take in through the air they breathe; the food, drinking water, and other beverages they consume; and in the soil and dust around their homes). As designed, NHEXAS has three phases, including: 1) development and validation of methods; 2) obtaining nationally representative exposure data; and 3) study of selected subpopulations. EPA conducted NHEXAS

phase I (pilot) surveys in Arizona, Maryland, and EPA's region 5 (Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin). In the Region 5 and Baltimore studies, analytes (in urine and blood) included chlordane, dieldrin, 4,4'-DDE, -DDD, and -DDT. In addition, the Region 5 survey included a Children's Pesticide Exposure Study (CPES) in Illinois, Ohio, Indiana, Michigan, Minnesota, and Wisconsin. Currently, EPA has completed most of the fieldwork for the NHEXAS phase I surveys and is now analyzing the results. Based on these results, EPA will finalize the scope and methods for NHEXAS phases II and III. Additional information on NHEXAS is available on the internet at: http://www.epa.gov/nerl/nhexas.htm.

Multi-media Monitoring

- **Toxics Release Inventory.** Under the Emergency Planning and Community Right-to-Know Act (EPCRA), facilities that are in certain industry sectors, that have 10 or more full-time employees, and that manufacture, process or otherwise use certain toxic chemicals in amounts greater than the regulatory threshold quantity are required to report releases of the toxic chemicals to EPA's Toxic Release Inventory (TRI). Only three of the Level 1 PBT pesticides – aldrin, chlordane, and toxaphene – are subject to the TRI requirements. The Level 1 PBT pesticides are no longer manufactured or processed in the U.S., although they are "otherwise used" because the "otherwise use" definition includes disposal, stabilization and treatment for destruction if the facility that conducts these activities received the toxic chemical for purposes of waste management. The industry sectors subject to the TRI reporting requirements include commercial hazardous waste treatment facilities that are regulated under RCRA Subtitle C (the Federal hazardous waste standards). An amendment to TRI was finalized by EPA on October 29, 1999, which established lower reporting thresholds for several PBT chemicals, including aldrin (100 pounds), chlordane (10 pounds) and toxaphene (10 pounds) (64FR 58665). Therefore, in the future EPA will receive reports of releases of these three pesticides from commercial waste treatment facilities that: (1) are regulated under RCRA Subtitle C; (2) have 10 or more full time employees; and (3) receive at least 100 pounds of aldrin, 10 pounds of chlordane, or 10 pounds of toxaphene for treatment (disposal) per calendar year.

- **Arctic Monitoring Assessment Program (AMAP).** As described above, AMAP includes monitoring and assessment of the ecological and human health effects of anthropogenic pollutants (including DDT and chlordane) in all compartments of the Arctic environment, including: air, snow, rain, ice, water, sediments, soils, biota, and humans.

7.0 PROPOSED GOALS AND ACTIONS

7.1 EPA'S ASSESSMENT AND STRATEGIC APPROACH

In the U.S., uses of the Level 1 pesticides have been canceled, production facilities have

been closed, and intentional releases have been effectively controlled. However, despite the strong regulatory controls, current research indicates that human and ecological health risks continue to exist from exposure to the Level 1 pesticides. Available data gathered in current multi-media monitoring efforts provide evidence that the Level 1 pesticides are ubiquitous in the environment, and at concentrations sufficient to warrant exposure reduction actions as well as actions that target reductions in reservoir sources. Evidence also suggests that there are significant stocks of unused Level 1 pesticides remaining in the U.S. and overseas. Because the potential for accidental release from these stocks exists, the encouragement of activities which reduce existing stocks of unused Level 1 pesticides is also warranted. Current research indicates that international sources may also be contributing to air deposition through long-range transport to environmental contamination in the United States; therefore, efforts to encourage international phase-out of the use of the Level 1 pesticides also should continue.

Unlike some of the other Level 1 PBT substances, the Level 1 pesticides were all at one time, and still are in some countries, intentionally produced products. Because intentional releases of the Level 1 pesticides have been controlled and they are not generated as unwanted byproducts of certain manufacturing or combustion processes, the strategic approach of this action plan significantly differs from other PBT action plans. The continued presence and cycling of these pesticides in the environment where use has long been discontinued, and their widespread distribution even in areas where no previous use has occurred, is the result of their long persistence in various environmental media and high potential for bioaccumulation, as well as their accidental release from unused product stocks and continued use internationally. Therefore, to address these remaining risks, the strategic approach of the Agency will be to:

1. Facilitate, encourage, and support states, tribes and local governments in their programs to collect and properly dispose of unwanted pesticides, including stocks of Level 1 pesticides.

2. Facilitate, to the extent possible, the remediation or containment of non-point and reservoir sources, including sediments, contaminated industrial sites, agricultural chemical dealer/storage sites, and past use sites on a priority basis.

3. Seek Level 1 pesticide exposure reduction, especially for highly exposed and sensitive populations, through public education, fish advisories, and other outreach.
4. Eliminate risks from the long-range transport (LRT) of these substances by working internationally to phase-out their production and use and to encourage environmentally sound management, disposal and/or destruction of stockpiles of these chemicals in other countries.

5. Conduct continued monitoring of the Level 1 pesticides in all relevant environmental media, fish and wildlife, and humans. Use monitoring results to provide information regarding continuing and emerging problems created by the presence of these substances, and as the basis for measuring progress.

The strategic approach is illustrated in Table 7-1 below.

Table 7-1. The Five Key Elements of the Pesticide Strategic Approach Address Prevention of Pesticide Releases Through Management of Old Pesticide Stocks, Management of Contaminated Environments, International Coordination, Human Exposure Reduction Through Education and Outreach, and Continued Monitoring

National Level 1 Pesticides Strategy		
Strategic Approach	**Key Players**	**Result**
Facilitate, encourage, and support waste pesticide collection programs	OPP, Regions, States, Tribes, Other Federal Agencies, OSWER	Prevention of new releases of Level 1 pesticides Proper disposal of Level 1 pesticide stocks
Facilitate the remediation or containment of non-point sources, reservoirs, and other contaminated sites on a priority basis	OW, OPPT, OSWER	Targeted remediation of pesticide contamination in the environment Reduction in pesticide levels in humans and wildlife
Seek exposure reductions through education and outreach	Regions, OW, OPPT, States, Tribes, Other Federal Agencies	Reduction in pesticide levels in humans
Work internationally to phase-out production and use of the Level 1 pesticides and encourage environmentally sound management, disposal and/or destruction of stockpiles in other countries	OIA, OAR, GLNPO	Reduction of long-range transport of pesticides Reduction in pesticide levels in humans and wildlife
Conduct continued monitoring of the Level 1 pesticides in all relevant environmental media, fish and wildlife, and humans.	ORD, GLNPO, OW	Identification of continuing and emerging problems Measurement of progress towards achieving reductions and meeting PBT goals

The Agency's specific strategy for addressing reservoir sources and for monitoring environmental pollutants will not be limited to a focus only on the Level 1 pesticides. Rather it will be part of a part of broader Agency and other Federal efforts, including:

- The Agency-wide Contaminated Sediment Management strategy, which utilizes a cross-program policy framework to promote consideration and reduction of ecological and human health risks posed by sediment contamination. The strategy advocates a watershed approach to managing existing sediment contamination and preventing future contamination.

- The Agency's CERCLA and RCRA programs to manage current and abandoned contaminated industrial sites.

- Ongoing monitoring efforts in relevant environmental media, biota, and humans (such as the Integrated Atmospheric Deposition Network, USGS's National Water Quality Assessment, EPA's National Study of Chemical Residues in Fish, and CDC's National Health and Nutrition Examination Surveys). The vigilance of monitoring programs to record progress, and to alert us to continuing and emerging problems created by the presence of these substances will continue.

- Agency research into the sources and pathways of human exposure, particularly children's exposure, to toxic pollutants.

7.2 GOALS

7.2.1 Relevant Government Performance and Results Act of 1993 (GPRA) Goals

The goal of the PBT Strategy, to identify and further reduce risks to human health and the environment from existing and future exposure to PBTs, is the guiding principle in the development of the strategic approaches for the Level 1 pesticides in this action plan. In addition, this action plan supports several goals outlined in EPA's 1997 Five Year Strategic Plan. As required under the Government Performance and Results Act of 1993 (GPRA), EPA's Strategic Plan describes EPA's mission and sets forth ten major goals that serve as the framework for the Agency's planning and resource allocation decisions. These ten goals apply to all of EPA's programs and projects and, therefore, clearly encompass many goals, targets and programs that do not apply to the Level 1 pesticides. There are, however, several GPRA goals and sub-objectives that do call for programs promoting reductions in the environmental presence of all toxics of concern, and thus effectively contribute to the desired outcome of pesticide exposure risk reduction. These broader GPRA goals that are relevant to the Level 1 pesticides and the associated strategy described in this report are listed in Appendix E. GPRA objectives in EPA's 1997 Strategic Plan are currently in the process of being revised in the Draft 2000 Strategic Plan, and therefore, some goals relevant to the Level 1 pesticides may change. Revised objectives in the Draft 2000 Strategic Plan are now undergoing external review separate from this Draft Action Plan for the Level 1 pesticides.

7.2.2 Goals for the Level 1 Pesticides

In addition to the goals of the EPA Strategic Plan, the Agency has established for this action plan the following goals specific to the Level 1 pesticides. These goals recognize that production, use, and intentional release of the Level 1 pesticides in the United States has been effectively controlled, but that accidental release and current environmental contamination may still pose risks to human health and the environment. Therefore, the Agency will work in collaboration with its federal partners and other stakeholders, to achieve the following goals:

- Facilitate, encourage and support states, tribes and local governments in their programs to collect and properly dispose of unwanted pesticides, including stocks of the Level 1 pesticides.

- Facilitate, encourage, and support the proper disposal of stocks of the Level 1 pesticides at federal facilities in the United States,

- Contain or remediate Level 1 pesticide releases from non-point and reservoir sources such as contaminated sediments, industrial sites, agricultural chemical dealer/storage sites, and past use sites.

- Reduce the atmospheric transport of Level 1 pesticides by eliminating production and use and promoting environmentally sound management, disposal or destruction internationally, taking into account related health and environmental concerns in other countries.

- Continue monitoring of Level 1 pesticides in the environment and in humans, until concentrations in human populations have been reduced and negative impacts on ecological health and beneficial use of water resources have been eliminated.

7.3 STAKEHOLDER INVOLVEMENT

EPA considers stakeholder involvement essential to reaching the goals of the PBT Strategy. EPA will seek stakeholder input and invite comment on this draft national plan, as well as encourage all interested partners to join in implementing the key actions contained in this plan to reduce risks to human health and the environment from exposure to Level 1 pesticides. During the development of this action plan, several industry, non-governmental, and environmental groups reviewed a preliminary draft of the Level 1 pesticides action plan and provided valuable comments. EPA has carefully reviewed those comments and incorporated them, as possible, into this draft for public review. EPA will continue to work with all of its stakeholders, both in the finalization and the implementation of this action plan. Stakeholder involvement will build upon the Great Lakes Binational Toxics Strategy (BNS) Pesticides work group as a starting point and will expand to include representatives nationwide. Stakeholder participation will be especially pertinent to Clean Sweeps and public outreach and education including fish advisories.

The Agency is currently soliciting public comment and information or data on the following topics and issues related to the PBT pesticides (Level 1):

- quantities of domestic unused stocks of pesticide products;
- historical trends or current soil residue levels (urban and agricultural);
- information on sites with significant Level 1 pesticide contamination that have not been identified in Appendix D;

- current levels of pesticides (used in residences) in indoor environments;
- alternative disposal and soil/sediment remediation methods, and performance information;
- other sensitive or highly exposed human subpopulations;
- meaningful and feasible ways to address the problem of canceled pesticides in the environment;
- meaningful PBT goals, performance measures, and timeframes for such accomplishments.

7.4 FUTURE DIRECTIONS AND ACTIVITIES

The following sections outline proposed actions specifically aimed at reducing risk associated with current and future exposure to Level 1 pesticides, but which will in some cases also aid in reducing human exposures to other priority PBT pollutants.

7.4.1 Pesticide Collection Programs

Actions Relating to Domestic Pesticide Collection. The continuation of Clean Sweep collections has been clearly justified, as significant amounts continue to be collected each year by states involved in such activities as discussed in sections 5.2.1 and 6.2.1. Despite some limitations of the currently available data, there is a clear indication that the Clean Sweeps Programs have reduced existing stocks of the Level 1 pesticides, and in addition, have prevented significant increases in environmental contamination, had such quantities of pesticides been released.

However, as discussed in section 5.2.1, there is a substantial indication that there is still a large (but unquantified) amount of pesticides still "out there". In addition, many Clean Sweeps programs may only currently be conducted on an intermittent or limited basis due to the lack of consistent funding. Therefore, while past Clean Sweep collections represent solid accomplishments of states and local governments, evidence supports not only the existence of a continuing need to collect and properly dispose of accumulated pesticides, but also a need to expand and better coordinate current Clean Sweeps efforts and to establish long-term, comprehensive programs.

Recognizing that the remaining waste stocks of Level 1 pesticides in the U.S. potentially represent the primary domestic source of new Level 1 pesticide release, the following activities will help to address this contamination threat. EPA will specifically support states, tribes and local governments in their pesticide collection and disposal efforts by activities such as:

- **Continuing to supply technical assistance**, as described in section 6.2.1. For example, EPA will continue to provide technical assistance to pesticide collection program managers by such activities as collecting, consolidating and disseminating information about Clean Sweep programs. Additionally, once EPA finishes the report on the status and success of Clean Sweep programs, it will be distributed and posted

on the EPA website as an easily-accessible source of information.

- **Helping to resolve regulatory issues and barriers**. One logistical obstacle often mentioned by Clean Sweep program managers is that the one incinerator in the U.S. that is permitted for dioxin-containing waste has been accepting dioxin wastes on an inconsistent and unpredictable basis over the past few years. Program managers don't want to accept dioxin-containing pesticides at Clean Sweep events if the state has to pay for storage until a disposal option becomes available at some uncertain point in the future. However, rejecting certain pesticides at events can disrupt the smooth operation of Clean Sweeps, because farmers may lose their motivation for participating if the program seems to have arbitrary rules or if they can't completely purge their storage areas. Even though none of the PBT pesticides contain dioxin, this issue is relevant to the long-term viability of Clean Sweep programs in general.

  Other regulatory issues that have been raised as obstacles are: certain RCRA requirements for hazardous waste generators (e.g., manifests, limited storage times, and obtaining a generator identification number); not adopting the Universal Waste Rule (which provides regulatory relief from some of the RCRA requirements for certain wastes); different interpretations of the Universal Waste Rule; and the Department of Transportation Hazardous Materials Regulations.

  The states and local governments with comprehensive, permanently-funded programs have found ways to minimize or alleviate these regulatory issues, but EPA may be able to facilitate Clean Sweeps in other states, tribes and local governments by addressing these potential barriers. Facilitation might incude:

  - In light of the potential safety benefits of successful Level 1 pesticide collection, the Agency will consider means for encouraging states and local governments to adopt policies that, where possible, minimize potential liability of the pesticide holder under RCRA hazardous waste generator rules. Adoption of such amnesty policies will help States to build trust with pesticide holders.
  - The Universal Waste Rule is an alternative set of management standards in lieu of hazardous waste regulations under 40 CFR Parts 260-272 (standards applicable to generators of hazardous waste, storage and disposal facilities, etc), and in effect, can serve as a regulatory relief mechanism. The Universal Waste Rule may be implemented by RCRA authorized states, but where there is no state RCRA authorization in place then the federal regulations are implemented. EPA will promote understanding and adoption of the Universal Waste Rule.

- **Helping states, tribes, and local governments identify options for financing Clean Sweep programs**. EPA will consider activities such as the preparation of resource materials to describe how states with comprehensive, long-

term programs obtain funding, and the development of a clearinghouse of information on potential sources of funding. As an example, there is opportunity to coordinate Clean Sweeps with the Office of Water activities in fulfillment of the Clean Water Act (Section 303(d) list of impaired or threatened waters). Several states have used Clean Water Act Section 319 grant dollars (used to address nonpoint sources of pollution) to fund such programs. The Office of Water could identify Clean Sweeps as one tool that should be considered to address pesticide-impaired waters. Additionally, the list of waters impaired for Level 1 pesticides, or the generic "pesticides", could be used to target outreach efforts to States to encourage them to institute a "Clean Sweep" program in the watershed. The issue of funding is important because a major limiting factor for many of the states without comprehensive programs is the absence of a consistent funding mechanism.

- **Supporting Clean Sweep program outreach**. EPA will provide communication materials encouraging states and other governments to accept waste pesticides from households and businesses other than farms.

- **Facilitating the collection of pesticides from households and urban business.** EPA will support local governments, to the extent possible, in their household hazardous waste and small quantity generator waste collection and disposal programs. For example, as part of the Consumer Labeling Initiative EPA is developing label instructions that would direct the users of certain consumer pesticides to local household hazardous waste collection programs (if available) as an option for disposing of unwanted pesticides.

DOD Coordination. EPA can support federal facilities by working with the Department of Defense (DOD), Defense Reutilization and Marketing Service (DRMS). EPA's Office of Pesticide Programs is considering the potential for coordination with the DRMS to publicize the procedure currently being developed to allow non-DOD Federal agencies to use this disposal system for their own disposal needs on a reimbursable basis, with the goals of maximizing the participation of non-DOD Federal agencies and facilitating the disposal of Federally-held PBT pesticides. This could facilitate the disposal of PBT pesticides that may currently be stored at Federal facilities at a reasonable cost and using an existing system.

7.4.2 Reservoir and Non-point Source Reduction and Remediation Activities

In the process of conducting reservoir and non-point source reduction and remediation activities, the Agency will give full consideration to media-transfer issues, such as the possible release of Level 1 pesticides to the atmosphere through volatilization, e.g., in the drying of dredged sediments, or disturbance of contaminated soils. Recognizing that past environmental contamination and continued multi-media cycling are remaining sources of food chain contamination and other human exposures to the Level 1 pesticides, the following activities directed at reservoir sources will help to address this important exposure pathway.

Actions Related to Sediments. As discussed in section 6.2.4 the baseline activities section, the Agency currently addresses sediments as part of a broad Contaminated Sediment Management Strategy, which focuses on a wide range of environmental pollutants, including the Level 1 pesticides.

Within the context of the agency-wide strategy for contaminated sediments, the Agency will also pursue other activities to streamline and expedite remediation of Level 1 pesticide contamination. These actions include development of guidance documents on sediment remediation and coordination of disposal approval with states.

The Agency will utilize the sediment database maintained by the Office of Water/OST and conduct research, as discussed in section 6.2.4, to identify sediment remediation techniques/technologies and set appropriate clean-up targets or thresholds for the Level 1 pesticides in sediments. Other resources to be used in this action include efforts under the BNS program, including the 5-year Assessment and Remediation of Contaminated Sediments (ARCS) program, and sediment cleanup activities and remediation plans in the Great Lakes Areas of Concern and other contaminated sites.

Finally, the Agency will utilize sediment strategies outlined in the Clean Water Action Plan, which includes a key action item that reads "EPA will initiate place-based contaminated sediment recovery demonstration projects in five watersheds selected from those identified in EPA's National Inventory of Sediment Quality as being of the greatest concern. Remediation efforts will be coordinated with federal natural resource trustees." Candidate projects are primarily oriented toward demonstrating the success of various types of projects. Although this was not funded in FY1999 and is not an item that is part of base funding, OW will request FY2000 funding *[update needed]*.

Actions Related to Land. Although the Level 1 pesticides are found throughout U.S. agricultural soils, Agency efforts regarding contaminated soils will primarily focus on the continuation of programs, including RCRA corrective actions and Superfund cleanups, that address severely contaminated, localized sites. The lower priority for ambient contamination is because of limited solutions available to address diffuse contamination of widespread agricultural soils, as well as the much greater level of concern associated with heavily contaminated sites relative to pesticide residues from past agricultural use.

As discussed in Section 6.2.2 on baseline activities, the Agency currently addresses contaminated industrial sites as part of several broad Agency programs focused on a wide range of environmental pollutants, which include the Level 1 pesticides.

7.4.3 Dietary Exposure Reduction Activities

The environmental monitoring data summarized in previous sections, as well as the continued incidence of fish consumption advisories, all indicate that people still have the potential to be exposed to Level 1 pesticides. The extent, persistence, and bioaccumulation of the Level 1

pesticides in the environment, coupled with the difficulty of remediating current environmental levels, requires that the Agency focus not only on source reduction, but also on exposure reduction for these substances. Recognizing that the consumption of contaminated fish is currently considered a primary route of human exposure, the Agency will continue to promote exposure reduction through public outreach with a focus on fish consumption advisories. This is consistent with EPA's GPRA Goal 2 in the Agency's 1997 Strategic Plan ". . .consumption of contaminated fish will be reduced. . ." Specific efforts will include continued support and strengthening of the states' and tribes' fish advisory programs.

Although EPA recognizes that certain populations have the potential to be at a greater risk due to Level 1 pesticide exposure, current information is largely insufficient to target specific populations for dietary exposure reduction activities. Therefore, until better information is available to direct targeted exposure reduction efforts, the Agency will primarily continue to direct outreach efforts toward the general population, with the assumption that they will help to reduce exposure risk for all populations. This issue will begin to be addressed in the March 2001 workshop planned by EPA to better identify and develop effective risk communication methods for reaching ethnically and economically diverse populations.

In the event that research studies uncover additional significant exposure pathways, the Agency will also consider other exposure reduction activities, as appropriate. Information obtained in the Children's Total Exposure to Persistent Pesticides (CTEPP) study on how and to what extent children are exposed to the Level 1 pesticides and other PBTs will be used to guide exposure reduction and environmental remediation activities and to determine what additional steps may be needed to protect young children.

Fish Consumption Advisory Programs. The Agency will increase facilitation of State and Tribal development and implementation of monitoring programs and risk-based fish and wildlife advisory programs. Although there are numerous state fish advisories for pesticides, many states do not have comprehensive, or any, monitoring programs. Several states also do not use risk-based approaches for setting advisories. The variances among States that do have advisories often create confusion, especially on shared water bodies. As a result, people are consuming contaminated fish who might not otherwise do so, or who might be adversely affected because they have not been warned (i.e., pregnant or nursing women). Specific exposure reduction efforts that will be conducted under the Fish Advisory program include:

> Work with State, Federal, and Tribal Agencies to Ensure Adoption of Consistent Methods for Developing and Communicating Fish Consumption Advisories. EPA will continue to provide assistance to States and tribes in establishing programs consistent with our National Guidance for States and Tribes on all aspects of how to establish a fully-protective fish consumption advisory program. If, after consultation with a State or Tribe, an appropriate advisory is not issued, EPA will issue fish or wildlife consumption advisories. EPA will continue to routinely revise and update the National Guidance materials.

Outreach Brochures for Fish Consumption Advisories. EPA will continue to work with ATSDR to develop and distribute a tool kit which will provide additional information for nurses and physicians to use when talking to patients about the risks associated with contaminants in fish.

User-Friendly Fish and Wildlife Consumption Advisories. The Agency will also attempt to increase education regarding risks associated with the consumption of pesticide-containing fish by keeping the National Listing of Fish and Wildlife Advisories (NLFWA) database up-to-date, and available on the web site as quickly as States and Tribes update the information.

7.4.4 International Activities

On an international level, negotiations towards a POPs convention show that some countries still use some POPs pesticides and may seek use exemptions, with some seeking alternatives pending financial and technical assistance. Some malarious countries, in consultation with the WHO, have determined a continued need to use DDT for vector control, although there is also strong support in these countries for eventual phase-out of DDT when affordable alternatives are in place. Several countries are undertaking programs to reduce their use of DDT and find feasible alternatives for malaria control. DDT is now manufactured only in India and China. Some countries are still producing chlordane for termite and fire ant control. Internationally, the UN Food and Agricultural Organization (FAO) has warned that risks from stockpiled pesticides are quite common in developing countries and estimates that large quantities of unused pesticides remain in foreign countries. All of these situations exemplify the importance of continued U.S. coordination with the international community on the issue of Level 1 pesticide reduction.

Actions Relating to Pesticide Products in Other Countries. The Agency strategy for addressing pesticides in other countries will primarily be done in coordination with several international efforts currently underway. Goals are to better understand quantities of pesticides remaining internationally, and to create an international framework within which reductions in global use and stocks of these substances can be achieved. Existing international efforts relating to pesticide use (previously described in section 6.2.1) that the Agency will continue to work on and coordinate with, include:

- United Nations Environmental Program (UNEP) Global Treaty on Persistent Organic Pollutants
- United Nations Environmental Program and Food and Agriculture Organization (FAO) Prior Informed Consent Procedure
- United Nations Food and Agriculture Organization International Obsolete Pesticides Program
- OECD-FAO-UNEP Workshop on Obsolete Pesticides.
- United Nations Economic Commission for Europe (UN ECE) Convention on Long-Range Transboundary Air Pollution (LRTAP) Protocol on Persistent Organic Pollutants

- North American Commission for Environmental Cooperation (CEC), Sound Management of Chemicals Program, Regional Action Plans for Chlordane and DDT
- North American Free Trade Agreement Technical Working Group on Pesticides
- World Health Organization's DDT Phase-Out Activities
- EPA International Training Module: Pesticide Disposal in Developing Countries

The Agency will continue to provide technical and advisory support for FAO efforts to facilitate proper disposal of obsolete pesticides in developing countries. FAO is currently in the process of negotiating possible future pesticide collections.

Actions Related to Long Range Transport. The Agency strategy for assessing Long Range Transport (LRT) and addressing non-domestic atmospheric sources of the Level 1 pesticides will also be done in coordination with several international efforts currently underway. Goals are to better understand the effects of LRT and to create an international framework within which reductions in global transport of these substances can be achieved. Existing international efforts relating to LRT (previously described in section 6.2.3) that the Agency will continue to coordinate with, include:

- UNEP Global Treaty on Persistent Organic Pollutants
- UN ECE Convention on Long-Range Transboundary Air Pollution (LRTAP), Protocol on Persistent Organic Pollutants
- Binational Toxics Strategy (BNS)

The Agency will work closely with the CEC, which has examined the issue of LRT in a 1997 document called "Continental Pollutant Pathways." In that report the CEC notes the sparsity of data related to atmospheric trends and conditions, due in large part to the fact that most monitoring networks have been established to determine local ambient concentrations and therefore are located in and around cities and at, or close to, ground level. The Agency will support CEC efforts to measure, monitor, model and assess the status and trends of chemicals, including the Level 1 pesticides, in the North American environment in conjunction with the CEC air program. Expected outcomes include (a) the preparation of a concept paper on monitoring, modeling, and assessment, (b) a workshop involving experts in those fields, and (c) preparation of an initial scoping paper on the nature, extent and significance of marine and freshwater ecosystems in the transport and cycling of persistent, bioaccumulative and toxic substances.

7.4.5 Monitoring Efforts

In addition to focusing on source and exposure reduction, the Agency will continue, as possible, to monitor the Level 1 pesticides in all relevant environmental media, fish and wildlife, and humans. Best available environmental monitoring data and routine assessment of Level 1 pesticide concentrations in human populations will be used both to measure success in reducing levels of the canceled pesticides in the environment, and to identify any continuing or emerging problems. In addition, monitoring efforts may aid in the identification of sensitive populations and geographic areas, as well as in deciding whether additional steps are necessary to protect sensitive sub-populations.

EPA will also consider options for additional monitoring to fill in information gaps such as potential long range sources (e.g., Asia) and other cross-border atmospheric transport of the Level 1 pesticides (e.g., Mexico-U.S. border). Recognizing that the need for a means to thoroughly evaluate Agency progress on achieving PBT goals has been identified by the PBT Plenary group as one of the top cross-cutting issues within the PBT program, EPA is also considering the potential development of a national monitoring strategy for all PBTs. Further supporting this need, a recent report from the U.S. General Accounting Office (GAO, May 2000) concluded that far more research is needed to understand human exposures to potentially dangerous chemicals, particularly for those who may be at most risk.

Although only certain of the Level 1 pesticides may be monitored in a particular program listed below, the primary existing environmental monitoring programs which will be used include:

Air Monitoring

- Integrated Atmospheric Deposition Network.

Water and Sediments Monitoring

- USGS's National Water Quality Assessment Program.
- EPA's National Sediments Database.
- State Lists of Impaired Waters.

Monitoring of Biota / Biological Indicators

- NOAA's National Status and Trends Program (Mussel Watch and Benthic Surveillance).
- EPA's National Study of Chemical Residues in Fish.

Food Monitoring

- FDA Monitoring Data for Pesticides on Food and Feed Commodities.
- USDA's Pesticide Data Program

Monitoring of Human Body Burdens

- CDC's National Health and Nutrition Examination Surveys
- National Human Exposure Assessment Survey
- Arctic Monitoring and Assessment Program (Body Burden Monitoring)

Multimedia Monitoring

- Arctic Monitoring and Assessment Program (atmospheric, terrestrial, and marine environment monitoring)
- Toxics Release Inventory.

The Level 1 pesticides will be monitored, as possible, in all of these efforts, and used as a leading indicator of the success of Agency remediation efforts directed at reducing current levels of all toxic pollutants in the environment.

7.4.6 Actions Considered but not Able to be Implemented Due to a Lack of Resources

Due to the limited availability of Agency resources, it was necessary to prioritize the actions considered in the development of this action plan. As a result, some actions were not designated as high priority actions within the constraints of current Agency resources even though they were considered to be worthwhile and/or necessary endeavors. Some of these activities, which may be considered for future action or possible non-EPA support, are listed below:

- **Soil emission inventories**. Historically, most PBT pesticides, such as toxaphene and DDT, were applied to plants to control pests and can still be found in soils across the US. It would be helpful to have a better understanding of soils as a domestic source of emissions of PBTs compared to inputs from international sources.

- **Atmospheric monitoring data.** When negotiating and implementing international treaties, it is important to understand the extent to which long range transport of pesticides from other countries contributes to deposition in the United States. Additional monitoring data would be useful to help in distinguishing between U.S. and international sources. For example, it would be useful to have monitoring stations at all of our borders to better determine levels of PBTs originating from other countries or regions of the world being transported and deposited in the U.S.. Monitoring is essential, especially to provide data for model evaluation. For long-range transport work, it is useful to have monitoring in rural areas -- relatively far from strong sources -- as one cannot easily combine urban spatial scales (e.g., meters) with global spatial scales (e.g., 1000's of kilometers) in the same modeling effort.

- **Atmospheric emission inventories.** Substantial additional resources are needed to develop, enhance, and correct existing emissions inventories. Improved geographically and temporally resolved emissions inventories are needed for each PBT substance of concern, as they serve as the basis of any policy development. Although difficult to obtain, global emissions inventories are also useful for evaluating the sources of PBTs from outside the United States.

- **Evaluation of FDA Action Levels.** The Federal Drug Administration sets “action levels,” or amounts of pesticides that can be ingested with food and not result in adverse health effects in the general population. FDA sets these numbers based on risk information supplied by EPA, and consumption assumptions derived from dietary surveys done by the Department of Health and Human Services. FDA’s action levels for the Level 1 pesticides have not been reviewed or revised for many years, and may not reflect the most current understanding of these chemicals. This is potentially of concern to the immediate consumers of food contaminated by these pesticides, but is also of concern because some States use the FDA action levels to set local fish consumption advisories. Through letters to all states, promulgated guidance documents, and annual seminars, this practice has been discouraged by EPA and FDA in favor of a risk-based approach to derive local fish consumption advisories. However, some states continue to misuse the action level in this way. Therefore, it may be useful for EPA to update relevant risk information and, if warranted,

recommend that FDA consider revising action levels for the Level 1 pesticides so that appropriate protection is assured until virtual elimination of these canceled pesticides is achieved.

- **Other Exposure Reduction Activities.** The Agency should also consider providing the public with information on the risks of exposure and current data on other exposure pathways such as other food sources, breast milk, placental transfer, etc., as research elucidates the significant of these pathways.

- **Pesticide Use Research and Monitoring / Improved Domestic Production Database.** The EPA domestic pesticide production data base should be improved. Currently, the data has a high error rate, relates to products rather than active ingredients, and tends to be several years old. The system itself should be automated, and modified so that it can generate reports directly responsive to inquiries. With modifications and improvements, the system could be an invaluable source for information about: production, export, and export destination; precise estimates of quantities remaining at the time of cancellation actions and their location.

7.4.7 Measures of Progress

The PBT Strategy requires that EPA follow several guiding principles, including the use of measurable goals and objectives and the assessment of performance. These principles coincide with EPA's Strategic Plan, as specified under the GPRA for all federal agencies, which requires the Agency to define measurable goals and objectives, measure progress, and report accomplishments. As stated in the PBT Strategy, EPA will use the following measures to track progress in reducing risks from pesticides: (1) environmental or human health indicators, (2) chemical release, waste generation, or use indicators, or (3) programmatic output measures.

In general, measures of progress for this action plan will focus on successful continuation of waste pesticide collection, successful remediation of contaminated sites, international agreements and implementation, and broad environmental monitoring programs. The environmental monitoring programs which will provide the data by which to measure continued reductions of the Level 1 pesticides in the environment were discussed previously in Sections 6 and 7.4.5. Specifically, the Agency will gauge the success of the strategic actions for Level 1 pesticide risk reduction according to the measures described in Table 7-2.

Table 7-2. Measures of Progress for Strategic Action Directed at the Level 1 Pesticides

Strategic Approach	Environment or Human Health Indicators	Source Management and Programmatic Output Indicators
Facilitate, encourage, and support waste pesticide collection programs	! Fish advisories and water quality indicators ! Reduction of pesticide levels in wildlife and humans[1]	! Amounts of pesticides collected ! Throughput at disposal facilities ! Decrease in accidental releases ! Increase in number of States and Tribes with Clean Sweeps programs ! Grants issued
Facilitate the remediation of non-point sources, reservoirs, and other contaminated sites on a priority basis	! Fish advisories and water quality indicators ! Pesticide levels in wildlife and humans[1]	! Amounts of pesticide-contaminated substrates removed and disposed ! Reduction of NPL/CERCLA sites and Areas of Concern (AOCs)
Seek Exposure Reductions through education and outreach	! Fish advisories and other water quality indicators ! Pesticide levels in humans[1]	! Increase in number of States and Tribes with fish tissue monitoring programs and risk-based fish and wildlife consumption advisory programs
Coordinate with the international community to monitor and reduce LRT	! Atmospheric levels of transport ! Pesticide levels in wildlife and humans[1]	! Implementation of international monitoring and research efforts ! International agreements signed and implemented
Conduct continued monitoring of the Level 1 pesticides in all relevant environmental media, fish and wildlife, and humans.		! Identification of continuing and emerging problems ! Measurement of progress towards achieving reductions and meeting PBT goals

[1] Human body burdens will be measured by pesticide levels in blood/serum (e.g., NHANES). The Fish Tissue Survey will be used to assess pesticide levels in wildlife.

7.4.8 Actions with links to other PBT chemicals

Effect on Other Chemicals and Integration with Other PBT Action Plans. The purpose of the following section is to address opportunities or problems related to other chemical substances that arise from actions proposed in this plan for the Level 1 pesticides. This includes such issues as:

1. Opportunities for resource and cost efficiencies in addressing sources or sectors that are associated with the Level 1 pesticides as well as other toxic chemicals besides the Level 1 pesticides. This involves coordinated efforts directed at achieving reductions in multiple pollutants, including the canceled pesticides, and integration with other PBT action plans.

2. Impact of the actions recommended in this plan on the use or emission of other toxic substances. This includes consideration of any negative environmental impacts resulting from the collection, storage, or disposal of the Level 1 pesticides.

With regard to the first issue, Agency actions directed at monitoring, addressing sediments, improving communication and outreach (especially with sensitive populations), and long range transport, discussed in previous sections, represent coordinated efforts to address a common source or pathway for many PBTs and other toxic substances. [*Comments and recommendations on potential integrated actions to be included in the action plan are solicited.*]

With regard to the second issue, the Agency is concerned about minimizing any potential negative impact related to the collection, storage, or disposal of Level 1 pesticides. The vast majority of pesticides collected at Clean Sweep and household hazardous waste collection programs – including all of the Level 1 pesticides – are incinerated at permitted incinerators. Some non-governmental organizations have expressed the opinion that this disposal method is unacceptable because it creates other PBT chemicals, such as dioxins and furans. These same parties believe that EPA should encourage the development and implementation of disposal technologies other than incineration. EPA's 1993 Strategy for Hazardous Waste Minimization and Combustion (http://www.epa.gov/epaoswer/hazwaste/combust/general/strat-2.txt) addresses these issues in the following goals for the role of combustion and alternative technologies: 1) Maintain appropriate role for combustion, and continue to ensure that combustion and other treatment facilities reduce toxicity, volume, and/or mobility of hazardous wastes in a manner that is protective of public health; and 2) Foster the commercial development and use of alternative treatment and other innovative technologies that are safe and effective in reducing the toxicity, volume, and/or mobility of RCRA industrial process and remediation wastes. As mentioned in section 7.4.1, one logistical obstacle faced by Clean Sweep program managers is that the one incinerator in the U.S. that is permitted for dioxin-containing waste has been accepting dioxin wastes on an inconsistent and unpredictable basis over the past few years. Clearly, this issue is related to EPA's regulations and policies regarding dioxin, another Level 1 PBT substance.

[*Comments and recommendations on potential cross-cutting actions that should be addressed in the action plan are solicited.*]

8.0 REPORTING PROGRESS

[reporting procedure to be developed]