

**U.S. ENVIRONMENTAL PROTECTION
AGENCY**

OFFICE OF INTERNATIONAL AFFAIRS

ENVIRONMENTAL JUSTICE ACTION PLAN

Fiscal Year 2009

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OFFICE OF INTERNATIONAL AFFAIRS ENVIRONMENTAL JUSTICE PROGRAM NARRATIVE

Background:

Since its establishment in the 1970s, the U.S. Environmental Protection Agency (EPA) has improved the quality of life for all Americans by safeguarding their air, water, and land and helping to protect their health. The domestic successes of EPA's public health and environmental protection have been very impressive.

Addressing issues at home is only part of the environmental equation. As globalization continues to affect the world and as we better understand the interdependencies of ecosystems and the transport of pollutants, it becomes clearer that we live in a global environment. For example, the water quality of a lake here in the United States is affected not only by pesticides from neighboring farms, lawns, and gardens, but also by pollutants emitted thousands of miles away. Similarly, the depletion of a natural resource in one nation can have environmental and economic ramifications in many other countries.

The mission of the Office of International Affairs is to protect U.S. human health and the environment, and to advance U.S. environmental interests through international engagement. Within this mission, OIA promotes environmental justice by informing our international partners of EPA's commitment to be fair and inclusive in all of our work, and by promoting environmental justice concepts that identify and address disproportionately high and adverse human health or environmental risks and hazards that plague vulnerable populations.

OIA partners with EPA program and regional offices, other U.S. government agencies, international organizations and governments, and domestic and international civil society organizations to implement our work. Since these partners are also environmental and/or social justice advocates, environmental justice principles are entrenched in the development and implementation of EPA's international programs. OIA encourages all stakeholders to participate and exchange positions and points of view. Knowing and understanding the views of others garners social responsibility and leads to good-will approaches to complex environment and public health issues.

At the 2002, World Summit on Sustainable Development (WSSD), delegates from all over the world assumed responsibility to advance and strengthen the interdependent and mutually reinforcing pillars of sustainable development – economic development, social development and environmental protection – at the local, national, regional and global levels, and committed to build a humane, equitable and caring global society, cognizant of the need for human dignity for all. As a result, "Partnerships" were formed under the

United Nation's Environment Program (UNEP), and much of EPA's international work is implemented under the auspices of these "Partnerships".

The present and former EPA Administrators' commitment to integrate environmental justice concepts in our work has had an influence in the international arena. In addition, global societies are now recognizing the value of protecting one another as we all move to achieve a sustainable world.

Management Accountability

OIA's Management is committed to the principles of environmental justice both at home and abroad. Management is dedicated to maintaining a diverse workforce at all levels. EPA staff is aware that it is a privilege to represent the United States Government in the international arena and is encouraged to ensure that programs developed to protect health and the environment are designed to be implemented with the utmost respect and with broad sensitivity and understanding of various laws, cultures, traditions, protocols and religions. OIA staff encourages other countries to use concepts that identify and address disproportionately high and adverse human health and environmental effects of activities that impact the most vulnerable populations. Our programs are designed and implemented to achieve measurable environmental results.

About the Office of International Affairs:

The Office of International Affairs is divided into three offices, with several programs operating in each office:

The Office of Regional and Bilateral Affairs (ORBA) provide policy and programmatic expertise for matters of environmental and geopolitical importance to the U.S. in other countries. ORBA maintains current environmental, cultural, political and economic information for use in developing Agency projects and programs with priority countries and regions. The Office identifies and deploys skills in designing and implementing international programs, including programs related to international capacity building and environmental governance.

The Office of Global Affairs and Policy (OGAP), provides policy and programmatic expertise for environmental and human health issues that are multinational in scope. OGAP engages on the domestic environmental aspects of international instruments, such as trade, finance, and investment agreements. This Office provides institutional knowledge concerning relevant international organizations and serves as EPA's primary point of contact with these entities. This Office identifies broad emerging international environmental issues and, in concert with internal and external partners, develops initiatives to address those issues identified. OIA's Environmental Justice Program is housed in OGAP.

The Office of Management and International Services (OMIS) is responsible for providing the full range of necessary management and administrative programs and coordinates cross-cutting administrative support services, providing expert management advice, services and support to the Assistant Administrator and all organizations within the Office of International Affairs.

OIA's Deputy Assistant Administrator is a member of the EPA Environmental Justice Steering Committee and meets with other DAAs and DRAs to establish environmental justice policy, activities, and progress. Information from these meetings is conveyed to OIA management and action is taken to ensure that OIA is in compliance with agreed upon strategies.

Internal Organization Engagement:

OIA serves as a focal point and catalyst for the Agency's international affairs. Providing leadership and coordination on behalf of the EPA Administrator, OIA mobilizes the vast policy, scientific and technical expertise available at EPA to help address environmental objectives in other countries. EPA's program and regional offices, also environmental justice advocates, play a critical role in pursuing international environmental objectives and in developing and implementing strategies to achieve strategic environmental goals.

OIA administers EPA's International Visitors Program, and hosts international delegates who engage in the discussion of various environmental justice related issues. Delegates from foreign countries engage in interactive dialogue with EPA experts and specialists working on issues common to those in other countries. These meetings provide opportunities for listening and solution-oriented tool sharing.

External Stakeholder Engagement:

For decades, significant attention has been devoted to address the need for global environmental engagement and collaboration among Nations. From voluntary measures to control climate change, to the establishment of highly touted "Partnership" efforts, there has been increasing recognition that global engagement in the pursuit of positive environmental outcomes is critical to achieve meaningful progress. These outcomes are driven by the relationships and collaborations amongst a variety of stakeholders, which include governments, non-government organizations, industry groups, financial institutions, academicians, civil societies, and others.

OIA engages and collaborates with international organizations and finance institutions around the world to inform, coordinate, and negotiate relevant U.S. environment policy, cultivate opportunities for programmatic cooperation in areas of shared interests, and to foster and maintain positive global relationships. In order to maintain existing partnerships and build new ones, we focus our efforts in strategic areas that bring about short and long-term life changing results around the world. We engage with the United Nations and other global institutions such as the World Bank to encourage regional development of finance institutions to promote cooperative ventures that can leverage resources in support of EPA's environmental collaborative work. We also engage and coordinate with international foray, such as the Group of Eight (G8), the Organization of

Environment and Cooperative Development (OECD), and the Arctic Council. We collaborate with our U.S. Government partners engaged with key international organizations, such as the State Department, U.S.AID, and the Treasury Department to invoke environmental justice considerations in international work as we foster productive relationships that benefit U.S. interests.

OIA works with EPA program offices to advance existing UN Partnerships on Mercury, Cleaner Fuels and Vehicles, and Chemicals. We monitor and provide targeted coordination and policy assistance in other strategic areas led by EPA program offices, including: combustion, products, chloralkali, artisanal mining, research, cement, vcm, non-ferrous metals, and waste. These partnerships address hazards that directly impact vulnerable populations, especially women and children, and offer education and prevention tools to improve quality of life.

Examples of our multi-lateral collaborations, successes and challenges include:

Partnership for Cleaner Fuels and Vehicles - Launched at the World Summit on Sustainable Development in Johannesburg in 2002, EPA is working to eliminate lead in gasoline and reduce sulfur in fuels, while introducing cleaner vehicle technologies. World-wide, there are 17 countries left that still use leaded gasoline, affecting over 300 million people. The Partnership is working towards global elimination of lead by 2011. The agreed global target for sulfur in fuels is 50 ppm. To date 14 developing/ transition countries are already at 50 ppm or less. The Partnership continues moving forward on the lead, sulfur and vehicle issues.

Global Partnership for Mercury - Provides a focused, global means for reducing mercury use and emissions, thus improving human health and environmental conditions in the near-term both locally and globally. EPA has led international action in a number of partnership areas, providing world class technical assistance and substantial in-kind and direct assistance to our partners.

World Conservation Union - Invasive species are a cause of biodiversity loss. They also cause direct economic losses and management costs to commercial and recreational interests. EPA is working with the World Conservation Union to better identify and develop techniques that reduce or eliminate the risks of new introductions of invasive species into U.S. waters.

Asia-Pacific Partnership - EPA is working with Australia, China, India, Japan, Korea and the private sector through the Asia Pacific Partnership to expand investment and trade in cleaner energy technologies, goods, and services in key market sectors. As part of this initiative, governments agreed to established eight public-private task forces: (1) cleaner use of fossil energy; (2) renewable energy and distributed generation; (3) power generation and transmission; (4) steel; (5) aluminum; (6) cement; (7) coal mining; and (8)

buildings and appliances. EPA leads the U.S. in four task forces: clean fossil energy; cement; aluminum; and buildings & appliances. The agency is also involved in the work of several other task forces and in other cross-cutting areas under development, such as transportation. The six partner countries represent about half of the world's economy, population and energy use, and they produce about 65% of the world's coal, 48% of the world's steel, 35% of the world's aluminum, and 61% of the world's cement.

The following are two examples of EPA's international partnership work with environmental justice considerations implemented in two Regions of the world:

Africa:

Under the Sub-Saharan Africa Program, EPA focuses on urban and industrial pollution issues as they impact people's health, particularly vulnerable populations such as children and the poor. With support from US AID and the US State Department, EPA is implementing projects to enable governments, universities, industry, non-governmental organizations and others to begin to address growing pollution issues and their consequent impacts on people's health.

EPA is a leader in building capacity in Sub-Saharan Africa (SSA) on urban air quality management, based on the pilot work conducted in South Africa, Ghana and Tanzania to establish air quality monitoring systems, and institutionalize air quality training courses developed by EPA and tailored for the SSA region. EPA provided support in phasing out leaded gasoline. Building on this success, EPA is working through the Clean Fuels and Vehicles Partnership to support Sub-Saharan African countries to lower sulfur in fuels. Currently in SSA sulfur levels range between 3,000 to 10,000 ppm which, particularly in diesel fuel, results in the emission of high levels of fine particulates which can be inhaled deep into the lungs causing cardiovascular and respiratory disease. SSA countries have now committed to reducing sulfur levels ultimately to 50 ppm, while at the same time promoting the use of vehicle emission technology. EPA is assisting in the effort by providing funding, technical and policy advice and public outreach information to achieve this ultimate goal.

Under the Partnership for Clean Indoor Air (PCIA), EPA is working to reduce the negative health impacts of indoor air pollution for the more than 75% of Africans who burn wood, charcoal, dung, crop residue and coal for their home cooking and (in some places) heating. The EPA is managing pilot projects in Mauritania, Nigeria, and Uganda that are jointly funded by the USAID and EPA.

West Africa Mercury work will be discussed in our Robust-Results Oriented Activity.

Russia/NIS

With its vast oil and gas reserves, Russia is becoming a major economic power. USEPA works with Russian Ministry of Natural Resources and Rostechandzor to address its major environmental challenges. Russia has inherited environmental legacy “hot spots” left by the Soviet Union. These pollution hot spots are also a major source of transboundary transport of contaminants from Russia to the United States. EPA is working to address key sources of contamination in Russia by partnering with U.S. agencies and international organizations. Two objectives of EPA’s work in Russia include 1) addressing key sources of contamination and legacy wastes, by 2) developing capacity for proper management, including safe storage, transportation and destruction of toxic and hazardous waste.

Mercury Global Partnerships in the Russian Federation - In response to the issues identified in the Russian mercury releases inventory, and the UNEP Governing Council challenge to establish Mercury Partnerships to address these issues, OIA established a Mercury Partnership with the Russian chlor-alkali industry. Since 2005, this Partnership has achieved an annual reduction of over 4 metric tons of mercury use and discharges that previously were released into the environment. Partnership is based on implementation of cleaner production principles, best available technologies and best environmental practices.

Volgograd “Caustic” successfully completed the assembly of their waste-water treatment system which is expected to return up to 900 kg of mercury per year back into the production cycle, rather than being released into the environment.

Under the Arctic Military Environmental Cooperation Program (AMEC), EPA is coordinating a project to recycle mercury-containing fluorescent lamps accumulated in the military bases of North Navy. The current stock exceeds 150,000 lamps). EPA, in partnership with the U.S.DoD and Russian Ministry of Defense, has established a model mercury lamp recycling facility at Navy Yard 10, above the Arctic Circle. Each fluorescent lamp, which is used by the Russian Navy in the Arctic, contains up to 1g of vaporized mercury. If broken, the mercury vapors are being released into the environment and contribute to the “Arctic Sunrise.”

Proper Storage of Contaminants - Since 2004, EPA has represented the U.S. in the Arctic Contaminants Action Program (ACAP), which includes the U.S., Canada, Denmark, Finland, Iceland, Norway, Sweden, and Russia. Under U.S. leadership, Arctic countries worked together to reduce environmental contamination in the Arctic. ACAP initiated work to inventory, analyze and provide temporary safe storage for over 4,000 metric tons of obsolete and prohibited pesticides in the Arctic and sub-Arctic regions of Russia. Prior

to this project, the contaminants were released directly into those northward-flowing Russian rivers and transported to the Arctic. Now ACAP is developing a model demonstration program (the first in Russia) to destroy 100 tons of obsolete pesticides.

Environmental Justice Empowerment - The Arctic Contaminants Action Program has also created a model environmental justice empowerment program in Russia called the Indigenous Peoples Community Action Initiative. This sustainable and replicable project has already resulted in the removal and safe storage of over a metric ton of PCBs and persistent organic pollutant pesticides from remote indigenous villages in Alaska and northern Russia. In the summer of 2008, through the ACAP Program, over 2000 drums were removed from two Arctic indigenous villages in Chukotka on the Bering Sea across from Alaska. These drums are “legacy wastes,” which have been in the Region for over 40 years.

Tribal Outreach

The federal governments of Canada, the U.S., and Mexico carry out bi-national co-leadership and partnership roles and responsibilities to help ensure protection of the many Tribes living along the 5,500 miles U.S. border with Canada and the 2,000 miles U.S. border with Mexico. Many international efforts are underway to ensure that human health, wildlife, and their habitats are protected. In a number of U.S. border regions, remediation of historic pollution areas contaminated land or toxic sediment in waterways has been completed or is near completion to restore impaired and adversely impacted environmental conditions.

The Office of International Affairs supports and assists a number of lead offices in the Agency which carries out close cooperation with a fair number of tribal governments in US border regions with Canada and Mexico. We believe that the North American trilateral Commission for Environmental Cooperation and the Arctic Council are important multilateral forums which help address priorities of the tribes and indigenous peoples in the North American and Arctic regions. OIA will continue to follow the EPA – National Tribal Council dialogue on climate change.

In collaboration with Regions 6 and 9, OIA works to accomplish the goals of the Border 2012 Program which is a collaborative program between the United States and Mexico to improve the environment and protect the health of the nearly 12 million people living along the border. The bi-national program focuses on cleaning the air, providing safe drinking water, reducing the risk of exposure to hazardous waste, and ensuring emergency preparedness along the U.S.-Mexico border.

Border 2012 is a results-oriented program that takes a “bottom-up” approach to addressing the environmental and public health needs of the border region. Issues and projects are identified and implemented at the local level. The program encourages stakeholder involvement through a variety of opportunities.

Examples of current and/or recently completed goals and tasks are:

WATER

Replacing an old water tank—The Campo Band of the Kumeyaay Nation received authorization to replace a failing water tank.

Treating septic waste—The La Jolla Band of Luiseño Indians developed and installed a lagoon to treat septic tank waste, funded by the Border 2012 Infrastructure program.

Renovating well systems— San Jose de la Zorra, a Kumeyaay indigenous community in Baja California, Mexico, has finished the restoration of 7 hand dug wells. (This project is completed but likely to be renewed in the future.)

AIR

In the Border Region on the U.S. side, Tribes conduct air monitoring activities under the Clean Air Act (CAA), General Assistance Program Grant (GAP) funding or partially fund their program with tribal funds. Current activities include, but are not limited to: monitoring for basic meteorological data and pollutants such as particulate matter (PM), ozone, air toxics, sulfur dioxide and nitrogen oxides.

The La Jolla Band of Luiseño Indians (La Jolla) and the Pala Band of Mission Indians (Pala) have been collaborating on an air quality study at the La Jolla Indian Reservation. A cooperative agreement was entered into whereby the Pala staff helps the La Jolla staff in calibrating the equipment on a monthly basis as required.

LAND

Pala Transfer Station— The Pala tribe opened the facility to the general public, charging a minimal fee to dump trash and the Tribe has already obtained state certification for a buy back center allowing for the purchase and marketing of commonly recycled items.

Torres Martinez Solid Waste Collaborative— The Torrez Martinez Tribe has closed all major dumps and successfully prevented the creation of new dumps on the reservation.

E-waste—The La Jolla Band of Luiseño Indians has started an electronics waste recycling.

HEALTH

Under the “Water and Sanitation Improvements Project”, San Jose de la Zorra and San Antonio Necua now have new sanitary facilities, centrally located in their communities, in order to improve the tribal members’ access to clean and environmentally friendly restroom facilities.

EMERGENCY RESPONSE

The Tohono O'odham Chair Ned Norris and Governors Napolitano and Bours of Sonora Mexico committed to developing a Tri-national emergency response plan during the AZ/Mexican Commission Emergency Management Committee meeting in Phoenix, Arizona. This is an historic commitment that formally brings tribal nations into the Border 2012 Emergency Preparedness and Sister City Plan program.

COMPLIANCE

The indigenous community of San Antonio Necua in Baja California embarked upon an eco-tourism venture for tourists in order to assist them in preserving the environmental integrity of the community.

Environment and Trade

Our trade policy aims to achieve the United States commitment that will remove barriers in foreign markets, while further liberalizing our market at home. Our goal is that free and open trade creates new jobs and new income, and lifts the lives of all people.

In developing and negotiating free trade agreements, OIA works to ensure effective enforcement of environmental laws, high levels of environmental protection, and assurances that environmental laws are not weakened to encourage trade and/or investment. OIA works diligently with international organizations to encourage corporate responsibility.

Protecting human health and the environment are key to sustainable economic development. EPA participates in a variety of foray to establish and implement environment-related trade provisions that protect human health and the environment and consider environmental justice. EPA is involved in the negotiation of new free trade agreements, and in implementing existing agreements, such as the environmental provisions under the North America Free Trade Agreement (NAFTA).

Working with the United States Trade Representative (USTR) to develop, negotiate, and implement environment-related provisions in all new free trade agreements, EPA helps the U.S. achieve its trade policy objective. EPA also collaborates with USTR and the President's Council on Environmental Quality to analyze the environmental impacts of new trade agreements, as required under an executive order of the President. In addition, EPA works with the U.S. State Department to help countries address potential environmental impacts of increased trade. EPA promotes sustainable development and helps to build the capacity of U.S. trading partners to develop, implement, and enforce sound environmental standards.

Data Collection and Management

Recent advances in data processes and information sharing present new opportunities for protecting the world's air, water, and land. The United States shares its decades of experience in environmental management with other countries with greater efficiency and less cost than ever before. Our ability to work with partners throughout the world to

monitor pollution, develop baseline environmental measures, and fill in gaps in environmental data has improved dramatically in recent years.

Professional and Organizational Development

OIA encourages staff to consider environmental justice concepts and recommends all staff complete EPA Environmental Justice training offered on-line.

Environmental Justice Assessment

OIA looks forward to conducting the Environmental Justice Review beginning in the Spring of 2009, to ensure all environmental justice considerations are being integrated in our work.

Program Evaluation

OIA regularly assesses the effectiveness of our programs and consults with our domestic and international partners to evaluate the need, progress and expected results of our projects, programs and activities.

Office of International Affairs

FY09 Robust-Results Oriented Activity Performance Measure Matrix

Description: EPA's Artisanal and Small Scale Gold Mining Projects to Reduce Mercury Use and Emissions in West Africa, and Latin America Brazil and Peru

EPA has placed a high priority focus on mercury, a persistent, bioaccumulative toxin which cycles globally. No one country alone can take action and hope to resolve health and environmental impacts of mercury exposures. Mercury has been important in commerce and trade. International mercury inventories developed through the United Nations Environment Program process have shown that use of mercury in artisanal and small-scale gold mining around the world contributes significantly to the global burden of mercury. Artisanal processing of gold produced using mercury amalgamation, with subsequent burn-off of mercury, leaving gold, occurs worldwide in over 50 countries. The United Nations International Development Organization's (UNIDO) Global Mercury Project has indicated that successful designs and applications of locally appropriate mercury control systems have a high potential for adaptation and propagation in other countries.

Because of the vast environmental justice implications of mercury use and emissions in the sector of artisanal small scale gold mining, and because we are encouraging the

transfer of our mercury capture technologies and the replication of our training for gold miners to other mining countries, OIA chose this model demonstration program to review and to ensure that, to the fullest extent possible, all environmental justice implementations are being addressed.

OIA's Strategy - To Reduce Environmental Mercury Emissions Using Improved Cleaner and Safer Technologies and Training

Working under the auspices of the Global Mercury Partnership, EPA and its partners designed a model demonstration program to: reduce mercury air emissions, mercury consumption, and mercury exposures to miners, gold processing shop owners and both rural and urban inhabitants from artisanal gold mining and refining in West Africa. The training includes awareness-raising of the significant personal and environmental health implications of mercury exposure. To accomplish this, we introduce miners to the retort technology; educate miners on the early signs of mercury exposure; and promote replication and expansion of this safer method to other mining communities once the EPA program has ended.

Mercury Reduction in Artisanal Gold Mining, Senegal, West Africa



Open Burning



Using Retort Technology

This project focuses on the Tambacounda Region in SE Senegal, which is part of the largest gold deposits in West Africa. There are about 10,000 artisanal gold miners in Senegal with an affected population of 70,000. Each miner uses about 10 grams of mercury per year, all of which is released to the environment.

To date over 1000 miners have been educated to the hazards of mercury, and trained to use retorts to capture mercury vapor. Hundreds of miners have purchased retorts with their own funds, a cost to them of approximately \$5.00USD. These gold miners make less than \$1.00 per day. Many of those who can't afford to purchase retorts share with their neighbors. Over 90% of miners with retorts use their retorts consistently in the burning of amalgam. EPA set a goal to train a total of 2,000 or 20% of the estimated 10,000 miners in Senegal by the end of the project.

Recognizing that the environmental situation of the artisanal miners would improve significantly if the Government of Senegal were more involved, EPA approached the Senegalese Government and suggested a meeting of all pertinent Government officials and other decision making stakeholders to obtain an understanding of the issues encompassing the plight of the artisanal gold miners. This EPA sponsored and Senegal Government hosted meeting occurred on September 22, 2008, in Dakar, Senegal. The

meeting outcomes were that: (1) the risks posed by mercury in the context of the traditional gold mining were identified and mitigation measures are being planned; and (2) a draft Action Plan was developed to ensure that this the Government will responsibly ensure that the additional 8000 untrained miners in Senegal will receive training after EPA's program has ended.

This meeting was a critical first step toward our mutual development of a West Africa Regional Workshop on Mercury in Artisanal Gold Mining. At this workshop, the Government of Senegal will display their forward-thinking approaches to reduce mercury emissions in the mining communities of Senegal. EPA will work with the Government of Senegal to encourage neighboring mining countries of Mali, Burkina Faso, Niger, Cote D'Ivoire, and Guinea to develop national action plans in the artisanal and small scale gold mining and processing sector. A follow-up meeting was held in November 2008 in the Kedougou gold mining region to gather the insight and views of the affected miners. (Representatives from the mining community were invited to the September meeting but could not travel due to the rainy season.)

Stakeholders in Senegal are excited to work together to solve their problems. EPA will help to ensure that efforts to reduce mercury exposure thus far achieved will be sustained.

This project has been especially helpful to women and children because once the risks and hazards of mercury are known, precautions are taken to keep the women and children out of harms way.

The project is achieving significant measurable results, reducing exposures and need for new mercury. More widespread use of the retorts will increase these environmental results and both the environment and the public health will benefit.

The following describes the gold shop hood technology which is the second phase of processing to extract more mercury and thus further purify the gold. This technology is not only being replicated in Peru but is scheduled to be transferred and demonstrated at the upcoming Artisanal Gold Mining Regional Workshop in West Africa.

Mercury Reductions in Artisanal Mining Project in Brazilian Amazon

Location: Itaituba and Creporizao, State of Para, Brazil

The EPA Mercury Reductions in Artisanal Mining project established in the Tapajos River Region, Para, Brazil targets reducing emissions from the intermediate gold processing facilities, or "gold shops", which further purify gold amalgam following initial applications of mercury and burn off in the field. The project's primary goal is to reduce mercury emissions from gold shops in the Tapajos Region by the introduction of a low-cost, locally constructed and implemented emission control technology.

The Tapajos River region in the state of Para is one of the most important gold mining regions in Brazil. Brazil, in turn, is the leading producer of gold ore in Latin America and the sixth largest gold producer globally. The majority of the gold in the Tapajos region is

produced using mercury amalgamation which results in an estimated 130 tons of mercury released to the environment annually. The region has between 60,000 and 90,000 artisanal and small- scale gold miners. The sites for this project are located in the city of Itaituba (pop. 140,000) and the village of Creporizao (pop. 764), both situated in the state of Para, and are located in the Tapajos River Basin.

Gold processing shops in these communities emit over 1,000kg of inorganic mercury vapor to the atmosphere annually (a conservative estimate). There are approximately 24 gold shops in the two project sites. Initially, only 2 of the 24 gold shops had any mercury emission controls, with little or no effectiveness. The rest of the gold shops emitted pure elemental mercury vapor directly to the air.

Gold that is brought from artisanal and small scale gold mining field areas to gold shops in towns for further processing and sale typically still contains 5-40% mercury. The uncontrolled removal of the residual mercury in gold shops using high temperature evaporation can be a significant source of mercury emissions in urban areas where the shops are located. EPA found that emissions from gold shop hoods in these communities during a burn can exceed 1000 mg/m³. The dominant component of the exhaust is in the form of aerosol or liquid particles.

EPA, with technical support from the Argonne National Laboratory, designed and tested a technology to remove the dominant aerosol component in the emissions from gold shops. Manufactured at low cost, under \$400, using locally available materials and manufacturing capabilities, it provides flexibility for installation, and does not disrupt ongoing operations. Six prototypes designed by Argonne were locally manufactured, installed, and tested in gold shops in Itaituba and Creporizao, Brazil.

We found that each can remove up to 60kg of mercury per year from the air, representing at least a 90% mercury reduction at the gold shops. To date, we have removed more than 100kg of mercury. A water-based system for installation in smaller shops was also tested and shown to be effective for certain applications, such as in small jewelry shops.

**Office of International Affairs
FY 09 EJ Robust-Results Oriented Matrix**

Description: Mercury Reduction in Artisanal Small-Scale Gold Mining

Goal 1: Clean Air and Global Climate Change; EJ Priority: Reduce Exposure to Air Toxics

Goal 3: Land Preservation and Restoration; EJ Priority: Revitalization of Brownfields and Contaminated Sites

EJ Priority: Collaborative Problem-solving to Address Environmental Justice Issues

ORG.	EJ Commitments (Subject and Description)	NATL EJ Priority*	Office Manager and Staff Leads	Projected Outputs	Change in Awareness	Desired Outcomes Change in Practice	Change in Condition
OIA	<u>Mercury Reduction Activities</u> - Reduce mercury use and emissions in the sector of artisanal and small scale gold mining in Senegal, West Africa, and in South America. - Educate miners to hazards and risks of mercury exposure. - Introduce and train miners to mercury capturing retort and gold shop hood technology. - Encourage replication of Training and education methods. - Explore micro-finance opportunities to neighboring mining countries.	Yes, 2	Walker Smith, Office Director 202-564-6639 Staff Leads: Marilyn Engle 202 564-6472 (Latin America) Wendy Graham 202 564-6602 (West Africa)	In Senegal, West Africa: - Train 2,000 artisanal small scale gold miners to the hazards, risks and early signs of mercury exposure. - Ensure awareness of health effects on pregnant women and children. - Introduce miners to cleaner, safer mercury capturing retort technologies. - Provide forum for outreach and education, and to discuss the benefits of replication to other mining countries. In South America: - Educate gold shop workers to the hazards and risks of mercury exposure. - Introduce gold shop owners to mercury capturing gold shop hoods which are constructed to further refine gold. - Partner with pertinent government officials so they have an understanding of the risks associated with artisanal small scale gold miners and gold shop workers. - Encourage replication and use of technology to other countries.	- Artisanal small scale gold miners and gold shop owners and workers are aware of the hazards and risks of mercury. - Miners understand that pregnant women and children should not be near mercury burning. - Miners know that retorts safely capture mercury to reduce exposure and lessen the need for new mercury. - Gold shop owners understand the benefit of using gold shop hoods. - Government officials understand the risks of mercury and agree to protect citizens through outreach and mercury reduction technologies - Encourage micro-finance strategies for the purchase of retorts.	- Miners recognize early signs of mercury exposure. - Pregnant women and children are kept away from burning mercury - Miners use retorts to safely work at mining gold. - Village miners purchase retorts to use or to share with their neighbors. - Gov'ts. understand hazards and risks of mercury & develop protection strategies to reduce miners' exposure. - Govt. officials construct a Plan of Action to reduce mercury exposure to small artisanal gold miners. - Microfinance strategies are in place to enable miners to purchase retorts and/or gold shop hoods.	- Pregnant women and children no longer exposed to burning mercury - Air quality improved due to miners purchasing and using retorts - Measurable results of mercury capture and reduction are realized.

Note: This matrix identifies the specific EJ Robust-Results Oriented Activities to be undertaken in FY 09 and identifies some of the specific output and outcomes expected from these activities.

EPA identified (8) National EJ Priorities in 2005, which each program and regional office has been asked to work to address and document these commitments in their EJ Action Plans: 1-Reduce Asthma Attacks, 2-Reduce Exposure to Air Toxics, 3-Fish and Shellfish Safe to Eat, 4-Water Safe to Drink, 5-Revitalization of Brownfields and Contaminated Sites, 6-Ensure Compliance, 7-Reduced Incidence of Elevated Blood Lead Levels, 8-Collaborative Problem-Solving

