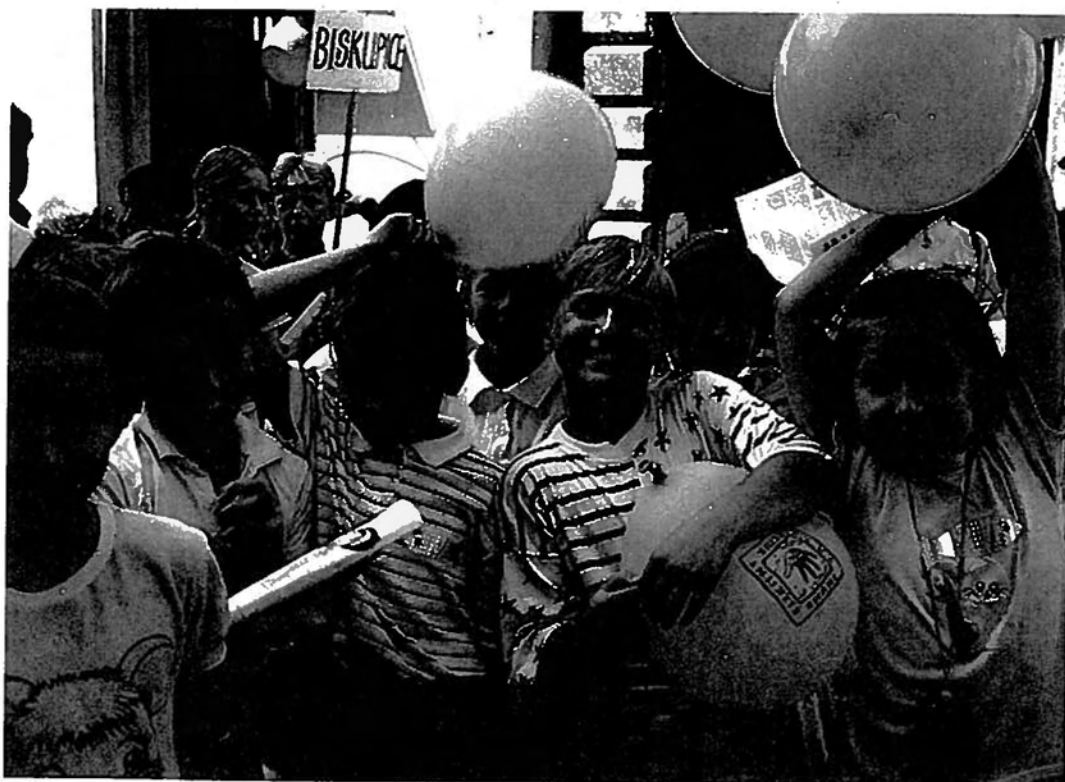
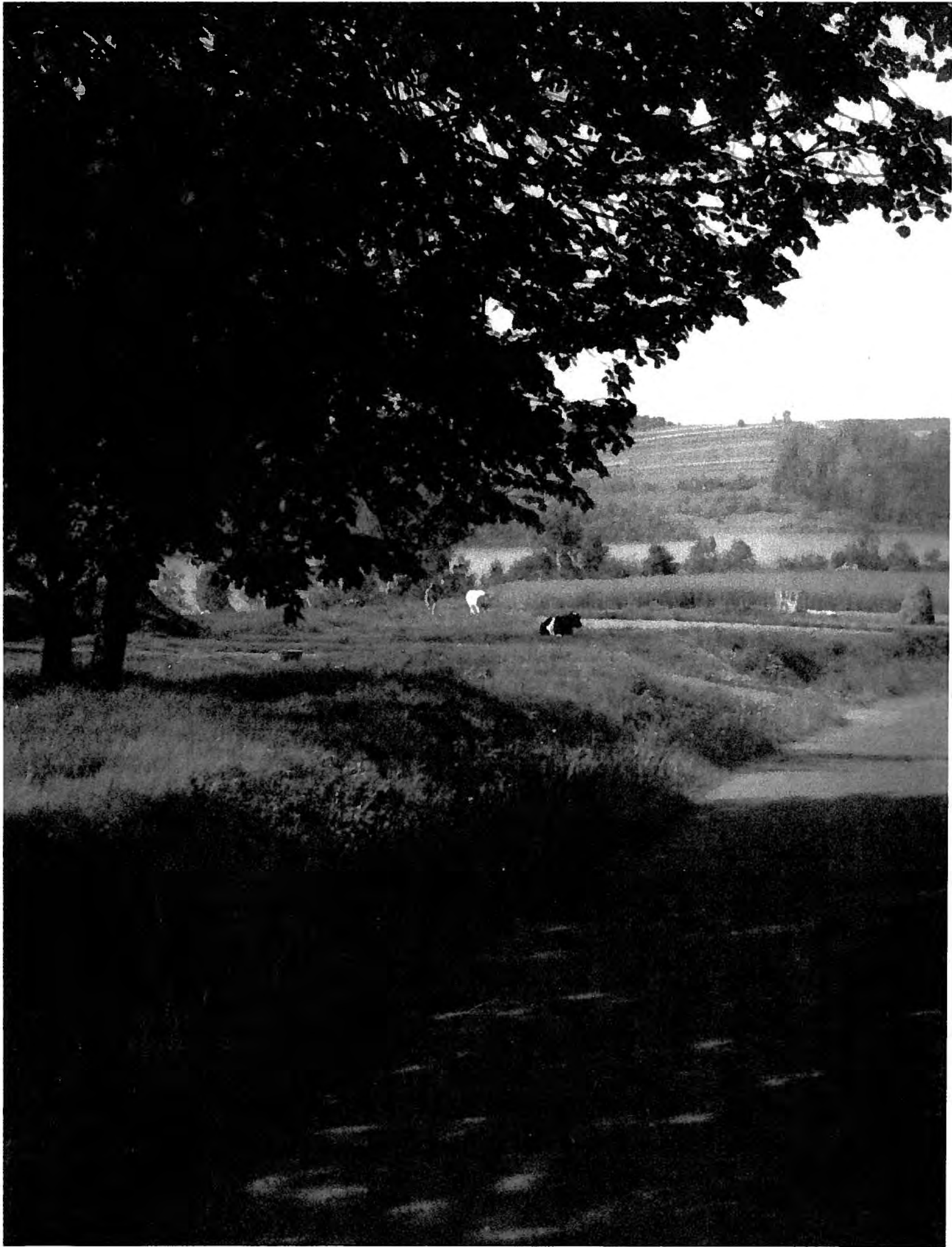




Promoting a Sustainable Future:

A Decade of EPA-Polish Cooperation



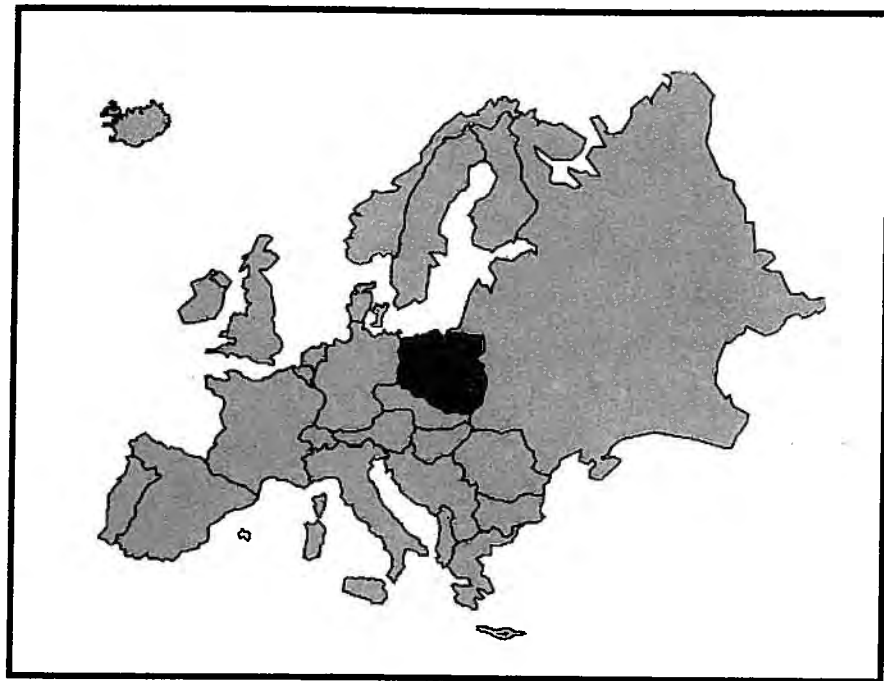


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Prologue

IRON CURTAIN RISES TO REVEAL DIRT, DEATH

-- Boston Globe (1989)

EASTERN EUROPE BREATHE THE AIR OF FREEDOM, AND CHOKES

-- New York Times (1994)

When the Berlin Wall fell in November 1989, the eyes of the world focused with excitement on the historic changes sweeping through Central and Eastern Europe. As these fragile new democracies emerged from behind the Iron Curtain, the world also saw significant environmental degradation, one of the unfortunate legacies of the previous regimes, and their attention to industrial production at all costs. In Poland, statues in the historic city of Krakow literally were melting away because of air pollution from a near-by steel mill. For many Polish and international observers, the blurred faces of these statues symbolized the importance of improving Poland's environment for current and future generations.

Under the Support for East European Democracy (SEED) Act of 1989, and with financial support from the U.S. Agency for International Development (USAID), the U.S. Environmental Protection Agency (EPA) was tasked to work with officials in Krakow to help them improve air and water quality for the city's residents. These programs, along with many other bilateral cooperative activities in Poland which followed in subsequent years, are described in the following pages.

Although the events of 1989 certainly gave greater impetus and attention to U.S.-Polish cooperation, EPA was privileged to have established bilateral professional relationships with Polish environmental experts even before the fall of the Berlin Wall. This cooperation initially took place under the auspices of the Polish-U.S. Agreement on Scientific and Technological Cooperation. Then, in 1987, the importance of strengthening environmental cooperation with Poland was underscored by the signing of an official Memorandum of Understanding (MOU) between EPA and the Polish Ministry of Environment, Natural Resources, and Forestry, an agreement which remains active today.

Although EPA is proud to have been a part of the success described in these pages, we recognize that none of it would have been possible without the professionalism, dedication and expertise of our Polish and U.S. partners. Some are mentioned in these pages by name, others by organizational affiliation. However, there are countless individuals and organizations, too numerous to mention individually, who also made an important contribution to the success of EPA-Polish environmental cooperation over the past decade.

EPA also would like to express its appreciation to USAID for its financial support, without which much of this work would not have been possible.

Project Overview

In 1989, then-U.S. President George Bush traveled to Krakow and made a commitment that the United States would provide support to improve the air quality and to set up a state-of-the-art air monitoring network for the city. EPA's support for air quality management in Krakow over the last 10 years was conducted in two phases: Phase I was the establishment of the air quality network. Phase II was the introduction of additional tools and methods to better understand and estimate air pollution in Krakow, with a focus on air pollution from motor vehicles.

Krakow Air Quality Project

Krakow is the historic capital of Poland, a city spared the ravages of war and adorned with many old churches and fine buildings. In the late 1980s and early 1990s, these churches and buildings were threatened by emissions from the giant Nowa Huta Steel Mill, from coal burned for home-heating, and from motor vehicles with no emission controls. Under the Support for Eastern European Democracy (SEED) Act of 1989, the United States provided EPA with \$1 million to establish an air monitoring network in Poland.

Key Objectives

- Develop an air quality monitoring network to provide information for emergency and long-term control strategies
- Disseminate information in order to improve air quality and educate and inform the public
- Transfer key U.S. tools and approaches to enable the development of an effective air quality management program in Krakow.

Project Activities

• Monitoring Air Quality

In the first phase of EPA's collaboration in Krakow, EPA and Polish experts worked together to design and set up a state-of-the-art, automated, ambient air quality monitoring network in Krakow.

In spring of 1991, a shipment of 20 tons of U.S. air monitoring equipment reached Krakow. EPA specialists worked with their Polish counterparts to install the monitoring stations and after two months of trial runs, the system was officially commissioned on November 7, 1991. The ceremony was

attended by officials from the United States and Poland.

The seven-station system is tailored to reflect the air monitoring situation in Krakow, with each station measuring different pollutants, including sulfur dioxide, nitrogen oxides, carbon monoxide, particles, ozone, and heavy metals. In addition to the seven fixed stations, the system also includes one mobile air monitoring unit.

• Disseminating Information

The data from the air quality monitoring system in Krakow have been extensively used to educate and inform scientists, school children, factory workers, and the general public. The information was presented in a variety of ways, including yearly reports, monthly bulletins, videos, slides, the annual State of the Environment Report, and press coverage. For the last several years, air pollution information from the monitoring network has been displayed on an electronic display board in Krakow's main square.

• Managing Urban Air Quality in Krakow

The second phase of EPA's collaboration with Krakow on air quality was designed to address the air pollution problems caused by the increase in mobile source pollution. The goal was to establish a basis for more informed decision-making through the use of improved data, analytical tools (including improved monitoring and modeling techniques) and transportation control options. EPA worked with experts in Krakow to develop tools and information to enable the *Voivodship* (region) and the City of Krakow to make reliable decisions on air pollution control measures, including:

- Updating the current air monitoring network to monitor pollutants associated with mobile sources such as non-methane organics and volatile organic compounds; adding more ozone samplers; and equipment to measure fine particulates (parti-

cles with a diameter of less than 2.5 microns, known as PM_{2.5})

- Reconfiguring the air monitoring network to better capture pollution from mobile sources. In addition, the network was rearranged to reflect the additional area added to the former Krakow *Voivodship*, now the Malopolska *Voivodship*, during the administrative restructuring that took place in Poland in 1998-1999
- Performing special air pollution studies to capture the volatile organic compounds in the air in Krakow, particularly those associated with mobile sources
- Providing training in air monitoring, specifically training to run the new samplers
- Providing emission inventory training and assistance in developing an emission inventory for all sources in Krakow
- Developing an updated emission inventory for Krakow, including stationary sources, mobile sources, and area wide sources
- Conducting dispersion modeling training, both for experts in modeling and for managers
- Transferring a dispersion model (CalPuff) to Krakow, and beginning trial runs of the model
- Organizing a Transportation and Air Quality Workshop in Krakow to bring together experts from Poland, the United States and European cities to share information and experiences on transportation and air quality issues
- Setting up a small office within the City of Krakow that will work on air pollution and transportation issues in collaboration with the *Voivodship* Environment Department and
- Organizing a final Krakow Urban Air Conference sharing lessons learned and tools and approaches with other cities in Poland.



Contacts

Poland

Jerzy Wertz
Environmental Protection Department
Malopolska Region
ul Ractawicka 56
30-017 Krakow, Poland
Tel: 48-12-633-11-22
Fax: 48-12-633-18-33

Konrad Pawel Turzanski
Voivodship Inspectorate
State Inspectorate for Environmental Protection
Pl. Szczepanski 5
31-011 Krakow, Poland
Tel: (48-12) 422-4895
Fax: (48-12) 422-3612

United States

Jane Metcalfe
U.S. EPA
1300 Pennsylvania Avenue, NW (2670R)
Washington, DC 20460
Tel: (202) 564-6451
Fax: (202) 565-2411
metcalfe.jane@epa.gov

Thomas Hartlage
U.S. EPA
National Exposure Research Laboratory
Research Triangle Park, NC 27711 USA
Tel: (919) 541-3008
Fax: (919) 541-4609
hartlage.thomas@epa.gov



Key Results

- Krakow now has a state-of-the-art air monitoring network, an updated emission inventory for all sources of air pollution, and an air dispersion model for Krakow.
- Air pollution experts in Krakow are now technically trained in air monitoring, emission inventory and air dispersion modeling, and are continuing the project with little assistance from EPA.
- Krakow will become one of the first cities in Poland to develop and put in place an air quality model, which is a requirement for accession to the European Union.
- The project convinced the City of Krakow and the *Voivodship* to establish a joint office, providing the institutional infrastructure to generate reliable information on air quality and transportation issues, and the ability to make joint policy decisions based on the best information available.
- Information from this project will be disseminated to other Polish cities and to other countries in the region.

Project Overview

Under the water/wastewater project, EPA helped the City of Krakow upgrade the Raba and Rudawa drinking water treatment plants, the Paszow and Myslenice wastewater treatment plants, and a central laboratory which supports drinking water and wastewater facilities. EPA provided equipment, supplies, replacement parts, and appropriate training for Krakow personnel.

Krakow Water Quality Project

The genesis of the Krakow Water Quality Project began with a proposal, offered by then-U.S. President George Bush during his visit to Poland in July 1989, that the United States work with Poland to assist Krakow with its air and water pollution problems.

Under the Support for Eastern European Democracy (SEED) Act of 1989, approximately \$4 million was provided to EPA for the water/wastewater project in Krakow.

Under an interagency agreement, the U.S. Army Corps of Engineers assisted EPA by acquiring equipment and arranging for its shipment to Krakow. A private engineering firm under contract to EPA helped select the equipment and prepared technical specifications used by the Corps in its purchase. The primary Polish partner is the water and sewer utility serving the city of Krakow, MPWiK.

Key Objectives

- Upgrade two drinking water treatment plants, two wastewater treatment plants, and a central laboratory which supports drinking water and wastewater facilities in the City of Krakow
- Train Polish experts to manage equipment and laboratory

Project Activities

- **Rudawa Drinking Water Treatment Plant**

This plant draws water from the Rudawa River and provides about one fourth of Krakow's water supply. The equipment provided by the United States, combined with local investments, enable the plant to

produce a higher quality of drinking water than it could produce prior to the initiation of the program.

- **Raba Drinking Water Treatment Plant**

This is a relatively new plant that was completed in 1986 and provides about one-half of Krakow's water supply. The equipment EPA provided for this plant includes: air blowers, equipment to add chlorine and ozone to the water, analytical equipment to control plant operations, and analytical equipment and other facilities for a remote monitoring station at the water intake.

- **Myslenice Wastewater Treatment Plant**

The Myslenice wastewater treatment plant is located on the headwaters of the Raba reservoir from which the Raba plant draws its water. The plant was converted to a biological nutrient removal system. In addition to improving the wastewater treatment facility, the City of Krakow installed a monitoring station and an early warning system for the Raba reservoir at the Myslenice site.

- **Paszow Wastewater Treatment Plant**

The major portion of this plant is a primary facility, but there is a secondary plant that treats approximately 0.3% of the flow. The secondary treatment system was converted to a demonstration plant for biological nutrient removal studies to determine how to produce effluent for industrial reuse. An existing building on the site was used for studies to investigate the physical/chemical treatment of the secondary effluent to remove additional phosphorus and suspended solids by coagulation with metal salts

1990

1996

and filtration.

• **Central Laboratory**

In view of the high level of pollution in the waters used for human consumption, more definitive and faster analytical techniques were required to identify the magnitude of the pollution problem and help protect public health. The effective use of the high-quality laboratory equipment is a cost-effective way to protect public health as Krakow implements an improved pollution control program.



Contacts

Poland

Wojciech Studnicki
City of Krakow Water & Sewage Utility Company
ul. Senatorska 1
30-106 Krakow, Poland
Tel: (48-12) 421-0008
Fax: (48-12) 421-4412
office@MPWiK.krakow.pl

United States

Charles E. Gross
U.S. EPA
1200 Pennsylvania Avenue, NW (4204)
Washington, DC 20460
Tel: (202) 260-7370
Fax: (202) 260-0116
gross.charles@epa.gov

Ron Hoffer
U.S. EPA
1200 Pennsylvania Avenue, NW (4607)
Washington, DC 20460
Tel: (202) 260-7096
Fax: (202) 401-6135

Key Results

- The quality of the drinking water available to Krakow residents has improved significantly.
- Raw water can now be monitored before it enters the treatment process because of new testing equipment and methodology.
- The water and wastewater utility in Krakow can now perform a full range of analytical tests to monitor the quality of raw water entering the water treatment processes and to measure the effectiveness of the treatment processes.
- U.S. firms were provided with the opportunity to introduce their equipment and services into the Polish market.



Project Overview

The Raba River in Poland flows through a beautiful mountainous region outside of the City of Krakow. The area is mostly rural, known for tourism, forests, and farmland. The Raba River supports the Dobczyce Reservoir, which supplies sixty percent of the drinking water for Krakow. The Reservoir is threatened by pollution from raw sewage, from runoff from agriculture, roads, and landfills, and from settling particles from air pollution. According to some estimates, the reservoir could become unusable in as little as six years. Communities in the Raba River area, facing the considerable challenge of protecting a resource used outside their boundaries, formed the Union of Upper Raba River Communities and Krakow (Union). The Union's purpose is to protect the water quality in the watershed and in the Dobczyce Reservoir.

Raba Watershed Management Project

In 1992, the U.S.-based Water Environment Federation (WEF) entered into a cooperative agreement with EPA to provide technical assistance in selected Central and Eastern European countries, including Poland. Because WEF is a professional association for the wastewater industry, the program was designed to use WEF members to provide *pro bono* technical assistance. In 1995, WEF began working with the Krakow *Voivodship* and the Union for the Raba River watershed to provide technical review of projects, training, and information on watershed protection and associations in the United States. WEF's assistance helped the Union gain critical funds for watershed protection projects, promoted cooperative approaches to resolving the region's problems, helped validate the work of the Union, and provided ideas for new approaches to watershed protection.

Key Objectives

- Develop a watershed management plan to protect and improve the water quality of the Raba River
- Improve skills and knowledge of mediation, and technical issues through training courses
- Foster sustainable relationships between Polish government officials and the Union in order to improve the Raba River watershed.

Project Activities

• Review of the Raba River Watershed Management Plan

A team of WEF experts reviewed the Raba River watershed management plan that had been prepared by a consulting firm. This review helped the Union acquire a funding commitment from the Polish Government for the construction of wastewater treatment plants.

• Alternative Dispute Resolution (ADR)

A WEF volunteer held a series of classes in the use of mediation and ADR in resolving environmental disputes. ADR was successfully used to resolve a wastewater treatment plant siting dispute.

• Training

WEF volunteers taught workshops on a variety of technical subjects including biological nutrient removal, biosolids management, storm water management, and highway spill protection.

• Technical Assistance

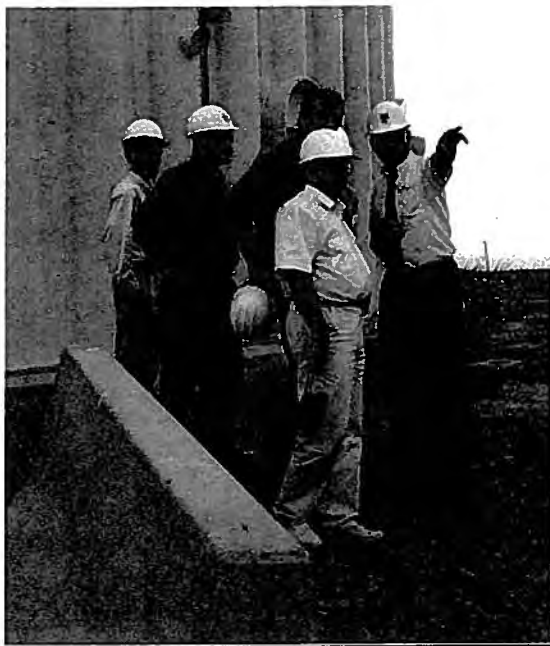
A WEF volunteer evaluated plans for the upgrade and expansion of a wastewater treatment plant. The same volunteer provided technical information to the consulting firm working with the Union.

• Technical Exchange

The director of the Union and several of the members (mayors of communities in the watershed) toured the United States to study watershed protection measures, and the structure of U.S. watershed associations. A staff member from the Charles River Watershed Association (CRWA) later visited the Raba River watershed and discussed CRWA's activities.

1992

1997



Contacts

Poland

Andrzej Sobczak
Union of Upper Raba River Communities and
Krakow
Rynek 9
32-400 Myslenice, Poland
Tel: (48-12) 274-1753
Fax: (48-12) 274-2743

United States

Tiffin Shewmake
Water Environment Federation
601 Wythe Street
Alexandria, VA 22314 USA
Tel: (703) 684-2400 ext. 7245
Fax: (703) 684-2492
tshewmake@wef.org

Ron Hoffer
U.S. EPA
1200 Pennsylvania Avenue, NW (4607)
Washington, DC 20460 USA
Tel: (202) 260-7096
Fax: (202) 401-6135
hoffer.ron@epa.gov



Key Results

- Training and technical reviews supported the goal of protecting the Raba River watershed. Programs were designed and implemented in support of this goal.
- Strong local leaders now have a vision and a clear idea of how to use assistance programs to improve quality in the Krakow region.
- Professional volunteers brought valuable experience and enthusiasm to the technical program. Some volunteers became vested in the program and conducted their own initiatives.
- A case study was written about the Raba River Union by WEF to encourage broader dissemination of the watershed management approach.



Project Overview

Blue Thumb began as an information exchange in 1994 when representatives from the Krakow water utility and other local government officials visited Water For People (WFP) in the United States. Discussions with practicing utility professionals and interviews with environmental education groups brought the group to a consensus: collaborative communication mechanisms must be learned and employed to build understanding, support and creative solutions for water service changes in Krakow.

1995

1998

Blue Thumb Project

In Poland, as in so many parts of the world, the long-term provision of safe and sufficient drinking water at a reasonable price relies less on the technical aspects and more on the voice and involvement of the customer. Unfortunately, consumers often lack an understanding of what it takes to supply safe drinking water in sufficient quantity and quality. There is a dire need to educate people on the origin and protection of their drinking water, on the related health and environmental issues, and on the rationale behind capital improvements and rate increases by the local water utility.

Water utilities, though, often suffer from a lack of public trust, more because of a traditional "top-down", technical and economic approach than actual misconduct. This makes effective communication with the public more complicated. The challenge is for utilities and local government to find supplemental, effective ways to build trust and to work with the customers in a two-way decision-making process. It was this need to build public awareness of and involvement in drinking water issues that led to the *Blue Thumb* Project in Krakow.

Key Objectives

- Provide public awareness and education materials for the general public concerning safe drinking water
- Create an open line of communication between utilities and their customers in order to develop a two way decision-making process to make safe drinking water choices.

Project Activities

• The *Blue Thumb* Project

After reviewing various public communications programs, Polish experts decided to adopt the *Blue Thumb* Project. *Blue Thumb* is a campaign developed by the American Water Works Association (AWWA) that provides public awareness and education strategies and materials on drinking water. To help in the effort, WFP committed to hire a *Blue Thumb* coordinator with a local non-governmental organization (NGO), the Regional Environmental Education Center, known by the Polish acronym ROEE. Funds also were provided for the development of *Blue Thumb* activities and distribution of materials. From 1995 through 1998, in partnership with EPA, WFP provided ROEE with direct financial support and donated services.

ROEE's approach to *Blue Thumb* continues to be the engagement of students and teachers to reach the general public, including government officials. Water-related materials and activities have been borrowed from the North American water community. WFP volunteers from the AWWA membership have reinforced ROEE efforts with occasional on-site support and training on public communications, outreach and education methods.

Blue Thumb's success has continued beyond WFP and EPA support. USAID and the Polish National Fund for Environmental Protection also provided funding to spread the *Blue Thumb* project throughout Poland. The annual "Water Week" continues with local corporate support. Also, a Peace Corps volunteer was assigned to ROEE to help with *Blue Thumb* and other activities. A web site on the work is now complete.

Results from ROEE's *Blue Thumb* project have been felt elsewhere. The Krakow Water and Wastewater Utility, an original participant in the information exchange to the United States, has not only opened its doors to facility tours, but also has hired a public relations professional and developed a strategic communications plan that addresses many of the issues brought

to light by *Blue Thumb*. *Blue Thumb* has also been replicated in Krakow's sister city of Lviv, Ukraine with ROEE serving as a training resource for Ukrainian NGOs and local government.

The *Blue Thumb* project underscored a number of lessons. One is the need to bring all stakeholders to the table to address complicated issues such as urban water supply. Also, the work has shown the need to have a local implementing group, like ROEE, at the helm. It is best positioned to deal with local interests and politics, and ultimately is the institution to continue the work after initial support is complete. Finally, the collaboration among a local NGO, national and local governments, and supporting efforts of volunteers from a North American professional group have proved to be a feasible and cost-effective development model.

Contacts

Poland

Mirosław Gaweda
Regional Environmental Education Center
12 Ślawkowska Street
31-014 Krakow, Poland
Tel: (48-12) 421-6796
Fax: (48-12) 429-5372
www.most.org.pl/roee/

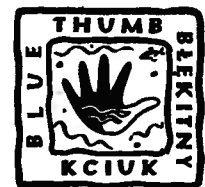
United States

Paul A. Sobiech
Water For People
6666 West Quincy Avenue
Denver, CO 80235 USA
Tel: (303) 734-3491
Fax: (303) 734-3499
www.water4people.org

Ron Hoffer
U.S. EPA
1200 Pennsylvania Avenue, NW (4607)
Washington, DC 20460 USA
Tel: (202) 260-7096
Fax: (202) 401-6135
hoffer.ron@epa.gov

Key Results

- Many sustainable activities have been prompted by the *Blue Thumb* project including an annual "Water Week," citizens' water monitoring committees, field trips to local water and wastewater treatment plants, video programs, water-friendly awards, workshops for students and teachers, and the formation of *Blue Thumb* clubs. Over 140 clubs have been formed with more than 4,000 students and their teachers participating.
- Membership and participation in *Blue Thumb* has been expanded to include business owners, city officials, water and sewage utility operators, civic leaders and the media in Krakow.



Project Overview

Poor agricultural and rural waste management practices contribute significantly to the degradation of surface and ground water quality, and may thus also affect urban populations who depend on these sources for drinking water. As nearly 100 percent of Poland lies within the Baltic Basin, the effects of poor agricultural practices extend beyond Poland's borders and affect much of northern Europe through contamination of the Baltic Sea. The Poland Agriculture and Water Quality Protection Project was a four year effort, begun in 1992, designed to address agricultural water pollution issues through a multi-focused approach. This project addressed these objectives through multi-level education efforts, assistance in policy development and demonstration of sustainable farming and waste management practices in selected watersheds in northeastern and northwestern Poland.

1992

1996

Agriculture and Water Quality Project

Approximately 38 percent of the Polish population lives in rural areas. The agricultural sector provides 25 percent of the employment and utilizes about 65 percent of the nation's land area. Thus, agriculture and related activities have a direct impact on large segments of the human population and ecological infrastructure of Poland. The Polish Agricultural Water Quality Project (PAWQP) was a cooperative effort between EPA and the Polish Ministry of Agriculture and Food Economy. The project was implemented by the Center for Agricultural and Rural Development (CARD) at Iowa State University in Ames, and the Institute for Land Reclamation and Grassland Farming (IMUZ) near Warsaw.

Key Objectives

- Create a social, economic and political climate that encourages the recognition of agriculture related water quality issues
- Develop solutions for agriculture related water quality issues
- Promote institutional innovation and policy changes that can result in long-term commitment to sustainable agriculture and improved water quality in Poland.

Project Activities

• Demonstration Farms

Demonstration farms were developed to display economically and environmentally sustainable agricultural practices, encouraging participation by farmers, agricultural advisory centers, local officials, schools and other agricultural professionals in adopting such practices in rural areas.

These farms were used to demonstrate a wide range of environmentally and economically sustainable agricultural practices. The goal was to improve human and animal waste handling, agricultural chemical handling, runoff control, and erosion control while maintaining or improving production and profitability. Sustainable technologies and land management practices demonstrated on the farms included:

- Manure storage and handling
- Domestic waste water management
- Integrated fertilizer application methods
- Integrated pasture management
- Introduction of legume crops as nitrogen sources
- Introduction of clover onto grasslands
- No-tillage permanent grassland renovation
- Cover cropping.

• Education and Dissemination of Information

Information on sustainable practices was given to the public, farmers, future farmers, governmental and non-governmental institutions and agricultural and environmental professionals. Through informative leaflets and training programs, the results from the farm demonstrations were extended broadly throughout Poland.

The project team worked with an environmental organization to organize and pilot a training program for local community leaders. The training demonstrated the benefits of merging advanced agriculture science and practice with well-trained local community leadership to solve agriculture and water quality problems and support longer-term economic and social development.

• Institutionalization and Policy Development

Efforts were designed to provide a strong, broadly based foundation for development of sustainable agriculture in Poland. By assisting in the establishment of programs within central and regional governmental institutions to

address agro-environmental issues and bridge institutional barriers, a closer cooperation between the agricultural and environmental research and regulatory communities was achieved.

Specifically, the project established a working group to coordinate activities between the Polish Ministries of Environment and Agriculture. An additional working group was established to assist the Ministry of Agriculture in developing the institutional capacity to address agro-environmental issues. Throughout the project, project staff coordinated closely with bilateral and multilateral donor organizations to leverage other sources of funding and to ensure the expansion of sustainable agricultural activities throughout the region.

Contacts

Poland

Andrzej Sapek
Institute of Land Reclamation and
Grassland Farming (IMUZ)
Falenty 05-090
Raszyn, Poland
Tel: (48-22) 720-0531

United States

Walt Foster
U.S. EPA
901 N. 5th Street (DISOENSV)
Kansas City, KS 66101 USA
Tel: (913) 551-7290
Fax: (913) 551-9290
foster.walt@epa.gov

Key Results

- The demonstration farm project helped to secure financial commitments from Polish local and national government organizations.
- The project sponsored a large conference for decision-makers throughout Poland and surrounding Baltic Basin countries to exchange information on sustainable agriculture and rural development.
- Papers and reports were presented by project staff and published in a variety of fora in the United States and Europe.
- Based on the success of the project, a number of additional projects sponsored by the World Bank, Sweden, Denmark, France are now being implemented throughout Poland and the Baltic Sea region.



Project Overview

Past efforts to revegetate coal and smelter waste pile sites in Katowice using topsoil were either too expensive (for the coal sites) or ineffective (for the smelter sites). From 1994 through 1999, a team of scientists from the United States and Poland worked cooperatively to develop a regional plan that would utilize biosolids (sewage sludge) from local wastewater treatment plants to revegetate the coal and smelter waste piles in the region. The team members represented the fields of wastewater treatment, agronomy, and soil science.

Biosolids Reclamation Project

Although the revegetation of coal waste piles was often done with biosolids in the eastern part of the United States, no successful work had ever been done or documented on the more toxic smelter wastes anywhere in the world. The methodology developed for the Biosolids Reclamation Project proved to be a low-cost and effective solution and shows great potential use throughout the world, especially where cost is the greatest constraint to effective reclamation.

Key Objectives

- Develop a regional plan to utilize biosolids from local wastewater treatment plants to revegetate several different types of coal and smelter waste piles in Poland
- Provide a remediation solution that was affordable in the local economy and which could be widely replicated
- Analyze soil samples to determine the geochemistry of the area in order to select the most suitable revegetation species.

Project Activities

• Project Silesia

From 1994 through 1999, a team of scientists from the United States and Poland worked cooperatively on the biosolids effort.

The wastes found on the demonstration sites, especially the smelter waste sites,

were phytotoxic (poisonous to plants) and contained high levels of lead, cadmium and zinc. The team determined that a combination of biosolids and lime would be the key components of the revegetation effort. The limestone is needed to adjust the acidity level of the soil. The biosolids supplied high levels of phosphate, iron, organic nitrogen, other organic matter and soil microbes. This combination proved to be a suitable growing medium which reduced soil acidity (pH) and counteracted the bio-availability of the lead. In order to authenticate the methodology and to ensure that it could be replicated at other sites, careful scientific methods and documentation were used.

• Analyzing the Geochemistry and Choosing a Tolerant Grass

Before any work was performed on the sites, samples needed to be taken and analyzed. This analysis included pH, total sulfur, zinc, cadmium and lead as well as electrical conductivity and solubility. Next, dozens of metal- and salt- tolerant grasses and cultivars were grown in laboratory test pots containing the waste materials in order to evaluate the best species for application at the sites. Based on the results, a mixture of several species of grasses and legumes were selected and used. Legumes were determined to be important in include in the vegetative cover because they are long lasting and help replace nitrogen in the soil. Grass species selected needed to be resistant to both salinity and heavy metals.

• Raising the pH

After the sites were graded, a 15-centimeter layer of waste lime (a waste product of the coal mining process) was applied. A mixture of biosolids, additional waste lime and smelter waste was plowed and incorporated in the upper level of the smelter sites. The waste lime

1994

1999

was added to raise the pH. Raising the pH suppresses the migration and plant uptake of heavy metals which cause the phytotoxicity. Only high quality biosolids (low in contaminants and pathogens) were used. The chemical and physical properties of the biosolids are able to restore soil-like characteristics and fertility to many different waste sites, barren areas, or deserts where water retention and fertility limit plant growth. Also, biosolids have the ability to limit the uptake of heavy metals into the plant's root system in a pH controlled or adjusted environment.



Contacts

Poland

Thomas Stuczynski
Institute of Soil Science and Plant Cultivation
Pulawy, Poland
Tel: (48-83) 831-3421
Fax: (48-83) 831-4537
ts@iung.pulawy.pl

Franciszek Pistelok
Center for Environmental Survey and Control
ul. Owocowa 8
40-158 Katowice, Poland
Tel: (48-32) 599-616
Fax: (48-32) 597-030

United States

Kenneth Pantuck
U.S. EPA
1650 Arch Street (3WP21)
Philadelphia, PA 19103 USA
Tel: (215) 814-5769
Fax: (215) 814-2318
pantuck.kenneth@epa.gov

W. Lee Daniels
Department of Crop and Soil Sciences
Virginia Technical University
Blacksburg, VA 24061 USA
Tel: (540) 231-7175
Fax: (540) 231-7630
wdaniels@vt.edu

Key Results

- The methodology developed by the project provides a template for remediating similar sites in other locations around the world.
- The methodology provides for the beneficial use of two waste products: biosolids and lime.
- The methodology is inexpensive and highly effective, especially when compared to the cost and effectiveness of using topsoil for reclamation.
- The beneficial use of biosolids is an important aspect of a regional sludge management program.
- The vegetative cover on the waste piles reduces wind and water erosion of metal-rich dusts and the associated medical risks from inhalation and ingestion.
- The vegetative cover decreases erosion and run off contamination of surface and groundwater supplies.
- The project has improved aesthetic and social value for the communities which surround the sites.



Project Overview

The goal of the Underground Storage Tank (UST) Project was to assist local decision-makers in Katowice to develop an underground storage tank management program and to identify gasoline stations in the Upper Silesia region which require an environmental assessment.

To meet this goal, EPA partnered with a project development and implementation team consisting of representatives from the Regional Implementation Unit (RIU), the Center for Environmental Survey and Control (OBiKS), and the Voivodship Inspectorate for Environmental Protection (WIOS). The team developed and implemented a pilot program for the inventory, reconnaissance, prioritization, and assessment of leaking underground storage tank facilities in the Katowice region.

Underground Storage Tank Project

As of 1994, Poland had minimal requirements for the assessment or remediation of leaking underground storage tanks which have the potential to endanger underground water supplies, surface water supplies (such as streams), and nearby homes. Historically, underground storage tanks were not installed with corrosion protection or leak detection. Unprotected tanks and piping eventually corrode and leak, but without systems for detection, leaks may continue to contaminate the subsurface for a long time before there are obvious impacts. Although Poland has general requirements for periodic tank tightness testing, there currently are no specific requirements for ongoing leak detection at existing underground storage tanks in Poland.

Key Objectives

- Assist local decision-makers in developing an underground storage tank management program
- Identify underground storage tanks which require an environmental assessment
- Train local officials to assess leaking underground storage tanks
- Develop a process to inventory and prioritize underground storage tank sites
- Assess gasoline stations in order of environmental priority to prepare for remediation.

Project Activities

- Training to Assess Leaks in Underground Storage Tanks

In May 1995, EPA provided training to technical representatives from various provincial and local governments, industry, private environmental consulting firms, as well as representatives from the Czech Republic. The objective of the training was to present methods in assessing whether underground storage tanks at gasoline stations are leaking and in determining the magnitude and extent of the leaks.

In the classroom, EPA provided a framework for conducting site assessments. In order to reinforce classroom presentations and to give opportunities to practice what was learned, the participants also conducted an actual field assessment of a gasoline station. The field assessment included sampling of soil, soil gas, groundwater, and surface water. A semi-quantitative field analytical method was used so that data would be readily available for review. The students were then able to use this "real time" data to develop their own conclusions.

The use of an actual assessment reinforced classroom discussions and exercises demonstrated some of the logistical difficulties that always arise in field work, and challenged preconceptions of the class. For example, many participants thought it would be highly unlikely for the tanks or piping at the gasoline station to be leaking since the station was only 15 years old and well maintained. These perceptions changed after the participants found contaminated soil and groundwater during the assessment.

•Inventory and Prioritization: Creating Tools for Decision-Making

During the second phase of the project, EPA's main role was as facilitator leading discussions among Polish experts on identifying sites, collecting site information, and prioritizing actions. On the basis of these discussions, the project team developed a process to gather and verify this information, then developed a computer database and a method to prioritize the sites.

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To manage all of the data collected, the project team developed a flexible computer database system to be used as a decision-making tool which could contain scanned maps as well as detailed facility information.

In a workshop held in Katowice in 1997, EPA facilitated discussions to determine the parameters to use to prioritize the sites. By selecting certain attributes and deciding how these attributes should be considered, the project team was able to develop an algorithm which ranked the gasoline stations in the database relative to their potential for leaking.

• Reconnaissance and Assessment

By the fall of 1998, the project team began conducting reconnaissance visits at 12 gasoline stations in the Katowice *Voivodship*. As a result of the reconnaissance visits, the project team updated the information in the database and re-ranked the sites. One site was selected from the re-ranked list and a full environmental site assessment was conducted in November 1998.

Contacts

Poland

Wojciech Stawiany
Center for Environmental Survey and Control
ul. 8 Owocowa 8
40-158 Katowice, Poland
Tel: (48-32) 599-616
Fax: (48-32) 597-030

United States

Cheryl Atkinson
U.S. EPA
1650 Arch Street (3ED00)
Philadelphia, PA 19103 USA
Tel: (215) 814-3392
Fax: (215) 814-5718
atkinson.cheryl@epa.gov

Joel Hennessy
U.S. EPA
1650 Arch Street (3WC11)
Philadelphia, PA 19103 USA
Tel: (215) 814-3390
Fax (215) 814-3113
hennessy.joel@epa.gov

Key Results

- In December 1998, the project team held a final workshop and project closeout seminar in Katowice to present the computer database and ranking system along with the results of the reconnaissance visits and site assessment.
- The workshop highlighted the need for the control of surface spillage at every gasoline station, as well as the need for ground-water monitoring to act as a leak detection mechanism at older stations.
- The *Voivodship* Inspectorate now has a computerized data-base system to use as a tool for the continuation of assessments at gasoline stations.



Project Overview

Stimulating the safe redevelopment of environmentally compromised properties --which are commonly referred to as Brownfields-- is a significant concern to the local officials. Due to the high population density and past and present industrial activities, the remaining "green fields" -- or open space tracts -- are limited and, therefore, highly valued. There are many tracts of land which have been impacted by past industrial practices that are not being adequately utilized. These abandoned or under-utilized properties often have existing or near-by infrastructure (i.e., roads, railroad tracks and utilities) making these properties, but for environmental concerns, prime candidates for redevelopment.

Brownfields Redevelopment Project

EPA and its Polish partners conducted a pilot study to evaluate the safe conversion of a property formerly used for zinc smelting and the manufacture of metallic oxides to productive future use as an industrial park. The former Warynski smelter property is situated in Katowice *Voivodship*, located in the Upper Silesia Region in southern Poland. Emphasis was placed on utilizing this pilot project to begin to establish uniform processes for assessing environmental risk which could be replicated at other properties in the future.

The Warynski Smelter property encompasses approximately 60 hectares located in the *gmina* (city) of Piekary Slaskie. Smelting and other operations related to mineral ore processes were conducted on the property from 1927 - 1990. The owner of the Warynski site, Orzel Bialy, has decommissioned and dismantled the smelter and other buildings to ground level. The site is no longer in use by the company. The entire property is covered with a thick layer of mining wastes which looks like soil, but it is rich in heavy metals (cadmium, lead and zinc) and is more acidic than natural soil. The property is sparsely vegetated because the waste material is toxic to most plants.

Current Polish law requires that industrial users return a property to "natural balance" when they are finished with a property. However, the "natural balance" standard is undefined and difficult to enforce as the state formerly owned most of the polluting industries. It is generally understood that the respective *gmina* makes a case-by-case determination as to whether or not a property has been returned to natural balance, releasing the former user of further restoration responsibilities.

Piekary Slaskie officials were interested in acquiring or facilitating the legal transfer of the property provided that it is safe for prospective users. They believe that the community would benefit if the property were converted into one or more of several uses, in order of priority: industrial park; recreational; retail outlets or shopping center; and/or a solid waste landfill. Piekary Slaskie officials determined that their highest priority was to move existing mini-industries out of residential areas. It was their strong desire to locate both existing and newly formed mini-industries to an industrial park to be created on the former Warynski property. Public park lands and athletic fields are also a priority in the region.

The project team, led by the Institute of Ecology of Industrial Areas (IETU), included the Orzel Bialy Mining and Metallurgical Works (current owner), the Piekary Slaskie *gmina* (responsible for land use planning) and EPA. EPA provided technical assistance to the IETU team throughout the project. IETU utilized Polish technical contractors to perform select activities. Additional funding was provided by the Katowice *Voivodship* Fund for Environmental Protection and Water Management.

Key Objectives

- Assess the health risks to industrial workers, recreational users and construction workers, associated with the redevelopment of the property
- Identify cost-effective construction methods to allow safe reuse of the property

Project Activities

- Assessing Risk

With the current owner no longer using the property and the *gmina* interested in putting the property back into productive use, a risk assessment was conducted to determine whether prospective users would be subjected to increased health risks if no special construction methods were employed to address the

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mining wastes. IETU toxicologists performed the human health risk assessment utilizing standard EPA methods which were provided during a 1995 risk assessment training in Katowice.

• Planning for Redevelopment

According to current plans, the property would be subdivided into parcels suitable for small businesses. Construction activities would include installation of subsurface utilities (i.e., water, sewer, electric) in "clean trenches" leading to each parcel. The clean trenches would allow future maintenance activities to be performed without risk to workers. The land surface in the vicinity of each business would be capped with concrete to reduce potential exposure to industrial workers and their customers. The concrete would provide a durable wear surface which is suitable for light industrial traffic. The surrounding areas would be revegetated to cover exposed waste material and reduce resuspension of metal dust. The revegetation component of the project would utilize soil conditioning and pH adjustment techniques developed in the biosolids project described previously. Institutional controls would need to be placed on the redeveloped property to ensure that prospective land users are aware of the subsurface contamination and that the integrity of the concrete cap is maintained.

Contacts

Poland

Rafal Kucharski
Institute for Ecology of Industrial Areas (IETU)
6 Kossutha Street
40-833 Katowice, Poland
Tel: (48-32) 254-6031, ext. 296
Fax: (48-32) 254-1717
sas@ietu.katowice.pl

Eleonora Weislo
Institute for Ecology of Industrial Areas (IETU)
6 Kossutha Street
40-833 Katowice, Poland
Tel: (48-32) 254-0029
Fax: (48-32) 254-1717
wci@ietu.katowice.pl

United States

Eric Newman
U.S. EPA
1650 Arch Street (3HS23)
Philadelphia, PA 19103 USA
Tel: (215) 814-3237
Fax: (215) 814-3002
newman.eric@epa.gov

Dawn Ioven
U.S. EPA
1650 Arch Street (3HS41)
Philadelphia, PA 19103 USA
Tel: (215) 814-3320
Fax: (215) 814-3015
ioven.dawn@epa.gov

Key Results

- Risk assessment and environmental data were collected for future use in the redevelopment of the Warynski site.
- The future land use for the Warynski property has been determined to be most suitable for an industrial park.
- Brownfields redevelopment techniques were developed which can now be replicated at other sites in the Voivodship and elsewhere in Poland.



Project Overview

The large number of abandoned and underutilized industrial sites throughout Poland require the development of policies, strategies and programs which will encourage the redevelopment of those sites. In order to develop workable policies and programs, officials need to have a common understanding of the current situation in order to move forward. The Brownfields Policy Development Project brings stakeholders together in the Katowice region to address the brownfields issues using their knowledge and experience to show that brownfields do not need to be perceived as a problem but, rather a hidden resource with a great potential to enhance economic renewal.

Brownfields Policy Project

EPA and the Slaskie (Katowice) *Voivodship* have been involved in a variety of land recycling and redevelopment (brownfields) activities. Initially, EPA provided support for several seminars to be conducted by the United States Environmental Training Institute (USETI) providing an introduction to the basic concepts involved in brownfields redevelopment. EPA also worked cooperatively with the Institute for Ecology of Industrial Areas (IETU), the city of Piekary Slaskie, and officials from Orzel Bialy smelter to redevelop a pilot brownfield site as described previously.

While the conduct of the pilot project had significant merits in demonstrating the usefulness of following a step-by-step program for the development of a particular brownfield site, it did not address the broader issues of policy development and program development and implementation on a *Voivodship*-wide basis. Based on discussions between EPA and the Institute for Ecology of Industrial Areas in Katowice (IETU), it was determined that a Steering Committee should be established in order to determine the future of brownfields redevelopment on a regional basis. Working with the Slaskie *Voivodship* Marshals Office and the Pennsylvania Department of Environmental Protection, an initial group of regional and local officials, city and urban planners, as well as academicians with an interest and/or knowledge of brownfields issues was assembled.

Key Objectives

- Determine what benefits and barriers exist to the development of brownfields in the Katowice region
- Determine what measures need to be taken at the national, regional and local level to overcome the identified barriers

- Determine the relevant stakeholders at the national, regional and local level
- Use the information and data gathered from the process to develop a brownfields policy for the region
- Use the policy to develop and implement brownfields programs and initiatives.

Project Activities

• Initial Meeting of Steering Committee

The inaugural meeting of the "High Level Steering Committee for the Establishment of a Brownfields Program in the Slaskie *Voivodship*" was held in May 1999. At that meeting, the Steering Committee determined the major impediments to brownfields redevelopment and prioritized them in basic categories. Each category was then assigned to a sub-committee for exploration. The chairs of the subcommittees agreed to report their findings at the second meeting.

• Four Committees Created

The steering committee established six areas of concern and grouped them into four research committees. The charge to the committees was to detail the specific barriers to brownfields redevelopment within the topic assigned to the committee, identify possible solutions, and make recommendations for further actions.

• Second Meeting of Steering Committee

The second meeting of the Steering Committee was held in December 1999. Each committee gave a short oral presentation of their written reports. The reports detailed and expanded on the barriers to brownfields redevelopment; how to overcome those barriers; how to create incentives for brownfields development; and, how to set appropriate clean-up standards that would facilitate redevelopment while protecting human health and the environment.

Among the key themes identified for further discussion were the regional role vis-a-vis

brownfields policy and program development; the role of local authorities; resource allocation for the implementation of policies and programs; the necessity to develop an inventory of possible brownfields sites; and site prioritization.

- **Coordination with the Slaskie Parliament**

The Steering Committee determined that it was necessary to coordinate with the local Parliament regarding the development of brownfields policy. An effort to formalize the Steering Committee within the structure of the *Voivodship* and the local Parliament was undertaken.



Contacts

Poland

Iza Ratman-Klosinska
Institute for Ecology of Industrial Areas (IETU)
6 Koszutha Street
40-833 Katowice, Poland
Tel: (48-32) 254-6031, ext. 269
Fax: (48-32) 254-1717
rat@ietu.katowice.pl

United States

Francesca Di Cosmo
U.S. EPA
1650 Arch Street (3DA00)
Philadelphia, PA 19103 USA
Tel: (215) 814-5549
Fax: (215) 814-2901
dicosmo.francesca@epa.gov



Key Results

- The Brownfields Steering Committee within the *Voivodship* structure has been formally established.
- Preliminary research has been completed on the barriers and benefits of brownfields redevelopment.
- The brownfields strategy identification process has begun to be developed.
- Further development of roles and responsibilities both inside and outside of the Steering Committee has been accomplished.
- A distribution system of reports and information to key decision-makers has been developed.
- The roles of funding organizations including the National Fund, *Voivodship* Fund, EcoFund, and State Treasury Fund have been expanded.



Project Overview

The Local Environmental Action Plan (LEAP) Pilot Project in Poland began in 1994 to demonstrate concrete examples and new approaches to local environmental management and sustainable economic development. The demonstration communities of Radom and Elk revealed how local governments and citizen-based committees can work together to implement low-cost solutions to solve pressing local environmental issues by setting environmental priorities, educating and involving the public, and developing local environmental action plans. In addition to EPA funding, this project also received financial support from the Charles Stewart Mott Foundation and the German Marshall Fund.

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Local Environmental Action Program (LEAP): Pilot Phase

Beginning in the early 1990s, Poland adopted new laws that increased local governments' responsibilities to manage environmental problems and stimulate local economic development. Over the last ten years, Polish communities have made significant environmental improvements. However, the environmental and economic issues facing Polish communities have been so vast, that there has been a growing need for a system that helps target limited financial resources toward the most urgent environmental problems.

Working with the U.S.-based Institute for Sustainable Communities (ISC) and its Polish partner, the Institute for Sustainable Development (ISD), two pilot communities in Poland created Local Environmental Action Plans (LEAPs) to prioritize their problems, identify cost-effective strategies for environmental protection, and involve the public in important community decisions.

Radom and Elk, the two pilot communities, offer a model for setting environmental priorities, developing a plan of action for solving these problems, getting the community involved in the process, and successfully implementing solutions.

Key Objectives

- Identify and rank local environmental problems according to relative risks to human health, ecological systems, and quality of life
- Develop a Local Environmental Action Plan (LEAP) that identifies specific strategies for reducing the most severe environmental risks and implement the most cost-effective strategies

- Promote public awareness and understanding of environmental issues to increase public support for environmental investments
- Strengthen the capacity of local and regional government to manage and implement environmental programs
- Disseminate and replicate the skills and experience gained in the demonstration communities to a broader number of Polish municipalities.

Project Activities

• Establishing Environmental Priorities

In September 1995, the Radom Project Committee identified depletion of the deep groundwater aquifer and air pollution from transportation sources as the two top priority problems facing the community. The Elk Project Committee identified pollution of Lake Elk and air pollution from low-level emission sources as the top two priorities in October 1995.

• Creating Local Environmental Action Plans and Implementation Plans

Local project committees prepared LEAPs that identified a range of strategies for solving the top priority problems in each community. The Radom and Elk City Councils approved these plans in March 1997.

• Soliciting Public Involvement

Project committee members set environmental priorities and developed appropriate solutions to these problems and initiated numerous public outreach activities to involve the greater community. The Radom project committee hosted a tree planting activity for Earth Day 1996 which involved 2,000 residents, while in Elk, the project committee sponsored a series of "family bicycle days" to tour the recently developed bicycle route.

• Implementing Water Conservation Programs

The Radom Regional Environmental Education Center implemented a comprehensive water conservation education program through the city. After the pilot program has been completed, the municipality plans to expand the program to the rest of the city based upon a careful evaluation of the pilot stage.

• Constructing a Purification System

The municipality of Elk recently completed construction of a purification system for storm waters entering Lake Elk. The system will remove crude oil derivatives from 60% of the storm waters flowing in Elk.

• Disseminating Results

ISC and ISD representatives participated in numerous forums promoting the project, including a presentation at the Environmental Action Program (EAP) Task Force in Warsaw in February 1996. ISD published five issues of the newsletter, *Rad-Elku Bulletin*, providing project updates to 200 interested communities and observers. Copies of the project's final report were distributed to 250 municipalities.

Contacts

Poland

Andrzej Kassenberg
Institute for Sustainable Development
ul. Lowicka 31
02502 Warsaw, Poland
Tel: (48-22) 646-0510
Fax: (48-22) 646-0174
ine@ikp.atm.com.pl

Jerzy Borycki
Radom Technical University
Chrobrego 27
26-600 Radom, Poland
Tel: (48-48) 341-509
borycki@kivx.man.radom.pl

Slawomir Chilicki
Municipality of Elk
ul. Marszałka J. Piłsudskiego 4
19-300 Elk, Poland
Tel: (48-87) 10-37-14
slawomir-chilicki@elknet.pl

United States

Paul Markowitz
Institute for Sustainable Communities
56 College Street
Montpelier, VT 05602 USA
Tel: (802) 229-2900
Fax: (802) 229-2919
pm@iscvt.org

Key Results

- The municipality of Radom, with assistance from an ISC/EPA grant, completed installation of water saving equipment in a total of 1800 residences.
- The community surrounding Lake Elk is moving closer to making Elk a sustainable city.
- Projects have begun to be replicated in other communities with similar issues.
- The LEAP methodology and U.S. experiences on local environmental management was transferred successfully to Poland.
- Polish experts gained an enhanced knowledge of comparative risk analysis methodology, as well as techniques for enhancing public participation.



Project Overview

The replication phase of the Local Environmental Action Program (LEAP) in Poland was designed to promote the broadest possible dissemination of LEAPs to municipalities throughout the country. The main goals of the LEAP replication phase were to reduce implementation costs (by eliminating much of the direct involvement of U.S. experts), and to revise the LEAP methodology to reflect Polish conditions. This was accomplished by working in several Polish municipalities facing different environmental challenges, which were selected through a national competition.

Local Environmental Action Program (LEAP): Replication Phase

Based on the success of the pilot phase of the Local Environmental Action Program (LEAP) in Radom and Elk, EPA became convinced that the LEAP framework could make a useful contribution to sustainable development planning in Poland. However, it was clear that widespread dissemination could not happen without first adapting the U.S.-developed methodology to reflect conditions in Poland. In addition, it was necessary to reduce the significant implementation costs which generally would be beyond the reach of most Polish municipalities.

In an effort to accomplish these dual objectives, EPA entered into a cooperative agreement with the Polish National Fund for Environmental Protection and Water Management (the National Fund), which agreed to serve as the Polish national coordinator for the LEAP replication effort. Using funding from EPA, the National Fund sponsored an open tender for a Polish team to manage the LEAP replication phase. The tender was won by a consortium consisting of the National Foundation for Environmental Protection and COWI-Polska. The management team held an open competition to select several Polish communities to participate in the LEAP replication program.

Key Objectives

- Encourage replication of the LEAP methodology throughout Poland
- Facilitate adaptation of LEAP methodology to reflect Polish conditions
- Decrease implementation costs and increase dissemination of LEAP approach.

Project Activities

As a result of a national competition, the communities of Starogard Gdanski and Chelm were selected to undergo a complete LEAP process assisted by the Polish management team. In addition, the communities of Tczew and the *powiat* (municipal association) of Aleksandrow Kujawski were selected to undergo an abbreviated LEAP process. This decision was intended to meet the particular needs of these communities, while providing a unique opportunity to make the LEAP methodology as flexible as possible for communities unable to devote the time and resources to the full 18-month process.

• Detailed Environmental Action Plans Based on Community Input and Priorities

With active support from the Polish project management team, each participating community produced a detailed action plan to address local environmental priorities based on a participatory and transparent process.

• Increased Attention to Benefit-Cost Analysis

The Polish LEAP replication process focused to a greater extent on assisting community experts to determine appropriate environmental actions based on an assessment of relative benefits and costs. This aspect of environmental decision-making had not been addressed as directly in previous iterations of LEAP. In fact, a simple, user-friendly model was developed within the framework of the project to assist community decision-makers in conducting simple benefit-cost analyses.

• Training Course for Regional Officials

Another product developed within the LEAP replication project was an intensive, three-day course for regional officials designed to familiarize them with the components of the LEAP process. The initial training was provided for approximately fifty officials from the Lublin and Kielce regions of Poland in November 1999. Based on the success of this training, the

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materials currently are being translated into English so that they can be made available to LEAP practitioners in other countries, particularly in Central and Eastern Europe.

• **Innovative Information Campaign to Disseminate LEAP**

After the conclusion of the LEAP process in the selected communities, and with the assistance of the National Fund, the Polish project management team printed a LEAP brochure, a detailed LEAP Guide, and recorded compact disks (CDs) describing the LEAP process. The team also made several speeches on public radio and published articles in newspapers and magazines. The brochure and CD is being mailed to communities, powiats and regional authorities. Additional information on LEAP activities in Poland also is available on their website: www.las.info.pl

Contacts

Poland:

Ryszard Jacek Rogowski
National Fund for Environmental Protection
and Water Management
Konstruktorska 3A
02-673 Warsaw, Poland
Tel: (48-22) 849-0079
Fax: (48-22) 849-2098
rjr@nfosigw.gov.pl

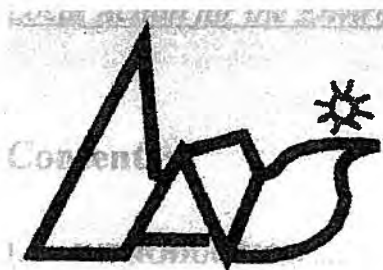
Tomasz Podgajniak
Beata Wiszniewska
National Foundation for Environmental
Protection
Krzywickiego 9
02-078 Warsaw, Poland
Tel: (48-22) 825-1428
Fax: (48-22) 825-2127
nfos@warman.com.pl

United States:

Anna Phillips
U.S. EPA
1300 Pennsylvania Avenue N.W. (2650R)
Washington, DC 20460 USA
Tel: (202) 564-6419
Fax: (202) 565-2412
phillips.anna@epa.gov

Key Results:

- The LEAP methodology was successfully adapted to Polish conditions with little outside involvement.
- A variety of Polish communities had an opportunity to utilize the LEAP process to make decisions on environmental issues with broad public participation.
- An active media campaign and training for local officials has created an increased demand for LEAPs in all parts of Poland.



National
Foundation for
Environmental
Protection

Project Overview

A negotiated compliance program schedules the completion of various environmental improvements that will achieve full environmental compliance with the law at an individual facility. The goal of the EPA compliance project was to increase the role of local government in the implementation of national and regional environmental policy in Poland. Under the proposed use of compliance periods, local government can actively participate in the process of formulating the content of environmental commitments of facilities that affect the environment in their area. This allows the opinion of the local community to be taken into account and will increase public participation in the decision-making process.

Enforcement and Compliance Project

The goal of this project was to provide a legal basis for the negotiation of compliance agreements between Polish inspectors and industrial facilities, in order to improve environmental performance and compliance with regulations. Previously, Polish inspectors would assess fines for non-compliance, and industry would either not pay, or pay without making the necessary changes to processes which created the pollution. With a negotiated compliance agreement in place, government inspectors agree to a phased-in approach to pollution reduction in exchange for the commitment of the regulated industry to make the necessary technical and financial investments. This results in significant environmental improvement over the medium and long-term. EPA's primary partner for this project was the Polish State Inspectorate for Environmental Protection (GIOS).

Key Objectives

- Evaluate different compliance models for application in Poland
- Develop proposals for changes to the current enforcement framework
- Introduce the practice of specifying compliance periods as a part of the issuing of environmental permits
- Develop a training course to enhance the negotiation skills of all stakeholders as a means for developing and implementing compliance schedules in the future

Project Activities

• Proposing New Solutions to the Current Enforcement Framework

Teams were formed both in Poland and in the United States to study and evaluate different compliance models. During the first phase of the project, the U.S. and Polish teams conducted a series of information exchanges and study tours which resulted in the submission of a program of solutions and changes to the current enforcement framework in Poland. Once the Polish team developed a working proposal, there was a considerable effort to meet with various stakeholders in the Polish environmental community to understand their concerns and needs as it related to the proposal. It was recognized that for this new mechanism to become a part of the Polish environmental compliance program, legislative changes were necessary and would need to be incorporated into the government's European Union harmonization efforts. The centerpiece for this harmonization effort is the new draft environmental framework law for Poland in which the compliance programs concept has been incorporated.

• Addressing Negotiation Issues

Concerns were raised by stakeholders relating to the components of a negotiated compliance agreement. In response, the Polish team contracted with the law department of a Polish university to research these issues. In addition, EPA wrote and presented papers on U.S. practices to provide possible models.

• Testing of Compliance Program Concept

The goal of the second phase of the project was to introduce the practice of specifying compliance periods as a part of the issuing of environmental permits. Four facilities were identified by the Polish State Inspectorate as demonstration sites:

- Huta Cynku "Miasteczko Slaskie" (Katowice)
- Huta "Czestochowa" (Czestochowa)
- Petrochemia Plock SA (Plock)

- Zakłady Szotowe "Kedzierzyn" SA (Opole)

Each of the firms are included on the "List of 80" worst polluters in Poland. By participating in the test negotiations, the facilities, if successful, were given conditional removal from the "List of 80".

• Conducting Negotiations Training

EPA was asked by its Polish partners to develop a negotiation course tailored to the compliance process. A three-day compliance negotiations training course was conducted in June 1997 for all participants in the four pilot negotiation projects and other inspectorate officials. The course focused on the basic principles of negotiations, helped the participants build skills in two-party and multi-party negotiations, and presented a framework which the stakeholders could actually use during the demonstration project negotiations. For the purposes of the demonstration project, the course was delivered as a workshop. In September 1999, the course was again presented to other individuals who may be involved in further pilot negotiations. A cadre of in-country facilitators was trained so that the course could be delivered on a continuous basis.

Contacts

Poland

Andrzej Miloszewski
Inspectorate for Environmental Protection (GIOS)
Ministry of Environment
52/54 Wawelska Street
00-922 Warsaw, Poland
Tel: (48-22) 825-1524

Zbigniew Kamiński
Dept. of Environmental Protection
Ministry of the Environment
52/54 Wawelska Street
00-922 Warsaw, Poland
Tel: (48-22) 825-8473
zbigniam@mos.gov.pl

United States

Thomas Maslany
U.S. EPA
1650 Arch Street (3WP00)
Philadelphia, PA 19103 USA
Tel: (215) 814- 2050
Fax: (215) 814- 2301
maslany.thomas@epa.gov

Key Results

- The negotiation process encouraged facilities, regulators, and local communities to view the development of a compliance program as a collective task that focused on solving environmental problems in a way that best meets each of their respective needs.
- The training and participation in the negotiation process has improved the skills of facility management in other business areas.
- Polish experts agreed that the law needs to be amended to formally recognize this process and provide greater flexibility for the negotiators.
- The team agreed that additional economic incentives and accountability mechanisms to promote responsible enterprise behavior should be considered.
- The team also agreed that the program can be expanded to include facilities which are included on the "list of 80" but are experiencing compliance problems.



Project Overview

With EPA support and working with local non-governmental organizations (NGOs), universities, and government agencies, the Institute for Sustainable Communities (ISC) helped establish the Environmental Management Training Center (EMTC) in Poland. The EMTC's goal is to improve environmental management capacity through training, information dissemination, and networking activities. The EMTC project was an integral part of the EPA's environmental and institutional strengthening assistance activities in Poland.

Environmental Management Training Center (EMTC) Project

The idea for EMTCs evolved after discussions with governmental officials and knowledgeable NGOs in various countries in Central and Eastern Europe (CEE). These discussions revealed that the successful integration of environmental protection activities into processes of economic restructuring and revitalization required the establishment of effective environmental management training organizations and adequately trained staff to manage and operate them.

Key Objectives

- Increase the governmental, institutional, and public capacity for effective environmental decision making and management in Poland
- Improve the skills and knowledge of a wide range of Polish professionals working with national, regional, and local governments, industry, NGOs, universities and others in the environmental field
- Improve communication and information dissemination as well as establish collaborative relationships among various governmental agencies, local organizations and professionals working in the field of environment
- Create a corps of Polish trainers able to design and deliver appropriate courses in the field of environmental policy and management
- Create a sustainable institution able to coordinate the delivery of trainings

Project Activities

• Training Courses

A two-step "train-the-trainer" approach was used at the Polish EMTC. EPA staff trained local facilitators who, in turn, adapted and delivered courses. Course materials included a number of environmental management topics. EPA facilitators conducted the first delivery of a course to local trainers. The local trainers then worked with the EPA facilitators in order to prepare to deliver the courses on their own. Ultimately, local trainers took over course delivery entirely. With each course delivery, the materials were adapted to use greater amounts of local data and case studies.

The courses included:

- Environmental Compliance and Enforcement
- Environmental Impact Assessment
- Risk Assessment
- Hazardous Waste Site Ranking
- Environmental Economics
- Environmental Policy
- Environmental Auditing
- Chemical Preparedness and Prevention
- Public Outreach
- Financing Environmental Investments
- Contract Management
- Community Environmental Action Planning
- Solid Waste Management Planning
- Environmental Impact Assessment II (Polish-designed course)
- Training of Trainers (facilitation skills)
- Fundraising for NGOs

1992

1998

• EMTC Network

In addition to the Polish EMTC, ISC has also helped to establish EMTCs in Hungary, Bulgaria, Russia and Ukraine with EPA support. To further support the EMTCs in all countries and to build capacity for shared fundraising projects, an EMTC Network based at the Regional Environmental Center (REC) in Hungary was established. This network provided the EMTCs with a newsletter, electronic bulletin board, and conferences to facilitate communication and share successes and concerns. Affiliation with the REC also facilitated the EMTCs' access to European and other funding sources.

Contacts

Poland

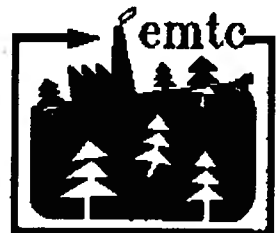
Zbigniew Naklicki
Environmental Management Training Center
ul. Zwirki i Wigury 93
02-089 Warsaw, Poland
Tel: (48-22) 658-38-19
Fax: (48-22) 658-38-90
emtc@free.ngo.pl

United States

Jill Arace
Institute for Sustainable Communities
56 College Street
Montpelier, VT 05602 USA
Tel: (802) 229-2900
Fax: (802) 229-2919
jarace@iscvt.org

Key Results

- An independent center was established to deliver on-going trainings that is self-sustaining through contracts, fees, and diversification of donors.
- EPA modules were adapted and delivered on a variety of environmental management topics.
- Building the capacity of Polish facilitators allowed these trainers to continue to deliver trainings without outside assistance.
- A total of 131 trainings on 16 topics were delivered to 2,817 participants from government agencies, universities, industries, private enterprises and NGOs through mid-1998.



Project Overview

In April 1994, with support from EPA, the Institute for Sustainable Communities (ISC) began a pilot project to assist in the development of community-based environmental education curriculum for middle schools and teacher training colleges in Poland. The project was named "Krag", symbolizing a group of people with linked arms singing around a traditional Polish campfire. ISC worked in partnership with the Regional Center for Environmental Education (RCEE) in Plock to assist Polish communities and schools in developing community-based environmental education materials for grades 4-8.

1994

1997

Krag Environmental Education Project

The Institute for Sustainable Communities (ISC) uses a community-based approach to education which bridges school-based learning and real life community issues. It is designed to prepare young people and their teachers to understand the complex relationships among the environment, society and economy, and to develop their skills to make scientifically grounded and socially responsible decisions about their future.

The Krag Environmental Education Project introduced interactive, community-based education methods to teachers and teacher trainers in Poland through a pilot project in the *Voivodship* of Plock. The middle school environmental education curricula developed and the courses adopted by the teacher training college in Plock were replicated in 150 communities throughout Poland. The Krag project continues to support replication activities and has helped secure government funding for community-based environmental education throughout Poland.

Key Objectives

- Demonstrate specific environmental education activities to Polish teachers including practical, hands-on approaches to learning and teaching
- Assist the Plock RCEE in working with schools to develop and implement community-based environmental education curricula for grades 4 - 8
- Assist in the development of an on-going, self-sustaining network of teachers and non-governmental organizations to support the advancement of environmental education
- Share program results widely to stimulate the establishment of new community-based environmental education projects in Poland

by replicating the project and by preparing Polish teachers to be workshop trainers

- Provide organizational and technical support to schools as they develop and implement an environmental education program
- Strengthen the institutional capacity of the Plock RCEE to provide targeted environmental education trainings to additional *Voivodships* in Poland and to disseminate the lessons learned in Plock to a national audience.

Project Activities

• Teacher Training for Environmental Education

During the first 18 months of Project Krag, teachers, professors, governmental officials, and representatives of NGOs and industry participated in a series of four training workshops in community-based curriculum development; hands-on teaching methodologies; team building; and field-based environmental education. Three new training manuals consisting of high quality environmental education materials were translated and distributed at the workshops. The 50 participants, primarily educators, became enthusiastic leaders in promoting community-based environmental education curricula and activities in their local communities.

• Development of Curriculum Models

The curriculum developed for grades 4-8 provides a framework covering a wide array of environmental issues. Communities can then add their own data to meet local needs.

• Building a Network of Environmental Educators

While most participants were from the demonstration region, the Plock *Voivodship*, representatives from Gdansk, Olsztyn, Zamosc, Radom, and Elk also attended the workshops. This helped form a network of environmental educators in Poland.

• Disseminating Information to Environmental Educators

Phase I culminated in a Project *Krag* environmental education conference in December 1995, which included the dissemination of the high quality project curriculum and newsletter to a national audience of 100 participants.

• Replicating Community-Based Environmental Education

With the success of Phase I of the project, the Polish National Fund for Environmental Protection and the EPA funded Phase II in 1996-1997 so that the project could be adapted in three new Polish regions: Suwalki, Sieradz, and Skierniewice.



Contacts

Poland

Katarzyna Rogucka- Maciejowska
Plock Regional Center for Environmental Education
Stary Rynek 20
09-400 Plock, Poland
Tel: (48-24) 268-3774
Fax: (48-24) 268-377424
plorcee@plohp.plock.ids.edu.pl

Witold Lenart
Center for Environmental Studies
University of Warsaw
ul. Zwirki i Wigury 93
02- 089 Warsaw, Poland
Tel: (48-22) 820-0381, ext. 688
Fax: (48-22) 826-1965
amagnusz@plearn.edu.pl

United States

Andrea Deri
Institute for Sustainable Communities (ISC)
56 College Street
Montpelier, VT 05602 USA
Tel: (802) 229-2900
Fax: (802) 229-2919
aderi@iscvt.org

Key Results

- The RCEE developed a popular and replicable teacher training program in Poland that has targeted approximately 750 educators to date.
- The project partners developed a high quality curriculum and education guide with lesson plans in the communities of Plock, Kutno, and Zychlin written by Polish educators.
- The Project *Krag* newsletter provided Polish educators with a much-needed forum for exchanging information and experiences related to their environmental education work.
- With funds from the GE Fund, ISC helped the project publish the Guide to Community Based Environmental Education
- The project led to the creation of a national network of environmental educators in Poland.
- A national advisory committee was formed to enhance credibility and fundraising possibilities.
- The Plock RCEE has become an established, independent association.



Epilogue

The news headlines of 1989 which focused the attention of the world on the Central and Eastern European struggle to improve environmental quality now seems a distant memory. If new headlines were written today to capture the accomplishments that EPA and its Polish partners have achieved together over the past decade, they might look something like this:

WATER QUALITY IMPROVED FOR KRAKOW RESIDENTS
City Receives State-of-the-Art Disinfection and Analytical Equipment

**AGRICULTURE RUNOFF IN POLAND REDUCED VIA INNOVATIVE
WASTE MANAGEMENT PRACTICES**

World Bank, European Union Finance Replication of Approach Throughout Poland

**LANDMARK COMPLIANCE AGREEMENTS
CONCLUDED WITH POLISH INDUSTRY**

Pilot Facilities Gain Provisional Removal from Worst Polluters List

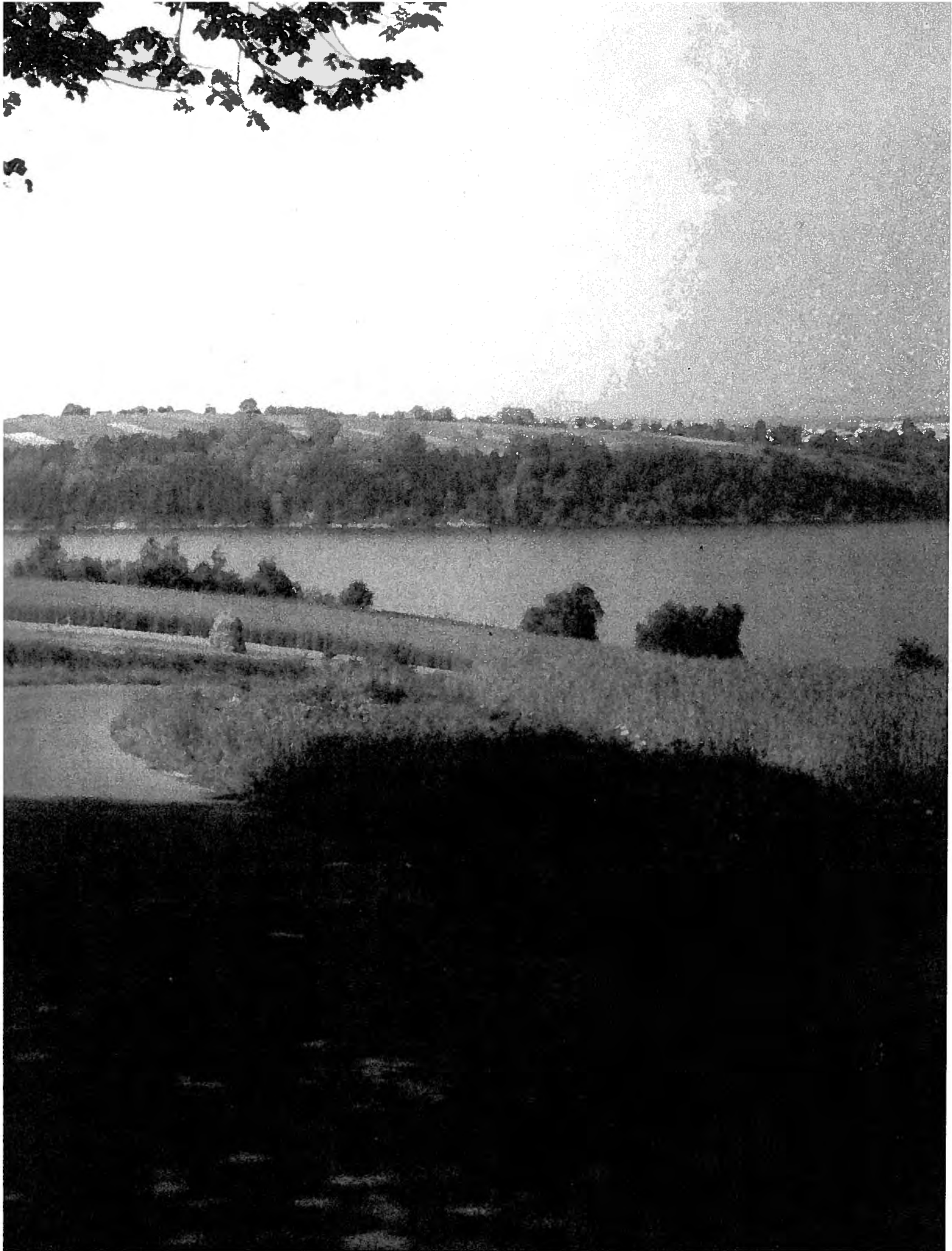
Of course, effective environmental protection is an ongoing process. So, in spite of the successes described in the previous pages, there still is much to do in Poland and in the United States to ensure that environmental quality is enhanced and maintained well into the future.

Although financial support from the U.S. Agency for International Development (USAID) will not be available in future years, EPA is confident that the strong relationships that have been forged with our Polish partners over the past decade will continue, albeit in a different form. As Poland continues to improve its environment--and as it looks ahead to membership in the European Union and other Western structures--EPA is ready to provide whatever support we can in order to share a bright, sustainable future with our Polish colleagues and friends.

For further information on EPA programs in Poland, please visit the EPA website at www.epa.gov/oia, or contact:

Anna Phillips
U.S. EPA
1300 Pennsylvania Avenue NW (2650R)
Washington, D.C. 20460 USA
Tel: (202) 564-6419
Fax: (202) 565-2412
phillips.anna@epa.gov

Francesca DiCosmo
U.S.EPA
1650 Arch Street (3DA00)
Philadelphia, PA 19103 USA
Tel: (215) 814-5549
Fax: (215) 814-2901
dicosmo.francesca@epa.gov





United States Environmental
Protection Agency
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Washington, DC 20460

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