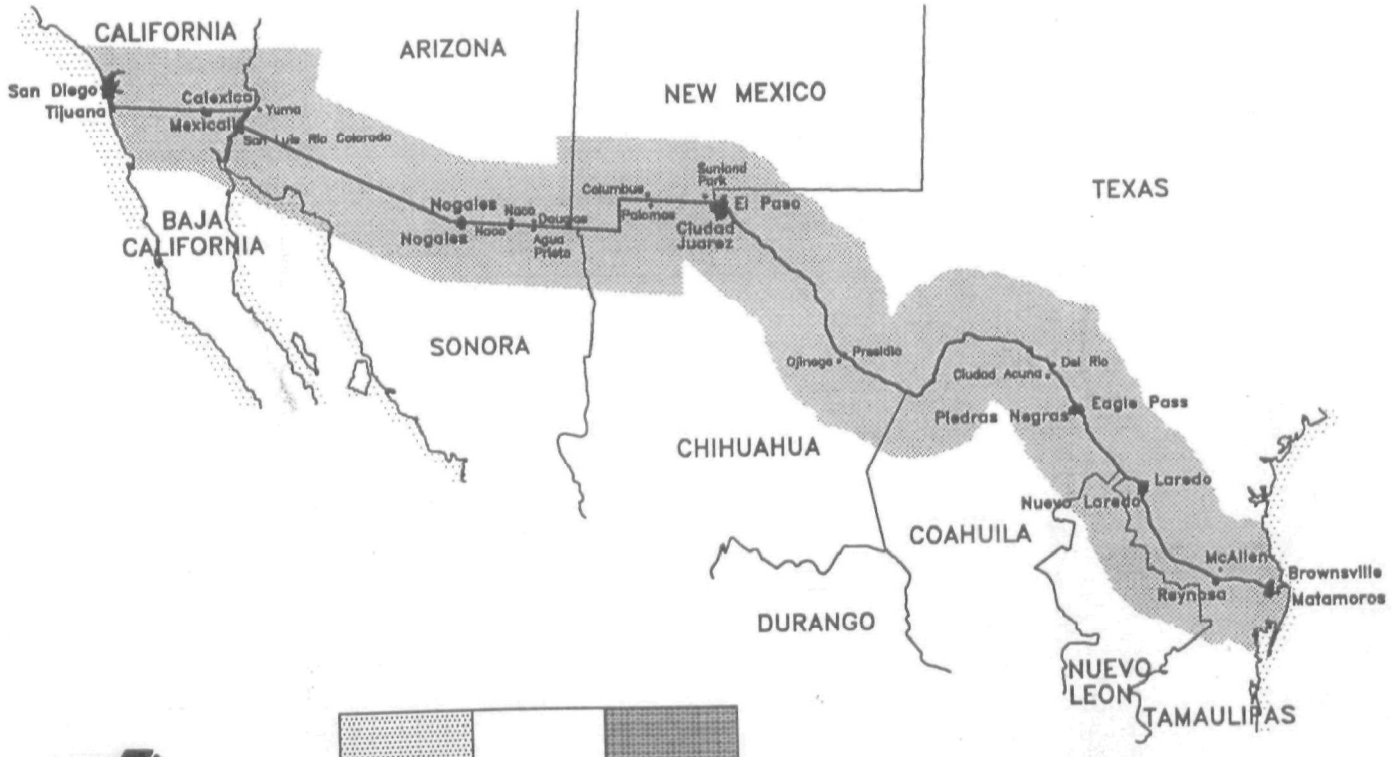
INTEGRATED ENVIRONMENTAL PLAN FOR THE MEXICAN–U.S. BORDER AREA
(First Stage, 1992–1994)

U.S. ENVIRONMENTAL PROTECTION AGENCY



SEDUE

SECRETARIA DE DESARROLLO URBANO Y ECOLOGIA

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SECTION I
INTRODUCTION

A. THE PRESIDENTS' COMMUNIQUE

On November 27, 1990, President Carlos Salinas de Gortari of the United Mexican States and President George Bush of the United States of America held one of their periodic meetings, this time in Monterrey, Mexico, to discuss issues important to both countries. The Presidents were accompanied by the heads of their respective environmental authorities and discussions took place concerning environmental conditions along the Mexican-U.S. border. The result of the meeting was a joint communique that included commitments and directives for cooperative activities in response to these conditions. The Presidents agreed to direct their respective environmental authorities (the Ecological Sub-Secretariat of the Secretariat of Urban Development and Ecology (SEDUE) of Mexico and the U.S. Environmental Protection Agency (EPA)), to work together to develop a comprehensive border environmental plan (the Border Environmental Plan or the Plan) designed to solve environmental problems in the Border Area. (Article 4 of the 1983 Agreement between the United States of America and the United Mexican States on Cooperation for the Protection and Improvement of the Environment in the Border Area (the 1983 U.S.-Mexico Border Environmental Agreement, often referred to as the La Paz Agreement), defines the Border Area as an area 100 kilometers on each side of the international boundary. The term "Border Area" has the same meaning in the Plan.) The text of their joint communique on the Border Environmental Plan is as follows:

> *The Presidents emphasized the need for ongoing cooperation in the area of environmental protection. Both Presidents instructed the authorities responsible for environmental affairs of their countries to prepare a comprehensive plan designed to periodically examine ways and means to reinforce border cooperation in this regard, based on the 1983 Bilateral Agreement. Such a mechanism should seek ways to improve coordination and cooperation, with a view to solving the problems of air, soil, and water quality and of hazardous wastes. State and municipal authorities of both governments and private organizations in both countries should participate in such tasks as appropriate.*

This first stage of the Plan (1992-1994) represents an important step toward the fulfillment of that joint Presidential directive.

B. BACKGROUND

Formal efforts between Mexico and the United States to protect and improve the environment in the Border Area began in 1983 with the adoption of the U.S.-Mexico Border Environmental Agreement. This Agreement outlines the primary objectives of common border environmental cooperation; establishes a mechanism for additional agreements, annexes, and technical actions; and provides for regular high-level meetings and special technical meetings to further promote and encourage environmental cooperation between the two countries. The 1983 Border Environmental Agreement also establishes formal communication procedures and provides that both countries designate National Coordinators to coordinate and monitor the implementation of the Agreement. Currently, Dr. Sergio Reyes Lujan, Undersecretary for Ecology of SEDUE, is serving as the Mexican National Coordinator and Timothy B. Atkeson, Assistant Administrator for International Activities of EPA, is serving as the U.S. National Coordinator. The 1983 Border Environmental Agreement is discussed in more detail in Annex A.

In response to the 1983 Border Environmental Agreement and subsequent annexes, SEDUE/EPA Work Groups were established and communication procedures were developed for dealing with the principal environmental concerns relating to water, hazardous waste, air, and contingency planning/emergency response issues affecting the Border Area. The binational Work Groups have provided the bulk of the expertise upon which this Plan is based. Recently created fifth and sixth Work Groups on cooperative enforcement strategy and pollution prevention will help guide implementation of the Plan, coordinate cross-cutting enforcement and voluntary pollution prevention issues, and focus on various aspects of specific enforcement programs. In addition, Mexico and the United States have long pursued common interests in water resources and water sanitation in the Border Area through the binational International Boundary and Water Commission (IBWC). The IBWC actively participates in the Water Work Group.

Growing support within the Mexican Government for environmental protection within the Border Area was confirmed by former President de la Madrid of Mexico in his introduction to the far-reaching 1988 Mexican General Law of Ecological Balance and Environmental Protection (General Ecology Law) when he stated that "...the conflict between environmental protection and economic development in Mexico has now arrived at the point where the best environmental solution is also often the best economic solution." This Border Environmental Plan is based upon a general recognition today that the Border Area's growth must now be made environmentally sustainable through the participation of industry and all segments of the Border Area community.

C. OBJECTIVES OF THE BORDER ENVIRONMENTAL PLAN

The purpose of this Border Environmental Plan is to strengthen the basis for continuing cooperation between Mexico and the United States in improving the environment of the Border Area. The Presidents specifically asked that the Plan be *comprehensive*, that it have the goal of *solving* pollution problems in the Border Area, that it be reviewed *periodically*, and that the participation of *state and municipal authorities of both governments and private organizations of both countries* be sought as appropriate.

In accordance with these guidelines, this first stage of the Border Environmental Plan:

- Outlines the environmental characteristics of the Border Area and describes the present status of significant environmental issues in the Border Area;

- Summarizes the cooperative environmental accomplishments achieved to date in the Border Area by binational, national, state and local environmental agencies;

- Articulates the commitment of all environmental agencies, both Mexican and U.S., to work cooperatively to better understand environmental issues in the Border Area and to establish priorities and develop mechanisms for implementing solutions;

- Sets out implementation plans to mobilize the cooperative efforts of governments at all levels, and to involve the private sector as well, in seeking solutions to the Border Area's priority environmental problems; and

- Sets out general provisions on implementation and a funding plan to help make the Border Environmental Plan fully effective.

It was the intent of both Presidents that preparation of the Plan involve the participation of governments, businesses, academic institutions, and environmental organizations as appropriate. SEDUE and EPA are undertaking systematic and carefully-coordinated efforts to provide for full and meaningful participation by the public in both countries at every stage of the Plan's development. The public and private sectors have been invited to submit relevant information and to comment on the Plan during its formation. They have had an opportunity to submit written comments and to participate in seventeen hearings on both sides of the border (see Annexes C and D). SEDUE and EPA are publishing the Border Environmental Plan, first stage (1992-1994) as agreed upon for presentation to Presidents Salinas and Bush. Under the Plan's general provisions on implementation (see Section V.B) the public and private sectors will continue to be involved in the

environmental planning process. The Plan will again be reviewed and revised in 1994 and subjected to a similar process of governmental, private and public participation.

Preparation of the Border Environmental Plan has been greatly facilitated by a spirit of close cooperation between SEDUE and EPA and a recognition that environmental problems exist on and affect both sides of the border. Just as there are unsolved waste problems of industries on both sides of the border affecting border waters, there are air pollution problems in the greater Ciudad Juarez/El Paso area (including Sunland Park, New Mexico) and Tijuana/San Diego affecting the air basins of their sister cities. The Border Environmental Plan is a dynamic, binational document that will be revised and expanded as new information is developed, as implementation of solutions evolves, and as further experience is gained in working together to achieve common goals. Mexico and the United States are aware of and concerned about the issues of the environment and the relationship between environmental protection and continued economic growth in the Border Area. Both governments have pledged to protect the environment in the Border Area while maintaining economic development, thereby fostering an economically sustainable growth that is compatible with the environment. This Plan lays the basis for translating that commitment into action.

D. SCOPE OF PLAN

This Border Environmental Plan is organized into four major sections. Section II describes the Border Area. Section III sets out existing environmental issues of concern, progress achieved to date, and current and anticipated needs with respect to these issues, including the need for information. Section IV outlines the procedure followed for assessing environmental priorities in the Border Area. Section V presents the first stage of implementation of the Plan through 1994 and sets forth general provisions on implementation and a funding plan designed to make the Border Environmental Plan effective. Annex A describes the existing environmental institutional framework on both sides of the border. Annex B sets out supporting data on the border economy. Annexes C and D lists the names and affiliations of those who testified or submitted comments on the Plan during its formation.

The scope of the Border Environmental Plan is such that some of the activities specified represent only the beginning of a series of actions that will ultimately achieve environmental results along the border. Not all environmental efforts will be completed in the first year, or even in the second or third years. Rather, this is the commencement of a substantially increased cooperative binational effort for at least the next decade to promote environmental improvements along the border.

E. THE NORTH AMERICAN FREE TRADE AGREEMENT

Mexico, the U.S., and Canada are currently engaged in the negotiation of a North American Free Trade Agreement (NAFTA) intended to reduce tariff and non-tariff barriers to trade among the three countries and create an open trading market of over 360 million people. Negotiations on the NAFTA began with a trilateral meeting of trade ministers on June 12, 1991.

In general, the parties are committed to proceeding on two separate tracks to reduce or avoid potential adverse environmental impacts of the NAFTA. These are: (1) negotiation of provisions in the NAFTA to limit or avoid potential adverse impacts associated with liberalization of trade in goods and services, such as impacts relating to pesticides and toxics in products; and (2) cooperative arrangements and agreements between SEDUE and EPA to deal with other environmental issues. The U.S. Government has indicated that the Border Environmental Plan is a central part of U.S. efforts to address border environmental issues outside the NAFTA.

Negotiation of a NAFTA is being conducted independently of the development of the Plan. The environmental program outlined in the Plan will continue whether or not a NAFTA is successfully concluded.

In October 1991, the U.S. Government released to the public a draft review of Mexican-U.S. Environmental Issues, analyzing possible environmental effects of the NAFTA (the "NAFTA Environmental Review Document" or the "Review"). This review was undertaken by an interagency task force coordinated by the Office of the United States Trade Representative (USTR) with the assistance of EPA and has been supplemented following receipt of written comments from the public.

The Review considers in detail the possible environmental impacts on the Border Area of a free trade agreement. This Review has been made available to the NAFTA negotiators, Congress, SEDUE and the public, and the possibilities discussed will receive continuing consideration in the SEDUE-EPA annual reviews of the Plan's implementation.

As is noted in the conclusion of the NAFTA Environmental Review Document:

- It is difficult to relate specific environmental effects to a NAFTA that is still undefined.

- When coupled with environmental sensitivity, however, policies which stimulate economic growth are an indispensable element in improving environmental protection.

- In assessing the possible environmental effects of a NAFTA, a particularly difficult analytical issue has been how to predict the effects of the NAFTA on growth in the Mexican-U.S. border region.

- Therefore, while it is difficult to estimate the effect of a NAFTA on border growth with precision, it seems likely that economic growth and industrialization in the border region will continue and possibly accelerate, whether or not a NAFTA comes to pass. This finding reinforces the importance of the completion and implementation of the Mexican-U.S. Border Environmental Plan.

- This Plan establishes a framework for dealing with existing environmental needs (including enforcement) and lays the groundwork for cooperation in dealing with future environmental challenges.

The conclusion in the Review that growth and industrialization in the Border Area are likely to continue, with or without a NAFTA, is in accord with SEDUE's and EPA's observations as well as with the assumptions on which the first stage of the Border Environmental Plan has been based. In shaping the Plan, it has been useful to have the benefit of the Review as well as the associated comments. A central element of the Plan involves the continued monitoring of environmental trends in the Border Area and the adjustment of its environment protection system to new pressures as necessary.

SECTION II
THE BORDER AREA--BASIC DESCRIPTION

This section describes the physical, demographic, and economic characteristics of the Border Area. The materials presented are meant to provide an overview of the conditions and recent developments that have shaped the Border Area.

A. PHYSICAL SETTING

The border between Mexico and the United States extends for nearly 3,200 kilometers (approximately 2,000 miles) from the Pacific Ocean to the Gulf of Mexico. Six Mexican states and four U.S. states adjoin the border, as illustrated in Figure II-1. The Border Area is defined in Article 4 of the 1983 Border Environmental Agreement as the area within 100 kilometers of each side of the international boundary. Figure II-1 shows the 100 kilometer-deep Border Area, its major cities, the principal sister city pairs along the border, and the six geographic regions described in Section II.A-Physical Description. Protected areas in the Border Area are shown in Figure B-1, Annex B. The climate, topography, hydrology, and geology along the Border Area can be divided into six physically distinct regions. These regions are, (from west to east), the Baja California/California Region, the Sonora Plains/Colorado River Basin Region, the Sierra Madre Occidental/Continental Divide Region, the Northern Plateau/Great Plains Region, the Sierra Madre Oriental/Santiago Mountain Region, and the Gulf of Mexico Coastal Plain/Gulf Coast Lowland Region.

Physical Description

A large part of the Border Area is a generally arid region with a unique ecology. There are some forest areas and irrigated farmlands. The physical characteristics of each region in the Border Area are discussed below:

1. The Baja California/California Region extends from the Pacific coast to the low plains along the Colorado River. The Sierra de Juarez (California Coastal Mountain Range) runs down the middle of this region. The arid coastal lands to the west of the mountains are a series of coastal terraces, mesas, and small basins with riverine deltas and restricted coastal strips. Irrigated portions of this arid region support agricultural production. The western face of the Sierra de Juarez has a gentle slope climbing to heights of approximately 6,500 (1,980 meters) feet in the Border Area. The high peaks support forests and woodlands. The eastern face drops off sharply, descending steeply down to the Colorado River Basin.

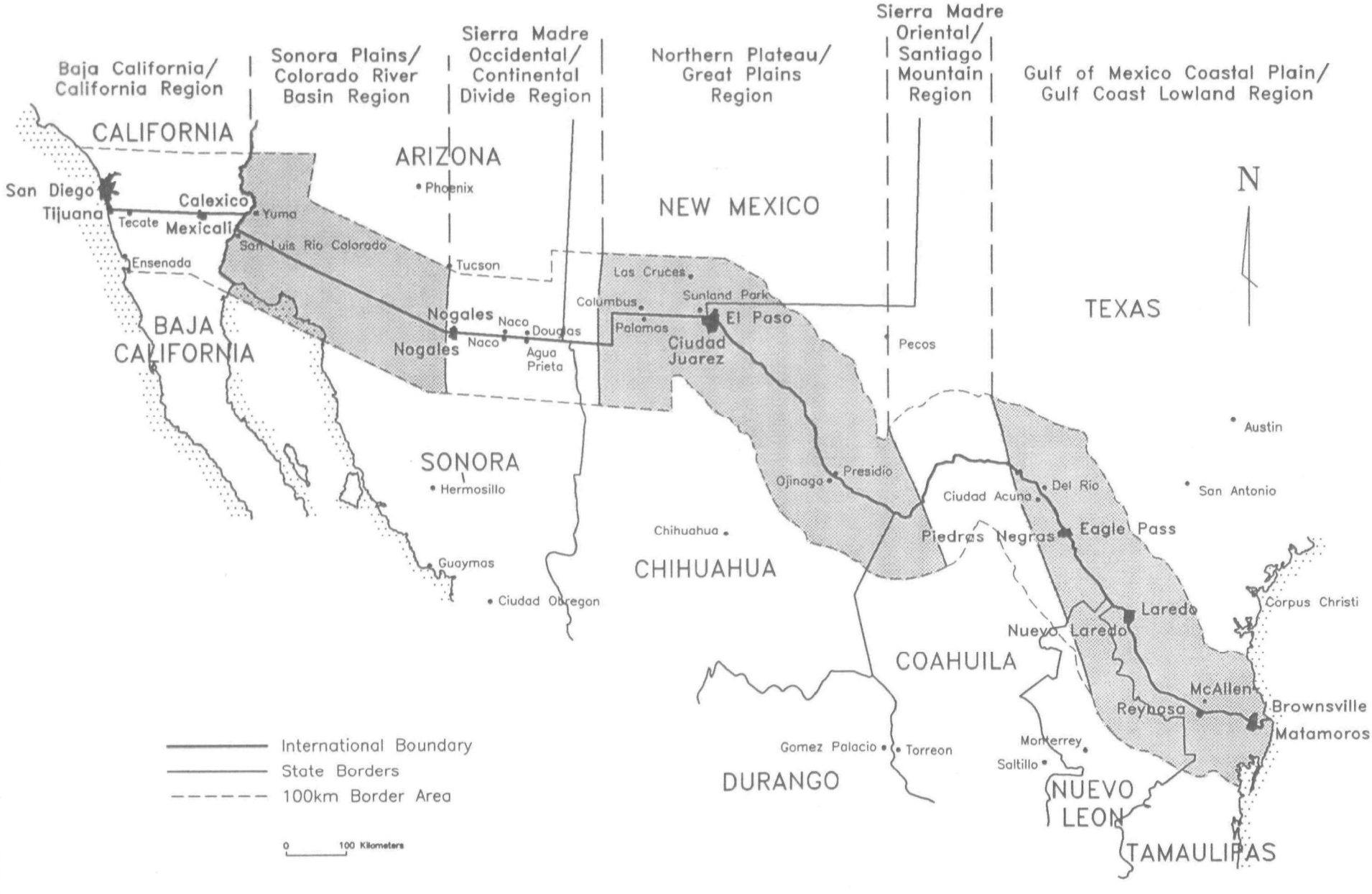

Figure II–1. Mexico/United States Border Area (showing major sister cities)

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2. The Sonora Plains/Colorado River Basin Region (the Pacific Lowlands) extends from the base of the Sierra de Juarez to the Continental Divide. This arid low-lying region has insufficient natural precipitation to support agriculture without irrigation. In its natural state it is dotted with shrubs and sparse grass. Irrigation in the Mexicali Valley, the Colorado Delta, and along the Magdalena River has made agriculture possible, although saline waters and soil are still a problem. Extensive irrigation supports crops of cotton, alfalfa, and grain. Large copper deposits have been mined from this area.

3. The Sierra Madre Occidental/Continental Divide Region separates the plains of the Colorado River Basin Region from the high plateaus of Mexico and the southern United States. This mountain range serves as a natural boundary between the normal western and eastern weather systems of this arid region. The mountain precipitation supports forests of oak and pine.

4. The Northern Plateau/Great Plains Region of the Border Area extends from the Sierra Madre Occidental (Western Sierra Mountains) and the Sierra Madre Oriental (Eastern Sierra Mountains) and crosses the northern portion of the Central Plateau System of Mexico. This region has a climate that is arid to mildly arid. Geographically, the region is comprised of plateaus, or mesas with mountain ranges, valleys, and arroyos which are normally dry. The Rio Bravo/Rio Grande forms the international border along all but the westernmost portion of this region. This region supports little more than shrubbery and sparse grass without irrigation. Extensive irrigation along the Rio Bravo/Rio Grande and the Pecos River has made agriculture possible.

5. The Sierra Madre Oriental/Santiago Mountain Region is a high mountain range that divides the Central Plateau and the Gulf of Mexico coastal lowlands. The Rio Bravo/Rio Grande passes through the valleys of this mountainous region at the Big Bend National Park. This region is semi-arid, supporting shrubs and sparse grass. Mountain precipitation permits the growth of forests in this region.

6. The Gulf of Mexico Coastal Plain/Gulf Coast Lowland Region of the Border Area follows the Rio Bravo/Rio Grande from the Sierra Madre Oriental to the Gulf of Mexico. The tropical maritime air and the extensively irrigated land support many types of crops. Irrigation and the presence of lowlands along the coast have allowed agriculture to develop in much of this portion of the Border Area along the Rio Bravo/Rio Grande.

Climate

Dry desert conditions exist over most of the Border Area with the exception of the areas along the peaks of the Sierra de Juarez (California Coastal Range), at the mouth of the Colorado River and irrigated sections of the

Sonora Plains, along the Rio Bravo/Rio Grande, and bordering the Gulf of Mexico. The climate west of the Continental Divide is strongly influenced by the semi-permanent Pacific subtropical anticyclone. This system stabilizes the off-shore circulation in the Baja California/California Region year round and is responsible for trapping air pollution. This system moves south during the winter months allowing an occasional storm to reach the western Border Area. Nearly all of the Border Area between the Baja California/California Region and east to the Sierra Madre Oriental Region receives less than 10 inches (25 cm) of rainfall yearly. Only the mountainous areas receive enough rain to support agriculture without irrigation. The majority of the Border Area in the Gulf of Mexico Coastal Plain Region receives between 12 to 20 inches (30 to 50 cm) of precipitation yearly, with the easternmost coastal area receiving up to 39 inches (100 cm) annually. Irrigation is also important to the agriculture of these regions.

Temperatures in the coastal Baja California and Gulf of Mexico area remain largely uniform year round with average yearly temperature extremes of 55°-75°F (13°-24°C) along the Pacific Coast and 65°-80°F (18°-27°C) along the Gulf of Mexico. Temperatures between the Sonora Plains/Colorado River Basin Region and the Northern Plateau/Great Plains Region are largely dependent on elevation. At elevations below 2,500 feet (760 meters) above sea level the mean annual temperature is 75°F (24°C). At elevations between 2,500 and 6,000 feet (760 and 1,830 meters) above sea level the mean annual temperature is 65°-75°F (18°-24°C). At elevations between 6,000 feet (1,830 meters) above sea level and the highest peaks of the Sierra de Juarez (California Coastal Mountain Range) and the Sierra Madre Occidental/Continental Divide Region, the mean annual temperature is 55°-65°F (13°-18°C).

Topography

The Border Area has three mountain zones passing through it. In the west, the Baja California/California Region is split by the Sierra de Juarez (California Coastal Mountain Range) with approximate elevations of up to 6,500 feet (1,980 meters) above sea level. The Sonora Plains/Colorado River Basin Region is a low-lying area (100-500 feet (30-150 meters) above sea level) that extends from the Baja California/California Region to the base of the Sierra Madre Occidental/Continental Divide Region with mountain peaks of over 7,000 feet (2,130 meters) above sea level. The Northern Plateau/Great Plains Region (approximately 4,000 feet (1,220 meters) above sea level) is the northern portion of the Central Plateau System of Mexico. Bordering the Plateau Region to the east is the Sierra Madre Oriental/Santiago Mountains Region with peaks over 7,000 feet (2,130 meters) above sea level. The Gulf of Mexico Coastal Plain/Gulf Coast Lowland Region follows the Rio Bravo/Rio Grande from the Great Bend (of the Rio Bravo/Rio Grande) to the Gulf of Mexico.

Hydrology

The majority of the Border Area between the Sonora Plains/Colorado River Basin Region and the Sierra Madre Oriental/Santiago Mountains Region is arid to semi-arid with little or no ground water. Rivers and streams flowing between the Sierra de Juarez and the Sierra Madre Occidental drain toward the Colorado River Basin. The waters from many rivers and streams are used extensively for irrigation. Low humidity, high temperatures, dry ground, and heavy irrigation cause many rivers and streams to dry up before reaching the Gulf of California. The high salinity of the soil and of the river water in this area presents problems for agriculture.

The area between the Sierra Madre Occidental and the Sierra Madre Oriental (Northern Plateau/Great Plains Region), within the Border Area, drains internally with few permanent rivers and streams. The ground in this region is generally composed of salt beds or salt lake floors.

The Gulf of Mexico Coastal Plain/Gulf Coast Lowland Region relies on the Rio Bravo/Rio Grande and ground water for irrigation. Insufficient supplies of ground water in the Border Area of this Region are restricting new settlement and agriculture.

Geology

Arid gray-brown desert soils cover most of the Border Area. These soils are high in lime and soluble salts. The underlying geological structures of each of the six regions are representative of a specific type of formation. The mountains of the Baja California/California Region are a westward tilted fault block with metamorphosed and unmetamorphosed sediments. The Sonora Plains/Colorado River Basin Region is characterized by its broad basins separated by isolated hills and low mountains. The detached block ranges are aligned generally north to south. The Sierra Madre Occidental/Continental Divide Region has an underlying strata that was deformed by folding and faulting. Paleozoic strata overlie Ordovician and Cambrian materials in the northern portions of the Sierra Madre Occidental. The Northern Plateau/Great Plains Region is composed largely of folded Mesozoic strata with Cretaceous and Upper Jurassic formations predominating among exposed rocks. The Sierra Madre Oriental/Santiago Mountains Region is composed largely of folded sedimentary rock that has been deformed by uplifting, faulting, and erosion. Exposed formations in the Gulf of Mexico Coastal Plain/Gulf Coast Lowland Region are of cretaceous strata that roughly parallel the coast.

B. POPULATION

Most of the Border Area is sparsely populated. The majority of the border population (72 percent) lives in fourteen pairs of "sister cities" located across the border from each other. Tijuana/San Diego have a combined population of over two million while Ciudad Juarez/El Paso have a combined population of over one million. Five other sister city pairs (Mexicali/Imperial County, Nuevo Laredo/Laredo, Reynosa/McAllen, Matamoros/Brownsville and San Luis Rio Colorado/Yuma) each have a combined population of over 200,000 residents.

The Border Area population is in excess of nine million and represents a growth of over sixty percent during the last ten years. Populations of the major sister cities for 1980 and 1990 are shown in Table II-1. These data include official census results for Mexico and the United States for 1980, preliminary U.S. Census data for 1990, and Mexico's census data for 1990.

The population of major sister cities in the Border Area has grown rapidly in recent years, increasing from 4,265,274 in 1980 to 7,897,504 (census data) in 1990. According to official Mexican and U.S. Census data, the smaller city in most sister city pairs experienced more relative growth from 1970 to 1980, creating severe pressures on infrastructure. Population growth in the Border Area has paralleled the expansion of the industrial base of the border cities.

There are close to 200 million crossings of the border northbound every year, making it the most frequently crossed border in the world. Figures for the top Mexican-U.S. land border ports of entry ranked by the numbers of persons and vehicles entering the U.S. are shown in Annex B, Tables B-1 and B-2.

The increased population along the border, particularly in Mexico, has brought about serious problems due to the uncontrolled urban growth and unplanned land use. Although significant investments have been made to resolve existing problems, they have been insufficient thus far to compensate for the current deficits in infrastructure and urban services. SEDUE has estimated that services in Mexico need to be increased by the following amounts: potable water by 14 percent; water treatment and sewage by 35 percent; electric power by 10 percent; public lighting by 30 percent; and roads and highways by 53 percent. In addition, the lack of preparation of land suitable for housing has resulted in unplanned settlements lacking in basic services, including wastewater treatment plants, public transportation facilities, and adequate means to manage and dispose of municipal solid waste.

TABLE II-1. POPULATIONS OF BORDER SISTER CITIES

	1990		1980	
	Metropolitan Area and/or County	City	Metropolitan Area	City
Tijuana, Baja California	742,686	688,690[2]	461,257	428,500
San Diego, California	2,498,016	1,110,549	1,861,846	875,538
*Tecate, B.C.	51,946	38,787[2]	30,540	23,900
Mexicali, Baja California	602,390	438,303[2]	510,664	341,559
Calexico, California	109,303	18,633	14,412	14,412
*Ensenada, B.C.	260,905	239,815[2]	175,425	120,483
San Luis Rio Colorado, Sonora	111,508	105,933[2]	92,790	76,684
Yuma, Arizona	106,895	54,923	62,550	43,433
Nogales, Sonora	107,119	102,124[2]	68,076	65,603
Nogales, Arizona	29,676	19,489	15,680	15,680
Agua Prieta, Sonora	39,045	32,778[2]	34,380	28,862
Douglas, Arizona	97,624**	17,324	13,058	13,058
Naco, Sonora	4,636	3,906[2]	4,441	3,742
Naco, Arizona	97,624**	675	768	768
Las Palomas, Chihuahua	16,565	2,500[2]	11,985	2,072
Columbus, New Mexico	18,110	641	414	414
Ciudad Juarez, Chihuahua	797,679	787,788[2]	567,365	544,496
El Paso, Texas	591,610	515,342	479,899	425,259
Ojinaga, Chihuahua	23,947	20,972[2]	26,421	18,162
Presidio, Texas	6,637	3,072	1,723	1,723
Ciudad Acuna, Coahuila	56,750	52,983	41,948	38,898
Del Rio, Texas	138,721	30,705	30,034	30,034
Piedras Negras, Coahuila	98,177	96,178	80,290	67,455
Eagle Pass, Texas	36,378	20,651	21,407	21,407
Nuevo Laredo, Tamaulipas[1]	219,468	218,413	203,286	201,731
Laredo, Texas	133,239	122,899	99,285	91,449
Reynosa, Tamaulipas	376,676	332,755	294,934	429,929
McAllen, Texas[3]	383,545	84,021	283,229	66,281
Matamoros, Tamaulipas	303,392	266,055	238,840	188,745
Brownsville, Texas[4]	260,120	98,962	209,727	84,997
U.S. County Non-Sister City Total	1,312,820	--	NA	--
Mexican Total	3,812,889	3,427,980	2,842,642	2,580,821
U.S. Total	5,722,694	2,070,886	3,094,032	1,684,453
TOTAL	9,535,583	5,498,866	5,936,674	4,265,274

[1]Total includes population data for the City of Rio Bravo.
[2]Estimated data (Mexican Census Bureau).
[3]Includes Edinburg and Mission, Texas
[4]Includes Harlingen, Texas
*Not included among fourteen sister city pairs
**Population data are for Cochise County, Arizona, which includes the cities of Naco and Douglas.

C. ECONOMIC BASE

According to the World Bank, average per capita income for Mexico in 1989 was $1,670. For the United States during the same year, average per capita income was $19,620 (figures are in 1987 U.S. dollars). Moreover, a marked element of the Mexican-U.S. border economy is the disparity in wealth on the two sides of the border. In 1984, the average per capita income of individuals living in the most affluent part of the U.S. border, the San Diego, California Metropolitan area, was more than 6.5 times greater than that of the Mexican national average. Average per capita income on the U.S. side of the border is at least twice the Mexican average. Nevertheless, collectively, U.S. border counties rank among the poorest in the United States. Along the U.S. portion of the Border Area, 25 percent of all family incomes fall below the poverty line (defined as a minimum needs threshold of U.S. $13,359 per annum (in 1990) for a family of four). An additional 50 percent of all families earn less than $12,000 per year. During 1991, unemployment rates across the U.S. portion of the Border Area ranged from a low of 8.3 percent in San Diego to 14 percent in Brownsville, Texas.

Of the major U.S. cities on the Mexican-U.S. border, the San Diego economy remains the most diversified with major employers in the defense, electronic, light manufacturing, and biotechnology industries. Tourism, agriculture, and government are also mainstays of the regional economy. For the rest of the U.S. Border Area, however, opportunities for economic development are more limited and are mostly tied to cross-border trade with Mexico. Tables B-3 and B-4 (Annex B) show employment growth rates in U.S. border counties for 1970-1988 and business patterns for employment for these U.S. counties for the same period.

Across the U.S. southwest border, trade and service industries dominate, including transportation, customs brokerage, finance, and warehousing. Retailing is another important border industry. These sectors remain peso-dependent with regional employment linked to the strength of the Mexican economy.

Although in most cases the economic growth of the U.S. portion of the Border Area has been accompanied by local, state, and Federal investment in transportation, water supply and treatment and other public works projects, there are well known, but not well documented problems with rural, unincorporated subdivisions ("colonias") in U.S. border counties which have substandard housing, inadequate roads and drainage, and substandard or nonexistent water and sewer facilities. It is estimated that about 215,000 residents of Texas and New Mexico live in such colonias. Similar settlements exist in the other U.S. border states and in the Mexican border states.

On the Mexican side, the government has promoted the development of the border region through the "maquiladora" program, initiated in 1965 and other similar policies. In the past, the term "maquiladora", or mill, referred to grain grinding mills and the "maquila" was the mill owners' share of the flour received for grinding the grain. Today, the term refers to the export-oriented processing and assembly plants located in the Mexican

Border Area that use imported inputs and materials. Most of the plants are part of production-sharing arrangements with U.S. firms that take advantage of local production factors and the proximity to suppliers and consumers in the United States.

The Mexican maquiladora program permits 100 percent foreign investment and allows the temporary importation of equipment, components, and inputs into Mexico on a duty-free basis. In many instances, finished products using U.S. inputs and materials pay duty when exported to the U.S. only on the value added in Mexico.

Mexican environmental regulations provide that the hazardous waste generated in Mexico by the maquiladora plants must be returned to the country of origin of the raw material. At the same time, the maquiladoras must comply with all Mexican environmental regulations.

Table B-5 (Annex B) shows the number and locations of maquiladoras in Border Area cities for 1989, 1990 and 1991. The number of employees for November 1991 is also shown. Nearly 380,000 people are employed by maquiladoras within the Border Area while other industries employ over 500,000 people. The average annual growth rate for the maquiladoras in terms of plants and employment has been 16 percent over the last eight years. Maquiladoras have become an important source of foreign exchange for Mexico, earning U.S. $3.6 billion in 1990.

In the last several years, a growing number of maquiladoras have moved to the interior of Mexico. This trend is likely to be reinforced in the future due to infrastructural strains and manpower shortages in the Border Area. Currently, 73 percent of all maquiladoras are located in cities along the Mexican-U.S. border. See Figure B-2 (Annex B).

As of 1991, the largest segments of the Mexican border industries were the electronics and transportation equipment sectors, as shown in Figure B-3 (Annex B). Figure B-4 (Annex B) shows the types of industry on the U.S. side of the border as of 1989.

As maquiladora industries and other sectors of the economy in the Mexican border cities have grown, the added economic activity and accompanying population increases have produced substantial strain on the Border Area's infrastructure. Congestion, uncontrolled urban development, and lack of basic public health and sanitation facilities have become significant problems. On the U.S. side of the border, industrial growth has not been as dynamic, amounting to 2.0 percent in the last decade. However, there are many of the same types of industries on the U.S. side of the border as are found on the Mexican side. Table B-6 (Annex B) shows the number and location of U.S. industrial facilities and toxic releases in the U.S. Border Area.

SECTION III
BORDER ENVIRONMENTAL CONDITIONS

The material set forth in this section on border environmental conditions in most cases presents (1) information on the current situation, (2) accomplishments to date, and (3) additional information needs. The implementation plans set out in Section V.A draw upon available data and experience to resolve the Border Area issues. Refinement of these plans will be undertaken as new information is obtained. Only in a limited number of cases will implementation await the collection of new information, and these cases have been identified in both Section III and Section V.

The proposals in this Plan are based primarily upon analyses of nine pairs of urban areas: Tijuana/San Diego, Mexicali/Imperial Valley, Nogales/Nogales, San Luis Rio Colorado/Yuma, Ciudad Juarez/El Paso, Piedras Negras/Eagle Pass, Nuevo Laredo/Laredo, Reynosa/McAllen and Matamoros/Brownsville. The priority given to these urban areas does not restrict consideration of environmental issues in other areas of the border region such as Naco/Naco, Agua Prieta/Douglas, Las Palomas/Columbus, Ojinaga/Presidio and Ciudad Acuna/Del Rio. One of the long-term objectives of this Plan is to investigate and identify environmental problems throughout the entire Border Area.

A. WATER

1. Water Supplies (For relevant implementation plan, see pages V-11 through V-13).

Surface water supplies are apportioned between Mexico and the United States by the IBWC under the 1944 Treaty between the United States of America and the United Mexican States on the Utilization of Waters of the Colorado and the Tijuana Rivers and of the Rio Grande (the Water Treaty of 1944) for most the Rio Bravo/Rio Grande, and for the Colorado and Tijuana Rivers. For the upper 90 miles of the Rio Bravo/Rio Grande, the U.S. Section of the IBWC makes deliveries to Mexico under the 1906 Convention Providing for the Equitable Distribution of the Waters of the Rio Grande for Irrigation Purposes. Distribution of each country's water is the responsibility of that country's domestic authorities. It is the responsibility of the State of Texas to apportion water under Texas water law to the U.S. cities and other entities on the Texas side of the Rio Bravo/Rio Grande.

For the Colorado River, the IBWC, in cooperation with the U.S. Bureau of Reclamation, delivers apportioned Treaty waters to Mexico at the Morelos Dam near Yuma, Arizona. Other surface waters of the Colorado River in the United States are governed by the Colorado River Compact of the States of Colorado, New Mexico,

Wyoming, Utah, Nevada, Arizona, and California, and are delivered under Compact rules by the U.S. Department of the Interior (DOI).

In Mexico, the apportioned surface waters from the Colorado River and Rio Bravo/Rio Grande are delivered by the IBWC to the Mexican National Water Commission (CNA) for distribution to Mexican users.

The principal communities along the Mexican/U.S. border that obtain drinking water from the Rio Bravo/Rio Grande include Ciudad Juarez, Chihuahua - El Paso, Texas; Ciudad Acuna, Coahuila; Piedras Negras, Coahuila - Eagle Pass, Texas; Nuevo Laredo, Tamaulipas - Laredo, Texas; Reynosa, Tamaulipas - Mission, McAllen, Hidalgo, and Pharr, Texas; and Matamoros, Tamaulipas - Brownsville and Harlingen, Texas. (In addition, there are a number of smaller communities and water districts that use the Rio Bravo/Rio Grande as a source of water or draw from canals or resacas into which the river water is diverted, principally in the Lower Valley.)

Tijuana, Baja California - San Diego, California; Tecate, Baja California; and Mexicali, Baja California - Calexico, California, each import all or part of their water supply from the Colorado River. Yuma, Arizona obtains water directly from the Colorado River. The other border communities obtain drinking water from both renewable and non-renewable ground water sources. Rapid growth in the border communities will continue to put pressure on the region's water resources and on the public water system treatment and distribution facilities that rely on these resources (see Annex B, Table B-7).

Areas where the source of the public water supply is ground water are scattered along the Border Area. The primary concentration of ground water sources of public water supply is located in the municipality of Ciudad Juarez, Chihuahua and in El Paso County, Texas. Bolson deposits of both the Mesilla and Hueco aquifers are the major source of ground water for municipal and industrial needs for the City of El Paso and nearby communities. The Rio Bravo/Rio Grande alluvium is an important source of shallow ground water as a supplemental source for agricultural uses in the area.

When aquifers in the Mesilla and Hueco bolsons are pumped heavily, significant quantities of ground water enter these aquifers as induced recharges from the Rio Bravo/Rio Grande and from storage in the Rio Grande alluvium. The quality of the surface water in the Rio Bravo/Rio Grande and the quality of the ground water in storage in the river alluvium can have a significant impact on the quality of the ground water in the bolsons. El Paso recharges highly treated domestic wastewater into the Hueco bolson from which part of the city's potable water supply is drawn.

Border Area potable ground water shortages would most likely impact the Ciudad Juarez area of Mexico and the El Paso County area of west Texas. The quantity of ground water available for agricultural purposes throughout the Border Area could be adversely affected by significant industrial growth. Widespread industrial growth and associated residential development in close proximity to El Paso County in the U.S. and in the vicinity of Ciudad Juarez, Mexico could create high rates of ground water withdrawal from the bolsons and result in unacceptable ground water quality degradation that would force the sister cities of Ciudad Juarez/El Paso to import supplemental drinking water supplies from sources outside the Border Area. Extensive ground water pumping throughout the Border Area may also lead to transboundary land surface subsidence problems.

At present, both the Mexican and U.S. Governments, through the IBWC, are exchanging hydrogeological information on ground water basins along the border in accordance with IBWC Minute 242. The IBWC will give priority to this matter in the Ciudad Juarez/El Paso area. Furthermore, under Minute 242, the two governments consult through the IBWC before undertaking substantial new modified surface and ground water developments that could adversely impact the other country.

2. **Water Quality** (For relevant implementation plan, see pages V-11 through V-13).

In some regions of the Border Area, the waters that cross the boundary, or those that drain into or form international rivers, have inadequate sanitary conditions caused by wastewater which flows into these rivers. There is the related risk of pollution of transboundary ground waters if proper management and treatment of wastewater and hazardous waste are not carried out. Mexico and the United States are concerned about the adverse public health and environmental impacts associated with pollution of transboundary water supplies. Such concern, along with concern about pollution of the marine environment, has been heightened by the approach of cholera, a waterborne intestinal disease. Among other factors, this disease has spread because of inadequate wastewater treatment in the Border Area. Both governments are closely monitoring the incidence of this disease.

Mexico and the United States are concerned about the adverse environmental and public health impacts of the contamination of common drinking water sources in the Border Area. In 1992, Mexico will initiate a ground water monitoring program and an inventory of the sources of quality of, and treatment processes for, drinking water.

Both governments have enacted laws and created regulations for the adequate treatment of drinking water. In the United States, the application of these regulations rests with the state governments with oversight by EPA. In Mexico, responsibility rests with the Federal Government but can be delegated to the states.

In addition, under the terms of the Water Treaty of 1944, which authorizes the sanitation programs of the IBWC, both governments are required to take measures necessary to ensure that the quality of international river waters is not impaired, along with their beneficial use.

Since the Water Treaty of 1944, the IBWC has had the lead role in undertaking border sanitation measures and works mutually agreed to by Mexico and the United States. These projects have consisted of constructing wastewater collection systems and treatment plants, and of conducting water quality monitoring.

The Mexican and United States Governments are concerned about any negative impact upon public health and the environment that may arise from ground water contamination. In accordance with the 1944 Water Treaty and Minute 242 of the IBWC, Mexico and the U.S. use the IBWC as a vehicle for information exchange and consultation regarding transboundary ground water resources. In the United States, EPA and the border states, within their respective borders, share jurisdiction over issues related to ground water quality. In Mexico, SEDUE and the National Water Commission (CNA) have corresponding jurisdiction.

Through the IBWC, SEDUE and EPA are exchanging information concerning water pollution control regulations and the industrial wastewater pretreatment regulations of their respective countries. Other information exchanges have included documentation supporting the development of categorical effluent standards and a computer program which determines the potential treatability of industrial wastes. EPA has also provided information on effluent limitation guidelines for existing sources, performance standards for new sources, and pretreatment standards for new and existing sources of water pollution. Through the Mexican section of the IBWC, SEDUE has provided EPA with adopted water quality criteria, final effluent guidelines for several different types of industries, and proposed discharge criteria for industrial releases into treatment and collection systems. SEDUE and EPA actively support the development of cooperative action plans to implement safe drinking water and wastewater treatment projects in the Border Area and will assist the IBWC in its development of pretreatment programs compatible with the agreed-upon design of wastewater treatment facilities.

In May 1990, EPA and the State of California conducted a two-week training seminar in San Diego for SEDUE and IBWC personnel on operations and maintenance of municipal wastewater treatment facilities. This technical assistance exemplifies the cooperative training efforts undertaken to date in the Border Area. SEDUE, EPA, and the IBWC also conducted an international forum on the Microbial Rock Plant Filter at El Paso, Texas in March

1991. This forum made possible the transfer of technology from a review of innovative practices used in the design, construction, operation, and maintenance of low cost municipal wastewater systems.

Ground water quality monitoring in the Border Area is conducted principally in the regions that rely upon ground water sources as a source of public water supply. The United States Geological Survey has a network of monitoring wells which are sampled and analyzed for water quality parameters such as hardness, pH, temperature, and total dissolved solids. The Texas Department of Health monitors all public water supplies including those in areas where the source of the public water supply is ground water.

Water quality data for surface waters are obtained and exchanged by Mexico and the United States through the IBWC for the Rio Bravo/Rio Grande, the Colorado River, the New River and the Tijuana River. The IBWC administers water measuring and data collection for the two countries as provided for in the Water Treaty of 1944. The two governments, through the IBWC, also exchange data on surface flow for all streams that cross the boundary.

The programs of the Mexican and U.S. Governments to address the data needs and water treatment requirements of the Border Area are discussed in Section V.A.4. In addition, there are a number of areas along the Border, particularly the U.S. colonias, which do not have adequate public water facilities and are in great need of these services.

3. **Wastewater Treatment** (For relevant implementation plan, see pages V-14 through V-23).

In some Border Areas, waters which cross the border or flow into rivers that form the international boundary between Mexico and the U.S. may be unsanitary because of wastewater discharges into these water bodies. Inadequate management and treatment of wastewater and industrial wastes also may pose a risk to transboundary ground water resources.

a. ***Tijuana/San Diego*** (For relevant implementation plan, see pages V-15 through V-17).

The current Tijuana wastewater collection system cannot convey and treat all of the wastewater being generated there. This has resulted in uncontrolled raw sewage from Tijuana flowing across the border into San Diego, California. Since the 1960s, in accordance with IBWC Minute 222, the City of San Diego has treated the City of Tijuana's wastewater whenever necessary. In accordance with IBWC Minute 270, Mexico has carried out construction work to enlarge the water supply and sewage system of Tijuana. The main components of the first phase were the construction of a pumping plant, pressure line, conveyance channel, and a treatment plant at San Antonio de los Buenos in Mexico. These facilities are now functioning properly.

In addition, the Government of Mexico, in order to stop some of the uncontrolled flows of wastewater crossing the border in the canyon areas and Tijuana beaches, has constructed and currently operates the pumping system that conveys wastewater to the treatment system at San Antonio de los Buenos built under the first phase. There are other defensive works (facilities to collect untreated Tijuana wastewater and convey them to Mexican facilities for treatment) located in the United States and operated by the IBWC.

The IBWC has constructed interim works to divert untreated wastewater from the Tijuana River and convey them for treatment to existing facilities in both countries. These interim controls went into operation in October 1991.

Section 510 of the U.S. Water Quality Act of 1987, authorizes EPA to make grants to the IBWC for the construction of international sanitation facilities in San Diego County. This treatment plant is expected to be completed by early 1995. Construction of the first land outfall component began in the spring of 1991. Mexico is working on collection system modification and plans to convey Tijuana wastewater to the new international plant. A cooperative program is being developed to control and pretreat industrial discharges into the proposed plant.

Currently, San Diego wastewater is treated to an advanced primary level. The City of San Diego and EPA are discussing upgrading treatment to a secondary level prior to ocean discharge and extending this discharge to three and one-half miles from shore. Among other improvement options, San Diego is considering additional treatment
facilities adjacent to the proposed international plant utilizing a common ocean outfall. The additional treatment facilities are needed to increase sewage treatment capacity and to meet treatment levels set by EPA.

b. ***Mexicali/Imperial County*** (For relevant implementation plan, see pages V-17 through V-18).

The New River, originating south of Mexicali, Mexico, flows north, carrying both raw and partially treated sewage, industrial wastes, and agricultural runoff into California where additional agricultural runoff enters the river.

The situation in Mexicali has improved since 1980 when the city's water quality problems were due to the existence of an inadequate collection system that discharged municipal wastewater into the New River. Other discharges into the New River included untreated industrial wastewater, waste from pigpens, and drainage from the open-air municipal solid waste dump. To resolve these problems, Mexicali has installed wastewater treatment systems in some of the local factories, relocated the pigpens so that their discharges do not affect the river, relocated the municipal solid waste dump which currently operates as a sanitary landfill, and improved the municipal solid waste collection system.

The Mexicali wastewater system is still insufficient for all of the wastewater generated in that city, resulting in transboundary contaminated flows in the New River. While a large part of Mexicali's sewage receives some treatment, the effluent is discharged into the New River without disinfection. The remaining sewage flows without treatment to the New River or its drainage tributaries. Industrial wastes from several areas of Mexicali are also discharged into drains that empty into the New River.

The IBWC is developing a conceptual plan to resolve the New River water sanitation problems which will, in the long term, eliminate all untreated domestic and industrial wastewater discharges destined for that river. These plans also include provisions for handling wastewater discharges associated with the proposed Port of Entry east of Mexicali-Calexico. Details on implementation appear in Section V.A.4.

c. ***San Luis Rio Colorado/Yuma*** (For relevant implementation plan, see pages V-18 through V-19).

San Luis Rio Colorado, which has a population of 111,500, generates approximately 4.5 million gallons per day (mgd) of municipal wastewater which, without treatment, is flowing into the Sanchez Mejorada, where it is completely utilized for the irrigation of crops.

d. ***Nogales/Nogales*** (For relevant implementation plan, see pages V-18 through V-19).

Surface water assessments by the State of Arizona since the 1970s indicate that surface water in Nogales was sometimes contaminated by fecal coliform. In order to confirm the results of these studies, an intensive survey by the Arizona Department of Environmental Quality (ADEQ), the City of Nogales, Arizona, the IBWC and responsible authorities in Mexico to characterize the contaminants is now underway. In addition, defensive chlorination measures are in place and operating in Mexico. Flows after chlorination are consistent with Arizona standards for determining the fecal coliform count. A plan for additional measures at Nogales, Arizona, is under development by the U.S. Section of the IBWC and will be submitted for public comment in 1992. At present, the wastewater of Nogales, Sonora and Nogales, Arizona are treated together in an IBWC international treatment plant north of the boundary built in 1951 and relocated and expanded in 1972. The plant is now being expanded from 8.2 mgd to 17.2 mgd capacity, and the expansion is nearly complete. The raw sewage that crosses the border through the Nogales Wash will be under control once the plant is finished.

In Nogales, Sonora, sewage collection has increased from 44 to 85 percent, and, with the addition of the collector sewer network, coverage increased to 95 percent during 1991. The Nogales Wash covered floodway extension in Nogales is 35 percent complete.

e. ***Ciudad Juarez/El Paso*** (For relevant implementation plan, see page V-19).

Small, continuous, untreated wastewater discharges from Ciudad Juarez and, with increasing frequency, occasional discharges of untreated wastewater used for irrigation in the agricultural Juarez Valley, flow into the Rio Bravo/Rio Grande.

Wastewater from Ciudad Juarez is collected and discharged to an open ditch without treatment. That ditch conveys approximately 45 mgd of Ciudad Juarez wastewater along with irrigation waters consisting of surface water diverted from the Rio Bravo/Rio Grande and larger quantities of ground water pumped from the Juarez Valley. The mixed waters are used to irrigate field crops, which are mostly cotton. On occasion, during the non-irrigation season, some of these mixed waters have been discharged into the Rio Bravo/Rio Grande. Effluent from El Paso's four wastewater treatment plants that discharge to the Rio Bravo/Rio Grande is treated to secondary levels with disinfection.

f. ***Piedras Negras/Eagle Pass*** (For relevant implementation plan, see page V-19)

The city of Piedras Negras has a population of over 98,000 and generates approximately 3.6 mgd of municipal wastewater. Drinking water and sewer systems are inadequate for this population.

At present, the city relies on oxidated ponds for sewage treatment. Most of these have reached their capacity and have been absorbed by encroaching urban development. The efficiency of treatment is low, and the resulting effluent is discharged to the Rio Bravo/Rio Grande. Some collector lines are not connected to the treatment plant and discharge untreated sewage into the Rio Bravo/Rio Grande.

g. ***Nuevo Laredo/Laredo*** (For relevant implementation plan, see pages V-19 through V-20).

Nuevo Laredo has a limited sewage collection system and no wastewater treatment facilities, resulting in discharges directly into the Rio Bravo/Rio Grande. A combined flow of 27 mgd of untreated wastewater enters the Rio Bravo/Rio Grande from more than 30 points in Nuevo Laredo. All such sewage will be treated to standards agreed to by the two governments in an international treatment plant to be located on the Mexican side of the border. Mexico is currently carrying out the expansion and rehabilitation of the Nuevo Laredo wastewater sewer system and the construction of the two principal interceptors which will convey the wastewater to the international treatment plant. The IBWC has been given responsibility for designing the plant.

Municipal wastewater in Laredo, Texas is treated by sewage treatment facilities and complies with Federal and state water quality regulations for total suspended solids and biochemical oxygen demand (BOD).

h. ***Bajo Rio Bravo/Lower Rio Grande*** (For relevant implementation plan, see page V-21).

The waters of the Rio Bravo/Rio Grande released from the Falcon Dam supply drinking water to more than one million people and irrigate more than 1.2 million acres of agriculture land in both countries. Due to inadequate treatment and collection facilities, untreated or partially treated sewage is discharged into the Rio Bravo/Rio Grande by some communities in the Border Area from the Falcon Dam to the Gulf of Mexico.

Of all the treatment plants in the U.S. communities along the Rio Bravo/Rio Grande, only one such plant, operated by the City of Brownsville, discharges secondary treated and disinfected effluent into the Rio Bravo/Rio Grande. Other U.S. border communities discharge into interior drainage systems away from the river.

Most Mexican communities in the lower reaches of the Rio Bravo/Rio Grande River also discharge their wastewater into interior drainage systems away from the river. The City of Reynosa, however, provides treatment to collected sewage by means of a 16-lagoon system adjacent to the Rio Bravo/Rio Grande. The effluent is discharged without disinfection into a tributary drain that empties into the river. Water quality sampling under an IBWC program has found high bacterial levels in the Rio Bravo/Rio Grande immediately downstream of these discharges.

Downstream of Matamoros/Brownsville the Rio Bravo/Rio Grande empties into the Gulf of Mexico. The Gulf is used for recreation, fishing and shellfishing.

4. Marine Environment

a. ***Tijuana River Estuary***

The Tijuana River National Estuarine Research Reserve (TRNERR) is one of 19 sites in the National Estuarine Research Reserve System (NERR), managed by the National Ocean Service (NOS) of the U.S. National Oceanic and Atmospheric Administration (NOAA). Located at the coastal end of the Tijuana River, along the border, this 2,513-acre site shares many similar environmental concerns with other estuarine areas.

To date, several projects including monitoring of water quality, channel fish, invertebrates, vegetation, and marsh soils have been funded by NOAA. The objective of these research efforts is to document pollutants that enter the TRNERR with freshwater inflows from the river and to assess changes in environmental indicators. In addition to changes in the environmental quality of the Tijuana River, changes in hydrology resulting from dredging activities intended to reduce mosquito breeding habitat also have produced negative impacts on the functioning and integrity of the National Estuarine Reserve.

b. The Gulf of Mexico

The Gulf of Mexico is a natural resource of incalculable value, important to the prosperity of both the United States and Mexico. This complex network of rivers, bays, estuaries, barrier islands, reefs, and beaches bordering on a vast, semi-contained and shallow body of water forming part of the Wider Caribbean Region sustains a broad range of economic activities, including: a rapidly-growing tourist industry along the coast that has contributed greatly to the U.S. economy; supply of over 50 percent of the U.S. market of fish and seafood, making the Gulf one of the world's major commercial fisheries; shipping lanes that convey 45 percent of U.S. import/export tonnage through U.S. Gulf ports; approximately 200 mobile rigs for offshore oil and gas exploration that drill as many as 1,000 new wells per year; over 90 percent of combined Mexican and U.S. offshore oil production; and wetlands that provide a habitat for more than 75 percent of North America's migratory waterfowl and a breeding ground for a wide variety of sport and commercial fish and shellfish.

The Gulf of Mexico is also important to the energy production capabilities of the United States. Historically, the Gulf has provided more than 72 percent of offshore petroleum and 97 percent of offshore U.S. natural gas production. The U.S. Department of the Interior estimates that 78 percent of the United States offshore petroleum and gas reserves are located in the Gulf. The economy of the states along the Gulf coast depends, in large part, upon the petroleum and chemical industries and upon agriculture. These activities generate significant amounts of toxic wastes.

This tremendous resource, however, has begun to show signs of environmental degradation. The commercial and industrial activity that has made the Gulf such a key resource for Mexico and the United States, has become a threat to the integrity of the Gulf's ecological systems. The Gulf receives both countries' contaminant discharges, and is greatly affected by agricultural and urban activities located in the Gulf region.

According to relevant studies, the six Mexican states along the Gulf generate approximately 695 mgd of residential wastewater, and an organic charge, measured as BOD 5, of approximately 535,000 tons (485,000 metric tons) annually. Matamoros, Tamaulipas, along with twenty other municipalities, is considered the major contributor of waste discharges into the Gulf. As a result of these waste discharges, ecological degradation has occurred, including degradation of some productive areas. In addition, natural changes caused by the pollutants have also caused a major decline in the productivity of these areas and put some species in danger of extinction.

The deterioration of the Gulf is evident in a variety of areas. Specific examples include:

- Approximately 92-98 percent of the Gulf's commercial fish and shellfish rely on estuaries (wetlands and adjacent open water) during at least part of their life cycle. Continuing rapid loss of wetlands and seagrass habitats threatens the productivity of commercial fishery stocks.

- Concerns over human health have resulted in the permanent or conditional closure of 8.4 million acres (57 percent) of shellfish-growing areas along the Gulf Coast. The number of closed areas is growing as a result of increasing human population along the coast.

- Another environmental concern in the Gulf of Mexico is marine debris. An estimated 2 million seabirds and 100,000 marine mammals die each year in the U.S. from entanglement in marine debris or ingestion of plastics mistaken for food. Over 1 million pounds of trash and debris were picked up on Gulf beaches during the 1988 beach cleanup project. Over 68 percent of the trash was plastic.

- Along the Texas coastline, aquatic vegetation has vanished due to dredging and construction activities and an increase in navigation. The industrialized and urbanized estuaries have lost most of their marine vegetation.

In response to these problems EPA created the U.S. multi-agency Gulf of Mexico Program. The main purpose of the Program is to develop and implement a management strategy aimed at protecting, restoring, and maintaining the health and productivity of the Gulf. Such a strategy should achieve a balance between the impact and demands of human-related activities and the preservation and enhancement of the marine resources of the Gulf. It is clear that binational efforts must be increased if irreversible damage to this key environmental resource is to be avoided. The Gulf transcends state and national boundaries, and the problems can only be overcome through cooperative efforts. It is through such international cooperation that steps are being taken to designate the Wider Caribbean Region (including the Gulf of Mexico) as a special area under Annex V of the International Convention for the Prevention of Pollution from Ships, 1973, and the 1978 Protocol to that Convention (MARPOL 73/78). (See Annex A, p. A-9.)

A protocol to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention) will also be developed under the auspices of the United Nations Environment Programme (UNEP) to control land-based sources of marine pollution (LBS) in the Wider Caribbean. A technical committee of experts, to include individuals from Mexico and the U.S., will be convened by UNEP, Mexico and the United States, in Mexico, to determine the policies, strategies, and plans for development of an LBS protocol. The technical committee will develop an agenda for a UNEP workshop, to be co-sponsored by Mexico and the U.S.

Starting in 1992, SEDUE and EPA will initiate a bilateral pilot program to focus on subregional LBS issues in the Gulf of Mexico. Under this pilot program, SEDUE and EPA will coordinate their conservation and environmental restoration efforts in the Gulf. The SEDUE and EPA pilot project in the Gulf of Mexico is expected to include an evaluation and monitoring phase, followed by development and implementation of any

regulations or guidelines that may be necessary. The pilot program is also expected to include the development of educational programs, public involvement, and establishment of a technical/scientific data management and public information system.

B. AIR

1. Overview (For relevant implementation plan, see pages V-23 through V-29).

The levels of U.S. criteria pollutants (ozone (O_3), carbon monoxide (CO), particulate matter of less than 10 microns (PM-10), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb)) for which U.S. National Ambient Air Quality Standards (NAAQS) have been established are monitored in several of the larger U.S. Border Area communities. In addition, there are five visibility monitoring stations along the border near Douglas, Arizona with other visibility monitors at several U.S. National Park Service (NPS) areas near the border (e.g., Big Bend, Guadalupe Mountains, and Carlsbad Caverns National Parks). U.S. border communities currently not attaining one or more NAAQS are: San Diego (O_3, CO) and Imperial County, California (PM-10); El Paso County, Texas (O_3, CO, PM-10); Yuma, Pima, Santa Cruz, and Cochise counties, Arizona (PM-10).

There are no current sets of data sufficient to characterize air quality in the area south of the Mexico-U.S. border, although monitoring has begun in Ciudad Juarez and one station has been put into service in Tijuana. The new cooperative sampling/monitoring network for Ciudad Juarez and El Paso includes five sites in Ciudad Juarez with equipment to monitor PM-10, CO, O_3 and meteorological parameters. Activated in June 1990, this network also includes four sites in El Paso and is part of a cooperative SEDUE-EPA air basin study program initiated under Annex V of the 1983 Border Environmental Agreement.

Emissions inventories on the U.S. side for the relevant criteria pollutants have been prepared for most of the non-attainment areas cited above, and inventories for all non-attainment areas are required by the U.S. Clean Air Act Amendments of 1990 (CAAA). Data on emissions and characteristics of major point sources (over 100 tons per year per facility) are reported to EPA by State or local agencies. In addition, the EPA National Air Data Branch periodically compiles county-level inventories for area and mobile sources. These were most recently updated for 1986.

Concerns have been raised about the contribution of mobile sources at U.S. Customs ports of entry to air pollution problems in border cities. The Binational Committee on Bridges and Border Crossings is working cooperatively and border-wide to promote improvements in infrastructure, procedures and staffing which would facilitate legal border crossings and, as a consequence, to help reduce the problem of air pollution which may exist in certain high volume traffic areas. In Tijuana/San Diego, a commuter/express lane has been established to encourage car pooling and reduce the volume of cross-border traffic at rush hour. In Ciudad Juarez, a

vehicular study will provide useful information in characterizing the contribution of mobile sources to air pollution at the customs ports. Once the study is complete, the information may be applied in the planning and construction of additional customs ports.

Sulfur dioxide emissions from copper smelters and utilities on both sides of the border have been a concern in the past but are currently not having major impacts on ambient SO_2 levels due largely to cooperative efforts between the two governments under Annex IV to the 1983 Border Environmental Agreement. Regular exceedances of the NAAQS for SO_2 in southern Arizona ceased after 1985 when control or closure of several large smelter operations eliminated these emissions. Currently, there are two smelters operating in the United States portion of the Border Area; both have major SO_2 and particulate controls.

Visibility studies conducted by NPS in pristine areas of the southwestern United States indicate that long-range transport and atmospheric transformation of emissions from these types of sources are still of concern due to their contribution to sulfate levels in areas hundreds of kilometers from the sources. Under certain conditions, major SO_2 sources in the Border Area or even deeper in Mexico or the United States can contribute to degradation of visibility in scenic areas along the border (such as Big Bend National Park and Parque International Del Rio Bravo), as well as in areas as far away as the Grand Canyon.

Very little is known about the potential levels of hazardous or toxic air pollutants in the border regions of Mexico or the U.S., because very little monitoring of non-criteria pollutants has been conducted there. However, the CAAA establishes a major new regulatory program for control of toxic air pollutants. U.S. agencies along the border will be responsible for this process as specified in the Act. Also, during the summer of 1991 cooperative SEDUE-EPA air monitoring of non-methane hydrocarbon species occurred at one site in Ciudad Juarez and one site in El Paso. Air quality issues for three of the principal areas needing immediate air quality monitoring are discussed in the following pages.

2. Tijuana/San Diego (For relevant implementation plan, see pages V-26 through V-29).

Tijuana and San Diego share an atmospheric basin, where the prevailing meteorological conditions in both cities are determinants in the diffusion and transport of pollutant emissions on both sides of the border. The topographic conditions, characterized by numerous canyons, and long seasons of drought, wide zones of erosion, and the consequent removal of particulate material (by wind erosion), cause complex contamination patterns common to both territories. Mobile and stationary source emissions are two of the principal atmospheric problems of the Tijuana/San Diego area. Mobile sources include private automobiles, cargo transport and passenger transport vehicles, and commercial and private airplanes. Stationary sources include industrial manufacturing plants and utilities.

In San Diego, as in most of California, ozone is the most significant pollutant, followed by PM-10, SO_2, CO, and NO_2. Air quality is monitored at ten different locations in the San Diego area. San Diego has not succeeded in meeting Federal standards for O_3 and CO, but has met standards for NO_2, SO_2, and PM-10. The California Clean Air Act of 1988 established general guidelines for areas in non-attainment of standards for O_3, CO, and NO_2. The San Diego area has been classified by the State of California as having severe air quality problems. It is doubtful that San Diego will succeed in meeting the state standards before the year 2000. Therefore, it will be required to reduce its emissions by 5 percent annually. The infrastructure characteristics (i.e., the lack of continuity of roads, existence of conflicting mergers of roads, lack of signs and traffic lights) and transportation characteristics (poor public service and inadequate and/or obsolete vehicular fleets) increase the contamination potential of mobile sources.

In the case of Tijuana, particulate material monitoring has not been carried out on a continuous basis, resulting in inconsistency in the PM-10 data base for this area. Gaseous pollutant, PM-10, and total suspended particulate monitoring equipment has been installed at the Tijuana Technical Institute, but data are not currently available. Through a cooperative effort with SEDUE and EPA, the California Air Resources Board (CARB) has provided technical assistance to and repair of SEDUE's ambient air monitoring instrumentation to be used at the Tijuana Technical Institute air monitoring station. In addition, the Tijuana emissions inventory is very sparse, providing only general information, principally oriented toward maquiladoras. However, since September 1991, SEDUE has established a technical staff dedicated solely to air quality issues in the area.

In Tijuana, some particulate monitoring occurred under a Total Suspended Particulate (TSP) Monitoring Network which was implemented from 1979 to 1984 and consisted of monitors in three locations. The program was conducted by the Mexican Subsecretariat for Environmental Improvement (SMA), with technical assistance provided by the San Diego Air Pollution Control District (APCD). However, no recent information is available concerning ambient levels of particulate matter or other pollutants. Consequently, air quality information in these areas is needed in order to identify and evaluate emissions sources and determine their impacts.

There has been some preliminary study of potential cross-border impacts of transported ozone and ozone precursors in the Tijuana/San Diego area. Local officials in San Diego have expressed a desire to include an area of Mexico 30 or 40 kilometers deep, in their State Implementation Plan (SIP) analyses but are now planning modeling and other activities with U.S. data only, due to the unavailability of required information for Baja California. San Diego County studies have also indicated that ozone levels may be affected by overnight transport of emissions from Los Angeles caused by sea breezes.

Tijuana/San Diego has been identified as a potential additional study area under Annex V to the 1983 Border Environmental Agreement. The addition of such a study area would produce much useful data for evaluating the Tijuana/San Diego air quality and emissions impacts.

3. **Mexicali/Imperial County** (For relevant implementation plan, see pages V-25 through V-26).

Ambient PM-10 concentrations exceed the annual and 24-hour PM-10 standards at the Brawley, El Centro, and Calexico sampling sites in Imperial County, California. In 1987, the PM-10 concentration level measured at the Calexico monitor was 405 $\mu g/m^3$ for the highest 24-hour average and 140 $\mu g/m^3$ for an annual average (applicable NAAQS is 50 $\mu g/m^3$). It is likely that PM-10 concentrations currently also reach unhealthy levels in Mexicali, Mexico.

CARB has prepared a PM-10 emissions inventory for Imperial County, but little information exists about emissions in Mexicali. Therefore, an emission inventory of major PM-10 sources is needed for the City of Mexicali. Information is also needed about episodic emissions (e.g., field burning, tilling) that may affect PM-10 levels. It is suspected that a large portion of the highest PM-10 concentrations are caused by fugitive dust emissions (e.g., unpaved road dust, windblown dust, agricultural burning, tilling, aggregate mining, and construction). The precise locations and timings of these dust emissions are unknown. The chemical profiles for dusts from various activities are very similar and it is unlikely that ordinary modeling methods can distinguish between the sources. Therefore, creative new approaches must be developed to identify the sources of these fugitive dust emissions.

SEDUE and EPA have agreed on bilateral participation in a Mexicali/Imperial County PM-10 study. Mexicali/Imperial County has been identified as an additional study area under Annex V to the 1983 Border Environmental Agreement. EPA Region 9 is developing a study plan for monitoring of sources and receptors and for the application of receptor models to apportion ambient PM-10 to its sources.

The Mexicali/Imperial County PM-10 action plan calls for workshops as a means to transfer technology from the research community to local air pollution control personnel in Mexico and the United States. Workshops on measurement technology include emissions survey techniques, ambient sampler operation and maintenance, and meteorological measurement systems. Similar workshops for training in PM-10 modeling techniques are also planned. The monitoring program is scheduled to last one year and will be followed by chemical analyses, computer modeling, and report preparation.

CARB is currently providing EPA and Imperial County technical assistance as well as actual monitoring assistance, in support of this plan. CARB is an active member of the Mexicali/Imperial Valley Border Task Force.

Even though the problem of vehicular emissions has not been quantified, the lack of efficient public transportation services encourages the use of personal automobiles. Vehicular exhaust and a lack of parking areas in midtown Mexicali are significant contributors to existing environmental problems.

4. **Ciudad Juarez/El Paso** (For relevant implementation plan, see pages V-23 through V-25).

Since the 1970s, El Paso, Texas has failed to meet NAAQS for ozone (O_3), inhalable particulates (now characterized as PM-10), and carbon monoxide (CO). Although the State of Texas and the City of El Paso have developed regulations under EPA guidance to reduce emissions of hydrocarbons (volatile organic compounds -- VOCs), CO, and PM-10 in El Paso County, these emission reductions have not resulted in attainment of the relevant NAAQS.

In fact, ambient concentrations of O_3, CO, and PM-10 have increased over the last ten years, possibly due to continuing high emissions of these pollutants in Ciudad Juarez. Preliminary air monitoring in Ciudad Juarez indicates an ambient problem in Ciudad Juarez at least as severe as that in El Paso. Ambient concentrations in Ciudad Juarez may exceed the comparable Mexican ambient air quality goals for at least O_3, CO, and PM-10.

The ASARCO primary copper smelter in El Paso operates a supplementary control system to avoid SO_2 exceedances. It consists of a series of meteorological stations, SO_2 monitors, and stack samplers. Data from this system are used to reduce smelter production when conditions indicate that an exceedance might occur. Since the use of this monitoring system is restricted to the U.S. side of the border, there is a possibility that emissions from this smelter may be impacting the Ciudad Juarez area. This will need to be investigated in order to make proper control determination.

Ciudad Juarez/El Paso was the first study area authorized under Annex V to the 1983 Border Environmental Agreement. Recent air monitoring efforts have included aerial and "saturation sampler" studies of PM-10 episodes in 1990, and deployment of monitors in Ciudad Juarez and El Paso since June 1990. An emission inventory program has been developed to collect information relating to releases in the Ciudad Juarez/El Paso airshed. Currently, only sources in Ciudad Juarez are included in this study. A standardized questionnaire was prepared in Spanish and was distributed to over 400 potential sources in Ciudad Juarez. A one-day workshop on questionnaire response preparation was presented to over 250 firms in Ciudad Juarez in September 1990.

A two-week cooperative SEDUE/EPA/Texas Air Control Board (TACB)/El Paso County field effort was conducted in April 1991 to identify and evaluate stationary, area and fugitive emission source locations in the Ciudad Juarez study area. In addition to collecting these data, assistance was provided to facilities in the preparation of individual emission estimates required by SEDUE. Facilities evaluated ranged from simple tile/brick kilns to complex state-of-the-art component production facilities. Unpaved roads, open dumping,

quarries and other open sources were also investigated during this field effort. Sampling of vehicle emissions in Ciudad Juarez was performed in the fall of 1990 to develop mobile source emission factors. A study of vehicle miles traveled in Ciudad Juarez is planned for early 1992. A special study of PM-10 emissions and meteorology during a December 1990 episode in the air basin is also scheduled for completion in early 1992.

From 1985 to 1987, EPA Region 6 developed three air quality training courses for use by Mexican personnel covering monitoring, quality assurance, and emission inventory techniques and in 1989, also sponsored attendance of SEDUE personnel at a week-long training course covering a variety of monitoring methods. Training also preceded SEDUE involvement in a PM-10 saturation monitoring study in December of 1989. In addition, in September 1991, EPA Region 6 sponsored a visible emissions inspection certification course and a combustion evaluation course in Saltillo, Mexico. The courses were taught in part by TACB personnel and were attended by representatives of Mexican environmental agencies. The ongoing air quality monitoring effort in Ciudad Juarez/El Paso has included training of Mexican personnel to operate and maintain the monitoring sites in Ciudad Juarez. SEDUE has established a technical staff dedicated solely to air quality issues in the area.

The El Paso City Council passed an oxygenated fuels ordinance which became effective October 1, 1991. The measure mandates the sale of 2.1 percent oxygenates in fuel and will be superseded by the EPA-mandated requirement of 2.7 percent oxygenates by the fall of 1992. The city's early action may reduce El Paso CO emissions by 15 percent - 20 percent during the 1991-1992 winter season.

5. Sunland Park, New Mexico

Recent data from air quality monitoring in Sunland Park, New Mexico indicate that ambient PM-10 concentrations have exceeded the 24-hour NAAQS at least twice in the past two years. However, the data are incomplete and, thus, inconclusive. This data, and new data that are being generated, are currently being reviewed by the New Mexico Environment Department (NMED) and EPA to determine the attainment status of Sunland Park. If it is determined that Sunland Park is a non-attainment area, appropriate actions based upon the CAAA will be taken to alleviate the problem. Since Sunland Park shares a common air basin with Ciudad Juarez and El Paso, controls in these cities may mitigate problems in Sunland Park. Depending upon the results of ongoing studies, additional controls in Sunland Park may also become advisable.

6. Other Areas

Other areas also require research concerning air emissions. The sister cities of Nogales/Nogales, San Luis Rio Colorado/Yuma and Agua Prieta/Douglas are currently exceeding the NAAQS for PM-10. Additional ambient air and meteorological monitoring and sampling are needed in Nuevo Laredo/Laredo, Reynosa/McAllen, and Matamoros/Brownsville. There is also a need to study visibility problems in Big Bend National Park, Guadalupe Mountains National Park, and Carlsbad Caverns National Park, as well as in southwest New Mexico. Little information beyond routine PM-10 compliance monitoring is currently available. With the expected increase in the number of industrial facilities in the Border Area and resulting growth in population and vehicle use, baseline air quality data in the Border Area would be needed before recommendations as to control strategies, can be made.

C. HAZARDOUS MATERIAL AND HAZARDOUS AND MUNICIPAL SOLID WASTE

1. Overview (For relevant implementation plan, see pages V-29 through V-35).

The management of hazardous material in both Mexico and the United States is of concern to both countries due to the potential for transboundary contamination and potential public health and environmental impacts. Hazardous waste, which is a subset of hazardous material, is of particular concern because waste management (including treatment, disposal, and recycling) may provide an opportunity for pollutants to enter the environment if such processes are inadequately controlled. The management of municipal solid waste is also an issue of environmental concern and is discussed separately in Section III.C.

Since environmentally sound management of hazardous material, and in particular hazardous waste, is an issue that geographically concerns the entire Border Area, the discussion that follows attempts to characterize the nature of the problem as a whole and describes bilateral programmatic efforts aimed at developing solutions.

Specific issues of concern include the following:

- The transboundary shipment of hazardous material (products and raw materials) is a result of the daily functioning of the modern economies of Mexico and the United States. The safe transport of such material to and from markets is essential.

- Significant volumes of hazardous waste are transported across the border. These wastes must be tracked by the appropriate authorities to ensure that they enter and/or leave Mexican and U.S. regulatory systems appropriately. This is fundamental to verifiable, proper waste management.

- Illegal dumping of hazardous wastes is periodically reported. Concerns related to this issue include potential impacts to public health via direct or indirect exposure from contamination of air, water, or soil.

- On both sides of the border, siting of regulated and controlled treatment, storage and disposal facilities for hazardous waste is hampered by unfavorable public opinion.

The Mexican and U.S. Governments recognize the need for information concerning hazardous and solid waste handling requirements of the Border Area (for relevant implementation plan, see Section V.A.6). To that end, they have identified the following issues:

- Transboundary movement of hazardous wastes;
- Abandoned or illegal dump sites; and
- Municipal solid waste capacity and siting.

2. **Transboundary Movement and Tracking of Hazardous Material** (For relevant implementation plan, see pages V-29 through V-33).

The last four years have seen an intense growth of industry within the Border Area at Reynosa, Matamoros, Ciudad Juarez, Tijuana, Nogales, Mexicali, and Nuevo Laredo. Many of the materials handled by border industries are hazardous, including solvents, acids, resins, paints, plastics, heavy metals, oils and varnishes. These materials are transported on heavily traveled roads and could present a risk to traffic and residential areas if a release occurs. While the transport of hazardous material is a necessary element of border commerce, little is being done in the area of pollution prevention to reduce the volume of hazardous material used or to identify alternative, non-toxic substitute materials.

Hazardous waste legally traverses the border for a number of reasons. Since, under Mexican law, hazardous waste generated from maquiladora processing of raw materials from outside Mexico must be returned to the country of origin, waste is readmitted under the terms of Annex III to the La Paz Agreement. Mexican treatment, storage, and disposal facilities do not accept maquiladora waste except for recycling when valuable materials may be obtained, provided it has been brought into the Mexican economy with all duties having first been paid. Until recently, the destination of waste generated by the maquiladora industry, particularly the amount returned to the United States, was not well known.

According to EPA data, 91 maquiladora parent companies have returned waste through U.S. Customs ports in Texas to the U.S. from their Mexican subsidiaries since 1987. These parent companies return waste from one or several maquiladoras during each shipment. According to EPA records, the number of shipments of hazardous waste through Texas has grown from 9 shipments and 189.9 tons (172.3 metric tons) in 1987 to 356 shipments and 2,388.5 tons (2,200 metric tons) in 1990. It is believed that there are more legal shipments made from Mexico to the U.S. than previously appeared, due to inconsistencies in tracking and mistakes in documentation. However, the total amount of hazardous wastes produced by maquiladoras is still not known and is believed to be significantly higher than the recorded values.

Transboundary movement of hazardous waste between Mexico and the United States poses unique challenges. A primary problem is the difficulty in tracking shipments, due to several factors:

- The difficulties in coordinating numerous agencies responsible for regulation of the transported wastes;
- The binational logistics of transboundary transport;
- Uncertainty as to the amount of hazardous waste generated by maquiladoras from U.S. raw materials; and
- Uncertainty as to the amount and type of hazardous waste transported and the location of the disposal site.

Current waste tracking in Mexico, with the exception of maquiladora wastes, relies on the Ecological Guide (Guia Ecologica), which serves as an import/export notification document, and on information contained in each company's semi-annual report to SEDUE. In addition, there is a Manifest of Delivery, Transport, and Acceptance of Hazardous Residues form which is used in the transport of hazardous material. This form must be forwarded to SEDUE. This reporting has been implemented for the past four years. Nevertheless, the amount of waste produced, stored, and/or shipped off-site is not adequately documented. It is therefore possible that illegal storage and disposal of waste occurs in Mexico. This situation negatively affects the accurate tracking of hazardous waste because: (i) less waste appears to be shipped from Mexico to the U.S. than is actually shipped; and (ii) tracking documents are lost, impeding efforts to accurately verify the disposition of such wastes. It is also possible that inaccurate information exists regarding the legal handling of waste in the U.S. This illegal flow of hazardous waste can produce a variety of environmental and public health problems, such as direct exposure to toxic chemicals, contamination of surface and ground water, and air pollution due to evaporation and burning.

Annual tracking of U.S. waste exported to Mexico is monitored by EPA. Mexico is currently accepting only the import of a steel dust from which zinc metal is reclaimed. U.S. waste exporters are required to file with EPA an annual notice of the projected amount of waste that they will ship. EPA uses this information to request consent from SEDUE for the shipment to take place. If the consent is given, the shipment may proceed. By March 1 of every year, U.S. exporters must also provide a summary of their shipments in the past calendar year. The frequency of illegal U.S. waste exports to Mexico is not known, nor is the ultimate fate of such illegal shipments, but SEDUE and EPA are cooperating much more closely in this area and have recently announced several enforcement actions. SEDUE and EPA are also developing a mechanism to accelerate the process of returning illegal hazardous wastes to the country of origin.

Mexico and the United States are currently seeking legislation to support ratification of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal which Mexico has already ratified. The proposed legislation would expand the categories of waste covered by U.S. export authority, provide broader authority to take charge of waste handled improperly abroad, and provide authority to stop shipments of hazardous waste if there is reason to believe they will not be managed in an environmentally-sound manner.

The primary mechanism for tracking the transboundary movement of hazardous waste into the U.S. is the Uniform Hazardous Waste Manifest. It documents the generator, transporter(s), and ultimate disposition of the waste, characterizing and quantifying each waste shipment. Sometimes, however, this information is incomplete or inaccurate.

In addition to the waste manifests described above, EPA also relies upon the advance notifications required of U.S. treatment, storage, and disposal facilities anticipating the receipt of hazardous waste from a foreign source. This is a one-time, constituent/source specific notification (i.e., subsequent shipments of the same waste from the same source do not require additional notice).

EPA has assisted in developing several training programs for U.S. Customs Inspectors on hazardous waste, manifesting, placarding, insurance, and safety issues. These programs have included participation by EPA, the U.S. Department of Transportation, and state agencies in their implementation, and have been followed by high-priority, intensive border inspection initiatives involving all incoming and outgoing truck traffic at several points along the border. Information obtained by U.S. Customs at the port of entry where the waste shipment will enter the U.S. waste tracking system is essential to the proper tracking of the waste. Other important information on shipments is obtained from Mexican Customs.

3. **Cooperative Strategy for Enforcement of Hazardous Waste Regulations** (For relevant implementation plan, see pages V-31 through V-32).

SEDUE and EPA have undertaken a variety of activities to enhance industry compliance with hazardous waste regulations in both countries. These include the following:

- SEDUE and EPA personnel have participated together in over 24 cooperative training visits at Mexican and U.S. industrial facilities in sister cities along the border since 1989. In addition, SEDUE and California state and county personnel have visited 16 U.S. facilities.

- EPA has provided SEDUE with training and technical assistance on hazardous waste incineration and other hazardous waste treatment techniques since 1987. In 1988 and 1989, EPA provided SEDUE with permitting guidance for a hazardous waste incineration facility being constructed in Tijuana. EPA is currently arranging a cooperative training visit to commercial hazardous waste management facilities for SEDUE inspectors. SEDUE personnel have also attended various training courses sponsored by EPA on the protection and safety of personnel, technologies for the treatment of hazardous wastes, and emergency response for incidents occurring in the handling of hazardous substances.

SEDUE and EPA have also coordinated several investigations and enforcement efforts involving the illegal storage and disposal of hazardous waste as noted above. A recent example occurred in 1990 when hazardous material of U.S. origin was identified in Tijuana. SEDUE and EPA worked together to conduct a preliminary assessment of the materials, which appeared to be solvents, heavy metals, and off-specification paints. Following lab analyses, the drummed wastes were packed and shipped to the United States for disposal. EPA and the U.S. Federal Bureau of Investigation have pursued criminal enforcement actions against the U.S. source of the materials and EPA has initiated a civil enforcement action against the U.S. company whose lax reporting prevented discovery of the illegal shipment sooner. As of September 1991, EPA had filed twelve enforcement actions involving waste exports to, or imports from, Mexico. Recently, EPA also filed seven administrative enforcement actions against U.S. steel producers exporting electric arc furnace dust waste to Mexico in violation of U.S. hazardous waste export laws. These actions were also initiated in cooperation with the Mexican Government. Another recent hazardous waste enforcement initiative is EPA Region 6's maquiladora pilot project which involved discussions among representatives of SEDUE, EPA, and some of the U.S. parent companies of the larger maquiladora facilities, designed to encourage a written voluntary commitment to compliance and compliance assessments.

4. **Education of the Regulated Community** (For relevant implementation plan, see page V-32).

SEDUE and EPA have intensified their educational outreach effort to the regulated community on the subject of hazardous waste requirements. The cornerstone for this effort is the annual Maquiladora Conference co-hosted by SEDUE and EPA and sponsored by the National Maquiladora Association. The conference has become a widely attended forum for the discussion of issues and dissemination of information related to hazardous waste management and transportation. At the conference each year, a manual of relevant SEDUE and EPA regulations is distributed. This maquiladora manual is revised each year in both Spanish and English.

5. **Abandoned and Illegal Dump Sites** (For relevant implementation plan, see pages V-33 through V-34).

The presence of abandoned and illegal hazardous waste sites is a problem in both countries. These sites can affect human health and the environment as contaminants migrate through the soil and into the ground water. By their nature these sites are often secret, their number is unknown, and locating them is difficult. The extent of contamination resulting from illegal dumping is also unknown. SEDUE is currently developing a program to remediate abandoned or illegal hazardous waste disposal sites and to ensure the proper handling and storage of hazardous waste. EPA currently has in place the Superfund program to handle such abandoned or illegal sites in the United States. EPA has identified approximately 450 sites on the U.S. side of the Border Area where it is possible that hazardous waste may be stored or disposed of improperly. The Agency has already initiated remedial action for five sites in the Border Area that are on the U.S. Superfund priority list for cleanup.

6. **Municipal Solid Waste** (For relevant implementation plan, see pages V-34 through V-35).

Because of the increased population caused by regional industrial growth, solid waste generation in the Border Area has changed in both quantity and type, requiring changes in collection and disposal procedures and changes in disposal locations. The Border Area has a population in excess of nine million. The Mexican side of the Border Area has a per capita waste generation rate of 0.645 kg/day (1.4 lbs/day). This yields a total of 3,286 metric tons per day (2,980 tons per day). The per capita waste generation rate is 2.2 kg/day (4.9 lbs/day) for the United States as a whole. This results in a total of 6,446 metric tons per day (5,846 tons per day). The average rate for the Border Area is lower. Of the total Mexican solid waste generated, it is estimated that only 1,511 (1,487 tons per day) metric tons per day are collected. Approximately 1,775 metric tons per day (1,747 tons per day) of solid waste are therefore discarded inappropriately due to the lack of dumpsters and collection systems in highly populated areas and areas of difficult access, as well as due to the lack of space to install solid waste storage facilities. About 65 percent of collected garbage is disposed of in open air dumps. In the absence of adequate landfills, incineration facilities, or a recycling program, many communities have no way of reducing the volume of their municipal solid waste or of disposing of this waste properly.

7. Industrial Waste

Approximately 900 facilities in the border regions of Texas, New Mexico, Arizona, and California have been identified as generators of hazardous waste under the U.S. Resource Conservation and Recovery Act (RCRA), the chief U.S. hazardous waste regulatory statute. A large percentage of these hazardous waste generators are small quantity generators such as dry cleaners, automobile shops, and small-scale painting operations, which are, for the most part, subject to reduced regulatory requirements under RCRA. There are similar types of small-quantity hazardous waste generators on the Mexican side of the Border Area, as well as large-quantity generators such as industrial facilities. About one percent of hazardous waste generators on the U.S. side of the Border Area are also storage facilities and have received or will receive the appropriate permits. There are no commercial treatment, storage, or disposal facilities within the Border Area although there are numerous facilities that perform these functions in neighboring areas.

SEDUE has authorized operation of two hazardous waste recycling plants in the Border Area. One is in Tijuana and the other is in Mexicali. Nineteen other recycling plants exist in Mexico, but operation of these plants can only be authorized by SEDUE once they fulfill regulatory requirements. Usually, wastes are recycled to recoup solvents, oils and metals. In addition, six installations near the border are currently authorized by SEDUE for controlled confinement of residues which can include stable hazardous residues and residues with metallic content. One of these authorized installations is in Baja California, and two are in Nuevo Leon. One is located in Tamaulipas, one in San Luis Potosi and another in Sonora.

D. PESTICIDES (For relevant implementation plan, see pages V-35 through V-37)

Controls over pesticides are important in the Border Area where their use creates health or environmental problems because of worker exposure or contamination of air and water. There is presently little hard data on these issues in the Border Area. The Texas Water Commission, in cooperation with the IBWC, made a study of 32 pesticides and organic compounds in the waters and biota of the Rio Bravo/Rio Grande from Amistad to Falcon Dam in 1990. DDT, DDE, and chlordane were detected in fish tissue samples collected in the reach from Laredo, Texas to the international Falcon Reservoir, though none of these compounds were detected in the water. The U.S. Department of the Interior's Fish and Wildlife Service (FWS) has also documented DDE concentrations throughout the peregrine falcon food chain at Big Bend National Park in Texas at levels high enough to be a concern to the protection of that endangered species.

There are agricultural lands on both sides of the border utilized for crop production, particularly the Imperial Valley in California, the Mexicali Valley in Baja California, and the Rio Bravo/Rio Grande Valley. The Sonora-Arizona border is less developed in this regard but has been increasing its agricultural production. The Rio Bravo/Rio Grande Valley on both sides of the border is a prolific producer of agricultural products, ranging from

cotton in the upstream areas to fruits and vegetables in the lower Rio Bravo/Rio Grande. Both the Mexican and U.S. growers use significant quantities of pesticides in the production of these crops, particularly for fruits and vegetables.

Generally, the pesticides used in both countries are the same or at least closely related. One major difference is that a few pesticides are used in Mexico which do not have the same registered uses in the United States, although they are most often approved for other food uses in the United States. Officials from Mexico and the U.S. have met to begin a project to identify Mexican or U.S. pesticide uses that do not have corresponding tolerances in the two countries, and to determine whether alternative pesticides with appropriate tolerances could be substituted or tolerance levels developed.

Spray drift across the border and its potential for non-point source pollution of water bodies are the two most important diversions of pesticides to control. An information system on pesticide usage in the Border Area is needed as a starting point for controlling pesticide use and applying monitoring systems.

CICOPLAFEST is the Mexican Government intersecretarial commission created in 1988 to provide integrated decision making and regulation of all aspects of pesticides, fertilizers, and toxic substances. Mexican law and regulations require registration of all pesticides. The requirements are similar to those in the U.S. but implementation of the regulations and protection of health and the environment is hampered by a number of factors. The Mexican Government is beginning to implement a program, similar to the U.S. Good Laboratory Practices (GLP) program, that would ensure quality of data for registration purposes and control over potential uses. Although pesticides are registered and instructions are provided on recommended uses, farmers and growers may often use pesticides contrary to directions. CICOPLAFEST and EPA plan to oversee pesticide issues in the Border Area as part of their national pesticide regulatory programs. They will attempt to understand the extent of pesticide-related problems and develop control mechanisms which can be mutually accepted and implemented by both countries. The Water and Air Work Groups will, of course, conduct monitoring programs to detect any evidence of pesticide runoff or drift problems.

E. CONTINGENCY PLANNING/EMERGENCY RESPONSE

1. Overview (For relevant implementation plan, see pages V-36 through V-39).

The potential for accidental releases, explosions, or spills of hazardous material in the Border Area requires responsible contingency planning and preparation for response to such emergencies. In the United States, chemical emergency preparedness and response activities are required and authorized by the 1980 U.S. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the 1986 Superfund Amendments and Reauthorization Act (SARA), the Emergency Planning and Community Right-To-

Know Act (EPCRA) as enacted by Title III of SARA, and the National Contingency Plan (NCP) contained in CERCLA. SARA Title III requires the formation of State Emergency Response Commissions (SERCs) and Local Emergency Planning Committees (LEPCs) for the purpose of developing local contingency plans and emergency response capability for accidental hazardous material releases. EPA shares responsibility for Federal responses to accidental hazardous material releases with the U.S. Coast Guard as provided in the NCP. SEDUE and the Mexican National System of Civil Protection share emergency response roles, as coordinated by the Mexican Secretariat for Administration. The process which has been used in Mexico and which serves as an overall guide for the development of contingency plans, response preparation, and prevention of accidents, including information to the public, community involvement, and risk reduction, is described in the program of the United Nations Environment Programme (UNEP) known as APELL (Awareness and Preparedness for Emergencies at the Local Level). APELL has as its main objective the prevention of loss of life and property and ensuring environmental safety in the community by creating and/or increasing public awareness of possible hazards existing within the community and using that awareness to help develop community plans to respond to any emergencies those hazards might present. Mexico sponsored a regional APELL workshop in 1990, in which representatives from the United States participated.

The Mexican-U.S. Inland Joint Response Team (JRT) was established under Annex II to the 1983 Border Environmental Agreement to coordinate hazardous emergency preparedness and response activities along the Mexican/U.S. border. Most small spills are handled by each country at the local level in coordination with the IBWC as part of the JRT response, specifically, in fourteen pairs of sister cities: Tijuana, Baja California/San Diego, California; Mexicali, Baja California/Calexico, California (including Imperial County); San Luis Rio Colorado, Sonora/Yuma, Arizona; Nogales, Sonora/Nogales, Arizona; Naco, Sonora, Naco, Arizona; Agua Prieta, Sonora/Douglas, Arizona; Las Palomas, Chihuahua/Columbus, New Mexico; Ciudad Juarez, Chihuahua/El Paso, Texas; Ojinaga, Chihuahua/Presidio, Texas; Ciudad Acuna, Coahuila/Del Rio, Texas; Piedras Negras, Coahuila/Eagle Pass, Texas; Nuevo Laredo, Tamaulipas/Laredo, Texas; Reynosa, Tamaulipas/McAllen, Texas; and Matamoros, Tamaulipas/Brownsville, Texas. The JRT is activated in the event of a significant hazardous substances incident in the Border Area. It is chaired for Mexico by SEDUE and for the U.S. by EPA. The JRT extends coverage into the Gulf of Mexico where response authorities are shared by the U.S. Coast Guard and the Mexican Navy. Additionally, the JRT serves as a conduit for information about each country's hazardous substances emergency preparedness and response activities. The JRT meets regularly to address issues and improve the status of emergency preparedness and response along the border.

2. Joint Response Team (JRT) Activities

In addition to addressing policy, protocol, and program development issues, the JRT participates in a number of activities including:

- ***Contingency Planning.*** Under the auspices of the JRT, the Joint Mexican-U.S. Contingency Plan for Accidental Releases Along the Border (JCP) was developed and presented to the Presidents of both countries in January 1988. Once the JCP was developed, emphasis shifted to developing contingency plans in the fourteen pairs of sister cities along the border named above. Initially, contingency plans are being developed for Mexicali/Imperial County, Tijuana/San Diego, and Matamoros/Brownsville.

- ***JRT Conferences.*** In April 1989, the JRT convened its first conference to initiate planning and preparedness efforts in the fourteen sister city pairs along the border. The conference brought together representatives from the public and private sectors of both countries. A second conference focusing more specifically on the development of sister city contingency plans and response mechanisms was held in June 1990. Future conferences and workshops will build upon the efforts of these two conferences.

- ***Simulation Exercises and Other Training Initiatives.*** The JRT has sponsored several simulation exercises including a tabletop exercise in Mexicali/Imperial County in 1989, a full field exercise in Matamoros/Brownsville in 1990 (described below), and a second full field exercise in the same sister city area in November 1991.

The JRT has been involved in several exercises in the past two years in Tijuana/San Diego, Ciudad Juarez/El Paso, and Matamoros/Brownsville. In December 1990, JRT members were invited by SEDUE to observe a field exercise which was planned by a maquiladora facility in Matamoros. The exercise involved a simulated emergency response to a hypothetical release that threatened the surrounding residential community in Matamoros and had the potential to threaten the downtown area of Brownsville, Texas. In the fall of 1989, Brownsville, Texas through the Cameron County Local Emergency Planning Committee (LEPC) and Matamoros, Tamaulipas through the Local Committee on Mutual Assistance (CLAM) began working with members of the JRT to develop the first full-field exercise in the Border Area, which took place in March 1990. The JRT, which sponsored the exercise, has encouraged and supported the establishment of local action committees to work together in developing the sister cities' plans and in all emergency preparedness, prevention, and response activities. Subsequently, other exercises were held in Matamoros with the participation of JRT and LEPC members and CLAM organizations. The second Local Committee on Mutual Assistance is being formed in Ciudad Juarez to work with the El Paso County Local Emergency Planning Committee in JRT activities.

The JRT also encourages industry, particularly the maquiladoras along the border, to participate as working members of LEPCs and CLAMs, to participate in border exercises and training sessions, to provide information on hazardous chemicals, to participate in the development of contingency plans, and to provide emergency equipment to enhance community efforts and response capabilities.

A training workshop developed by EPA Region 6 currently is being offered to those organizations charged with responding to hazardous material incidents. Materials are being translated into Spanish to facilitate similar training of Spanish-speaking personnel and to promote consistent response to accidents involving the release or potential release of hazardous material on both sides of the border. In 1990, EPA Region 9 conducted training in San Diego and Calexico concerning hazardous material recognition for those responsible for responding to hazardous material incidents. These bilingual sessions were conducted in collaboration with other Federal agencies. Primary attendees were local emergency officials.

The Mexican and U.S. Governments are addressing the various data needs and coordination mechanisms necessary to enhance the contingency planning/emergency response capabilities of the Border Area. These implementation actions are discussed in Section V.A.9.

F. POLLUTION PREVENTION (For relevant implementation plan, see pages V-42 through V-44)

Whereas traditional efforts to protect the environment have emphasized the collection, treatment, and disposal of pollutants after they have been generated (for example, the use of catalytic converters on cars), pollution prevention emphasizes the minimization of pollution before it is generated. That is, if production systems can be redesigned to use less input material and less energy, less waste will be generated. As a result, less pollution will need to be treated in traditional ways.

Pollution can be prevented in several different ways:

- Products can be reformulated to use less hazardous material.
- Processes can be modified to use less input material.
- Equipment and processes can be redesigned to use less energy.
- Waste materials can be recovered for recycling or reuse.

Besides the environmental benefits, there are a number of economic benefits to pollution prevention. Businesses can reduce the money spent on production materials and energy; employees are exposed to less hazardous material; the potential dangers associated with accidents involving hazardous material are reduced; and the costs of waste disposal are minimized. In short, businesses often can improve their competitive position because of

their pollution prevention efforts. To date there has not been a significant pollution prevention effort in the Border Area but there appears to be ample opportunity to initiate such an effort.

Pollution prevention strategies must be based on sufficient knowledge and data to predict pollution threats and the ability to make appropriate management decisions.

G. ENVIRONMENTAL HEALTH IN THE BORDER AREA

Sections III.A through III.D identify many of the root causes of environmental health consequences of increased industrialization along the border. Environmental health as a concern is also discussed in Section IV.B.

Over the past year, the U.S. Public Health Service (PHS) and the Mexican Secretariat of Health (SSA) have been developing a special program for the Mexican-U.S. border. The Pan American Health Organization (PAHO) has also assisted in this initiative. PHS and SSA have agreed on the goal of improving public health along the border.

As an initial step in developing a cooperative program to achieve this goal, the Region 9 Office of the U.S. Public Health Service has undertaken Project CONSENSO. This project has identified those public health problems along the border that can be addressed through binational cooperation. Priority state and local health problems were identified through a series of regional workshops.

Mexican and U.S. Federal health agencies supported Project CONSENSO as a mechanism through which local health officials would identify binational priority problems, based on their expertise. CONSENSO's workshops also suggested responses and the project plan included an inventory of health programs and resources along the entire border.

In January, February, and March 1991, four regional CONSENSO workshops were held in San Diego, California; El Paso, Texas; Harlingen, Texas; and Tucson, Arizona. Forty to sixty representatives of health organizations, both public and private, and health workers of both countries attended each of the workshops. The workshop participants discussed and reached consensus on border health priorities. Each meeting identified approximately 13 to 14 priority issues of a binational nature.

A fifth general meeting of CONSENSO was held in El Paso, Texas in March 1991. Participants included key individuals from previous meetings; representatives of local, state, and Federal Governments; representatives of private sector entities from Mexico and the U.S. (including maquiladoras); and representatives from non-governmental organizations.

The general priorities identified through Project CONSENSO, included the following:

- primary health care
- drug dependency
- health promotion and disease prevention
- environmental health
- mother/infant care
- occupational health

The Border Area needs, with respect to environmental health, were identified as follows:

- There is a need to improve the infrastructure of urban services. Large deficiencies exist in services related to water quality and solid waste disposal.

- Due to the growth of the maquiladora industry, there is a need to monitor, control, and manage hazardous waste.

In addition, Project CONSENSO identified specific key concerns:

- water, air, and soil pollution
- hazardous waste
- education and legislation

Regional priorities were summarized by the participants as follows:

- Decrease the number of people served by ground water wells
- Decrease air pollutants
- Reduce the deterioration of the environment, giving priority to the elimination of solid wastes and water pollution
- Ensure the adequate elimination of hazardous waste associated with the maquiladora industry
- Establish a binational entity capable of analyzing health and environmental needs and improving the conditions along the border
- Increase the availability of drinking water and sewage systems
- Prevent the contamination of food crops by pesticides
- Reduce risk of harm to health associated with water, air, and soil pollution through pollution prevention and corrective actions
- Reduce diseases related to environmental conditions

- Identify and reduce pollution from sources that affect the water quality of the Rio Bravo/Rio Grande
- Quantify levels of environmental pollutants and initiate the necessary reduction efforts
- Increase binational coordination through responsible national organizations

With the priorities identified through Project CONSENSO, SSA and PHS have been working closely with local health officials to identify specific binational responses. These activities must be based on one or more of the priority areas, and lead to the larger goal of strengthening public health capacity along the border.

As is clear from Section IV, Environmental Priorities, SEDUE and EPA, as well as other U.S. health agencies, have been particularly concerned with the water and sanitation problems along the border, especially in the U.S. colonias, where the problems are most severe. Currently, health problems due to a lack of appropriate sanitation are even more perilous, as a result of the movement of cholera from South to Central America and into Mexico. Often the U.S. colonias either do not have any water and/or sanitation systems, or they have shallow wells which can easily be contaminated by inadequate waste disposal. These shallow wells have also been associated with the prevalence of Hepatitis B in this area. There are over 350 colonias in the El Paso area alone, and more than 100 in the Harlingen/Brownsville areas. This sanitation situation, combined with the fact that colonias are inhabited mainly by highly transient populations which receive many visitors from the Mexican side, provides opportunities for the introduction and rapid spread of communicable and particularly diarrheal diseases.

Many U.S. and Mexican experts are convinced that outbreaks of diseases such as cholera could be more rapidly controlled and to a large extent prevented, if adequate potable water and sanitation systems could be introduced as soon as possible. Both governments have begun cholera prevention and treatment preparation measures along the border which include informing the public and medical communities about how to avoid cholera and informing medical and laboratory workers about how to identify and treat it. The PHS has also participated in trilateral meetings with Mexico and Canada to facilitate a more effective response to outbreaks of cholera in North America, Central America and the Caribbean.

As the Plan is implemented, additional information on environmental health will be collected to identify routes of exposure, quantify environmental health consequences to workers and the surrounding community, and prioritize problems and resources for responding to these environmental health problems.

SEDUE and EPA will continue to coordinate their efforts with PHS and SSA to further develop the environmental health component of the Plan as it specifically relates to activities associated with the CONSENSO project which are relevant to environmental concerns, and to build support through local involvement in this important issue.

H. ENVIRONMENTAL EDUCATION (For implementation plan see pages V-43 through V-45)

Economic development in the region and the Border Areas natural characteristics suggest the need to promote environmental education and public participation to raise the population's consciousness and motivation regarding environmental problems. Furthermore, in many cases, the insufficient level of environmental education contributes to increased environmental degradation due to inappropriate natural resource use.

Because the affected populations are heterogeneous and have diverse cultures, it will be necessary to develop both formal and informal environmental education programs. Such programs will foster diverse alternatives for the solution of environmental problems, promote better conduct towards the environment, and train specialists capable of suggesting technical solutions to minimize adverse environmental impacts.

Throughout the Border Area there are a number of academic institutions at the primary, secondary, and university levels, dedicated to the study of border environmental protection and conservation. Increasingly, academic institutions from both Mexico and the U.S. are collaborating in a number of border environmental research and education efforts.

SEDUE has also initiated a number of actions to address the need for environmental education. These include incorporation of environmental concepts in school curriculum plans at the national level. Although this work is not specifically focused on the Border Area, it affects the border due to its status as a nationwide program.

To increase local government participation, SEDUE is promoting education of local government officials in environmental protection. Mexican municipal councils ("ayuntamientos") give little attention to environmental problems. Due to the lack of technical and administrative knowledge among the general population, a local official should be responsible for promoting, organizing, and directing environmental measures approved in council, as well as for involving the public in such activities to the extent appropriate. Mexico now has trained local government officials in 47 municipalities in the border states of Baja California, Chihuahua, Coahuila, Nuevo Leon, and Tamaulipas. These officials rely on such publications as *The Municipality and Environmental Protection*, which guided the creation of the Municipal Environmental Management System.

To promote bilateral environmental education initiatives even further, the Mexican Secretariat of Public Education and the U.S. Department of Education signed a Memorandum of Understanding (MOU) in 1991, which identifies environmental education as an initiative that should be given priority by both governments. In support of the MOU between Mexico and the United States, SEDUE and EPA will work with their respective departments of education to promote environmental education in the Border Area.

EPA's participation in this educational effort will be shaped by the U.S. National Environmental Education Act, which became effective in November 1990. This statute calls on EPA to join with Mexico and Canada in the development of environmental education initiatives. The law also establishes a National Environmental Education and Training Foundation with the goal of fostering international cooperation in the area of environmental education.

I. CONSERVATION ISSUES (For implementation plan see page V-45).

1. Description

Just as pollution has impaired water and air quality in the Border Area, it has adversely affected the region's wildlife, natural areas, and habitat. In addition, population growth, increased timber harvesting, cattle grazing and the pumping of ground water have put pressure on the borderland's natural environment. SEDUE has more extensive authorities with respect to natural conservation than does EPA, but developments with respect to conservation in the Border Area will be followed in the Plan.

For example, the coastal wetlands and beaches of both Baja California and the Gulf of Mexico are unique and their irreplaceable habitat and important recreational resources are threatened by pollution. Near shore waters support a wide variety of important recreational fisheries, as well as marine mammals and endangered and threatened sea turtles. Inland it is necessary to establish wildlife travel corridors if important species are to be preserved. There is already such an acquisition project on the U.S. side of the lower Rio Bravo/Rio Grande Valley to establish a chain of wildlife refuges. However, a number of new bridges have been proposed between the Gulf of Mexico and Del Rio, Texas. Each bridge and its approaches impact brush and riparian habitats along the Rio Bravo/Rio Grande. The environmental effects of the numerous proposed bridges need to be addressed.

Mexico and the United States have a long history of cooperating on wildlife protection and the conservation of natural resources in the Border Area. By virtue of their long common border and the migration patterns of many species, both countries have a common interest in a great number of wildlife and natural resource issues. The entire border region, and in particular the Rio Bravo/Rio Grande Valley, has a great deal of unique biological diversity which the two countries are taking steps to protect. Major areas of cooperation include the conservation of wildlife, the protection of national parks and forests, and the preservation of marine resources. As can be seen from the following discussion, there is a strong institutional basis for cooperation between the two countries on conservation issues affecting the Border Area.

Cooperation efforts to protect wildlife date back to the Convention Between the United States of America and the United Mexican States for the Protection of Migratory Birds and Game Mammals, which was signed by the

two countries in 1936. Under this agreement, Mexico and the United States work together in conducting on-the-ground surveys and management activities for the protection of migratory species. In 1940, Mexico and the U.S. joined with other countries in signing the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere.

More recently, in 1984, SEDUE and FWS signed an Agreement for Cooperation in the Conservation of Wildlife. Under this agreement, a Mexican-U.S. Joint Committee on Wildlife Conservation was established to serve as the joint coordinating body for bilateral efforts in such areas as the conservation of threatened or endangered species of wild flora and fauna, exchange of wildlife specimens, and management of migratory birds.

The Joint Committee has a mandate to address five priority issues for both countries. These include:

-species in danger of extinction;
-management of species in protected areas;
-migratory species;
-technical assistance; and
-legal and administrative issues.

SEDUE, through the Directorate General for the Conservation of Natural Resources (DGCERN), and the U.S. Department of the Interior (DOI), through FWS, have conducted annual meetings for the design, evaluation, monitoring, and planning of specific projects designed to address the priority issues mentioned above and to involve research and academic institutions, non-governmental organizations (NGOs), interested citizens groups, and local authorities on both sides of the border.

In spite of these efforts, the populations of a number of species of migratory birds are declining. Reduction of habitat appears to be a problem for both summering grounds in Canada and the Northern United States and winter grounds in Mexico and the U.S. Therefore, representatives of the U.S. Western Governors' Association, the Mexican-U.S. Border Governors' Conference, and the Western Premiers' Conference of Canada are developing plans to manage the ecosystems of the Mid-Continent Flyway.

The United States has also undertaken a significant effort to train Mexican officials in the procedures employed to enforce the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Mexico's recent accession to CITES marks an important step in efforts to address the illegal trade in wildlife and will continue to require cooperation between the two countries.

The U.S. Forest Service has had a cooperative agreement with Mexico's Forest Service since 1985. Joint projects include firefighter training, cooperative research on insects and pest control, protecting migratory bird

habitats, and remote sensing inventories of Mexico's forests. Technical assistance efforts include training in techniques to inventory forest resources and produce maps of existing forested areas throughout Mexico based on satellite data. The U.S. Forest Service will implement the 1985 Cooperative Agreement with the Forest Service of Mexico under the auspices of the North American Forest Commission.

Important conservation work is also conducted under the trilateral Mexico-U.S.-Canada MOU on the conservation of wetlands, signed by DGCERN, FWS, and the Canadian Wildlife Service of the Department of the Environment of Canada, in March 1988. These wetlands are used by aquatic and migratory birds throughout North America as hibernation areas and feeding grounds. It also establishes a Trilateral Committee among Mexico, the United States, and Canada to carry out joint projects designed to protect and preserve wetland areas which are essential to the survival of aquatic and migratory birds.

Pursuant to the MOU, cooperative projects are carried out by FWS and SEDUE in Mexico under the U.S. North American Wetlands Conservation Act and the North American Waterfowl Management Plan. Appropriations under the Act provide significant levels of funding for the development of projects for wetlands conservation and the protection of aquatic and migratory birds in all three countries. The budget for these projects is administered by a committee on which representatives of Mexico and Canada participate as ex-officio members. Work is also underway to identify wetland and wintering sites for migratory birds which are considered priority areas for trilateral cooperation.

In 1988, SEDUE and NPS signed an MOU on Cooperation in Management and Protection of National Parks and Other Protected Natural and Cultural Sites. National parks are particularly important in the Border Area and comprise approximately 18 percent of the Border Area on the U.S. side. Big Bend National Park, for example, is a designated international biosphere reserve. Cooperation in this area is increasing and NPS recently set up a Mexico Coordination Office in Las Cruces, New Mexico.

This MOU established the Joint Committee for the Management and Protection of National Parks and Other Protected Natural and Cultural Sites, coordinated by SEDUE, through DGCERN, and DOI through FWS.

The Joint Committee has a mandate to address five priority areas, of interest to both countries:

- planning and management of protected areas;
- operation of protected areas;
- environmental education with regard to, and interpretation and designation of, protected areas;
- assessment and capacity building; and
- legal and administrative issues.

Mexican and U.S. officials have also been discussing the possible creation of counterpart parks along the border. SEDUE and NPS are discussing the establishment of a protected area adjacent to Big Bend National Park that would include the Sierra del Carmen. SEDUE plans to develop the park in Mexico primarily for the protection of the fragile Chihuahua Desert environment. Another proposal being considered is the establishment of a Greater Sonoran Desert Biosphere Reserve that could include such areas as Organ Pipe Cactus National Monument, Cabeza Prieta Game Refuge, and Pinacate Reserve. Workshops have been proposed to bring the principal planning and land management agencies together to discuss regional cooperation for protection of these resources.

For the past several years, the U.S. Agency for International Development (A.I.D.) has funded conservation projects in Mexico. Several of these projects are directly related to the border environment. For example, in 1991, A.I.D. provided a grant to The Nature Conservancy to assist Mexican Government agencies in the management and protection of Mexican national parks, including parks located along the border. An A.I.D. grant to the World Wildlife Fund is being used to develop and implement pilot buffer zone management projects in Mexico. One of those projects will include baseline ecological studies, master planning, institution building, and management practices in forests along the border.

Mexico and the United States have an extensive relationship in the area of fisheries and marine resources in the Gulf of Mexico and the Pacific Ocean. At the technical level, Mexican and U.S. scientists have worked together for years on issues of mutual interest and concern, including the exchange of data and information on a variety of shared resources on both coasts through two long-standing cooperative scientific programs.

Both countries worked to have the Gulf of Mexico designated as a specially protected area under Annex V to MARPOL 73/78. This proposal was expanded to encompass the Wider Caribbean Region (including the Gulf of Mexico). The designation will require stringent restrictions on the disposal of wastes resulting from the normal operation of ships in the Gulf of Mexico. In addition, under the 1980 Agreement of Cooperation between the United States of America and the United Mexican States Regarding Pollution of the Marine Environment by Discharges of Hydrocarbons and Other Hazardous Substances, the two countries have established contingency plans to address oil spills and other related marine emergencies in shared waters that help protect the Border Area.

With regard to the marine environment of the Border Area in general, NOAA monitors the concentrations and effects of pollutants in the coastal marine environment on both the Pacific and the Gulf of Mexico portions of the Border Area. Mexican and U.S. marine pollution monitoring activities will be coordinated as part of the Plan's overall environmental monitoring and assessment activities.

Both countries were also active in recent regional efforts to reach agreement on a Specially Protected Areas and Wildlife (SPAW) Protocol (1990) to the Cartagena Convention. Under this Protocol, signed by Mexico, the U.S., and other Caribbean region countries, the parties have agreed to cooperate in identifying and protecting ecosystems and species that may be at risk. When it becomes effective, the SPAW Protocol will provide an important mechanism for addressing areas of concern, including endangered species and such fragile ecosystems as coral reefs, sea grasses, and mangroves. As discussed on Page III-11, under the Cartagena Convention, Mexico and the United States are jointly assisting UNEP in developing a protocol for the Wider Caribbean Region (including the Gulf of Mexico) to reduce land-based sources of marine pollution which could diminish flows of such pollutants northward from the Caribbean along the Texas coast. All the conservation measures discussed in this section, as they affect the Border Area, will be reviewed prior to the second stage of the Plan.

2. Projects Developed to Date

The Joint Committees referred to above have developed projects and studies to respond to specific natural resource problems and emergencies in the Border Area. These projects and studies are listed according to the committee which developed them, as follows:

a. Joint Committee for the Conservation of Wildlife

(1) Endangered Species

- Project for the conservation of the berrendo and other native fish of Sonora;
- Project for the conservation of the Mexican wolf in Chihuahua and New Mexico;
- Project for the conservation of native cacti; and
- Study of populations of the royal eagle, the bald eagle, the plumed falcon, the peregrine falcon, the spotted owl and the miniature guacamaya in the States of Sonora, Baja California, Sinaloa, Tamaulipas, Nuevo Leon, and Coahuila.

(2) Migratory Species

- Evaluation of populations of the white-winged dove in Tamaulipas;
- Aerial studies of Pacific and Gulf of Mexico flyways;

- Identification of refuges for neotropical migratory birds that winter in Mexico and migrate from border regions in the United States (proposed project for 1992-1994);

- Study of the habitat of the snow goose in Chihuahua and Durango;

- Study of the habitat of the golondrino duck which winters on the western coast of Mexico with subpopulations of the white-headed goose on the northern Pacific coast;

- Study of Baja California habitats of beach birds and migratory water birds; and

- Study of the general habitats of migratory birds.

(3) Species in Protected Areas

- Monitoring and evaluation of cacti in risk of extinction in the Cuatro Cienagas Biosphere Special Reserve, Coahuila;

- Monitoring and evaluation of populations of prehistoric blind fish in the Cuatro Cienagas Biosphere Special Reserve;

- Basic studies of populations of black bears in the Maderas del Carmen, Coahuila; and

- Monitoring and evaluation of cacti populations in the Tamaulipas Biosphere of the Sky Reserve.

(4) Issues of Technical Capacity Building

- Capacity building for inspectors and SEDUE oversight personnel of the means of identifying species in commerce;

- Capacity building for SEDUE personnel on CITES regulations; and

- Establishment of a permanent training course dealing with protected areas.

(5) Legal and Administrative Issues

- Development of publications to assist in the identification of forest flora and fauna, products and by-products derived from those flora and fauna, and products confiscated through inspection and surveillance;

- Establishment of inspection and surveillance programs in the following border locations, which are authorized ports of entry for flora and fauna and their by-products: Tijuana, Baja California; Ciudad Juarez, Chihuahua; and Nuevo Laredo, Tamaulipas in Mexico; and San Diego, California; El Paso, Texas; and Laredo, Texas in the United States. The objective of these programs is to control illegal traffic in cacti, orchids, birds, wildcats, and other natural products imported from Mexico into the U.S.

b. Trilateral Committee Among Mexico, the U.S., and Canada for the Conservation of Wetlands

- Designation of the habitat of aquatic migratory birds in Laguna Madre, Tamaulipas, Mexico;

- Population surveys of migratory birds and analysis of the Colorado River delta habitat and;

- Conservation and management of: the salt marshes of Topolobambo and Bahia de Pabellon in Sinaloa; Laguna Ojo de Liebre, Laguna San Ignacio, and Bahia Magdalena in southern Baja California; and Laguna Bavicora in Chihuahua. These are all priority wetlands which provide essential habitat for nesting and wintering of the geese and shore birds of the southern United States.

c. Joint Committee for the Management and Protection of National Parks and Other Protected Natural and Cultural Sites

(1) Planning and Management of Protected Areas

- Fifth course on the management of protected areas;

- Course on the management of protected areas in humid tropical zones, focusing on the habitat of neotropical species that migrate from regions bordering the United States (1992); and

- Fifth regional conference addressing wildlife, protected areas and recreational use issues in the Border Area, to be held in 1992.

(2) International Seminar and Workshop on Environmental Education and Nature Interpretation

3. Technical Training

SEDUE is in the process of developing and conducting the following technical training projects.

- Studies concerning the Kikapoo Indians who migrate between the U.S. and Mexico;

- Studies concerning the Boquillas del Carmen and Maderas del Carmen National Parks in Coahuila, areas protected as "sister parks" of Big Bend National Park;

- Training courses for administrators and park security officers (1992);

- Training course on the formulation of management plans in protected areas (1992);

- Workshops on environmental education for teachers in rural districts near protected areas in the border region, such as: the Park of the National Constitution of 1857 in Baja California; the Biosphere Reserve in Project "El Pinacate" in Sonora; the Cascada de Basasseachic and Tecuan National Parks in Chihuahua; the protected areas of Cañon de San Lorenzo, Cuatro Cienegas, Boquillas del Carmen, and Maderas del Carmen in Coahuila; the Cumbres National Park in Monterrey; the Sabinal National Park in Nuevo Leon; and the Cielo and Los Novillos Reserves and the white-winged dove nesting reserve in Tamaulipas; and

- Technical training on the management of reserves designed for recreational uses.

SEDUE is cooperating with various governmental entities in conducting the projects described above, including: the Governments of the States of Sonora, Tamaulipas, and Coahuila; FWS; and the game and wildlife departments of Arizona, New Mexico and Texas, among others.

In addition, SEDUE has worked with, or is currently working with, diverse academic and research institutions in conducting the above-referenced projects. These institutions include: the Universities of Tamaulipas, Baja California, Chihuahua, Guadalajara, Nuevo Leon, and Antonio Narro; the Jalisco Research Center; the Monterrey Technological Institute; the University of Texas; and the Sonora Ecology Center. The following environmental organizations are also involved in these activities: Ecosfera, Pronatura, Naturalia, Profauna, The Nature Conservancy, the Patuxent Wildlife Research Center, the Peregrine Fund, Conservation International, Dumac, Ducks Unlimited, the World Wildlife Fund, the Aragon Zoo, the Chapaultepec Zoo, and the San Cayetano Wildlife Station.

J. URBAN DEVELOPMENT ISSUES (For implementation plan, see page V-45)

As noted earlier (see Section III.B), the population of major sister cities in the Border Area has grown rapidly in recent years. This has led to increased pressures on the region's urban infrastructure. In Mexico, growing infrastructure deficits in housing, paved roads, and public works are having adverse environmental and health impacts throughout the Border Area. Increased economic activity in Mexico has attracted a population which has, in turn, contributed to a housing shortage and the proliferation of unplanned communities, many of which are adjacent to industrial areas.

The establishment of enterprises in the Border Area should be the result of careful planning. In accordance with this objective, the Mexican General Ecology Law requires all new enterprises seeking permission to operate in the Border Area to be evaluated in terms of their environmental impact and risk. In this way economic development will be made compatible with environmental protection and public safety.

As of early 1991, Mexican authorities had identified over 1,100 maquiladoras whose activities require environmental risk analysis to determine their regulatory status.

However, urban development problems are not restricted solely to the Mexican side of the border. In the United States, the growth in cross-border commerce during the 1980s has made many of the commercial ports of entry physically obsolete. There are also well known problems with rural, unincorporated subdivisions (colonias) in U.S. border counties. These colonias are characterized by substandard housing, inadequate roads and drainage, and substandard or nonexistent water and sewage facilities. The residents of colonias face many of the same health risks found on the Mexican side of the border (see Environmental Health in the Border Area, Section III.G).

1. Mexican Urban Development Program

Given that the demographic growth of the border cities is contributing to the commercial development of the Border Area, it is indispensable that this growth be handled appropriately. It has resulted in a significant demand for goods, services, and housing and increased pressure on urban infrastructure. The situation threatens to accelerate the deterioration of the environment due to the excessive demands being made on it for material and energy resources. The stress placed on the environment and existing infrastructure places limits on the effectiveness and profitability of development projects or actions.

In order to address this problem, an urban development assistance program has been formulated for Mexican border cities, the intent of which is to increase local productivity and raise the standard of living of the inhabitants. The program focuses on the changes caused by commercial growth in the affected areas and defines objectives and strategies for dealing with these changes. The program, which will be carried out by the Mexican Government, emphasizes identification of the current weakness in infrastructure, addresses the dynamics of commercial trade and the underdevelopment of these populated areas, and identifies specific measures which would increase the efficiency and productivity of the border cities. In addition, it will analyze the current sources of funding for public works and development, including independent development organizations and state and local institutions.

In cities on the Mexican side of the border, due to the lack of adequate urban housing for people of low income, villages have developed which lack the basic services that help create acceptable living conditions. These villages generally are located in greater metropolitan areas lacking the infrastructure necessary to provide them with basic services. These villages are important sources of environmental contamination due to the lack of drainage, paved roads, and waste collection systems. In order to resolve these problems, parcels of land will be reserved for low income families in urbanized areas so that services needed for satisfactory living conditions can be obtained on a cost-effective basis.

2. U.S. Colonias

According to a November 1990 U.S. General Accounting Office (GAO) report, "Rural Development: Problems and Progress of Colonia Subdivisions near the Mexican Border," an estimated 215,000 residents of Texas and New Mexico reside in colonias. Sixty percent of the Texas colonias have water supplies, but less than 1 percent have sewage systems. According to the GAO report, there are more than 824 colonias in six Texas counties alone. This figure does not include one hundred colonia subdivisions in Pueblo Socorro, Texas that have an estimated population of 15,000 inhabitants. In New Mexico, 80 percent of the colonias have water but only 7 percent have sewer systems. In colonias without public water systems, residents typically use shallow wells that

are often easily contaminated by private septic systems. In colonias without sewers, residents typically use septic tanks and privies which do not meet public health standards.

Lack of potable water and proper sewage disposal in the colonias have resulted in a very high rate of hepatitis A in El Paso County, Texas. Shigella dysentery is also a serious health problem. In El Paso County there are 350 colonias with a population of about 68,000 lacking either proper sewage disposal or the benefit of potable water. A study by the University of Texas Health Science Center revealed that by the age of 8 years approximately 35 percent of the children of the colonias had already been infected with Hepatitis A, and that by the age of 35 years, some 85 to 90 percent of the residents had been infected with Hepatitis A. Figures for the Rio Grande Valley (Brownsville, McAllen, and Laredo, Texas) are worse.

Both Texas and New Mexico have funding programs for water and sewer development needs in colonias. Texas authorized a $100 million bond issue for water and sewer projects in economically distressed counties and in all counties adjacent to the Mexican border and recently approved an additional $150 million bond issue to further assist the colonias. Since 1987, the State of Texas has had authority to require developers to provide water and sewer systems to buyers of real estate. While state and local efforts in New Mexico have provided public water supplies to colonias, efforts to provide sewer systems have not been as successful. The U.S. Government, through EPA, has made available $15 million in loans to fund residential plumbing connections to homes in Texas colonias.

Housing developments similar to colonias have also emerged in Arizona and California. In Arizona, lots are often split into three parcels (the maximum allowed by state law) and then subdivided further, creating unregulated developments. These developments are similar to colonias with respect to their lack of a potable water supply, although the sewage systems of individual housing units must be approved by state authorities in Arizona. In areas of California, such as San Diego, the lack of affordable housing for legal and illegal aliens has resulted in the unauthorized occupation of land owned by others. Such "settlements" in California are not, therefore, like the Texas and New Mexico colonias in which unincorporated subdivisions are built on parcels of land that are reportedly sub-leased. However, they are characterized by the presence of little or no shelter, water, or sewage facilities.

3. Additional Binational Initiatives

Mexico and the United States maintain cooperative relations in the area of urban development through SEDUE and the U.S. Department of Housing and Urban Development (HUD). Cooperative efforts include the harmonization of urban development/land use plans for sister cities and the establishment of binational border urban development round tables for all sister city pairs.

These initiatives seek to better define existing capabilities in zoning, land use policies, infrastructure (bridges, border crossings, and roads), and the utilization of natural resources for sister cities located along the border in order to facilitate improved bilateral coordination and cooperation in the cross-border movement of persons, goods, services, and traffic (rail, automobile, and commercial carriers.)

K. BORDER INFRASTRUCTURE/BRIDGES AND BORDER CROSSINGS

To facilitate the cross-border flow of commerce and to reduce the impact of border traffic delays upon air pollution, Mexico and the U.S. have undertaken a coordinated Border Area infrastructure initiative through the Binational Group on Bridges and Border Crossings. This group will coordinate the planning and construction of additional border crossings along the Mexican-U.S. border in the immediate future. These collaborative efforts will be undertaken jointly by the Governments of Mexico and the United States.

In the United States, the U.S. General Services Administration (GSA), under the auspices of the Southwest Border Station Capital Improvement Program, is modernizing and expanding existing border stations and building new stations. In the U.S., $357 million has been appropriated for the program started in fiscal year 1988 for work on 52 projects. These projects extend from Brownsville, Texas to San Diego, California. By the end of 1991, GSA completed some 27 projects. Most of the 52 projects will be completed by the end of 1994. When complete, the program will have constructed 772 new truck docks. These docks will be able to handle over 8 million trucks annually -- four times the truck traffic handled in 1990. In addition, there will be expansion capacity for over 1,000 additional truck docks. These facilities should be able to handle northbound commercial traffic until well into the next century.

L. OTHER MULTIMEDIA ISSUES

The Mexican and U.S. Governments are addressing relevant data needs and other multimedia issues in the Border Area. These actions involve the following:

- Obtaining information on industrial sources;
- Conducting training programs;
- Developing methods of technology transfer;
- Developing methods to track industrial facilities usage of hazardous materials and disposal of hazardous wastes;

- Obtaining and exchanging information on existing disposal and storage facilities for hazardous waste, including information on their operation and control;

- Performing risk studies;

- Performing monitoring studies;

- Conducting cooperative training visits to facilities;

- Exchanging enforcement information;

- Developing private pollution prevention initiatives; and

- Developing an industrial chemical stockpile data sharing capability between sister cities pairs.

SECTION IV
ENVIRONMENTAL PRIORITIES

A. GENERAL

The 1983 Border Environmental Agreement authorizes SEDUE and EPA to establish technical advisory groups to address environmental issues facing the Border Area. The first annual meeting of National Coordinators designated under the 1983 Border Environmental Agreement was held in November 1984 to institute such groups. Following this meeting, three Work Groups were staffed from SEDUE, EPA the IBWC, the Mexican Ministry of External Relations, and the U.S. Department of State to address the topics of water pollution, air pollution, and pollution from hazardous waste. Work Groups on contingency planning, cooperative enforcement strategy, and pollution prevention were added later. The topic of training was also included in the agenda of each group. These Work Groups meet with the National Coordinators at least once a year to discuss significant issues along with past and future activities.

In December 1990, representatives of SEDUE, EPA, the foreign ministries of Mexico and the U.S., and the IBWC met in Washington, DC, in response to the request made by President Salinas and President Bush in Monterrey, Mexico on November 27, 1990, that an environmental plan be prepared for the Border Area. SEDUE and EPA agreed to seek a risk-based approach to prioritize environmental issues in the Border Area. It was acknowledged that a quantitative risk assessment could not be conducted at this time due to a lack of sufficient data which would have to be accumulated as the first stage of the Border Environmental Plan is put into effect.

The following qualitative approach was adopted to set priorities for this first stage of the Border Environmental Plan, with the goal of conducting a further review of priorities during the preparation of the Plan's second stage in 1994.

In January 1991, the Work Groups met in Dallas, Texas to establish environmental priorities for the Border Environmental Plan based on a comparison of actual and potential risks. Participants at the meeting contributed their technical experience, knowledge, and professional judgment. In addition to working on setting environmental priorities, the Work Groups prepared outlines for action plans based on the results of the priority-setting exercise.

Both EPA Region 6 (including Texas and New Mexico) and EPA Region 9 (including California and Arizona) have recently conducted comparative risk projects to identify and evaluate the human health and ecological risks posed by environmental problems in their respective regions. In this process, risks, both quantitative and qualitative, were determined, and each region developed a relative ranking of the risks associated with the particular environmental problems. The results of this experience provided the Work Group participants with useful insight into how environmental priorities for the Border Environmental Plan should be set. Participants from both SEDUE and EPA had also reviewed the EPA Science Advisory Board's report entitled *Reducing Risk: Setting Priorities and Strategies for Environmental Protection* (EPA-SAB-EC-90-021A-C).

B. ENVIRONMENTAL HEALTH

The evaluation of environmental priorities in the Border Area has been assisted by the recent "Project CONSENSO Final Report" on state and local environmental health priorities of border communities, discussed in Section III.G. Environmental health is one of the principal concerns of the region. These environmental health concerns were described as follows in the Project CONSENSO Report of December 1990:

- Environmental conditions directly affect the whole border population. Further, in terms of the environment, solutions will be effective only if issues are addressed binationally. General considerations included:
  - The need to improve the urban infrastructure associated with the provision of basic services such as potable water and proper solid waste disposition.
  - The need, due to the emergence of the maquiladora industry, for surveillance, accountability, and the proper disposition of hazardous waste.
- Specific areas addressed include:
  - Water, soil, and air pollution
  - Hazardous wastes
  - Education and legislation

All these topics are also addressed in this Border Environmental Plan.

To ensure expert and continuing attention to environmental health considerations in the Plan, regular consultations by SEDUE and EPA with the El Paso regional office of PAHO, and with SSA and PHS are being

instituted. These entities will be collaborating closely in order to support mutual objectives. Discussions are underway concerning appropriate mechanisms for at least annual consultations.

C. TYPES OF RISK

Environmental priorities in this Plan have been assessed on the basis of combined impacts to public health and welfare and the environment. Problem areas have been identified through experience with known violations of current environmental laws. The environmental issues determined to pose the greatest risk to the Border Area were identified as water scarcity and contamination, problems associated with the transboundary movement of hazardous waste, air pollution, and chemical emergencies. Although exposure to pesticides was not ranked high by the Work Groups, it was decided that pesticides should be included in the Plan for monitoring and potential action purposes.

SEDUE and EPA agreed that action plans to deal with the four major environmental problem areas covered by the Work Groups should be incorporated into the Border Environmental Plan as follows:

1. **Media specific issues** including municipal wastewater, water supply sources, and air (e.g., ozone and particulate matter);

2. **Source control issues** including industrial wastewater, hazardous waste, air toxics, and accidental releases;

3. **Hazardous and municipal waste issues** including import/export of hazardous waste, abandoned or illegal hazardous waste sites, and municipal solid waste sites along with the collection and transportation of municipal solid waste; and

4. **Emergency response/contingency planning** including the development and coordination of all affected agencies to prepare, train, and respond to potential/actual accidental releases.

D. REGIONAL PRIORITIES

The Work Groups also agreed to target major implementation activities in the first stage of the Plan geographically, concentrating on the largest sister city areas along the border which were determined to have the highest risks from environmental contamination based on the severity of the problems and population density.

While the Work Groups agreed that these geographic target areas should receive primary attention in the first stage of the Plan, it was also agreed that other sister cities and their related environmental issues should be included in the Plan, along with other non-geographic environmental issues facing the Border Area. As the Plan evolves and is reviewed, environmental priorities will be evaluated and revised or modified as appropriate.

The initial geographic target areas identified by the Work Groups are Tijuana/San Diego, Mexicali/Imperial County, Nogales/Nogales, Ciudad Juarez/El Paso, Nuevo Laredo/Laredo, and Bajo Rio Bravo/Lower Rio Grande (Matamoros/Brownsville and Reynosa/McAllen). The groups evaluated the environmental issues that both Mexico and the United States had ranked high for each of these areas. An effort was made not to prioritize environmental media for the whole Border Area but rather to rank those media of concern with respect to each geographic target. The Work Groups emphasized that though these areas were initially targeted, other areas will be evaluated as experience is gained when implementation plans are instituted, or as better data on public health and ecological risks become available.

It was agreed that the following media-specific initiatives should be geographically targeted in implementation plans as follows:

Tijuana/San Diego - municipal wastewater and ozone/carbon monoxide
Mexicali/Imperial County - municipal wastewater and particulate matter
Nogales/Nogales - municipal wastewater and particulate matter
Ciudad Juarez/El Paso - ozone/carbon monoxide and particulate matter
Nuevo Laredo/Laredo - municipal wastewater
Bajo Rio Bravo/Lower Rio Grande - municipal wastewater and water supply sources

The group agreed that control of industrial sources should initially be focused in Tijuana/San Diego and Ciudad Juarez/El Paso and, later, in the other sister cities. Industrial source controls are process-oriented and involve multimedia responses. The Work Groups recommended that solutions to this problem be pursued through a combination of government and private initiatives.

It was recommended that some of the efforts to address problems associated with the import/export of hazardous waste should initially be focused in the Tijuana/San Diego, Ciudad Juarez/El Paso, and Bajo Rio Bravo/Lower Rio Grande (Matamoros/Brownsville and Reynosa/McAllen) areas.

In addition, the Government of Mexico has established the following geographically targeted multi-media initiatives on a unilateral basis during the Plan's first phase (1992-94):

Tijuana - solid waste management and transportation infrastructure

Mexicali - transportation infrastructure

San Luis Rio Colorado - municipal wastewater

Nogales - solid waste management

Ciudad Juarez - municipal wastewater, solid waste management, and territorial reserves

Piedras Negras - municipal wastewater

Reynosa - municipal wastewater, solid waste management, transportation infrastructure, and territorial reserves

Matamoros - solid waste management and roads

E. GENERAL PRIORITIES

Several environmental issues were identified that do not have a specific geographic focus but need to be addressed border-wide. In particular, maquiladoras raise multimedia source concerns throughout the Border Area. This issue will be addressed in all the implementation plans. Other border-wide issues include the import/export of hazardous waste, abandoned or illegal hazardous waste sites, municipal waste sites, and unplanned urban areas.

There are border-wide issues peculiar to the Mexican and U.S. sister cities such as contingency planning/emergency response. The relevant Work Group recommended that contingency planning/emergency response be scheduled for all sister cities, and that the information obtained through such activities be shared with all interested parties.

The public is impacted by the activities of the regulated communities of both countries. The regulated communities, engaged in transboundary commerce, must be responsive to the regulations of both countries. Therefore, additional technical and educational outreach is necessary, tailored specifically to the needs of the Border Area and reaching border-wide.

SECTION V

IMPLEMENTATION OF THE BORDER ENVIRONMENTAL PLAN

(First Stage, 1992-1994)

This section describes specific actions that SEDUE, EPA, and the other relevant environmental agencies intend to implement during the first stage of the Plan (1992 - 1994). Further refinements and other environmental media needs will be a priority in later stages of the Plan. The action items have been prepared by SEDUE/EPA Work Groups and reviewed by the relevant participants.

SEDUE and EPA will be primarily responsible, pursuant to the 1983 Border Environmental Agreement, for ensuring full coordination and implementation of activities under this Border Environmental Plan. The IBWC will carry out its mandate under the provisions of the treaties currently in effect. Other Federal, state, and local agencies, as well as industrial and non-governmental organizations and the IBWC, are each expected to play an integral part in carrying out activities under this Plan.

While media-specific implementation plans are set out in this section, it is expected that integration will occur through data collection tasks, technology transfer, exchange of multimedia pollution prevention information, and cross-over benefits of reducing toxic and hazardous materials in the work place. Implementation of the hazardous waste plan, for example, will serve the goals of several implementation plans by controlling potential sources of surface and ground water contamination, reducing emissions of toxic substances into the air, and lowering the risks of accidental releases or spills. In this fashion, activities within the IBWC, Federal, state and local agencies, and between governments can be designed to ensure maximum benefit to the Border Area.

Funding for specific actions outlined in this first stage of the Plan (1992-94) will come from a variety of sources, including commitments from the Mexican and U.S. Governments, state and local governments in the Border Area, and the private sector (See Border Environmental Plan Funding, Section V.C). A portion of SEDUE's financial resources to address environmental problems in the Border Area is expected to come from a U.S. $50 million World Bank loan, combined with a U.S. $38 million counterpart commitment from the Mexican Government.

The total Fiscal Year (FY) 1992 and 1993 financial commitment by the U.S. Government for environmental protection along the border is $384 million. The Mexican Government has allocated U.S. $460 million over a three year period (1992-1994) for urban infrastructure projects along the border, including not only municipal wastewater treatment but solid waste management, highways and the creation of "territorial reserves."

A. SPECIFIC IMPLEMENTATION PLANS

The specific implementation plans set out below collectively constitute the first stage, 1992-1994, in a continuing process of assessing and responding to the Border Area's environmental needs. Each has at least three major components: data collection, information and technology transfer, and specific implementation initiatives.

The Border Environmental Plan envisions an integrated approach to implementation of numerous environmental solutions. Specifically, it seeks to achieve four goals:

1. Continue media-specific and multimedia monitoring and pollution control activities in the Border Area, including the performance of baseline and periodic environmental health risk assessments;

2. Strengthen current environmental regulatory activities, as appropriate, in the Border Area through new SEDUE-EPA cooperative programs and projects supplementing the 1983 Border Environmental Agreement as needed;

3. Mobilize additional resources for pollution prevention and control in the Border Area; and

4. Supplement current pollution control programs through pollution prevention and voluntary action programs.

Examples of cooperative multimedia activities include: development of a uniform data base to be used for risk based management; inspections of industrial facilities generating hazardous waste, wastewater discharges, and air emissions; sponsorship of industrial conferences focusing on water, hazardous waste, air, and emergency response/contingency planning and compliance issues; and promotion of waste minimization, source reduction, and other facets of pollution prevention programs. Private sector pollution prevention initiatives include: voluntary reporting of wastes generated or emitted; industrial waste minimization; and source reduction, recycling and reuse. The significance of the slightly different definitions of hazardous waste in the two countries will be evaluated and addressed.

Implementation topics are discussed in the following order:

- enforcement
- multimedia industrial source control requiring government and private initiatives
- water quality
  - water supply (including ground water monitoring), control of municipal and industrial wastewater, colonias, and rural sanitation
- air quality
- contingency planning/emergency response
- wastes
  - transboundary movement of hazardous wastes
  - abandoned or illegal dump sites
  - solid waste
- pollution prevention
- environmental education

Although the majority of the Plan focuses on the sister cities in the Border Area with the highest populations, this is not meant to exclude environmental activities at other locations. These sister city pairs serve as models for addressing environmental issues across the entire Border Area. Scheduled environmental projects in sister cities will be completed as planned and additional environmental projects will be funded as resources become available.

1. SEDUE/EPA Cooperative Enforcement Strategy

A SEDUE/EPA Cooperative Enforcement Strategy Work Group has been charged with the task of coordinating cross-cutting enforcement issues and of focusing attention on various aspects of enforcement over the three-year implementation period for the first stage of the Plan. The U.S. participants also include representatives from the Departments of State and Justice. In addition to SEDUE, the Mexican participants also include representatives from the Secretariat for External Relations (SRE), and other Mexican Government agencies.

While recognizing the sole and sovereign responsibilities of each government for law enforcement in its respective jurisdiction and territory, Mexico and the United States also recognize that damage to human health and the environment in the Border Area may be reduced through increased cooperation, and that a cooperative enforcement strategy is necessary to promote compliance and ensure the integrity of environmental laws and requirements. The strategy will include actions to be taken by each government to require compliance with environmental laws and regulations, within its respective jurisdiction. They further agree that, because the environmental problems of the border are common to both countries, a cooperative enforcement strategy between the two governments to promote compliance with their respective environmental laws can achieve and convey a more effective message of deterrence. They recognize that compliance can also be fostered by addressing infrastructural needs and public attitudes to ensure that technological development and human and financial resources make compliance by the regulated community feasible. To this end, the Mexican Government has recently executed a training and technology compact with key elements of the Mexican industrial community and a number of universities that should help assure the availability of pollution control equipment and technical expertise to Mexican industry.

In 1992, SEDUE will spend U.S. $6.33 million on environmental enforcement, monitoring and associated control activities in the Border Area. Stricter controls will be placed on border crossings of raw materials and hazardous waste and environmental inspections will be stepped up through increasing regulation of the maquiladoras. This effort represents a strengthening of ongoing enforcement mechanisms, which have produced positive results. In 1989, only 6 percent of the maquiladoras had obtained operating licenses; in 1991, the percentage had increased to 54.6 percent. In 1990, 30 percent of the maquiladoras generating hazardous waste declared such activity; by 1991, this figure had risen to 55 percent.

The Cooperative Enforcement Strategy Work Group will coordinate and report on the various media-specific, multimedia, programmatic, and geographic enforcement initiatives and focus on particular high priority enforcement areas, such as hazardous waste.

The SEDUE and EPA cooperative enforcement strategy will include the following operational elements:

- **Targeting Violations** -- Enforcement will be "targeted" so that initiatives focus enforcement action by each government against priority targets, such as industries with poor compliance histories, specific pollutants, and sensitive geographic areas of mutual interest and concern;

- **Preventive Solutions** -- Pollution prevention/waste minimization is a principal goal of enforcement. Pollution prevention strategies will focus on either the medium in which the original violation occurred or require, within the scope of applicable regulations, reductions in emissions from other media in order to leverage the scope and impact of compliance agreements; and

- **Communications** -- Enforcement dissuades violation of the laws. SEDUE and EPA will use the stigma of unfavorable publicity to encourage industries to realize that noncompliance involves serious risks. The two agencies, within their respective countries, will cooperate in developing an enforcement communications capability to ensure that the public and the regulated community is informed about industry's record of environmental compliance and SEDUE's and EPA's enforcement accomplishments in the Border Area.

a. Cooperative Enforcement Strategy Work Group

The Cooperative Enforcement Strategy Work Group will meet regularly (no less than annually) and will:

1. Exchange information concerning priorities for the respective enforcement actions of both countries.

2. Establish subgroups comprised of appropriate representatives of both countries to cooperate on enforcement actions in agreed-upon priority areas. Representatives will exchange relevant information concerning enforcement priorities, develop plans for targeted enforcement and identify, if possible, opportunities for cooperative enforcement activities.

3. Develop compatible hazardous waste tracking systems to facilitate the exchange of data on the movement of hazardous waste within the Border Area and across the border, including compatible computer software.

4. Work with the Hazardous Waste Work Group to improve the effectiveness of border surveillance of hazardous waste shipments, including border checks and improved targeting, through training of border officials and increased presence of environmental specialists at key border crossings consistent with available resources.

5. Consistent with available resources, develop Spanish-language multimedia inspector training courses to be given at a border location in 1992, and conduct (under Mexican and U.S. law)

periodic bilingual hazardous waste inspector training courses in Region 6 for inspectors from both countries. Also, train Mexican and U.S. Customs inspectors in the identification and compliance monitoring of hazardous waste shipments.

6. Arrange exchanges of personnel to share experiences and develop technical skills to support enforcement.

7. Exchange information on laboratory facilities and analytical techniques; provide sample analysis in targeted situations to support enforcement.

8. Exchange information on emissions monitoring technology.

9. Exchange information on methodologies to support strong enforcement such as protocols for self-auditing and compliance certification.

10. Exchange, at least annually, statistics related to compliance with environmental laws, such as data concerning inspections, shutdowns, orders, fines collected, civil judicial actions, and criminal actions.

11. Submit to the National Coordinators, on an annual basis, a report on the activities and discussions of the Work Group.

Several activities associated with these operational elements are currently underway and will continue. Examples of recent cooperative enforcement strategy accomplishments include: coordination of investigations and enforcement efforts regarding illegal waste disposal such as the successful U.S. prosecution of a case involving drums of solvents, heavy metal contaminants and off-specification paints identified in Tijuana; the recent EPA filing of several administrative enforcement actions, developed with the cooperation of the Mexican Government, for violation of hazardous waste export laws; and a regional pilot project, which involved discussions among representatives of SEDUE, EPA, and some of the larger maquiladora facilities, intended to encourage a commitment to compliance by the maquiladoras.

b. Role of Private Companies in the Border Area

SEDUE and EPA will seek to ensure industry compliance in the Border Area with applicable environmental laws and requirements. SEDUE and EPA agree to focus on this as a highly visible

general policy and to exchange, when appropriate, information relating to the environmental conduct of transnational companies.

c. Information Exchange

SEDUE and EPA, working together with the U.S. Departments of Justice and State, will assist one another in accordance with the Mexican-U.S. Mutual Legal Assistance Treaty and the Hague Convention in future legal proceedings involving regulatory compliance.

d. Visits and Observer Participation

Officials of each agency will, subject to mutual agreement, participate as observers in visits to facilities located within the other country's Border Area. Efforts will be made to expand cooperative interaction of SEDUE and EPA personnel through such visits. Each government will make public the environmental compliance record of companies operating facilities in the Border Area.

2. Industrial Multimedia Source Controls Requiring Government and Private Sector Initiatives

The goals of industrial multimedia source controls are: to minimize the degradation of water, air, and land resources and to minimize environmental and public health threats by minimizing the use and discharge of hazardous substances in the environment. This is achieved through: (1) an assessment of industrial sources and risk; (2) regulatory review; (3) compliance with applicable regulations; and (4) private sector initiatives, including pollution prevention.

Assessment of industrial sources and risks involves the identification of the locations of industries in the Border Area and the nature of their actual and potential discharges and releases of hazardous substances into the environment. This is followed by an assessment of the potential human health and environmental risks associated with these discharges and accidental releases.

The private sector pollution prevention initiative consists of voluntary programs, established by industry and by non-governmental organizations in each country, to minimize waste and prevent pollution. In addition, voluntary programs could be established for items not specifically covered under the regulations of each country such as more extensive reporting of wastes generated or discharged. Typical examples of private sector initiatives are listed below:

- pollution prevention - changing chemical use or processes so that fewer toxic waste streams are produced;

- waste minimization - minimization of waste and releases through source reduction, the use of less toxic chemicals, or the recycling of waste;

- voluntary emissions reductions - voluntary reduction of pollutants;

- chemical safety audits - a review of facility management practices which might be applied to reduce the possibility of a significant, accidental release of hazardous materials from the facility; and

- corporate commitments to environmental ethics.

Implementation Plan for Industrial Multimedia Source Control

While ongoing activities continue, formal Plan implementation will begin in 1992. The Plan will be implemented initially in Ciudad Juarez/El Paso and Tijuana/San Diego and quickly expanded to other sister cities. A brief description of the relevant activities follows. (Quantitative objectives presented below are meant to be taken as potential targets for each year.)

Assessment

Identification of Facilities Producing Water, Air, or Hazardous Waste Discharges

- Track industrial facilities' production and usage of hazardous material and storage and disposal of hazardous waste to identify possible illegal disposal of waste. Develop estimates of waste quantities that a generator is expected to produce checked against documented quantities shipped domestically and internationally and/or reused or stored on-site (1992).

- Identify industrial facilities in two targeted sister city areas including the location, owner, type of pollution produced, and type of releases made into the air, water and land; develop information on U.S. corporate affiliations with maquiladora plants (1992).

- Develop a shared computer system to store facility information and other data (1993).

Study of Risk

- Begin collection of the discharge and release data necessary for the development of an initial comparative risk study (1992).

- Continue to collect the discharge and releases data necessary for completing the comparative risk study (1993).

- Collect discharge and release data until completed (1994).

Monitoring

- Begin ambient air, water, and ground water monitoring to assess the impact of industrial sources in the Border Area (1992).

- Improve access to laboratory facilities and information by EPA personnel in Mexico and SEDUE personnel in the United States (1992).

- Continue to monitor the impact of industrial sources (1993).

- Complete a substantial portion of the monitoring to assess the impact of industrial sources (1994).

Regulatory Review

- Exchange information concerning the full spectrum of applicable Federal and state statutes, regulations, policies, procedures and their development; translate these materials (1992).

- Increase cooperation among SEDUE, EPA, and Mexican and U.S. state and local officials and regulatory entities (1992).

Cooperative Visits to Facilities

- Conduct an increasing number of cooperative training visits to facilities in border sister city pairs in which officials of an environmental authority of one country participate as observers at the invitation of an environmental authority of the other country (1992).

Regulatory Program Implementation

Training

- As an expansion of existing efforts, develop and implement a training plan for SEDUE and EPA inspectors, regulation writers, and enforcement personnel working in the Border Area; training should include visits of selected personnel to specific facilities (1992).

- Institutionalize the training sessions (1993).

Communication with the Regulated Community

- Develop methods regarding transboundary technology transfer and dissemination of information to industry on pollution prevention, waste minimization, and waste recycling (1992).

- Begin preparations for the First Annual SEDUE/EPA Multimedia Environmental Educational Conference (1992).

- SEDUE and EPA speak at Fifth Annual Maquiladora Conference (1992).

- Hold Third Annual Joint Response Team Conference (1992).

- Hold the First Annual SEDUE/EPA Multimedia Environmental Educational Conference (1993).

- Continue to hold annual conferences on multimedia issues to enhance industry compliance (1994).

Initiatives for the Private Sector

Technology Transfer

- Initiate cooperative efforts on computer software to enable SEDUE and EPA to share relevant data bases more easily (1992).

- Develop mechanisms for SEDUE/EPA technology transfer (e.g., data/compliance information software, transfer of pollution control technology to regulators or regulated entities, and demonstration projects) (1992).

- Hold a three-day technology transfer conference regarding pollution prevention, waste minimization, and pollution control for the maquiladora industry in three border cities (1993).

The transfer of technology is important to:

- Increase the sensitivity of industry to the need to protect the environment.

- Develop a policy linked to a campaign of institutional incentives for the design and implementation of clean technologies as well as the development of recycling and waste management industries.

Voluntary Reductions

- Identify interested trade associations, citizen groups and other non-governmental organizations and begin meeting with these groups to receive input on voluntary industrial waste reductions (1992).

- The EPA Administrator and Regional Administrators from EPA Regions 6 and 9 will continue meeting with a number of chief executive officers of U.S. companies in the Border Area for them to consider a voluntary program to reduce pollutants (33 percent in 1992 and 50 percent by 1994). In addition, a serious effort will be made to encourage border facilities to make a 90 percent voluntary reduction in air toxics emissions (95 percent for particulates emissions) as called for by Title III (Hazardous Air Pollutants) of the CAAA.

3. **Protection of Water Quality/Conservation of Water Resources** (For current status, see pages III-1 through III-5).

Water quality implementation plans are discussed in terms of water supply, municipal wastewater, and control of industrial wastewater affecting water quality in the Border Area.

a. ***Surface Water Supplies*** (For current status, see pages III-3 through III-5).

The objective is to identify the sources and ensure the quality of the drinking water supplies of Mexican and U.S. Border Area communities that are supplied from transboundary surface sources (i.e., border rivers, lakes, and reservoirs).

The implementation plan for surface water supplies follows the section on Border Ground Water Supplies.

b. ***Border Area Ground Water Supplies*** (For current status, see pages III-3 through III-5).

In 1992, Mexico and the U.S. will initiate a program to monitor ground water sources and to inventory the source, quality and treatment process of existing drinking water supplies. The Governments of Mexico and the United States are concerned about adverse impacts on public health and the environment in border regions where transboundary ground waters may be contaminated or are threatened by contamination. There is no existing ground water treaty between the two countries. However, Mexico and the United States utilize the IBWC as the vehicle for exchange of information and consultations regarding border ground waters pursuant to the Water Treaty of 1944 and IBWC Minute No. 242. In the United States, EPA and the four U.S. border states share jurisdiction over border ground water quality matters within their respective boundaries. In Mexico, SEDUE and the National Water Commission (CNA) have corresponding jurisdiction. Border ground water aquifers that may be contaminated or are threatened with contamination will be identified. With such aquifers as a first priority, a cooperative Mexican-U.S. ground water quality monitoring program and data base will be developed through the IBWC, with the cooperation of responsible agencies of both countries. This process will require time for its implementation and will be initiated by data gathering in 1992 and identification of problem areas in 1993, along with the development of criteria for remediation. Among remediation alternatives could be enforcement actions by the proper agencies in each country, international construction projects, and other cooperative solutions and preventive measures.

EPA will also coordinate its efforts closely with the U.S. Department of the Interior's Bureau of Reclamation (USBR), which will initiate a new water resources investigation in 1992 that covers a portion of the Border Area. The USBR's Lower Rio Grande Basin Study will include the Texas portion of the Bajo Rio Bravo/Lower Rio Grande Basin from Amistad Dam to the Gulf of Mexico. It will also include portions of some counties in the adjoining Nueces-Rio Bravo/Rio Grande Basin. The USBR study will focus primarily on U.S. domestic water supply/demand issues. A special report will be completed by September 1995. This document will include present and projected populations, water demand by sectors, assessment of the available resources, evaluation of current and anticipated technologies, and options/alternatives for meeting future needs. Proposed end products will include development of water management computer modeling programs.

c. ***Implementation Plan for Surface Water and Ground Water Supplies*** (For current status, see pages III-3 through III-5)

- Based on data obtained from appropriate authorities in each country, SEDUE, CNA and EPA, working with the IBWC, will develop an inventory of the sources, quality, and treatment processes of the existing drinking water facilities of the sister city communities by the time of the 1992 meeting of the National Coordinators. In addition, each government will determine the priority needs for water supply treatment and distribution systems for existing and future development in the sister city communities (1992).

- SEDUE and EPA, working with the IBWC, will exchange information on surface and ground water protection programs (e.g., underground injection and storage tanks, wellhead protection, and storm water control) (1992).

- Through monitoring programs, SEDUE, CNA and EPA, working with the IBWC, will identify areas where any transboundary surface or ground water source or any potential transboundary water source is contaminated or where there is an identifiable threat of contamination to these sources of water (1993).

- SEDUE, CNA and EPA, working with the IBWC, will develop cooperative programs for solving identified problems under existing Mexican-U.S. agreements (1993).

d. ***Colonias and rural sanitation in the U.S.*** (For current status, see pages III-43 through III-44).

The objective is to provide basic indoor plumbing, safe drinking water and an acceptable method of wastewater disposal for the people living in the colonias.

Implementation Plan for the colonias

- The Texas Water Development Board (TWDB) and other relevant border state agencies will implement programs for disadvantaged areas financed by EPA, the Rural Development Administration (RDA) of the U.S. Department of Agriculture, and relevant state agencies.

- EPA and USDA, through the RDA, will provide colonia-related technology transfer assistance to the relevant state agencies.

- EPA and USDA will seek to establish a clearinghouse network to provide colonia residents with information on government grant and loan programs.

4. Border Wastewater Control (For current status, see pages III-5 through III-9).

a. Wastewater Treatment

The IBWC, in cooperation with SEDUE, EPA, and the CNA, will take an active role in assessing the existing and future public health/environmental threat associated with present industrial and municipal wastewater disposal practices in the Border Area. The Mexican and U.S. Governments will determine existing and future infrastructure needs for collection, treatment and disposal, and will conduct preliminary planning, and develop preliminary project budgets. Both governments will also determine the amount of industrial and urban growth projected for the next 10, 20, and 30 years.

The Mexican and United States Governments, in accordance with their respective national laws, shall ensure public involvement with a view to facilitating timely access by the public to information and data concerning water quality in their respective jurisdictions, including domestic and international wastewater treatment projects.

The Mexican and United States Governments, through appropriate agencies, are committed to assuring public environmental review procedures to analyze and take into account the environmental effects of their joint water quality activities. Such processes will comply with applicable existing laws of both Mexico and the United States, including all laws relating to public participation in any review process.

EPA will continue to provide training regarding wastewater facility operations, maintenance, and fiscal management.

Wastewater treatment implementation plans are set out separately for eight geographic areas: Tijuana/San Diego, Mexicali/Imperial County, San Luis Rio Colorado/Yuma, Nogales/Nogales, Ciudad Juarez/El Paso, Piedras Negras/Eagle Pass, Nuevo Laredo/Laredo, Bajo Rio Bravo/Lower Rio Grande (including Reynosa/McAllen and Matamoros/Brownsville).

(1) Tijuana/San Diego (For current status, see pages III-5 through III-6).

The objectives for this location are specified in IBWC Minute No. 283, and include:

- Eliminate all uncontrolled Tijuana wastewater flows and treat them in existing facilities through interim IBWC works;
- Provide adequate treatment at the new international treatment plant to be completed in 1995 for domestic Tijuana sewage; and
- Develop an industrial pretreatment program in 1992.

As discussed in Section III, the Mexican Government is participating in the financing of an international wastewater treatment plant in San Diego County near the international boundary with Mexico that would handle about one half of the projected sewage load from Tijuana to the year 2010. The international wastewater treatment plant would be one of several components of an international solution to the Tijuana border sanitation problem.

Three major components are included in the international treatment works:

- Construction of wastewater transport works in Tijuana;
- Construction of a land and ocean outfall in San Diego County near the international boundary; and
- Construction of a 25 mgd secondary treatment plant in San Diego County near the international boundary.

Implementation Plan for Tijuana/San Diego Wastewater

- Complete construction of the land portion of the ocean outfall component (1993).
- IBWC, SEDUE, and EPA complete their assessment of the need for development of an industrial pretreatment program (1992).
- Construct an international treatment plant under IBWC supervision (1992-1995).

As provided in IBWC Minute No. 283, the Mexican and U.S. Governments:

- Have reserved the right to return for reuse in their respective territories all or part of the international plant effluent corresponding to each country's sewage inflows;

- Are committed in all sanitation facilities constructed in the Tijuana Valley, to take measures to avoid negative impacts on both sides of the border;

- Are agreed that, in the event of a breakdown in sewage collection and detention facilities, the Government of Mexico will take special measures to immediately prevent such discharges and make repairs; and

- Are agreed that Mexico will operate and maintain, at its own cost, the integrated sewage collection system, as well as the conveyance and treatment facilities which have been constructed for Tijuana as described in IBWC Minute No. 270.

During 1992, the drainage collection systems for the primary sanitary sewer systems will be completed and will connect 24,000 dwelling discharges, which will reach 75 percent of the total coverage and will conclude the goals of the Interamerican Development Bank Tijuana project which includes the construction of a 195-km network, drainage collection systems, installation of pumping stations, pressure lines, and the 30,000 dwelling discharges.

Implementation Plan for the City of San Diego

The City of San Diego is currently planning a major expansion of its metropolitan sewage system. The city's program was created in 1987 to fulfill the following goals:

- Provide full secondary treatment of wastewater discharged to the ocean;

- Achieve the maximum amount of water reclamation possible to minimize dependence upon imported water supplies; and

- Accommodate future increases in wastewater flows.

The City of San Diego's plan includes the following features:

- A secondary treatment system consisting of the Point Loma and South Bay plants which would ultimately treat 205 mgd of wastewater prior to discharge of the treated water into the ocean;

- A water reclamation system consisting of seven plants with a capacity to treat 135 mgd to State of California standards for reuse;

- Sludge processing and disposal facilities for digestion of sludge generated by treatment and reclamation facilities; and

- A joint ocean outfall in the South Bay. This outfall will provide for disposal of effluent from the proposed IBWC international secondary treatment plant for Tijuana, as well as effluent from the city's South Bay secondary treatment plant and the excess reclaimed water from nearby reclamation plants.

(2) Mexicali/Imperial County (For current status, see page III-6).

The IBWC has sought an interim solution to the New River border sanitation problem at Calexico, California, and Mexicali, Baja California. Under the IBWC agreement in Minute No. 264, interim water quality standards are established for the New River at the international boundary, and Mexico has undertaken a number of corrective measures at its expense designed to meet those quality standards.

Implementation Plan for Mexicali/Imperial County Wastewater

The objectives for this location will be defined in an IBWC minute now under negotiation. Although agreement has not been reached, the minute contemplates a conceptual plan for the long-term solution of the New River problem including the following components:

- Achievement of the efficient operation of existing wastewater treatment lagoons;

- Completion of construction of new treatment facilities in southeast Mexicali to handle domestic and industrial wastewater from this industrial area of Mexicali;

- Elimination of all discharges of untreated domestic and industrial wastewater through expansion of the sewage collection system;

- Incorporation into the sanitary system called Mexicali II the wastewater of new urban development that will be generated as a result of the construction of the new Mexicali/Calexico port of entry; and

- Elimination of untreated wastewater discharges into the New River.

(3) San Luis Rio Colorado/Yuma (For current status see p. III-7)

The Mexican Government has unilaterally included San Luis Rio Colorado in the Plan as a result of problems experienced with wastewater treatment. Although there are no international implications, the improvements will have an important benefit for this location. It is anticipated that there will be an increase in the areas covered by the sanitary sewer systems and the construction of a treatment plant for wastewater during 1992.

(4) Nogales/Nogales (For current status, see page III-7).

The objectives in Nogales/Nogales are to ensure elimination of all uncontrolled wastewater flows and to begin an industrial wastewater pretreatment program.

In September 1988, the IBWC recommended, and the two governments approved, a further expansion to the Nogales International Wastewater Treatment Plant as stipulated in Minute No. 276 of July 26, 1988. This expansion is for the treatment of generated volumes, from both Nogales, Arizona, and Nogales, Sonora, until the year 2000, and is expected to be completed in early 1992. Capacity will increase from 8.2 mgd to 17.2 mgd of which Mexico's share would increase from 4.9 to 9.9 mgd. Mexico in turn is rehabilitating its sewer collection system to stop uncontrolled sewage flows across the border. The two governments are required to assure pretreatment to industrial wastes before discharge to the international plant.

Implementation Plan for Nogales/Nogales Wastewater

- The IBWC, SEDUE, and EPA have opened talks on an industrial pretreatment cooperative program and the IBWC plans to begin expanded treatment plant operations in February, 1992. Nogales, Sonora is completing wastewater collection works, and has completed the first stage of the covered Nogales Wash Floodway. The IBWC is exploring solutions to renegade transboundary sewage flows that may occur from the Nogales Canyon area.

- The IBWC will open discussions on planning for future flows in excess of the expanded international treatment plant capacity in 1992.

- There will be an expansion of drainage collection systems in Nogales, Sonora.

(5) Ciudad Juarez/El Paso (For current status, see page III-8).

The objective is to eliminate discharges of untreated wastewater into the Rio Bravo/Rio Grande as specified in IBWC Minute No. 261.

Ciudad Juarez will make improvements to its wastewater collection system to eliminate existing discharges into the Rio Bravo/Rio Grande. Also, treatment facilities will be constructed having the capacity to treat estimated flows by the year 2010. The effluent could still be used for irrigation, but, if any of it reaches the Rio Bravo/ Rio Grande, it should be of such quality that it would not result in a violation of water quality criteria to be adopted by Mexico and the U.S. in cooperation with the IBWC.

Implementation Plan for Ciudad Juarez/El Paso Wastewater

- The IBWC will recommend to the Governments of Mexico and the United States, a conceptual framework for solution of this problem to include water quality standards for this section of the Rio Bravo/Rio Grande (1992).

- SEDUE, CNA, state and municipal authorities, and local industries will recommend a plan for wastewater treatment works in Ciudad Juarez consistent with the conceptual framework agreed upon by the two governments (1992).

(6) Piedras Negras/Eagle Pass (For current status, see page III-8).

With regard to Minute 261, the IBWC will prepare a plan that will address pollution effects and include water quality standards for this section of the Rio Bravo/Rio Grande.

(7) Nuevo Laredo/Laredo (For current status, see page III-8).

The objectives are to eliminate untreated wastewater discharges into the Rio Bravo/Rio Grande for Nuevo Laredo and to begin an industrial pretreatment program.

IBWC has agreed on specified "Joint Measures to Improve the Quality of the Waters of the Rio Grande at Laredo, Texas/Nuevo Laredo, Tamaulipas" through Minute No. 279 which provides for a sanitation project for the City of Nuevo Laredo, Tamaulipas, to be jointly funded by the Mexican and U.S. Governments. The works

recommended by the Commission, and approved by the two governments, consist of six principal elements to be completed by 1994:

- Construction of the Riverside Collector;
- Construction of the Coyote I Collector as an extension to the Riverside Collector;
- Expansion of the sewage collection system to collect and convey to the Riverside and Coyote II Collectors sewage generated in areas not currently served and which presently discharge into the Rio Bravo/Rio Grande;
- Rehabilitation of the sewage collection system at specific points to intercept and convey to the Riverside and Coyote I Collectors those uncontrolled sewage flows that presently discharge into the Rio Bravo/Rio Grande;
- Construction of a pumping plant to convey the sewage from the Riverside Collector to a treatment plant; and
- Construction of a secondary treatment plant with an estimated capacity of 31 mgd located seven miles downstream of the Ciudad Juarez/Lincoln International Bridge.

Implementation Plan for Nuevo Laredo/Laredo Wastewater

- The IBWC has opened talks on an industrial pretreatment cooperative program on surface water standards for this reach of the Rio Bravo/Rio Grande, and on operation and maintenance details (1992).
- The IBWC will complete expansion and rehabilitation of the wastewater collection system and construction of the pumping station and interceptor (1992).
- The IBWC will complete wastewater treatment plant construction. The total cost of the project will be U.S. $44 million, which will be split among the Mexican Government, the U.S. Government, and the State of Texas (1994).

(8) Bajo Rio Bravo/Lower Rio Grande (For current status, see page III-9).

The objective is to eliminate discharges of untreated or partially-treated wastewater into the Rio Bravo/Rio Grande in the reach from the Falcon Dam to the Gulf of Mexico.

Implementation Plan for Bajo Rio Bravo/Lower Rio Grande Wastewater

In 1992, the IBWC will recommend to the Mexican and U.S. Governments, a conceptual framework for the solution of the problem of sewage discharges into the Bajo Rio Bravo/Lower Rio Grande, which includes the areas of Reynosa/McAllen and Matamoros/Brownsville. In accordance with the Water Treaty of 1944 and IBWC Minute 261, the IBWC will assess water quality at the source of supply and will assess wastewater management options. The IBWC's recommended plan will include:

- potential population growth;
- water supply needs;
- wastewater collection, treatment and disposal needs; and
- water quality criteria.

(9) Reynosa/McAllen

To prevent untreated wastewater from entering the Rio Bravo/Rio Grande, the Mexican Government will increase coverage by the municipal sewage system from 60 percent to 85 percent and will recondition the oxidation ponds during 1992 and 1994.

(10) Matamoros/Brownsville

In order to address the water contamination issues in Matamoros, the Mexican Government will increase coverage by the municipal sewage system from 65 percent to 75 percent, and initiate the construction of a wastewater treatment plant. Brownsville, Texas currently meets applicable U.S. discharge standards.

(11) Studies in Other Sister Cities

In 1992, other IBWC water treatment studies will also be focused on the following cities:

Acuna/Del Rio
Tecate/Tecate

Agua Prieta/Douglas

Ojinaga/Presidio

b. Characterization of Wastewater Flows to Protect International Treatment Plants

Mexico and the U.S. recognize their obligation to ensure that appropriate pretreatment procedures will be implemented for industrial wastewater before it reaches the international treatment plants or transboundary water courses.

Under the Water Treaty of 1944 and IBWC Minutes 261, 264, 279, and 283, both governments have given the IBWC, in cooperation with SEDUE and EPA, the responsibility of coordinating the implementation of domestic industrial wastewater control programs in order to ensure proper performance of the international treatment facilities and to avoid any degradation of transboundary water sources which may adversely affect stream water quality and beneficial uses. IBWC coordination with SEDUE, EPA, and other domestic agencies will include:

- Characterization of flows into international treatment facilities through a systematic program to identify and monitor all industrial waste discharges into Border Area collection and treatment systems;

- Definition of substances that would adversely impact and impair the efficiency of treatment facilities, and specification of permissible levels for such substances entering the sewerage collection system;

- Definition of substances that, despite standard pretreatment requirements, would adversely affect receiving water quality and/or beneficial uses (i.e., via pass-through mechanisms). For such substances, specification of permissible discharge levels, including any necessary prohibitions on discharge;

- Development of industrial inventories by SEDUE and EPA to identify potential sources and contaminants, consistent with the industrial multimedia source control initiative outlined in this section;

- Determination, by means of the industrial inventories developed by SEDUE and EPA in their respective countries, of the source of any substance undesirable in treatment facilities and control of such substances in accordance with the respective laws of each country; and

- Consultation twice per year by SEDUE, EPA, and the IBWC with other responsible agencies in each country to review the results of this cooperative industrial control program.

5. **Air Quality** (For current status, see pages III-12 through III-18).

The air quality action plans are based on the premise that monitoring, modeling, and emission inventory development form the fundamental basis for a cost-effective emissions reduction strategy.

a. ***Ciudad Juarez/El Paso, Texas - Sunland Park, New Mexico*** (For current status, see pages III-16 through III-17).

The primary objective of the Ciudad Juarez/El Paso air quality studies is to reduce ambient concentrations of air pollutants to mutually acceptable levels throughout the airshed. The study area also includes the adjoining city of Sunland Park, New Mexico.

New requirements of the CAAA may influence implementation of the Plan in the United States. Under the CAAA, El Paso must accomplish the following three major tasks. First, as a serious ozone non-attainment area, El Paso must implement VOCs and/or nitrogen oxides reduction strategies to attain the NAAQS by November 15, 1999. These requirements include obtaining reductions of 15 percent in VOC emissions by 1996 and 3 percent every year thereafter until attainment by implementing an enhanced inspection and maintenance (I/M) program, implementing a new source permitting program, requiring Reasonably Available Control Technology (RACT) for VOC emissions for additional stationary sources and vapor recovery controls for gasoline fueling, participating in EPA's fleet vehicle Clean Fuels Program, and completing a major air modeling effort by 1994. Second, for CO, El Paso must implement an alternative vehicular fuels program to be used during winter months. Third, for PM-10, El Paso must implement additional Reasonably Available Control Measures (RACM) for existing affected stationary and area sources.

In addition, major stationary sources in El Paso will be subject to new requirements for control of toxic air pollutants and new requirements for operator permits.

Implementation Plan for Ciudad Juarez/El Paso Air Quality

Technical Aspects

- Appraise the causes of, and potential remedies for, urban air pollution problems in Ciudad Juarez and El Paso (1992).

- Continue long-term air and meteorological monitoring throughout Ciudad Juarez/El Paso-Sunland Park (1991-1994).

- Perform additional short-term field studies as required (including VOC monitoring) (1991-1993).

- Identify air modeling techniques and wind models to be used (1992).

- Complete a refined air emission inventory for Ciudad Juarez, including stationary, area, and mobile sources, facilitated by a study of Ciudad Juarez vehicle miles traveled (VMT) (1993).

- Develop realistic control strategy scenarios for evaluation, based upon refined emissions estimates (1992-1994).

- SEDUE, with assistance from EPA, will establish a vehicular I/M program in Ciudad Juarez to reduce emissions from older vehicles (1992).

- Determine the feasibility of extending the oxygenated fuels program to Ciudad Juarez and implement the program if beneficial (1992).

- Quantify the contribution of vehicles at U.S. Customs Bridges to the total level of air pollution in the area and make recommendations for solutions to the problem by reducing traffic delays and through other means (1993).

- Develop a study of highway improvement to facilitate the flow of traffic and reduce emissions from unpaved roads and highways (1993).

- Establish public transportation programs that include the improvement of roads and bus routes, and address parking needs and repair traffic lights (1993).

Administrative Aspects

- Compile a report comparing and contrasting the current responsibilities, operational procedures, and funding mechanisms/levels of the Mexican and U.S. air pollution control agencies that play a role in regulating air quality in Ciudad Juarez/El Paso-Sunland Park (1993).

- Prepare a report detailing the principal organizations (including non-governmental organizations) and individuals involved in making public policy in Ciudad Juarez and El Paso as well as the social and political framework within which these groups and individuals operate (1993).

- Hold followup meetings (arranged during bilateral discussions by the Ciudad Juarez/El Paso policymakers) to encourage harmonization of the air regulatory programs throughout Ciudad Juarez/El Paso (1993).

- Execute computer modeling to evaluate the selected control scenarios (1994).

- Disseminate the project's technical results to Mexican and U.S. policymakers at the local, state, and Federal levels (1994).

b. Mexicali/Imperial County (For current status, see pages III-15 through III-16).

The long-term air quality goal in the Mexicali/Imperial County area is to develop a cooperative relationship between Mexican and U.S. air pollution control organizations to define the PM-10 problem in Imperial Valley and to develop effective emissions reduction strategies which are beneficial to the populations of Mexicali and Imperial County.

Implementation Plan for Mexicali/Imperial County Air Quality

- When the proposed study area under Annex V to the 1983 Border Environmental Agreement has been approved, convene a study team composed of representatives from air pollution agencies in Mexico and the United States to refine the study plan, identify resources for the proposed study, and appoint a principal investigator to coordinate the study (1992).

- Estimate the spatial and temporal distribution of PM-10 concentrations in Mexicali and Imperial County (1992).

- Apportion PM-10 concentrations to source emissions (1993).

- Estimate cross-border fluxes of PM-10 (1993).

- Finalize a control strategy (1993-1994).

- Modernize transportation facilities (1994).

- Begin implementation of the control strategy (1994).

c. ***Tijuana/San Diego*** (For current status, see pages III-13 through III-15).

Tijuana and San Diego share an atmospheric basin where the prevailing meteorological conditions in both cities are determinants in the diffusion and transport of pollutant emissions to both sides of the border. The primary objective of the proposed Tijuana/San Diego study is to reduce ambient concentrations of air pollutants to mutually acceptable levels throughout the airshed.

For Tijuana, objectives include: (1) identification of the factors that determine the transborder interchange of pollutants and its impact on air quality and potential health risks; (2) development of a method to determine potential emission sources and to determine feasible reductions for identified sources; and (3) establishment of the terms through which reduced emissions levels set as goals (and regional air quality goals) can be reached. San Diego objectives include: (1) attainment of the national ambient air quality standard for ozone (0.12 parts per million) by November 2005; (2) attainment of the national ambient air quality standard for carbon monoxide (9.0 parts per million) by November 1995; (3) installation of maximum achievable control technology (MACT) on plants that are major sources of air toxics; (4) attainment of California standards for ozone, carbon monoxide, nitrogen dioxide and inhalable particulates (PM-10) as soon as practical; and (5) reduction of non-attainment pollutants or their precursors by 5 percent or more per year.

Implementation Plan for Tijuana/San Diego Air Quality

Tijuana

- Following the approval of the proposed study, create the infrastructure required to evaluate air quality in the City of Tijuana, supplementing the information provided by the station at Mesa de Otay, operated by the San Diego Air Pollution Control District (1992-1994).

- Establish a local work group with sole responsibility for evaluating air quality in Tijuana (1992).

- Establish a similar work group for the cooperative enforcement and control of emissions sources (1992).

- Establish a program for training a SEDUE Work Group in different aspects of the program (1992).

- Identify and implement approaches to reduce vehicular emissions at border crossings (1992).

- Develop and promote a phased-approach vehicular Inspection and Maintenance (I/M) program (1992).

- Implement Phase I of the I/M Program (1992).

- Implement Phase II of the I/M Program (1992-1995).

- Improve public transportation (1994).

San Diego

Major Requirements under the CAAA are listed below:

- As part of the ozone control strategy, achieve annual VOC emissions reductions of 3 percent per year after the first six years, with compliance measured every three years;

- Install reasonably available control technology on existing stationary sources emitting in excess of 25 tons per year of VOCs and nitrogen oxides;

- Implement a construction permit program for new stationary sources of VOCs and NO_x requiring the lowest achievable emission rate and offsetting emissions reductions from other sources by a ratio of 1.3 to 1; implement an operating permits program for certain stationary sources (1993);

- Implement control measures such as hose and nozzle controls on gas pumps to capture fuel vapors, enhanced motor vehicle I/M programs, tighter tailpipe controls, and clean fuel fleet programs (1994);

- Develop transportation control measures, such as carpooling programs, driving restrictions, and high occupancy vehicle lanes, if needed (1993);

- Expedite road traffic at border crossings (1994);

- Establish an oxygenated fuels program (1993);

- Require maximum achievable control technology (MACT) on plants that are major sources of air toxics (plants with the potential to emit at least 10 tons per year of any one of the 189 toxic air pollutants listed in the CAAA) and such area sources that EPA determines warrant regulation (1994);

- Require preparation and implementation of risk management plans by facilities where a regulated substance is present in more than a threshold quantity; the plan is to provide for prevention and detection of releases and emergency response (1992); and

- Apply U.S. New Source Performance Standards (NSPS) to control air emissions from municipal, hospital, and other commercial and industrial incinerators (1992).

Major Requirements Under the California Clean Air Act are listed below:

- Ensure that there are no net increases in emissions from new or modified sources (1992);

- Require the installation of best available retrofit technology (1993-1994);

- Control heavy-duty truck traffic during commuting hours (1992-1993); and

- Comply with the following statewide emission control measures: clean fuels and low-emission vehicles; reformulated gasoline; heavy-duty diesel smoke enforcement program; and emissions

reductions from construction and farm equipment, locomotives, marine vessels, off-road motorcycles, off-highway vehicles, and utility engines (1992-1994).

6. Hazardous Materials and Hazardous Waste (For current status, see pages III-18 through III-24).

Implementation plans dealing with waste *per se* are grouped in this subsection under transboundary movement of hazardous wastes and abandoned or illegal dump sites. The related topics of waste generation, hazardous materials mass balances, pollution prevention and waste minimization are also considered in subsection V.A.2, (Industrial Multimedia Source Control Requiring Government and Private Sector Initiatives). The topics related to enforcement and the cooperative enforcement strategy are also discussed in subsection V.A.1, (SEDUE/EPA Cooperative Enforcement Strategy).

a. Transboundary Movement of Hazardous Waste (For current status, see pages III-19 through III-21).

Goals have been developed for: waste tracking, surveillance/enforcement, education of the regulated community, and transportation issues.

The primary waste tracking objective is to determine the amount of waste generated in the Border Area and the ultimate disposition of this waste (treatment, storage, or disposal in Mexico or the United States or illegal disposal in either country). A secondary objective is to develop a cooperative Mexican-U.S. system for tracking hazardous waste transported between the two countries. The cooperative enforcement strategy includes the following objectives: cooperative Mexican and U.S. Customs training; high visibility deterrent enforcement; the development of a Mexican-U.S. border tracking system to monitor hazardous waste shipments; detection and interception of illegal transboundary movement of hazardous wastes; increased enforcement of notification and reporting requirements for hazardous waste shipments between the two countries; and increasing the number of cooperative enforcement actions against maquiladoras and their parent companies where appropriate. These enforcement objectives will be a special focus of the SEDUE/EPA cooperative enforcement strategy for compliance with environmental laws during the initial years of the implementation plans. The regulated community must be educated in Mexican and U.S. environmental laws and regulations through training conferences. Mexican and the U.S. environmental regulations will be published in Spanish and English.

SEDUE will explore ways to increase public awareness of illegal hazardous waste movements and disposal by further encouraging the Mexican public to report illegal dumping to the relevant authorities.

Transportation objectives are to increase coordination between both SEDUE and the Mexican Secretariat of Transportation (SCT) and EPA and the U.S. Department of Transportation (DOT) and to assess the threat of transboundary movement of hazardous waste to the population in the Border Area.

Implementation Plan for Transboundary Movement of Hazardous Waste

Implementation of the proposed activities will occur across the Border Area but with concentrated efforts occurring in the following high priority city-pairs: Tijuana/San Diego, Ciudad Juarez/El Paso, and Matamoros/Brownsville. Overall, the implementation plan is based on a shared data base, training, regular border checks, a continuous presence at the border, routine/regular personnel exchanges, and coordination between and among Federal, state, and local entities in Mexico and the United States. The hazardous waste tracking and cooperative enforcement activities also receive special attention in the SEDUE/EPA Cooperative Enforcement Strategy Implementation Plan.

(1) Hazardous Waste Tracking

Binational Inventory of Wastes Produced in the Border Area

- Information on waste generation rates of Mexican and U.S. facilities in the Border Area is being collected. SEDUE will provide the information from semi-annual industrial reports and EPA will provide corresponding information obtained through inspections and review of U.S. manifest data (1992).

- EPA will attempt to collect information regarding amounts of raw materials being sent to maquiladora facilities from the U.S. (1992-1993).

- A mass balance methodology will be investigated to permit calculations of waste and by-products generated for each industrial process. SEDUE and EPA will investigate the feasibility of requiring industries to provide mass balance data at each plant in their respective countries (1993).

- Manifests and associated paperwork on shipments of waste will be exchanged by Mexico and the United States. The exchange of transportation data including manifests and the Ecological Guide is currently limited by the absence of a central binational computerized tracking system

providing this data. SEDUE and EPA, with the assistance of state environmental agencies, will develop and institute such a computerized system (1993).

- SEDUE and EPA on their respective sides of the border will conduct facility visits and inspections to determine the amount and types of hazardous waste produced in the Border Area (1992).

- SEDUE and EPA will exchange information on existing and proposed facilities capable of handling hazardous wastes.

Mexican/U.S. Data Base

- Initiate a regular data exchange of manifests and other transportation paperwork (1992).

- Develop training for SEDUE and EPA inspectors in issues related to the transboundary movement of hazardous waste (1992).

- Initiate an Inspection sub-Work Group to discuss common problems including manifest and data base issues (1992).

- EPA will review the U.S. Customs paperless tracking system (1992).

(2) Cooperative Enforcement Strategy

Customs Initiative

- Explore opportunities to enhance environmental enforcement capabilities at key border crossings (1993).

- Improve the effectiveness of surveillance of hazardous waste shipments through training and increased regulatory presence (1993).

- Initiate programs with Mexican and U.S. Customs for the regular exchange of data relating to hazardous waste shipments (1992).

- Conduct additional inspections by SEDUE and Mexican Customs and by EPA and U.S. Customs to find illegal shipments of hazardous waste in their respective countries along with increased training visits (1992-1994).

Enforcement Initiative

- Exchange information concerning Mexican and U.S. enforcement priorities (1992).

- Increase cooperation among Mexican Customs, U.S. Customs, and state/local entities (1992). Information relevant to transboundary pollution and related enforcement activities will be exchanged on at least an annual basis (1992).

- Develop a cooperative Mexican-U.S. hazardous material transportation enforcement strategy (1992).

- Develop a program to increase cooperative enforcement activities against companies that cannot verify the ultimate fate of waste they have generated (1993).

(3) Education of the Regulated Community

- Evaluate border industry informational and educational needs (1992).

- Identify cities that should be targeted for additional education and input (1992).

- Analyze the above information to determine the most effective means of transferring information regarding regulations to the affected companies (1992).

- Initiate waste management training and educational programs for the regulated community, in cooperation with the New Mexico-based Waste Management Education and Research Consortium and the U.S. Department of Energy (DOE) as well as other institutions that may be interested in such activities (1992-1993).

- Publish a binational document covering environmental and transportation requirements for the transboundary movement of hazardous wastes (1993).

(4) Transportation Issues

- Develop a cooperative Mexican-U.S. hazardous materials transportation enforcement strategy (1992).

- Perform an environmental evaluation of increased traffic carrying hazardous wastes in the Border Area with recommendations for reducing risks (1993).

- Obtain training for SEDUE and EPA personnel in waste transportation requirements from respective transportation agencies (1993).

b. Abandoned and Illegal Dump Sites (For current status, see page III-23).

Goals have been developed for two topics: site identification and education. For site identification, the goal is to devise a strategy for locating abandoned or illegal hazardous waste dump sites in the Border Area. For education, the goals are to develop deterrents to illegal dumping and to heighten the environmental awareness of the regulated community and government officials.

Implementation Plan for Abandoned or Illegal Dump Sites

Initially, site identification will be conducted borderwide.

Site Identification

- Devise a strategy to locate abandoned and illegal hazardous waste sites in the Border Area. (1992). SEDUE and EPA will explore ways of making available technology, including air surveillance technology, useful in locating such hazardous waste sites.

- Begin field studies to locate abandoned and illegal hazardous waste sites (1993).

Education

- Devise a SEDUE/EPA educational program for the regulated community and state and local officials regarding proper waste disposal (1992).

- Develop a referral system for citizen reports of illegal dump sites (1992).

- Implement education programs through conferences, meetings, and publicity to inform the public in the use of the referral system (hotline) (1993).

7. **Municipal Solid Waste** (For current status, see pages III-23 through III-24).

An implementation strategy has been developed to address four areas: assessment, public outreach, waste collection improvements, and construction and development of additional sanitary landfills. The assessment will determine the infrastructure, regulations, and numbers, locations and types of landfills needed in the Border Area to mitigate public health and environmental threats associated with municipal solid waste disposal. The public outreach goal is to involve the general public in the prevention of illegal dumping and to foster pollution prevention, waste minimization and recycling.

Implementation Plan for Municipal Solid Waste

Assessment

- Assess the public health and environmental threats associated with municipal waste disposal in the Border Area (1992).

- Determine the infrastructure and regulatory needs for municipal waste handling and disposal (1992).

- Determine the number, location, and types of landfills needed (1993).

Public Outreach

- Provide training regarding site selection (1992).

- Provide training regarding facility management (1992).

- Develop an educational campaign on the detrimental effects of illegal dumping and on alternatives to illegal dumping (1992).

- Organize border recycling workshops (1993).

Waste Collection Improvements and Development of Additional Sanitary Landfills

- In 1992, Mexico will improve waste collection systems and develop the landfill sites in the following border cities:

  - Tijuana, Baja California
  - San Luis Rio Colorado, Sonora
  - Nogales, Sonora
  - Piedras Negras, Coahuila
  - Nuevo Laredo, Tamaulipas
  - Ciudad Juarez, Chihuahua
  - Mexicali, Baja California

8. **Pesticides** (For current status see pages III-24 through III-25)

There are several specific actions, in addition to those noted above in the sections on water and air quality with respect to pesticide residues, which should also be undertaken:

- Pesticide use record-keeping systems need to be instituted by border states with significant pesticide use to identify the amounts and kinds of pesticides being used. This would assist in assuring that environmental monitoring programs are keeping track of the appropriate pesticides;

- SEDUE and EPA will develop technical cooperation programs in the areas of pesticide misuse control, and farmer/applicator training and dealer training. Each agency will prepare pesticides training materials and related legal materials, taking advantage of similar materials that have

already been developed in the United States by border states, the U.S. Department of Agriculture (USDA), EPA, and private industry;

- Mexico and the U.S. will exchange information on a regular basis regarding unreasonable health or environmental risks created by pesticides, and will coordinate actions to regulate the use of such pesticides, as necessary;

- The U.S. will continue to provide assistance in product and residue analysis, including training of chemists, and conducting joint quality assurance programs, etc. Mexico is taking steps to consolidate its laboratory capability in Matamoros and privatizing other laboratories to provide commercial services. Incentives for private sector residue checking can be provided by strong border inspection programs.

Mexico imports pesticides from the U.S and from other countries. There have been several recent proposals in the U.S. Congress to prohibit the export to any country of pesticides banned in the U.S. for human health reasons. If any of these legislative proposals becomes law, this should eliminate the export of banned U.S. pesticides to Mexico. Both Mexico and the U.S. will take every opportunity to encourage other pesticide exporting countries to conform to the Food and Agriculture Organization (FAO)/UNEP prior informed consent procedures.

9. **Contingency Planning/Emergency Response** (For current status, see pages III-25 through III-28).

In its efforts to strengthen chemical emergency preparedness and response along the border, the JRT has identified several important areas to be addressed during the first stage of the Plan:

- Establish a complete three-year work plan with specific schedules and priorities. The work plan should identify activities which relate to each item in V.A.9.

- Clarify the relevant legal authorities of both countries; promote understanding of and compliance with laws and regulations;

- Establish a formal notification system between governments to ensure timely response and awareness of releases affecting the Border Area;

- Encourage participation from industry along the border concerning preparedness, prevention and response activities;

- Identify appropriate Federal, state and local officials on both sides of the border who can assist in the cooperative development of emergency response capabilities;

- Establish appropriate mechanisms, including communications mechanisms, to address financial, political, and operational issues pertaining to cross-border movement of emergency equipment and personnel in the event of an incident;

- Improve public availability of information about hazardous waste storage in local communities;

- Work jointly toward the development of an accident prevention program focused on facilities handling toxic substances;

- Identify appropriate future JRT activities such as training and technical assistance for existing emergency planning and response entities such as the Cameron County LEPC in Brownsville, Texas and the CLAM in Matamoros to assist in promoting awareness of preparedness and response activities on both sides of the border; and

- Identify the need to disseminate written materials about the above activities, and provide Spanish and English versions of such materials.

Implementation Plan for Contingency Planning/Emergency Response

For the initial implementation stages of this Border Environmental Plan, contingency plans in the three original areas (Tijuana/San Diego; Mexicali/Imperial County; and Matamoros/Brownsville) will be improved and tested. In addition, contingency plans will be developed and completed for the remaining eleven pairs of sister cities within three years.

A description of the agenda for all fourteen pairs of sister cities follows:

- Develop for each sister city, a detailed implementation schedule for the development of a planning structure and contingency plan. In each case, the schedule will provide for the

completion of the plan within three years. The process and milestones described in UNEP's APELL program will be used as a guide for establishing the schedule (1992).

- Establish a working relationship with each sister city pair focused on contingency planning, preventing and responding to accidents involving the management and/or transportation of hazardous substances in their management or transport (1992).

- Improve methods of making information and data concerning hazardous substances and installations accessible and available in the fourteen pairs of sister cities. In this way, these communities can better plan to prevent chemical emergencies and be better prepared to respond if they occur. UNEP's APELL program will be used as a guide (1992-1993).

- Establish additional local groups such as the CLAM/LEPC organization for coordination of planning, prevention, and response activities. Membership in CLAM/LEPC should include broad-based representation from each community including: local planning, emergency, and environmental officials; elected and other public officials; representatives from industry and businesses; representatives from non-governmental organizations concerned with border issues (1992).

- Establish a formal 24-hour notification system in the sister cities encompassing both sides of the border (1992).

- Ensure that an effective hazardous material release notification system is in place on both sides of the border and that personnel are fully trained in its use (1992).

- Establish protocols to facilitate cross-border mobility of emergency response equipment and personnel (1992).

- Test the established 24-hour cross-border notification system for accidents (1992).

- Begin the development of contingency plans for each sister city pair (1992-1993).

- Conduct a simulation exercise to test parts of the system (1992-1993).

- Establish a data base of hazardous substances releases in the sister cities (1992-1993).

- Initiate the establishment of an information exchange system on chemical facilities (especially those industrial installations capable of having a transboundary effect) transportation routes of major concern, and response capabilities (1992-1994).

- Continue to update/exchange data base information on inventories and releases (1992-1994).

- Conduct annual reviews of the sister cities plans (1992-1994).

- Sponsor a workshop/conference on border activities (1993).

- Conduct a simulation exercise to test the full system thoroughly (1993).

- Finalize the sister city contingency plans (1993-1994).

- Revise contingency plans where necessary (1994).

While these activities will be the focus of initial implementation of the Plan in the geographic areas mentioned above, these activities will be repeated for each sister city pair until the entire Border Area is covered and a regular process of reviewing, updating, and testing is established and maintained. The JRT is encouraging and supporting all sister cities in efforts to have their contingency plans developed by 1994.

10. Regulation of Activities Impacting Upon the Environment

As part of the Plan, SEDUE has developed an ecological policy for the Border Area to promote environmental protection, conservation, and soil and natural resources use and restoration, taking into consideration the ecological and socioeconomic characteristics of the region with an emphasis on the critical areas of the border.

The ecological policy will serve as a reference point for environmental impact and risk assessment of new projects. Similarly, it will help to reduce the time needed to process and respond to applications for

environmental impact authorization. Evaluations of the applications will be streamlined by making them shorter and more specific.

SEDUE considers that environmental impacts and risk are being caused by the production of: petroleum and petroleum derivatives, pharmaceutical products, chemical products, plastic products, cement, non-metallic mineral-based products, synthetic resins and artificial fibers, basic chemicals and fertilizers.

To implement this regulatory program, SEDUE will rely upon its authorities located in the Mexican border states.

SEDUE's local authorities along the border will advise those promoting new construction projects that any project governed by Article 29 of the General Ecology Law must describe the environmental impact and the risks that it may present, before construction may be authorized.

SEDUE will monitor the area closely, to ensure that no construction projects are initiated that involve any of the previously-mentioned industrial activities, or that are governed by Article 29 of the General Ecology Law, unless prior environmental impact assessment authorization has been granted.

To develop a regulatory program for productive activities falling within the scope of the Plan, SEDUE has designed a program for implementation composed of the following actions:

- Application of the ecological policy to the Border Area will facilitate the development of legislation at the state and municipal level governing soil usage and promote the establishment of regional ecological policy programs, through coordination between the Mexican Federal Government and the Mexican state and municipal governments in the Border Area.

- Identify the industrial environmental impact and risks that should be addressed at the Federal level and those which could be handled at a local level.

- Formulate environmental criteria to evaluate the environmental impacts and risks related to industrial activity in the border region.

- Formulate environmental criteria to evaluate environmental impacts caused by maquiladora industries.

- Formulate rules governing environmental impact assessment for the maquiladora industries.

- Formulate an agreement for decentralization of the environmental impact evaluation process for the maquiladora industries.

- Develop training courses on environmental impact and risks associated with the maquiladora industries.

- Develop programs for the prevention of environmental accidents. In Mexico, the prevention of environmental accidents to date has been the sole responsibility of SEDUE, and has been carried out primarily through those projects which, by their nature are subject to environmental impact and risk studies under Articles 28 and 35 of the General Ecology Law.

- Establish buffer zones for industries.

- Regulate the environmental impact of and risks associated with unauthorized maquiladora industries. SEDUE will visit maquiladora facilities considered to present potential environmental risks and will verify that they were constructed after the General Ecology Law was passed. Upon such verification, SEDUE will proceed to regulate their operations. Where construction of unauthorized projects has not been completed, and completion may pose environmental risks, SEDUE will order an immediate cancellation of the project.

SEDUE will offer, upon request by the border states, environmental impact and risk workshops.

11. Pollution Prevention (For current status, see page III-28 through III-29)

Pollution prevention is an innovative approach to environmental protection that promises substantial benefits in the Border Area. It is a relatively inexpensive way to protect the environment; the costs involved in preventing pollution often are dramatically lower than the costs of treatment and disposal. Because privately-owned businesses always have an incentive to develop ways of minimizing waste, they sometimes are willing to apply their own technical expertise in voluntary programs, thus reducing the need for government expenditures. Furthermore, pollution prevention efforts lessen the possibility of hazardous spills or accidents occurring either within or outside a facility's boundaries because less hazardous material needs to be handled, transported, and disposed.

a. Border Area Pollution Prevention Initiatives

Because of the potential for pollution prevention techniques to protect the border environment, SEDUE and EPA will incorporate a pollution prevention component into the first stage of this Plan. As a first step, the two agencies will establish a new pollution prevention Work Group under the 1983 Border Environmental Agreement. This Work Group will coordinate bilateral efforts to define and implement pollution prevention projects in the Border Area.

For example, the Pollution Prevention Work Group will draw from EPA's 33/50 Project in the Border Area. A special effort will be made to encourage industrial facilities on the U.S. side of the border to enlist in the project, and the U.S. owners of facilities on the Mexican side of the border will be encouraged to apply their pollution prevention activities in Mexico as well as in the United States.

The Pollution Prevention Work Group will develop joint pollution reduction initiatives in the border area similar to EPA's existing 33/50 program. In the United States, the 33/50 program encourages industries to reduce emissions of the 17 hazardous substances by 33 percent by the end of 1992 and by 50 percent by the end of 1995. At the end of 1991, over 700 U.S. companies had committed to reducing their emissions of the 17 target chemicals by almost 300 million pounds by 1995.

During the Plan's first stage, the Work Group intends to assess the potential effectiveness of other kinds of pollution prevention initiatives. Pollution prevention projects affecting municipal wastewater treatment, water use efficiency, and agricultural chemical use may be especially beneficial in the Border Area. Based on its assessments, the Work Group will recommend to the two agencies other pollution prevention projects in the first or second stage of this Plan.

b. Technical Assistance for Pollution Prevention

To maximize the effectiveness of their joint pollution prevention program, SEDUE and EPA will work together to provide a technical assistance program to participating businesses and to establish effective technology transfer methods. This technical assistance will consist of training, information regarding clean production processes, university-based technical resource centers, and demonstration projects.

Under this technical assistance program, industry employees will be trained to conduct internal environmental audits and assessments in their facilities. They will also be assisted in identifying alternative production processes, technologies, and materials that minimize waste.

The information element of the technical assistance program will consist of a direct hook-up for SEDUE to the International Cleaner Production Information Clearinghouse operated jointly by EPA and UNEP. This computer-based network will supply businesses in the Border Area with access to international technology information, case studies, and technical guidance data bases.

EPA also will explore ways to support several university-based pollution prevention research and education centers in the Border Area. These centers will conduct research on pollution prevention techniques especially appropriate for the particular industries located in the Border Area, and they will help local businesses gain access to and apply the information contained in international data bases.

Finally, EPA will work with SEDUE and Border Area universities to develop model pollution prevention and recycling demonstration projects for local communities. These model projects will engage local businesses, schools, and communications media in a coordinated, cross-media strategy to prevent specific kinds of pollution in specific communities. The results of these demonstration projects will be shared with other communities in the Border Area so they can be duplicated where appropriate.

12. Environmental Education (For current status, see pages III-32 through III-33)

SEDUE and EPA believe that environmental education and widespread involvement by the general public is essential to the success of this Plan. Consequently, both agencies will work with the public, local public and private educational institutions, and with the private sector, to improve public understanding of the border environment and the role the public can play in protecting it.

Environmental education is an instrument for the formation of environmental consciousness and a tool for reducing the degradation of natural resources and the environment. It is one of the elements that is helpful in changing public conduct. The approach to environmental education that will be developed in Mexico can be divided into the following categories:

a. Formal "Classroom" Environmental Education

Activities in this category incorporate an environmental dimension into educational systems of the Border Area, and share the experience that has been gained on the national level.

This initiative will promote cooperation among institutions in environmental instruction and the training of professionals in environmental management. To achieve the aforementioned objectives, meetings will be held to design the materials and the content. Colloquia among universities will be held that lead to the formation of a network for the exchange of knowledge and experience in the design of a university curriculum for the training of environmental professionals.

b. Informal Environmental Education

The objective in this category is to increase public awareness of natural resource management without using formal mechanisms. To that end, individuals need to be educated about appropriate use of soil, water, forests, and waste management, through printed and audio-visual materials. These will permit the most direct communication with the public. In the same manner, regional seminars and meetings will be arranged in which non-governmental organizations and individuals committed to the defense of the environment will be invited to participate.

c. Environmental Education Workshops

Environmental education workshops will be developed to instruct the public in the reuse of domestic and industrial solid waste materials for useful purposes, such as recreational, artistic and other activities. These workshops will be designed for both children and adults.

In addition, SEDUE and EPA will develop public service messages to be distributed to newspapers and radio and television stations in the Border Area. These bilingual messages will encourage other actions, such as water conservation, waste minimization, and basic home sanitation that individuals and families can take to help protect the border environment. Through such public service messages, SEDUE and EPA will publicize not only the importance of broad public participation in environmental protection, but also the active cooperation of the two nations through their respective environmental agencies.

SEDUE and EPA intend to develop bilingual environmental education materials for distribution. They will encourage the international exchange of teachers and other education professionals who work with local school systems to design educational projects that foster international cooperation in addressing border environmental issues.

To promote public participation on environmental issues, it is important that local governments designate an official who will be responsible for environmental matters. It is also important to organize the private sector and the public in order to build commitments to environmental protection. It is important to encourage the participation of environmental groups which could work towards environmental solutions

13. **Conservation of Natural Resources** (For current status, see pages III-33 through III-37).

The three joint committees established for the conservation of natural resources (the Joint Committee for the Conservation of Wildlife; the Tripartite Committee of Mexico, the U.S. and Canada for the Conservation of Migratory Birds and their Habitats (Preservation of Wetlands); and the Joint Committee for the Management and Protection of National Parks and Other Protected Natural and Cultural Sites) will continue to work on the design, implementation and evaluation of priority programs. These themes will be explored in cooperation with research and academic institutions, non-governmental organizations, interested citizen groups and local governmental authorities on both sides of the border. The committees will continue to work on the projects referenced in Section III as part of the Border Plan.

The part of this work pertaining to wildlife will be coordinated by SEDUE, and by DOI, through the FWS. The work pertaining to protected areas will be administered by SEDUE and NPS. At forthcoming meetings, scheduled for April 1992, the joint committees will develop action plans dealing with wildlife and protected areas of the affected countries.

14. **Urban Development** (For current status, see pages III-41 through III-43)

In an attempt to address the array of urban development problems confronting the Border Area, a number of initiatives have been taken by the Mexican Government. In particular, on October 23, 1991, the Mexican Government announced a three-year commitment of U.S. $460 million to address current deficiencies in the areas of wastewater treatment, collection and proper disposal of solid waste, road construction, and territorial reserves for housing.

B. GENERAL PROVISIONS ON IMPLEMENTATION

In planning for an environmentally-sound Border Area, SEDUE and EPA have agreed upon the following general provisions on implementation as an integral part of the Border Environmental Plan. Most cut across many of the border problems, and all merit early action.

1. Intergovernmental Coordination and Public Involvement

a. Intergovernmental Coordination

SEDUE and EPA, as National Coordinators, will actively coordinate the activities of Federal, state, and local governments in the implementation of the Plan, and in the continuing planning process.

- Programs that affect the environment of the Border Area will be coordinated, consistent with treaties and other Mexican-U.S. agreements in force, by SEDUE (for other Mexican agencies) and by EPA (for other U.S. agencies) to insure the overall integrity of the Plan.

- State and local environmental agencies will be invited to provide their extensive knowledge, expertise, and resources to the Plan by encouraging their involvement and participation in the binational Work Groups constituted by SEDUE and EPA pursuant to the 1983 Border Environmental Agreement. Particularly on the U.S. side, state and local governments play a significant role in carrying out Federal mandates; therefore, their direct and active involvement is essential.

b. Public Participation

Public participation is essential to addressing environmental problems. Regardless of the efforts undertaken by government, these will not be sufficient to deal fully with environmental problems unless they have public support. The Plan must thus reflect the interests and participation of the general public and public officials in Mexico and the United States. In the U.S., the general public is often represented by organizations such as:

- citizen groups
- industry associations
- labor unions

- non-governmental organizations
- academic institutions

In Mexico, public participation occurs through municipal Ecological Committees of Citizen Participation, which include representatives of social and private organizations. The first type of social organization consists of trade unions, clubs, agricultural organizations, sporting associations, and professional organizations. The second type of private organization consists of industrial associations, trade associations, farmers' associations, and press associations. The Ecological Committees involve the public in reviewing regulations for environmental protection, promote environmental awareness generally and provide a system to direct public attention to existing problems. The various "publics" in Mexico and the U.S. may be involved in the Plan on three different levels:

(i) **National/Binational** - The SEDUE and EPA Border Environmental Plan Public Advisory Committees will be chartered in Mexico and the U.S. respectively. The Mexican group will advise SEDUE and the U.S. group will advise EPA.

Representatives of these groups are encouraged by SEDUE and EPA to meet periodically, freely exchange ideas, and make joint recommendations to both SEDUE and EPA. Such binational collaborative efforts will be valuable in forging measures to protect and enhance the environment of the Border Area.

(ii) **Sister City** - Considerable public interaction already occurs between Mexican and U.S. sister cities (mayoral meetings, industry alliances, community groups, etc.). As specific environmental programs are developed and carried out in the sister cities, specific public advisory groups may be established to fit specific needs as they arise. SEDUE and EPA will strongly encourage and facilitate such public involvement; but will leave its form and content to the participants to design on their own behalf.

(iii) **People-to-People** - SEDUE and EPA recognize that people-to-people community groups play a significant role in forging a society aware and motivated by environmental quality, public health, and economic vitality. SEDUE and EPA strongly endorse these efforts.

The SEDUE and EPA Border Environmental Plan Public Advisory Committees will each perform the following general functions, subject to their respective charters and the approval of their participants:

- Serve as advisory bodies to SEDUE and EPA, respectively, including the Plan Coordinators and provide recommendations with respect to the implementation of the Plan;

- Serve as fora for the exchange of ideas and discussion on Border Area environmental problems; and

- Assist in the promotion of information and technology transfer among industry and non-governmental organizations.

Both the SEDUE and EPA Border Environmental Plan Public Advisory Committees will:

- Serve as conduits for the public dissemination of information concerning specific projects and programs pursued under the Plan and, together with the Plan Coordinators, serve as a clearinghouse for the receipt of public comments from area residents and others related to the Plan and its implementation; and

- Promote community relations activities and right-to-know policies.

2. Other Programs to Promote Public Awareness and Increase Public Participation

To ensure effective implementation of the Border Environmental Plan, it is essential to make the public aware of the Plan and to enlist their participation in implementing it. The following additional activities will be implemented:

- **Public Meetings, Conferences and Workshops.** SEDUE and EPA will develop educational and information programs about the Border Environmental Plan, targeted at Mexican and U.S. industries, governmental agencies, academic entities and the general public in the Border Area. Programs should address both technical and policy issues, and focus on opportunities for the private sector and for technology transfer.

- **SEDUE/EPA Translation of Environmental Laws, Regulations, Standards and Guidance.** SEDUE and EPA will publish a SEDUE/EPA-approved English language translation of the 1988 Mexican Comprehensive General Ecology Law, the regulations and technical norms or standards developed to implement the law, and such other Mexican and U.S. laws, regulations, standards and guidance as SEDUE and EPA deem appropriate. The relevant U.S. laws, regulations, standards and guidance will be translated into Spanish. These publications will be regularly updated.

- **Public Information on Environmental Conditions in the Border Area.** SEDUE and EPA will jointly arrange for the publication of triennial environmental indices and data on the Border Area. SEDUE and EPA will seek establishment of requirements for public availability of data on emissions and effluents of pollutants and other elements of a right-to-know program in the Border Area.

- **Bilateral Environmental Education Program.** SEDUE and EPA will develop a bilateral environmental education program for the Border Area. The program will include cross border research, data collection and academic programs at the university level; public service announcements; cooperation to support international youth exchange initiatives; and bilingual teaching materials to promote environmental education in classrooms across the border at the primary and secondary level. In cooperation with border public television and radio stations, an initiative to increase the level of environmental awareness in the region through media programming will be launched.

- **Private Volunteer Initiatives.** SEDUE and EPA will promote increased environmental awareness in the border communities through private initiatives to address the specific public health and social infrastructural problems that contribute to adverse environmental conditions in the Border Area. This will include model self-help demonstration programs to protect water supplies and promote sanitation.

3. Effective Protection of Transboundary Environmental Resources

SEDUE and EPA, in cooperation with the IBWC, are taking steps to assure that the environmental standards and requirements of each agency, and their enforcement, provide effective protection to transboundary environmental resources in the Border Area such as border surface waters, transboundary aquifers, and the air basins of sister cities. In this connection, the IBWC will, in consultation with SEDUE and EPA, announce during 1992 the policies to be applied for the protection of Border Area binational wastewater treatment facilities through pretreatment requirements and for the protection of transboundary aquifers.

4. Increased Financial Resources for Environmental Protection in the Border Area

SEDUE and EPA have reviewed ways to resolve financial resource problems and strengthen their cooperation in mobilizing funding for pollution control facilities needed in the Border Area. The initial commitments to financing the first stage of the Plan are set out in Section V.C of the Plan. Where pollution control facilities, such as those for handling hazardous wastes, are lacking or inadequate, consideration is being given to developing market incentives and user fees on pollution sources to pay for such facilities. SEDUE is promoting

a program for the creation of new hazardous waste handling facilities in Mexico by 1994. SEDUE and EPA will periodically review the need for technical assistance in developing market incentives and other environmental policies, as well as for preparing proposals for loan financing of pollution control facilities. It is recognized that external resources will be required to achieve complete implementation of the Plan by Mexico. During 1992, SEDUE will set out Mexico's program for seeking such external financial support for the Plan through 1994. SEDUE will also set out Mexico's program to generate financial support from industries on the Mexican side of the Border Area for environmental infrastructure called for under the Plan.

5. Periodic Review of the Border Environmental Plan

SEDUE and EPA will review and update this Border Environmental Plan as the need arises. In any event, the Plan will be reviewed and revised in 1994. At that time there will be similar opportunities for participation by the governmental, public and private sectors before the Plan's second stage is adopted. In the interim, SEDUE and EPA will convene an annual review of the Plan's implementation with opportunity for comment by the governmental, public and private sectors.

C. BORDER ENVIRONMENTAL PLAN FUNDING

Funding for the first stage of the Plan (1992-94) will derive from a variety of sources, including contributions from the Mexican and U.S. Governments, border state and local governments of both countries, and the U.S. and Mexican private sectors. A portion of Mexico's funds to address border environmental problems will come from a U.S. $50 million loan from the World Bank contingent upon matching Mexican Government support. This funding will permit a substantial increase in SEDUE's Border Area inspectors, from 50 to 200. To help make these new inspectors more effective, SEDUE's 1992 operational budget for the Border Area will increase about 450 percent to U.S. $6.3 million.

The Mexican Government has committed U.S. $460 million over the 1992-1994 period for the development of urban infrastructure along the border, including the handling and disposal of urban solid waste and municipal wastewater and the creation of territorial reserves to support low-income housing. The 1992 commitment is U.S. $147 million and additional funding commitments for Mexico's portion of the Plan will be announced on an annual basis.

For 1992, the Mexican Government is committed to spend $147 million to ameliorate border environmental problems, as follows: wastewater treatment -- U.S. $60 million; road improvement -- U.S. $40 million; public transportation -- U.S. $19.4 million; solid waste management -- U.S. $16.6 million; and territorial reserves --

U.S. $11 million. The funding will be utilized in the following cities: Tijuana -- U.S. $28 million; Ciudad Juarez -- U.S. $26 million; Mexicali -- U.S. $17 million; Nuevo Laredo U.S. $16 million; Reynosa -- U.S. $14 million; Matamoros -- U.S. $13 million; Nogales -- U.S. $7 million; Piedras Negras -- U.S. $6 million; San Luis Rio Colorado -- U.S. $6 million; and other municipalities along the border -- U.S. $14 million.

In the United States, wastewater treatment facilities and clean drinking water have been given the highest priority. The total U.S. commitment contemplated in the FY93 budget to address environmental problems along the border is $241 million, including $199 million in water-related construction grants. Of this sum, $50 million will be earmarked for EPA wastewater grants to colonias in border regions. An additional $25 million in grants has been proposed for drinking water hook-ups for colonias, to be administered through the Rural Development Administration of the U.S. Department of Agriculture (RDA).

Other areas will receive additional EPA assistance totaling over $9 million in FY93. These areas include: air pollution monitoring in Ciudad Juarez/El Paso, Tijuana/San Diego, and Mexicali/Imperial Valley; U.S. environmental technical assistance initiatives; enforcement; emergency planning and response; border environmental education; border environmental roundtables and border crossing facilities; and the U.S. Border Environmental Plan Public Advisory Committee. An additional $2 million will be directed to Border Area public health projects administered by the U.S. Department of Health and Human Services. The U.S. Export-Import Bank will also commit $5 million in loan guarantees to help Mexico acquire pollution control equipment and other U.S. goods and services for the improvement of Mexico's environment.

U.S. support for the Plan will also come from state and local governments. In Texas, for example, $100 million in revolving loan funds were targeted in early 1991 for the water needs of colonias in that state. An additional $150 million of funding for colonias was recently authorized by referendum in Texas last November. In Nuevo Laredo/Laredo, funds from the State of Texas will be contributed to support a portion of the area's $44 million binational sewage treatment facility.

Similarly, in California, $5.3 million in state funds have allocated to support the planned Tijuana/San Diego sewage treatment facility. An additional $1 million in state funds have already been used to pay for a temporary sewage diversion project for the Tijuana River. A further State of California contribution to the funding of the New River project is contemplated.

The private sector will also play a role in providing funding for programs and infrastructure projects outlined in the Plan. A principal example is the planned Chamizal reclamation project, the first part of a U.S. $70 million sewage treatment plant for Ciudad Juarez that includes two more treatment plants to be located east of the city, with construction scheduled to be completed in 1993. The Ciudad Juarez treatment project will be funded in part

by the Mexican Government, the State of Chihuahua and Ciudad Juarez. The local maquiladora industry association is considering the assumption of a 30 percent share of total project costs. Construction is scheduled to commerce in February 1992.

MEXICAN/U.S. BORDER ENVIRONMENTAL PLAN FUNDING COMMITMENTS
(in millions of U.S. dollars)

I. Mexican Government

A. SEDUE Border Environmental Initiatives (Excluding IBWC)

	1992-1994
Sewage Treatment	$220.0
Solid Waste	$25.0
Transportation\Roads	$168.0
Territorial Reserves	$43.0
Contingency Funds	$ 4.0
Construction Grant Sub-Total	$460.0
Border Area Administration/ cooperative enforcement strategies	$ 6.3[1]
TOTAL MEXICAN COMMITMENT	$466.3

B. Mexican IBWC Wastewater Project Construction

	To Date 1988-1991	**1992-1995**
Laredo	---	$22.0
Nogales project	---	---
-Stage One	$3.0	---
-Contribution to treatment plant	---	$1.0
Tijuana project		
-Stage one works	$30.0	---
-Stage two works	---	$20.0[2]
Mexicali project	---	Pending
	$33.0	$41.0[2]

[1]1992 budgeted commitment (1993 and 1994 commitments to be announced)
[2]Committed to-date

C. 1992 SEDUE Commitment by City

Ciudad Juarez	$26 Million
Tijuana	$28 Million
Mexicali	$17 Million
San Luis Colorado	$ 6 Million
Nogales	$ 7 Million
Piedras Negras	$ 6 Million
Nuevo Laredo	$16 Million
Reynosa	$14 Million
Matamoros	$13 Million
Other	$14 Million
	$147 Million

II. U.S. Federal Government

A. Border Wastewater Project Construction (EPA and IBWC)

	To Date 1988-91	1992	1993	Two Year 1992-93
Tijuana Project				
-EPA	---	$49.0	$65.0	$114.0
-IBWC	---	$3.0	$4.0	$7.0
Nogales Project				
-EPA	$0.0	$0.0	$5.0	$5.0
-IBWC	$11.7	$0.5	$0.0	$0.5
Nuevo Laredo Project				
-IBWC	---	$12.1	$0.5	$12.6
New River				
-EPA	---	$0.0	$10.0	$10.0
-IBWC	---	$ 0.0	$ 0.0	$ 0.0
	$11.7	$64.6	$84.5	$149.1

B. Colonias Assistance Initiative

	1992	1993	Two Year 1992-93
EPA (Grant Program)	$0.0[3]	$50.0	$50.0
USDA (Grant Program)	$0.0	$25.0	$25.0
	$0.0	$75.0	$75.0

C. Technical Assistance/Other Programs

	1992	1993	Two Year 1992-93
EPA			
-border programs	$3.0[4]	9.1[4]	$17.0
-other wastewater treatment (i.e., San Diego project)	$40.0	$40.0	$80.0
HHS	$2.0	$2.0	$4.0
Export-Import Bank	$18.0	$5.0	$23.0
IBWC (other than wastewater construction)	$ 10.4	$ 25.5	$ 35.9
	$73.4	$81.5	$154.9
TOTAL U.S. COMMITMENT	$138.0	$241.1	$379.0

[3]Note: An additional $15 million had been appropriated in FY 1990 for an EPA state revolving loan fund (SRF) program which continues to provide assistance to colonia communities in the State of Texas.

[4]Includes $1.6 million in FY-1992 and $2.1 million in FY-1993 for EPA border area enforcement initiatives.

ANNEX A

EXISTING ENVIRONMENTAL INSTITUTIONAL FRAMEWORK FOR THE BORDER AREA

A. OVERVIEW OF SEDUE AND MEXICAN ENVIRONMENTAL LAWS IMPACTING THE BORDER AREA

Mexican environmental laws, regulations and standards are administered and executed by the ecological sub-secretariat of SEDUE. Mexico's first modern environmental laws were passed in 1972, 1982 and 1984. These laws were superseded in 1988 by the "General Law of Ecological Equilibrium and Environmental Protection" (the General Ecology Law), a comprehensive statute covering all types of pollution as well as the protection and preservation of natural resources.

Four regulations relating to national air pollution, air pollution within the Mexico City Metropolitan Zone, environmental impact assessment and hazardous wastes have been issued under the General Ecology Law since 1988. A fifth regulation covering wastes at sea which implements the London Ocean Dumping Convention was adopted in 1979 and will remain in force until superseded. A new regulation dealing with the prevention and control of water pollution is expected to be published. As of November 1990, 57 technical ecological standards (NTEs) and ecological criteria have been issued to implement the regulations. Since then, SEDUE has also approved several additional NTEs involving source categories for water. Other NTEs, particularly in the air and hazardous waste pollution areas, are slated to be presented for approval by the end of 1992.

Mexico's environmental laws, regulations and standards are similar in many respects to those in the United States. The General Ecology Law embodies principles similar to those in U.S. laws and regulations, and the technical standards for implementing the General Ecology Law that have been issued are generally comparable to those of the United States.

Mexico is committed to ensuring new source compliance and to "growing clean." Most of those entities intending to construct new facilities or modifications to existing facilities, whether public or private, are required to file an environmental impact analysis with SEDUE and, for high risk activities, a risk assessment. SEDUE reviews these analyses and has the authority to deny authorization for a project or to impose design, construction, and operating conditions to avoid significant adverse environmental effects. Even in cases where all applicable NTEs have not yet been developed, SEDUE can impose limits and other "special conditions." Separate air, water, and waste permits are also necessary where applicable.

In accordance with the General Health Law in Mexico, the Secretariat of Health sets water quality standards for human use and consumption, as well as standards relating to treatments for water disinfection, and performs monitoring and certification of drinking water quality. A national system to monitor and certify water has been established and is applicable throughout Mexico. Likewise, the Secretariat of Health is also responsible for the establishment of sanitary quality criteria for wastewater treatment and for monitoring the health of workers and the general population for risks of exposure to toxic substances and hazardous waste.

The Secretariat of Health is also the entity responsible for establishing the maximum allowable limits of pollutants in the air, as well as evaluating the effects of air pollution on public health and educating the population on reducing the associated risks. Programs are underway for establishing a regulatory framework as well as for training personnel to evaluate the effects on health resulting from exposure to these materials.

The Secretariat of Commerce and Industrial Development (SECOFI) oversees the operations of Mexico's maquiladora industry under the August 15, 1983 "Decree for the Fostering of the Exporting Maquiladora Industry." Under that Decree and in accordance with Annex III of the 1983 Border Environmental Agreement, if waste resulting from materials imported into Mexico from the United States cannot be "nationalized" by the maquiladora operator in accordance with Mexican law, such waste must be returned to the United States.

Since the General Ecology Law was passed, SEDUE has taken increasingly strong measures to bring existing sources into compliance and to demonstrate its commitment to the law. From March 1988 through the end of 1990, 5,405 inspections occurred nationwide resulting in 980 partial and 1,139 temporary plant closings and 3 permanent closings. From January 1 through May 15, 1991, there were more than 275 plant inspections in Mexico City resulting in the temporary or partial closing of 102 facilities and 3 permanent closings. In March 1991, Mexican President Salinas de Gortari closed the "18th of March" PEMEX oil refinery near Mexico City. The closing of this refinery, which accounted for eight percent of PEMEX's total distillation capacity and involved

a U.S. $500 million investment and 5,000 jobs, demonstrates Mexico's commitment to improving the environment. SEDUE has recently hired fifty new inspectors for Mexico City and proposes to have 200 inspectors assigned to the Border Area.

Mexico's efforts however, have been hampered by a lack of resources. Nevertheless, the 1991 SEDUE budget for ecological activities was approximately $39 million, more than three times its 1990 budget for this purpose. In addition, Mexico is negotiating with the World Bank for a loan of $50 million to assist SEDUE which, together with allocations from the Federal Government of Mexico, will provide significant additional resources for SEDUE's activities.

B. OVERVIEW OF EPA AND U.S. ENVIRONMENTAL LAWS IMPACTING THE BORDER AREA

Most United States pollution control and prevention laws are administered by EPA, a Federal regulatory agency headed by an Administrator who is appointed by, and reports directly to, the President. Formed in 1970, EPA is responsible for pollution abatement and control programs, including air and water pollution control; water supply and radiation protection; solid and toxic waste management; emergency preparedness and response and contingency planning; pesticides control; and toxic chemicals regulation. Those offices within EPA having the most direct responsibility for the Border Area include: the Office of International Activities, which maintains Agency contacts with SEDUE and provides the U.S. Coordinator for the 1983 Border Environmental Agreement; the Office of Chemical Emergency Preparedness and Prevention, which maintains contact with SEDUE on spill preparedness and emergency response issues; and the EPA Regional Offices in Dallas (Region 6, which includes the Texas and New Mexico border regions with Mexico) and San Francisco (Region 9, which includes the California and Arizona border regions with Mexico), which help implement and enforce national policy and the full range of EPA environmental programs. As the Border Environmental Plan is implemented, a number of other EPA offices, including the Office of Water and the Office of Enforcement, are having increased involvement in Border Area issues.

Enforcement of EPA-administered statutes affects the U.S. side of the Border Area directly. Some U.S. laws also impact directly upon certain maquiladora operations. For example, the return of hazardous waste to the United States from maquiladora facilities in Mexico is regulated by both U.S. Federal and state laws once those materials reach the U.S. border.

Hazardous substances and wastes in commerce are regulated by the U.S. Department of Transportation (DOT) as hazardous materials. Shipments of hazardous wastes, including those originating in foreign countries, must comply with the regulations applicable to hazardous materials having similar hazardous properties.

Federal regulation of the transportation of hazardous materials is aimed at ensuring public safety through proper containment of hazardous materials during transportation and adequate communication of the nature of potential hazards. The Hazardous Materials Transportation Act, as amended, governs transportation of materials in commerce found by the Secretary of Transportation to pose an unreasonable risk to health and safety or property. Hazardous materials include explosives, flammables, corrosives, poisons, and other materials that have acute potential for human injury as well as radioactive and disease-causing agents.

Pursuant to the U.S. Resource Conservation and Recovery Act (RCRA), which authorizes EPA to regulate hazardous wastes and develop hazardous waste management practices, EPA tracks the domestic movement of hazardous wastes from generation to final disposal. Transboundary shipments of hazardous wastes are also tracked. Through reporting and manifesting requirements, exported hazardous wastes are tracked from their generation in the United States to their arrival at the border with Mexico. For each such export, the exporter must notify EPA of its intent to export; the Mexican Government must consent to receive the export; a copy of the Mexican Government consent must be attached to the manifest accompanying each shipment; and each shipment must conform to the terms of the consent. Imports of hazardous waste from Mexico are tracked from the time they reach the U.S. border until they reach their final U.S. destination.

EPA and authorized states have the authority for administrative enforcement of RCRA requirements. A variety of tools exists under U.S. law to compel transporters, brokers, TSDFs (Treatment, Storage and Disposal Facilities), U.S. sister plants, other intermediaries and any other RCRA violators to come into compliance. These enforcement tools include administrative orders, civil actions, criminal actions, and special penalty actions.

Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 contains U.S. provisions for preparing for responses to accidental releases of extremely hazardous substances. Under Section 301, all U.S. states are required to establish Local Emergency Planning Committees (LEPCs) that are responsible for developing local emergency plans for chemical accidents. Section 304 requires immediate notification of chemical releases above a certain threshold level. Sections 311-312 require facilities to provide information on chemicals produced, stored, and used. Section 313 requires facilities to report the amounts of all routine and accidental releases of certain chemicals. Finally, Section 325 sets forth penalties and enforcement criteria for failure to meet Title III requirements.

EPA has the authority on the U.S. side of the border to protect the supply of drinking water delivered through public water systems. The U.S. Safe Drinking Water Act requires EPA to set drinking water standards, commonly known as Maximum Contaminant Levels, which are applied to such public water systems. In addition, EPA administers a program within the Border Area to improve access to water and sewer systems. To ensure water quality within the Border Area, the Clean Water Act provides the authority for the establishment and enforcement of limitations on point sources discharging into U.S. waters. Water quality standards developed by the states and approved by EPA consist of designated uses and criteria to meet those uses.

Section 815 of the CAAA, which remains in force until July 1, 1995, authorizes the EPA Administrator, in conjunction with the U.S. Department of State and affected border States, to agree upon a cooperative program with SEDUE to monitor and improve air quality in regions on both sides of the Border Area. Section 815 provides, among other things, for establishing air quality monitoring and remediation programs and annual progress reports to the U.S. Congress which are to include funding recommendations for monitoring and remediation efforts.

Monitoring components include ambient air quality monitoring programs, emissions inventory development and collection of additional monitoring data to support state-of-the-art mathematical modeling studies. The ultimate goal of these programs will be to collect and produce data projecting the level of emissions reductions necessary in both Mexico and the United States to attain both primary and secondary National Ambient Air Quality Standards (NAAQS) and other air quality goals in areas within the United States along the Mexican border. The EPA Administrator is authorized to negotiate with appropriate Mexican representatives to develop remediation measures for reducing airborne pollutant levels to achieve and maintain air quality standards and goals. This remediation program will also identify those control measures to be implemented by Mexico with the help of material or financial assistance from the United States.

Section 818 of the CAAA amends the requirements governing State Implementation Plans (SIPs) in international border areas. Among other things, it provides that if a state can demonstrate that the SIP would be adequate to attain and maintain the relevant NAAQS by the specified attainment date, except for emissions emanating from outside the United States, EPA should approve the SIP provided it meets all applicable requirements other than NAAQS attainment and maintenance and not penalize the U.S. city in question by "bumping up" its pollution severity category.

C. APPLICABLE INTERNATIONAL AGREEMENTS AND TREATIES

1. Bilateral Agreements Between Mexico and the United States

Two major groups of bilateral agreements between Mexico and the United States relate to air, water and land resource protection and pollution control.

The first group of agreements includes the 1889 International Boundary Convention which established the International Boundary Commission (IBC), and the Water Treaty of 1944 which replaced the IBC with the International Boundary and Water Commission (IBWC) and granted the IBWC enhanced authority to address water quality, conservation, and use issues. The IBWC was made responsible for undertaking any border water sanitation measures or works mutually agreed upon by the two governments. Such agreements are expressed in the form of IBWC minutes which, upon approval of both governments, become binding obligations upon each as international agreements and relate to planning, construction, operation, and maintenance of joint activities including obligations for measures that each government must undertake. Wastewater treatment facilities are presently under construction at Nuevo Laredo and Nogales, and are scheduled for the New River at Mexicali/Calexico and Tijuana/San Diego. Through the IBWC, Mexico and the United States have launched their largest project to date, a new international secondary sewage treatment plant in the Tijuana/San Diego area.

The second major group of relevant bilateral agreements includes the 1983 Agreement between the United States and Mexico on Cooperation for the Protection and Improvement of the Environment in the Border Area (the "1983 Border Environmental Agreement") and its five Annexes. The 1983 Border Environmental Agreement provides a framework for cooperation between Mexican and U.S governmental authorities to prevent, reduce, and eliminate sources of air, water, and land pollution in a 100-kilometer wide zone along each side of the international boundary. The Agreement creates the general structure under which specific projects set out in technical annexes (currently five) are implemented.

Annex I signed on July 18, 1985 addresses Tijuana/San Diego wastewater treatment facilities. Activities relating to this project have been conducted by the IBWC in coordination with SEDUE and EPA.

Annex II signed on July 18, 1985 and the 1988 Joint U.S./Mexico Contingency Plan for Accidental Releases of Hazardous Substances Along the Border authorize the establishment of the Inland Joint Response Team (JRT). The JRT undertakes emergency actions to respond to accidental oil and hazardous substance spills along the 200-kilometer-wide inland Border Area defined by the 1983 Border Environmental Agreement. The JRT also

coordinates international hazardous substance emergency preparedness and response activities in this area. Establishment of the JRT supplemented the 1980 Agreement of Cooperation between Mexico and the United States regarding Pollution of the Marine Environment by Discharges of Hydrocarbons and other Hazardous Substances (implemented by the U.S. Coast Guard and the Mexican Navy), which establishes a similar mechanism for the Gulf of Mexico and Pacific Ocean regions of the Border Area.

Annex III signed on November 12, 1986 governs the transboundary shipment of hazardous wastes and hazardous substances between Mexico and the United States. It establishes notification and consent procedures which require the country of export of hazardous waste to provide written notice to, and obtain consent from, the country of import prior to commencing export. The Annex further requires the country of export to readmit any shipment of hazardous waste returned for any reason by the country of import. For the United States, this means that the U.S. will allow re-entry of hazardous waste and hazardous substance shipments in compliance with domestic U.S. law. In addition, hazardous waste generated from raw materials admitted to either country "in-bond" for purposes of processing must be readmitted by the country from which the raw materials originated, as in the case of hazardous wastes generated in maquiladora facilities. With respect to hazardous substances, Annex III requires each party to notify the other of regulatory actions undertaken to bar or severely restrict a pesticide or chemical and to give notice of any ongoing hazardous substances export that comes to the attention of the country of export.

Annex IV signed on January 29, 1987 requires copper smelters in the Border Area of Arizona, New Mexico, Texas and Sonora, Mexico, operating as of January 29, 1987, to comply with certain emissions limits that are no stricter than U.S. New Source Performance Standards (NSPS). The Annex contains an annual reporting requirement and provides for the transfer of emissions and compliance monitoring data between SEDUE and EPA.

Annex V signed on October 3, 1989 provides for a quantitative appraisal of causes of, and potential remedies for, urban air pollution problems in Mexico-U.S. border cities identified as "study areas." Under Annex V, for each study area, SEDUE and EPA will compile emissions inventories (including major stationary, mobile, and area sources of selected pollutants), estimate control requirements needed to attain applicable standards, conduct ambient air quality monitoring, and perform air modeling analysis to evaluate air quality changes that would result from airshed-wide emissions reductions. The first study area to be identified under Annex V was Ciudad Juarez/El Paso. At the 1991 Binational Commission meeting in Mexico City, Tijuana/San Diego and Mexicali/Calexico were proposed to be added for study under Annex V.

Four Work Groups of technical experts were established prior to 1991 to implement the terms of the 1983 Border Environmental Agreement and its technical Annexes; the Water Work Group, the Hazardous Waste Work Group, the Air Work Group, and the Contingency Plan/Emergency Response Work Group (Inland Joint Response Team (JRT)). A Cooperative Enforcement Strategy Work Group was established in June 1991 and a Pollution Prevention Work Group in November 1991.

The Mexico-United States Mutual Legal Assistance Cooperation Treaty became effective in May 1991 and provides for mutual legal assistance by the parties in criminal matters. Mexico is also a recent signatory to the Hague Convention On the Taking of Evidence Abroad, to which the United States is also a party. These agreements will make it easier in criminal and civil proceedings for administrative and judicial authorities in one country to obtain assistance from their counterparts in the other.

Since 1983, the following other bilateral and trilateral cooperative agreements associated with protecting natural resources in the Border Area have been signed by Mexico and the United States:

- Agreement between the Directorate General of Natural Resources of SEDUE and the U.S. Fish and Wildlife Service of the U.S. Department of the Interior for Cooperation in the Conservation of Wildlife (1984).

- Agreement between the Forest Service of Mexico and the U.S. Forest Service on Cooperation (1985).

- Memorandum of Understanding among the Directorate General of Natural Resources of SEDUE and the U.S. Fish and Wildlife Service of the U.S. Department of the Interior and the Canadian Wildlife Service of the Department of the Environment of Canada to Evaluate the Possibilities of Developing Strategies for Conservation of Migratory Birds and their Habitats (1988). This agreement provides for trilateral cooperation in promoting projects for the conservation of wetlands.

- Memorandum of Understanding between SEDUE and the U.S. National Park Service on Cooperation in Management and Protection of National Parks and Other Protected Natural and Cultural Heritage Sites (1988).

2. Multilateral Environmental Agreements

Several multilateral agreements to which Mexico and the United States are parties affect the Border Area. Both Mexico and the United States are parties to the 1985 Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol On Substances that Deplete the Ozone Layer, which entered into force in 1989. Mexico was the first country to ratify the Montreal Protocol which has as its objective the enactment of precautionary measures for the control of ozone depleting emissions. Both Mexico and the United States have signed the Basel Convention on the Transboundary Movement of Hazardous Wastes and Their Disposal (the Basel Convention). Mexico has ratified the Basel Convention and President Bush has submitted implementing legislation to Congress for its advice and consent to ratification. The Basel Convention will require an exporting party to provide the receiving country with advance notice of proposed shipments of waste and the prior written consent of the receiving country. It will also require that the exporting country be assured that the waste will be managed in an "environmentally sound manner" in the receiving country. Article 11 of the Convention provides that parties can enter into bilateral agreements with non-parties and with other parties for the trans-shipment of hazardous wastes, so long as the provisions of these agreements are no less protective of the environment than the Basel Convention itself. As noted above, Annex III to the 1983 Border Environmental Agreement, signed in 1986, covers the transboundary shipment of hazardous wastes and hazardous substances.

Both Mexico and the United States are parties to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (the Cartagena Convention) which entered into force in 1986. A 1983 protocol to the Cartagena Convention concerning cooperation in combatting oil spills in the Wider Caribbean Region requires parties to promote contingency plans for combatting oil pollution. Under a second protocol on Specially Protected Areas and Wildlife (SPAW), signed in 1990, the parties have agreed to protect certain ecosystems and species which may be endangered. Mexico and the U.S. are signatories but have not yet ratified the protocol. The parties to the Convention are now attempting to develop a third protocol covering land-based sources of marine pollution.

The International Convention for the Prevention of Pollution from Ships, 1973, and the 1978 Protocol to that Convention (MARPOL 73/78) establish international environmental rules on the design, construction, and operation of ships. As noted above, the International Maritime Organization's Marine Environment Protection Committee (MEPC) has voted to include the Gulf of Mexico and the Wider Caribbean Region (including the Gulf of Mexico) as a special area under MARPOL 73/78 at the July 1991 Meeting of the MEPC. When the special area designation becomes effective, the discharge of oil, oily mixtures, and garbage from ships operating in the region will be prohibited, provided that port facilities to handle such wastes are available.

The United States and Mexico are also parties to the 1972 Convention on the Prevention of the Marine Pollution by Dumping of Wastes and Other Matter (London Ocean Dumping Convention) which controls pollution of the sea by the dumping of wastes and other matter that are liable to create hazards to human health, harm living resources and marine life, damage amenities or interfere with other legitimate uses of the seas.

Several other multilateral instruments may also be relevant to the Border Area. Principle 21 of the 1972 Stockholm Conference on the Human Environment provides that States have the sovereign right to exploit their own resources pursuant to their own environmental policies and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or areas beyond their jurisdiction.

The United Nations Convention on the Law of the Sea (UNCLOS), opened for signature in 1982 but not yet in force, contains provisions on natural resources and the marine environment. It has been signed and ratified by Mexico, and is part of the Supreme Law of Mexico. While the UNCLOS has not been signed or ratified by the United States, the United States accepts and acts in accordance with the balance of interests set forth in the Convention relating to the traditional uses of the ocean set out in the non-deep seabed mining provisions. Where the UNCLOS does not reflect customary international law, the provisions of the 1958 Geneva marine conventions are still applicable for both countries.

3. Mexican-U.S. Environmental Planning and Coordination Mechanisms

The commitments to strengthen cooperative environmental activities in the Border Area and the planning goals set forth in the November 1990 joint Presidential communique, together with SEDUE-EPA collaboration under the 1983 Border Environmental Agreement and the experience with IBWC management of border water projects, creates a flexible binational mechanism for upgrading the border environment. As has already occurred in the process of public comment and hearings, the Plan will draw in and coordinate the participation of the border states and cities, the private sector and the public. By approaching the Plan in stages, together with annual reviews of implementation, a continuing process of review and refinement involving all the relevant parties will be initiated.

The Presidents of Mexico and the United States hold regularly-scheduled meetings to discuss issues of mutual concern including environmental issues and to promote continued friendly and cooperative relations. Progress reports on this Plan are being made available to the Presidents on such occasions.

The next level of Mexican-U.S. planning activities occurs within the framework of the Mexican-U.S. cabinet to cabinet Binational Commission, which brings together the highest levels of authority within the environmental agencies of both countries. The Secretary of SEDUE and the Administrator of the EPA meet at least annually as part of this cabinet-level Binational Commission to further discussions involving cooperative environmental agreements between the two nations. The preparation of the Plan was reviewed in such a meeting during the 1991 Binational Commission meeting in Mexico City.

The 1983 Border Environmental Agreement provides for an annual meeting between the National Coordinators of the Agreement. The Mexican coordinator is the Under Secretary for Ecology of SEDUE. The U.S. coordinator is the Assistant Administrator for International Activities of EPA. The foreign affairs ministries of both countries and the IBWC also participate. Additional representatives from both countries are asked to attend these meetings to facilitate the discussion and understanding of technical and policy issues depending on the agenda for the individual meetings. The purpose of these meetings is to review the manner in which the Border Environmental Agreement is being implemented and to review other environmental cooperation between SEDUE and EPA. It is planned that representatives of the Mexican and U.S. border states as well as the public and private sectors will join the SEDUE-EPA Coordinators' 1992 meeting, to be held in June in Santa Fe, New Mexico.

4. Federal-State Environmental Relationships in Mexico and the United States

SEDUE is more centralized than EPA. As compared with the United States, a much larger portion of Mexico's environmental protection regime is currently developed and implemented by Federal authorities. Mexican laws and regulations provide for an expanded role for the states but this has not yet been fully implemented. For example, in its achievement of ambient air quality standards, Mexico relies on a source permitting program which is currently carried out at the Federal level through SEDUE. SEDUE intends to eventually turn most permitting responsibilities over to the states as intended by Mexico's air regulation. Under Mexican water pollution law, either Federal or state governments may authorize wastewater discharges into bodies of water or into the soil or subsoil.

Since the General Ecology Law was enacted in early 1988, nineteen of the Mexican states, including the States of Coahuila, Sonora, Nuevo Leon and Tamaulipas in the Border Area, plus the Federal District have adopted environmental statutes. Other states have yet to adopt such statutes, leaving to the Federal Government exclusive jurisdiction over most environmental matters. Those regulations and standards passed or promulgated at the local level may not be less stringent than the Federal regulations or standards.

Mexico is currently examining how SEDUE might become more "decentralized" by shifting some of the functions which it now administers centrally to state environmental authorities.

In the United States, many minimum pollution control standards are set at the Federal level. However, these are often implemented by state plans, which may call for more but not less stringent pollution control measures, with Federal authorities retaining oversight responsibility. Examples of this approach include the U.S. air and water pollution control regimes. Under the U.S. Clean Air Act, the states develop state implementation plans or "SIPs" which are submitted to EPA for approval. The SIPs, which must contain a number of measures prescribed by the Federal statute and must provide for their implementation, are subject to Federal oversight. Under the U.S. Clean Water Act, the EPA sets minimum technology-based guidelines for pollutant discharges into surface waters. These are implemented through a permitting program largely carried out by the states under Federal oversight, except where states have chosen not to participate. In these cases, the Federal Government conducts the permitting program. Standards are developed by each state with respect to the quality of their own receiving waters which may be more but not less stringent than the Federal standards. On the other hand, implementation of some U.S. environmental programs, including those in the pesticides area, remain highly centralized.

States and local governments have also adopted their own sets of environmental laws and requirements. In some cases, these laws and requirements parallel Federal rules or are adopted to implement Federal laws and regulations, as noted above. In other cases, states and local governments have adopted different and, in some instances, more stringent protective standards, where permitted by Federal law. For example, the air quality rules and regulations in California and its South Coast Air Quality Management District are in some respects more stringent than Federal standards.

Both SEDUE and EPA have reviewed this Plan with their border state environmental authorities and have included in the general provisions on implementation to this Plan (see Section V) a provision on coordination of environmental programs in the Border Area.

D. ENVIRONMENTAL AGENCIES OF MEXICAN AND U.S. BORDER STATES AND CITIES

The following subsection briefly describes the state and local agencies involved along the Mexican-U.S. border which administer, manage, monitor, permit and enforce environmental regulations.

1. Mexico

At a national level, the National Water Commission has as one of its programs, the responsibilities of promoting and implementing sewage collection and treatment systems for municipal wastewater and providing technical assistance to local operating agencies. A majority of these activities are already taking place in the Border Area.

There are six Mexican states that border the United States: Baja California, Sonora, Chihuahua, Coahuila, Nuevo Leon and Tamaulipas. SEDUE has offices (*"delegaciones"*) in each border state as well as local offices in most Border Area cities. The CNA also has managerial offices in each of the states and most of the cities in the Border Area. Four of the states, Sonora, Nuevo Leon, Coahuila, and Tamaulipas, have state environmental laws, although regulations have not been promulgated pursuant to those state laws.

The principal municipal governments affected include: Tijuana and Mexicali in Baja California; Nogales in Sonora; Ciudad Juarez in Chihuahua; and Nuevo Laredo and Matamoros in Tamaulipas.

Baja California

State water quality programs are administered primarily by the State Public Service Commissions (CESPs) within the Secretariat of Human Works and Public Services (SAHOPE). CESP-T administers the program for the cities of Tijuana and Tecate and CESP-M administers the program for Mexicali. These Commissions are responsible for monitoring wastewater discharges into municipal sewage systems. They are also responsible for water quality monitoring programs in the Pacific Ocean and for monitoring the water quality of transboundary rivers such as the Tijuana and New Rivers. The Commissions coordinate with SEDUE and CNA in the implementation of these monitoring programs.

The State of Baja California, in coordination with and through the assistance of CNA, SEDUE and the IBWC, has begun to construct drinking water and wastewater treatment facilities in compliance with existing arrangements between Mexico and the United States.

Sonora

The Safe Drinking Water and Sewage Commission of Sonora (CEAPAES), within the Secretariat for Infrastructure and Urban Development, is primarily responsible for Sonora's water quality programs. This Commission has offices in various cities throughout the State of Sonora which monitor wastewater discharges

into municipal sewage systems. In coordination with SEDUE and CNA, these Commission offices are also responsible for water quality monitoring programs for transboundary rivers (Nogales, Santa Cruz, and Agua Prieta), and for obtaining additional sources of safe drinking water for the municipalities of the state.

The State of Sonora has constructed, in coordination with and through the assistance of CNA, SEDUE and the IBWC, drinking water and sewage treatment facilities for the City of Nogales, to implement the relevant Mexico-United States binational arrangement.

Chihuahua

Ciudad Juarez has a recently-created municipal ecological committee which participates actively in the process of finding solutions to environmental problems.

Air Quality Control

Ciudad Juarez has worked with SEDUE and the State of Texas to establish a long-term air quality monitoring network. This network, the first of its kind to be established in a Mexican border city, was launched on June 10, 1990, and will continue to operate at least through August 1992.

Water Quality Control

Water quality programs in Chihuahua are administered primarily by the Central Water and Sanitation Board (JCAS), which is an arm of the state government. These programs are also administered by municipal water and sanitation offices, established in various cities, which form a part of the JCAS. The state is considering a delegation of its current responsibility for water quality programs to those local JCAS offices with management capabilities. The JCAS also has programs to monitor wastewater discharges in municipal sewage systems and to monitor the quality of drinking water sources, which are mostly ground water aquifers. The JCAS, in cooperation with SEDUE and CNA, also conducts exploration programs, aimed at obtaining new sources of safe drinking water for each of the cities within the state.

SEDUE, CNA, and the IBWC are also active participants with the states of Chihuahua and Ciudad Juarez in an integrated project to resolve the transboundary water sanitation problem at Ciudad Juarez.

Coahuila

In Coahuila, water quality programs are carried out by the Coahuila Potable Water and Sewage System (SAPAC), which is part of the state government and has local offices in several Coahuila cities. At present, the state government is considering the possibility of transferring responsibility for drinking water and wastewater treatment programs from the state level to the municipal level. SAPAC currently monitors wastewater discharges into municipal sewage systems and has constructed, rehabilitated, and increased the capacity of wastewater treatment facilities in a number of local communities.

Nuevo Leon

Water Quality Control

In Nuevo Leon, the State System of Potable Water and Water Treatment (SISTELEON) administers water quality programs. SISTELEON is a state government agency with local offices at the municipal level. The Monterrey branch of SISTELEON, referred to as the Monterrey Water and Drainage System, has implemented drinking water and wastewater treatment projects for the Monterrey metropolitan area, and has assisted other parts of the state in establishing the same type of programs. The Monterrey Water and Drainage System, in coordination with CNA, SEDUE, and the IBWC, is also working to establish a system for the collection and treatment of wastewater from Colombia, the only border city in Nuevo Leon.

Solid Waste Control

The Metropolitan Waste Collection System (SIMEPRODE), is part of the state government and is responsible for the handling and disposal of solid waste in the Monterrey metropolitan area. Solid waste management in the rest of the state is essentially a municipal activity, carried out in compliance with standards established by SEDUE.

Tamaulipas

Water quality programs within the State of Tamaulipas are administered primarily by the state government's Commission for Potable Water and Wastewater Treatment (COAPA), which has local offices in cities throughout the state. At present, COAPA is considering transferring responsibility for safe drinking water systems and sewage systems to the municipalities. COAPA has programs to monitor wastewater discharges into municipal sewage systems, as well as programs for monitoring effluent discharges from treatment plants to collection

facilities. COAPA also has constructed, rebuilt, or increased the capacity of drinking water systems and sewage treatment facilities in several cities.

The State of Tamaulipas, through the Secretariat of Human Resources and Public Services, is participating actively, in coordination with CNA, SEDUE and the IBWC, in the construction of a municipal wastewater collection and treatment system, within the context of the Mexican/U.S. bilateral program.

Mexican states do not have air pollution control agencies. All air quality control activities in Mexico are undertaken by SEDUE with the assistance of municipal authorities. Management of solid waste is essentially a municipal responsibility in Mexico, conducted under the supervision of SEDUE. Each municipality manages solid waste or contracts with private companies for solid waste management services. Each Mexican state operates, selects and provides sites for disposal of hazardous wastes and substances, in accordance with standards set by SEDUE. Mexican Customs and SEDUE participate with each state in the control of transboundary movements of hazardous waste.

2. United States

The States of California, Arizona, New Mexico and Texas each share a border with Mexico. The principal municipal governments affected by border environmental concerns include the following: San Diego and Calexico in California; Nogales in Arizona; and El Paso, Laredo, and Brownsville in Texas. The bulk of existing data on concentrations of metals, volatile organic compounds, and other toxic constituents (i.e., non-conventional pollutants) is a result of state monitoring programs supported by funds from EPA provided under the U.S. Clean Water Act, the U.S. Clean Air Act, RCRA, and other similar programs. For example, California has been routinely monitoring conventional pollutants in Border Area water bodies since the mid-1970s and many airborne priority pollutants since the mid-1980s.

California

The principal environmental officer of the State of California is the Secretary for Environmental Protection, a recently created cabinet-level position that oversees the California Environmental Protection Agency (Cal-EPA). Cal-EPA consists of the following:

- Office of the Secretary for Environmental Protection;
- Air Resources Board;

- Integrated Waste Management Board;
- State Water Resources Control Board (including Regional Water Quality Control Boards);
- Department of Toxic Substances Control;
- Department of Pesticide Regulation; and
- Office of Environmental Health Hazard Assessment.

The constituent boards, departments and offices, such as the Air Resources Board and the Department of Toxic Substances Control, manage individual, media-specific programs. Although the boards are independent agencies, the Secretary is responsible for ensuring that board activities are consistent with State policy. The Secretary also fulfills the Agency Secretary role for the boards, departments, and offices within Cal-EPA.

Along with the California Air Resources Board (CARB), the San Diego Air Pollution Control District as well as the Imperial County Air Pollution Control District have provided technical assistance and resources. It is anticipated that this assistance will increase as programs implemented under the Border Environmental Plan are begun. CARB is also responsible for regulating emissions from motor vehicles.

Air Quality Control

The statewide custodian of air quality is CARB, located in Sacramento. CARB oversees regulations of California's various air quality management districts. CARB coordinates the plans prepared by the individual districts into an overall state implementation plan and has the authority to override district decisions regarding state ambient air quality standards and emission limitations. CARB also has the authority to replace district standards.

Water Quality Control

The administration of California's water quality programs is divided among nine regional water quality control boards that report to the California Water Resources Control Board in Sacramento. The nine boards are authorized to adopt regional water quality control plans, prescribe waste discharge requirements, and perform other water quality control functions within their respective regions, subject to state-board review or approval. The State Water Resources Control Board and two Border Area regional boards have provided a significant amount of technical assistance with regard to border water quality issues. California has been routinely monitoring conventional pollutants in border water bodies since the mid-1970s and many priority pollutants since

the mid-1980s. The state has also apportioned U.S. $5.3 million in matching funds for the design and construction of wastewater treatment works to address the Tijuana sanitation problem.

Solid Waste Quality Control

Solid waste disposal facilities, including landfills, transfer processing stations, and waste-to-energy facilities, must obtain permits and are otherwise regulated by local enforcement agencies under the overall coordination of the California Waste Management Board. The local agencies may consist of counties or cities or both.

Hazardous Waste Quality Control

The California Department of Toxic Substance Control is a comprehensive department that regulates hazardous waste generators, treatment storage and disposal facilities (TSDFs), transporters, site mitigation, alternative technology, and runs the state hazardous waste program.

California law regulates all firms generating waste oil, asbestos, or polychlorinated biphenyls (PCBs). Once the amount stored exceeds prescribed thresholds, the U.S. Resource Conservation and Recovery Act (RCRA) and the U.S. Toxic Substances Control Act (TSCA) take effect.

In California, the Department of Food and Agriculture regulates the use of pesticides, however, this responsibility may be shifted by an upcoming state government reorganization.

Emergency Response/Contingency Planning

Emergency planning is carried out by the Governor's Office of Emergency Services. There are local planning efforts as well.

Arizona

In 1987, Arizona created a new cabinet-level Department of Environmental Quality (ADEQ). All sources with the potential to emit significant amounts of any regulated pollutant must have installation and operating permits in Arizona.

Air Quality Control

The state regulates only the major sources of air pollution, defined as those capable of individually generating more than 75 tons of air contaminants annually and those that are involved in copper smelting or in crude oil refining. Emergency planning at the state level is the responsibility of the Division of Emergency Services of the Arizona Department of Emergency and Military Affairs. Air pollution programs are managed by the Office of Air Quality which seeks to prevent, control and abate air pollution by testing, determining standards, conducting investigations, compiling and publishing reports, and initiating and prosecuting enforcement actions.

Water Quality Control

Arizona's water quality control activities are managed by the Office of Water Quality Management within ADEQ. The state administers substantial portions of the National Pollutant Discharge Elimination System (NPDES) program, while EPA is responsible for carrying out enforcement functions.

Arizona has been routinely monitoring conventional pollutants in border water bodies since the mid-1970s and many priority pollutants since the mid-1980s. ADEQ, in cooperation with the IBWC, the City of Nogales, and Santa Cruz County, recently developed a four month surface and ground water quality monitoring program for the Nogales area.

ADEQ's Office of Water Quality approves construction of sanitary facilities; provides general construction supervision; conducts routine operation and maintenance inspections; certifies operators of treatment facilities; and administers Federal construction grants through the Wastewater Management Authority of Arizona. Arizona's Aquifer Protection Permit Program regulates many of the wastewater and solid waste facilities mentioned in the Border Plan.

Solid/Hazardous Waste Quality Control

In Arizona, solid waste landfills are under the jurisdiction of local communities, although the state Office of Waste Programs monitors those efforts. In Arizona, the State Chemist regulates the use of pesticides.

Emergency Response/Contingency Planning

Emergency planning at the state level is performed by the Division of Emergency Services in the Arizona Department of Emergency and Military Affairs. There are local planning efforts as well.

New Mexico

New Mexico's environmental programs are managed by the New Mexico Environmental Department (NMED). Emergency planning is led at the state level by the Division of Emergency Services. Each county has a local Emergency Planning Committee which implements the Emergency Planning and Community Right-to-Know Program. New Mexico has full responsibility, as delegated by EPA, for new source review permitting for sources in the state.

Air Quality Control

New Mexico's ambient air quality standards include EPA's criteria pollutants as well as other pollutants. Any new or existing source that, without controls, would emit more than an average of 0.25 parts per million (ppm) of the pollutant per eight-hour shift must use the best available control technology (BACT) to reduce those emissions.

Water Quality Control

NMED administers a public water supply program which regulates all public water systems in the State for drinking water quality system design and operation and the certification of utility personnel. NMED also administers the Wellhead Protection Program to protect ground water as a source of public water supply. NMED has not assumed full authority to manage the Federal water pollution control programs. State rules specify that discharges covered by the NPDES permit programs are not subject to state regulations unless a source has not corrected a violation within 30 days of receiving notice from EPA. In such cases, state discharge regulations take effect until the violation has been rectified.

EPA has delegated responsibility for the public water supply program to the New Mexico Environment Department.

Solid/Hazardous Waste Quality Control

Solid nonhazardous waste management is under the jurisdiction of the Solid Waste Bureau of the NMED. The Bureau has a key role in the development of state regulations and implementation of both State and Federal regulations governing solid waste management. While the NMED has a role in the siting, permitting and operation of solid waste facilities in New Mexico, primary responsibility for managing solid waste disposal rests with the counties and municipalities.

Hazardous waste regulation in New Mexico is under the jurisdiction of the Hazardous and Radioactive Waste Bureau of the NMED. The NMED is authorized under RCRA and state law to issue permits to, and enforce against, hazardous waste facilities. Thus, it has a role in the siting and operation of hazardous waste disposal facilities in New Mexico. The NMED also has a role in the transboundary movement of foreign waste through the monitoring of waste manifesting required under RCRA. In addition, the NMED administers the RCRA import/export regulations which require all hazardous waste treatment, storage and disposal facilities in New Mexico to provide notification of anticipated receipt of foreign waste. NMED has also cooperated with Federal authorities in case development investigations related to the enforcement of RCRA import/export regulations.

In New Mexico, pesticide use falls under the jurisdiction of the New Mexico Department of Agriculture.

Emergency Response/Contingency Planning

Emergency response and contingency planning activities in New Mexico are performed or coordinated by the Department of Public Safety, Emergency Management Bureau. The Bureau serves as the coordinator and repository for all hazardous materials emergency planning information and response activities for the State Emergency Response Commission (SERC).

Texas

Environmental programs in Texas are decentralized and are administered by several individual offices. Unlike California and Arizona, Texas has no comprehensive cabinet level environment department. Texas is in the process of unifying its environmental agencies.

Air Quality Control

The Texas Air Control Board (TACB) has complete autonomy over all matters related to air pollution, including managing and enforcing all federally required air permit programs. The central office in Austin is responsible for enforcement, monitoring and technical support, and program development, while routine day-to-day activities are carried out by 12 regional offices.

Since the signing of the Border Environmental Agreement in 1983, the City of El Paso and the State of Texas have increased their activities with respect to Border Area air concerns. They have attended meetings of the National Environmental Coordinators, have sponsored meetings of the local Ciudad Juarez/El Paso air quality Work Group, and have assisted in providing training to Mexican and U.S. personnel working in the Border Area. City and state involvement in the provision of technical guidance to SEDUE-Ciudad Juarez in the establishment and operation of the long-term Ciudad Juarez PM-10, CO, O_3, and meteorology monitoring network has been of particular assistance. This network, the first long-term network of its kind in a Mexican border city, was first activated on June 10, 1990 and will continue in operation at least through August 1992.

Water Quality Control

The Texas Water Development Board (TWDB) administers the Construction Grant Program under delegation from EPA. The TWDB also administers the State Revolving Loan Fund and the Colonias Plumbing Loan Programs which receives funding from EPA. The TWDB provides administrative, financial, and engineering support for these programs.

The Texas Department of Health (TDH) administers a public water supply program which regulates all public water systems in Texas for drinking water quality, system design and operation and certification of operating personnel. The TDH also jointly administers the Wellhead Protection Program with the Texas Water Commission (TWC) to protect ground water quality as a source of public water supply.

The Texas General Land Office (TxGLO) serves as the chief liaison for the state on all matters relating to the Gulf of Mexico including LBS, marine debris, and habitat protection. Generally TxGLO is responsible for managing and leasing all public school lands for the State of Texas. In coastal Texas, this includes all exploration for and production of oil and gas, including royalties. TxGLO has recently been charged with the responsibility for administering the new Coastal Zone Management (CZM) Program under NOAA. TxGLO is also the agency responsible for coastal oil spill response.

Other Texas Programs Related to Water Quality

Texas Department of Health - Mexico/U.S. Border Council

In 1989, the Texas legislature created an Office of Texas-Mexico Health and Environment within the Texas Department of Health to determine health and environmental problems along the Mexican-Texas border and make recommendations to the legislature for solutions to these problems. An interagency advisory council, composed of members from state and Federal agencies and universities, issued a report on border problems. In addition, there is a Mexico/Texas Border Health Association which has existed for many years and provides a forum for health and environmental officials from Mexico and Texas to discuss problems and needs.

Texas Water Development Board Economically Distressed Areas Program

In the Border Area along the Rio Bravo/Rio Grande, corresponding to the states of Texas in the United States and the states of Chihuahua, Coahuila, Nuevo Leon, and Tamaulipas in Mexico, there has been a history of unplanned rural subdivision development which has accelerated during the past decade. These residential subdivisions, referred to as "colonias", have common characteristics: substandard housing, inadequate roads, poor drainage, and substandard or nonexistent water and sewer facilities. They are usually located beyond official city and town limits, or at least outside municipal water and sewage treatment districts. Often the residents haul potable water from the nearest available source, sometimes miles away. Some residents, for lack of other options, use water taken from irrigation ditches. If ground water is available, shallow wells may be used, but the water is of poor quality. When organized water systems are available, residents may obtain water from a yard tap or common tap which serves several residences. Human waste is disposed of in pit privies or substandard on-site waste disposal systems that pollute the shallow ground water relied on for drinking water.

In 1989, the Texas legislature created a program called the Economically Distressed Areas Program in 1989, which is a broad program, not designed exclusively for the colonias. State legislation requires that a project area defined as an Economically Distressed Area must be located within an affected county. Affected counties are those where either per capita income is 25 percent below the state average and unemployment is 25 percent above the state average for the last three years or are adjacent to Mexico. Economically Distressed Areas were defined by the legislature to be those areas that have inadequate water or wastewater systems, in adequate financial resources to meet those needs and whole 80 percent of the dwellings to be served were occupied in June 1, 1989. All the current projects under the State program are located in the Border Area as defined in the Plan.

The FY 1990 Appropriation Act for EPA programs allocated $15 million for establishing a special revolving fund (SRF) for loans in the colonias of 12 Texas counties. This SRF will work in concert with the state program. Whereas the state program will fund water and wastewater treatment facilities, the colonias SRF will fund individual plumbing needs and connections to sewer collection systems and water mains.

Solid/Hazardous Waste Quality Control

The Texas Department of Health, Bureau of Solid Waste Management has responsibility for solid (non-hazardous) waste in Texas. The Bureau drafts and implements regulations applicable to all aspects of solid waste management to include permitting of solid waste disposal facilities and enforcement of regulations. County and municipal authorities play a major role in the implementation of the regulatory requirements. Various Councils of Governments (COGs) in Texas are developing regionalization plans for solid waste management. As these plans become final and are implemented, these COGs will be assuming greater roles in regulatory implementation.

The TWC has jurisdiction over hazardous waste management in Texas. The TWC issues permits to hazardous waste treatment, storage, and disposal facilities and enforces applicable regulations, including RCRA import notification requirements. The TWC has a role in the siting and operation of hazardous waste facilities as well as the transboundary movement of hazardous waste. Import/export information obtained by the TWC from the regulated community is supplied to the Regional Office as part of the implementation of their annual grant work plans.

The TWC has been active with Customs in responding to accidental chemical spills and providing assistance in the identification/classification of unknown substances crossing the border. Their activities also include Operation Exodus (spot checks of exports to Mexico).

The TWC periodically conducts informative workshops for the regulated community on import/export regulations. In addition, the TWC had an educational conference on hazardous waste management for the regulated community along the border in El Paso, Texas, in July 1991. The TWC has participated in some of the cooperative inspections with SEDUE and Region 6. The TWC has cooperated in case development investigations related to the enforcement of RCRA import/export regulations.

In Texas, the State Department of Agriculture controls the use of pesticides.

Emergency Response/Contingency Planning

The State Emergency Response Commission (SERC) is chaired by the Governor's Division of Emergency Management (DEM). The DEM coordinates contingency planning and preparedness activities of the county-based Local Emergency Planning Committees (LEPCs) and also becomes the lead state agency for emergency response action where a disaster has been declared. Other emergency response responsibilities are shared by the Texas Water Commission for spills of hazardous substances, the Texas Air Control Board for air releases, the Texas Railroad Commission for land based oil spills, and the General Land Office for marine oil spills. The Texas Department of Health is the repository for hazardous substance facility inventories.

The Texas SERC was awarded a $75,000 grant by EPA in 1991 to conduct workshops in border cities to foster development of contingency plans and emergency response capabilities.

ANNEX B

BACKGROUND MATERIALS RELATING TO SECTIONS II AND III

Figure B-1. Protected Areas in the Mexico/United States Border Area

TABLE B-1. TOP MEXICAN/U.S. LAND BORDER PORTS OF ENTRY RANKED BY PERSONS ENTERING U.S.

Port of Entry	Persons Entering U.S. in Millions 1986	1987	1988	1989	1990	Average Annual Growth Rate (%) 1986-1990
San Ysidro/Otay Mesa, CA	41.5	44.6	51.6	60.4	62.2	10.8
El Paso, TX	33.1	32.4	39.8	42.4	43.1	7.2
Calexico, CA	15.8	15.7	21.4	27.6	29.9	18.3
Laredo, TX	14.4	15.1	16.6	16.8	17.9	5.7
Hidalgo, TX	13.5	13.2	13.4	15.0	16.6	5.5
Brownsville, TX	14.2	13.6	12.8	14.8	15.8	3.0
Nogales, AZ	11.7	11.9	13.7	14.0	15.2	6.9
San Luis, AZ	5.2	5.5	7.1	7.3	7.9	11.3
Eagle Pass, TX	4.9	5.2	6.0	6.7	6.3	7.0
Douglas, AZ	4.3	4.2	4.4	4.6	4.9	3.3
TOTAL	**158.6**	**161.4**	**186.8**	**209.6**	**219.8**	**7.9**

Source: U.S. Customs Service Border Interdiction Committee.

TABLE B-2. TOP MEXICAN/U.S. LAND BORDER PORTS OF ENTRY RANKED BY TRUCKS ENTERING U.S.

Port of Entry	Trucks Entering U.S. in Thousands 1985	1986	1987	1988	1989	1990	Average Annual Growth Rate (%) 1986-1990
San Ysidro/Otay Mesa, CA	182.4	243.5	292.0	342.1	399.8	373.5	16.2
El Paso, TX	143.6	177.0	172.4	179.2	182.3	539.4*	6.6**
Brownsville, TX	141.2	152.7	160.9	160.9	142.5	180.1	5.7
Calexico, CA	131.4	127.4	133.0	134.1	140.2	155.1	3.5
Laredo, TX	103.5	113.3	137.9	182.0	322.3*	313.7*	21.1**
Nogales, AZ	102.6	119.6	107.0	132.0	154.3	143.3	7.8
Hidalgo, TX	36.2	39.6	57.6	89.4	125.6	119.4	29.1
Eagle Pass, TX	32.5	26.6	28.0	31.2	36.8	36.3	3.0
Douglas, AZ	12.3	13.4	16.6	17.7	12.5	13.8	4.1
San Luis, AZ	10.7	13.1	16.7	23.5	29.8	33.6	26.0
TOTAL	**896.4**	**1026.2**	**1122.1**	**1292.1**	**1546.1**	**1908.2**	--

Source: U.S. Customs Service Border Interdiction Committee.

*Data includes empty trucks that were previously counted with passenger traffic.
**Average does not use data with empty trucks included.

TABLE B-3. GROWTH IN EMPLOYMENT IN U.S. BORDER COUNTIES, 1970-1988

County	Total Number of Employees			Average Annual Growth Rate	
	1970	1980	1988	1970-1980	1980-1988
Yuma, AZ	10,698	16,281	22,502	5.22	3.82
Pima, AZ	76,496	149,545	209,786	9.55	4.03
Cochise, AZ	9,868	11,674	15,260	1.83	3.07
Santa Cruz, AZ	3,586	6,710	7,962	8.71	1.87
Subtotal	100,648	184,210	255,510	8.30	3.87
San Diego, CA	290,958	533,027	767,646	8.32	4.40
Imperial, CA	11,866	18,129	18,835	5.28	0.39
Subtotal	302,824	551,156	786,481	8.20	4.27
Hidalgo, NM	800	1,322	1,342	6.53	0.15
Luna, NM	1,824	2,232	2,487	2.24	1.14
Dona Ana, NM	9,932	16,174	24,754	6.28	5.30
Subtotal	12,556	19,728	28,583	5.71	4.49
El Paso, TX	81,269	130,753	152,179	6.09	1.64
Hudspeth, TX	203	140	215	-3.10	5.36
Culberson, TX	816	587	513	-2.81	-1.26
Jeff Davis, TX	46	160	195	24.78	2.19
Presidio, TX	605	599	536	-0.10	-1.05
Brewster, TX	951	1,345	1,452	4.14	0.80
Terrell, TX	241	140	94	-4.19	-3.29
Val Verde, TX	3,423	5,417	5,266	5.83	-0.28
Kinney, TX	209	276	245	3.21	-1.12
Maverick, TX	2,706	4,883	4,018	8.05	-1.77
Dimmit, TX	519	1,580	1,069	20.44	-3.23
Webb, TX	12,922	24,363	26,818	8.85	1.01
Zapata, TX	227	652	706	18.72	0.83
Jim Hogg, TX	540	574	535	0.63	-0.68
Starr, TX	1,115	1,712	2,518	5.35	4.71
Hidalgo, TX	27,807	41,249	67,775	4.83	6.43
Willacy, TX	1,162	1,741	1,662	4.98	-0.45
Cameron, TX	25,270	47,866	53,621	8.94	1.20
Subtotal	160,031	264,037	319,417	6.50	2.10
Total	576,059	1,019,131	1,389,991	7.69	3.64

Source: County Business Patterns, U.S. Department of Commerce, Bureau of the Census.

TABLE B-4. BUSINESS EMPLOYMENT PATTERNS FOR U.S. BORDER COUNTIES

County	Number of Employees by Industry, 1970											
	Total	Agriculture Forestry and Fishing	Mining	Construction	Manufacturing	Transportation and Public Utilities	Wholesale Trade	Retail Trade	Finance, Insurance, Real Estate	Services	Unclassified Establishments	Subtotal*
Yuma, AZ	10,698	380	D	739	948	616	1,079	3,646	531	2,690	D	10,629
Pima, AZ	76,496	347	6,053	8,752	7,574	4,173	3,582	20,641	5,008	19,947	419	76,496
Cochise, AZ	9,868	7	D	D	1,681	636	327	2,648	528	1,810	D	7,637
Santa Cruz, AZ	3,586	D	D	167	200	289	769	1,430	134	478	112	3,579
Subtotal*	100,648	734	6,053	9,658	10,403	5,714	5,757	28,365	6,201	24,925	531	98,341
San Diego, CA	290,958	2,145	551	19,982	73,302	19,394	13,758	74,012	19,683	66,442	1,697	290,966
Imperial, CA	11,866	540	17	566	1,288	826	1,435	4,655	561	1,948	30	11,866
Subtotal*	302,824	2,685	568	20,548	74,590	20,220	15,193	78,667	20,244	68,390	1,727	302,832
Hidalgo, NM	800		D	D	D	46	26	336	32	207		647
Luna, NM	1,824	107	D	119	251	255	33	651	117	265	D	1,798
Dona Ana, NM	9,932	71	13	823	1,425	934	337	3,388	675	2,190	76	9,932
Subtotal*	12,556	178	13	942	1,676	1,235	396	4,375	824	2,662	76	12,377
El Paso, TX	81,269	256	169	6,297	22,467	6,826	6,917	18,552	4,884	14,475	426	81,269
Hudspeth, TX	203		D	7		D	D	102	D	53		162
Culberson, TX	816		D	D	D	D	19	272	D	69		360
Jeff Davis, TX	46			D								
Presidio, TX	605	D	D	27	D	56	24	299	30	88	D	524
Brewster, TX	951	D	D	33	42	112	90	339	43	280	3	942
Terrell, TX	241		D	D	D	25	D	96	D	22		143
Val Verde, TX	3,423	14	D	189	D	231	175	1,125	228	545	42	2,549
Kinney, TX	209			12		D	D	49	D	D		61
Maverick, TX	2,706	D	101	60	908	148	93	1,052	98	226	D	2,686
Dimmit, TX	519	D	105	20		19	D	242	33	85		504
Webb, TX	12,922	D	67	403	1,147	1,153	1,015	5,089	730	2,801	D	12,795
Zapata, TX	227		62	23		D	D	68	14	47		214
Jim Hogg, TX	540	D	116	49	D	D	32	171	D	46	D	414
Starr, TX	1,115	D	416	18	5	27	33	399	D	169	D	1,067
Hidalgo, TX	27,807	746	651	1,894	2,861	1,329	5,533	8,543	1,245	4,778	227	27,807
Willacy, TX	1,162	D	17	63	63	55	301	436	57	164	D	1,156
Cameron, TX	25,270	865	74	1,875	4,987	1,904	2,353	7,328	1,325	4,402	168	25,272
Subtotal*	160,031	1,881	1,778	10,970	32,471	12,275	16,585	44,189	8,687	28,250	866	157,952
Total	576,059	5,478	8,412	42,118	119,140	39,444	37,931	155,596	35,956	124,227	3,200	571,502

TABLE B-4. BUSINESS EMPLOYMENT PATTERNS FOR U.S. BORDER COUNTIES (CONTINUED)

County	Total	Agriculture Forestry and Fishing	Mining	Construction	Manufacturing	Transportation and Public Utilities	Wholesale Trade	Retail Trade	Finance, Insurance, Real Estate	Services	Unclassified Establishments	Subtotal*
	Number of Employees by Industry, 1980											
Yuma, AZ	16,281	1,069	16	1,620	1,467	866	1,426	5,590	786	3,220	221	16,281
Pima, AZ	149,545	950	6,685	17,189	20,589	7,805	7,367	37,971	9,902	39,625	1,462	149,545
Cochise, AZ	11,674	28	458	893	1,925	1,152	448	3,682	637	2,256	195	11,674
Santa Cruz, AZ	6,710	A	A	291	858	496	1,099	277	329	1,024	110	4,484
Subtotal*	184,210	2,047	7,159	19,993	24,839	10,319	10,340	47,520	11,654	46,125	1,988	181,984
San Diego, CA	533,027	4,266	658	10,293	28,547	28,219	127,219	127,681	43,846	149,387	5,477	436,027
Imperial, CA	18,129	770	B	2,120	1,302	1,783	6,219	1,230	3,142	E	17,817	
Subtotal*	551,156	5,036	658	38,904	29,849	30,002	133,900	45,076	152,529	5,477	453,844	
Hidalgo, NM	1,322		A	18	F	B	52	393	B	C	38	501
Luna, NM	2,232	B	26	127	170	227	192	839	162	344	B	2,087
Dona Ana, NM	16,174	307	B	2,111	1,843	925	705	4,999	1,088	3,824	E	15,802
Subtotal*	19,728	307	26	2,256	2,013	1,152	949	6,231	1,250	4,168	38	18,390
El Paso, TX	130,753	399	259	11,477	35,089	9,128	9,759	31,058	7,045	25,269	1,271	130,754
Hudspeth, TX	140		A	A		A	26	58	11	19	8	122
Culberson, TX	587		43	9	B	20	19	264	A	135	35	525
Jeff Davis, TX	160		B	A		A		44	A	26	A	70
Presidio, TX	599	A	A	30	B	47	25	273	43	76	47	541
Brewster, TX	1,345	A	B	84	23	134	58	535	57	327	B	1,218
Terrell, TX	140		A		A	12		94	A	A	A	106
Val Verde, TX	5,417	B		446	745	327	257	2,229	388	924	B	5,316
Kinney, TX	276			50		B		45	B	B	3	98
Maverick, TX	4,883	A	168	C	G	218	293	1,860	228	392	96	3,255
Dimmit, TX	1,580	A	193	125	231	136	167	397	64	244	B	1,557
Webb, TX	24,363	104	1,136	1,615	2,183	2,878	2,008	8,982	1,201	3,821	435	24,363
Zapata, TX	652		C	48	A	A	7	189	B	93	55	392
Jim Hogg, TX	574		126	30	A	A	106	206	A	58	15	541
Starr, TX	1,712	B	97	70	A	90	65	805	69	393	46	1,635
Hidalgo, TX	41,249	635	831	4,722	7,921	2,423	8,951	15,354	2,356	7,471	585	51,249
Willacy, TX	1,741	102	160	53	323	172	116	491	85	228	11	1,741
Cameron, TX	47,866	295	88	3,343	11,960	2,988	4,209	13,298	2,696	8,602	387	47,866
Subtotal*	264,037	1,535	3,101	22,102	58,475	18,573	26,066	76,182	14,243	48,078	2,994	271,349
Total	1,019,131	8,925	10,944	83,144	97,740	59,893	67,357	263,833	72,223	250,900	10,497	925,567

TABLE B-4. BUSINESS EMPLOYMENT PATTERNS FOR U.S. BORDER COUNTIES (CONTINUED)

	Number of Employees by Industry, 1988											
County	Total	Agriculture Forestry and Fishing	Mining	Construction	Manufacturing	Transportation and Public Utilities	Wholesale Trade	Retail Trade	Finance, Insurance, Real Estate	Services	Unclassified Establishments	Subtotal*
Yuma, AZ	22,502	1,814	B	1,482	1,725	992	1,392	7,337	969	6,541	C	22,252
Pima, AZ	209,786	1,991	1,801	18,143	31,618	9,111	8,619	52,459	12,837	71,527	1,680	209,786
Cochise, AZ	15,260	79	151	761	1,398	1,211	437	5,102	847	5,081	193	15,260
Santa Cruz, AZ	7,962	17		302	1,008	393	1,838	2,734	408	1,142	120	7,962
Subtotal*	255,510	3,901	1,952	20,688	35,749	11,707	12,286	67,632	15,061	84,291	1,993	255,260
San Diego, CA	767,646	7,135	678	58,917	124,379	33,065	42,723	184,606	64,541	243,821	7,781	767,646
Imperial, CA	18,835	1,847	E	1,170	1,634	1,215	1,799	6,196	828	3,583	C	18,272
Subtotal*	786,481	8,982	678	60,087	126,013	34,280	44,522	190,802	65,369	247,404	7,781	785,918
Hidalgo, NM	1,342		A	21	F	44	17	472	B	204	1	759
Luna, NM	2,487	B	A	92	92	119	154	975	222	760	37	2,451
Dona Ana, NM	24,754	165	61	2,496	2,585	1,360	1,136	7,181	1,759	7,623	388	24,754
Subtotal*	28,583	165	61	2,609	2,677	1,523	1,307	8,628	1,981	8,587	426	27,964
El Paso, TX	152,179	481	78	9,216	39,170	8,679	9,790	35,311	8,571	39,366	1,517	152,179
Hudspeth, TX	215		A	B		B	A	135	A	9	4	148
Culberson, TX	513	A	B	A	B	A	37	213	A	144	9	403
Jeff Davis, TX	195			24	A	A		57	A	87	2	170
Presidio, TX	536	A		15	A	68	11	282	54	74	8	512
Brewster, TX	1,452	A	A	58	36	124	79	515	172	416	B	1,400
Terrell, TX	94				A	A	A	43	A	27		70
Val Verde, TX	5,266	26	B	225	475	330	418	2,115	370	1,210	B	5,169
Kinney, TX	245	A		A		B		52	16	84	10	162
Maverick, TX	4,018	16	B	50	1,028	174	209	1,534	261	621	B	3,893
Dimmit, TX	1,069	A	109	67	B	66	35	418	67	218	3	983
Webb, TX	26,818	21	476	930	1,515	4,074	1,840	9,115	1,837	6,517	493	26,818
Zapata, TX	706		127	38	A	13	A	288	B	159	12	637
Jim Hogg, TX	535		35	19	A	26	47	263	57	70	A	517
Starr, TX	2,518	B	B	48	A	143	118	1,236	158	645	56	2,404
Hidalgo, TX	67,775	935	850	3,632	10,031	2,492	9,452	20,734	3,645	14,856	1,148	67,775
Willacy, TX	1,662	74	A	41	E	128	79	582	116	302	20	1,342
Cameron, TX	53,621	315	B	2,279	9,278	2,871	3,764	15,715	3,870	14,893	F	52,985
Subtotal*	319,417	1,868	1,675	16,642	61,533	19,188	25,879	88,608	19,194	79,698	3,282	317,567
Total	1,389,991	14,916	4,366	100,026	225,972	66,698	83,994	355,670	101,605	419,980	13,482	1,386,709

* Subtotals for individual employment categories do not include data withheld to avoid disclosure.

Letters indicate figures withheld to avoid disclosing data for individual companies:

- For 1970, D denotes figures withheld to avoid disclosing data for individual companies.
- For 1980 and 1988, employment-size classes for these companies are indicated as follows: A-0 to 19, B-20 to 99, C-100 to 249, E-250 to 499, F-500 to 999.

Source: County Business Patterns, U.S. Department of Commerce, Bureau of the Census.

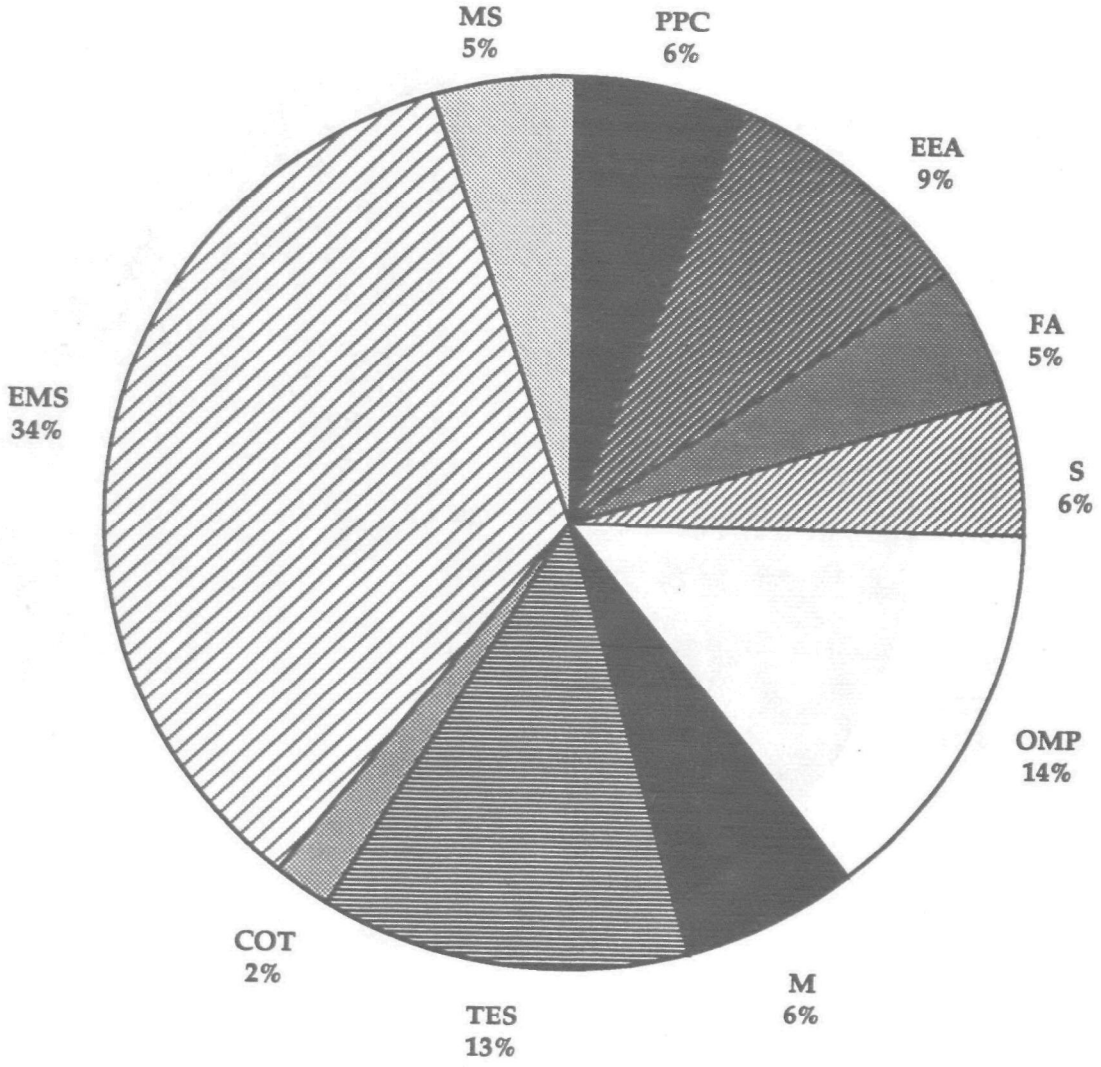
TABLE B-5. NUMBER AND EMPLOYMENT OF MAQUILADORAS

	November 1991 Number of Maquiladoras	November 1991 Number of Employees	June 1991 Number of Maquiladoras	June 1991 Number of Employees	March 1990 Number of Maquiladoras	March 1989 Number of Maquiladoras
Border Cities (within 100 km.)						
Tijuana	656	70,262	530	65,255	530	334
Ciudad Juarez	321	134,838	320	134,838	309	260
Mexicali	122	19,400	161	20,576	148	131
Matamoros	94	38,268	94	38,268	89	72
Tecate	110	5,934	90	4,665	86	46
Nuevo Laredo	93	21,000	93	21,000	67	63
Nogales	75	21,084	80	21,084	65	64
Reynosa	82	30,000	82	30,000	57	35
Piedras Negras	37	7,182	43	8,130	39	30
Ciudad Acuna	46	14,261	44	14,151	36	32
Ensenada	44	5,706	41	1,735	33	--
Agua Prieta	27	7,500	32	7,500	28	28
San Luis Rio Colorado	23	3,000	3,000	12	0	
Naco	4	1,200	6	1,200	0	0
Palomas	5	137	5	137	0	0
TOTAL	1,739	379,772	1,641	371,509	1,499	1,100

Source: Twin Plant News

Figure B–2. Numbers of Maquiladoras in Mexican Border States

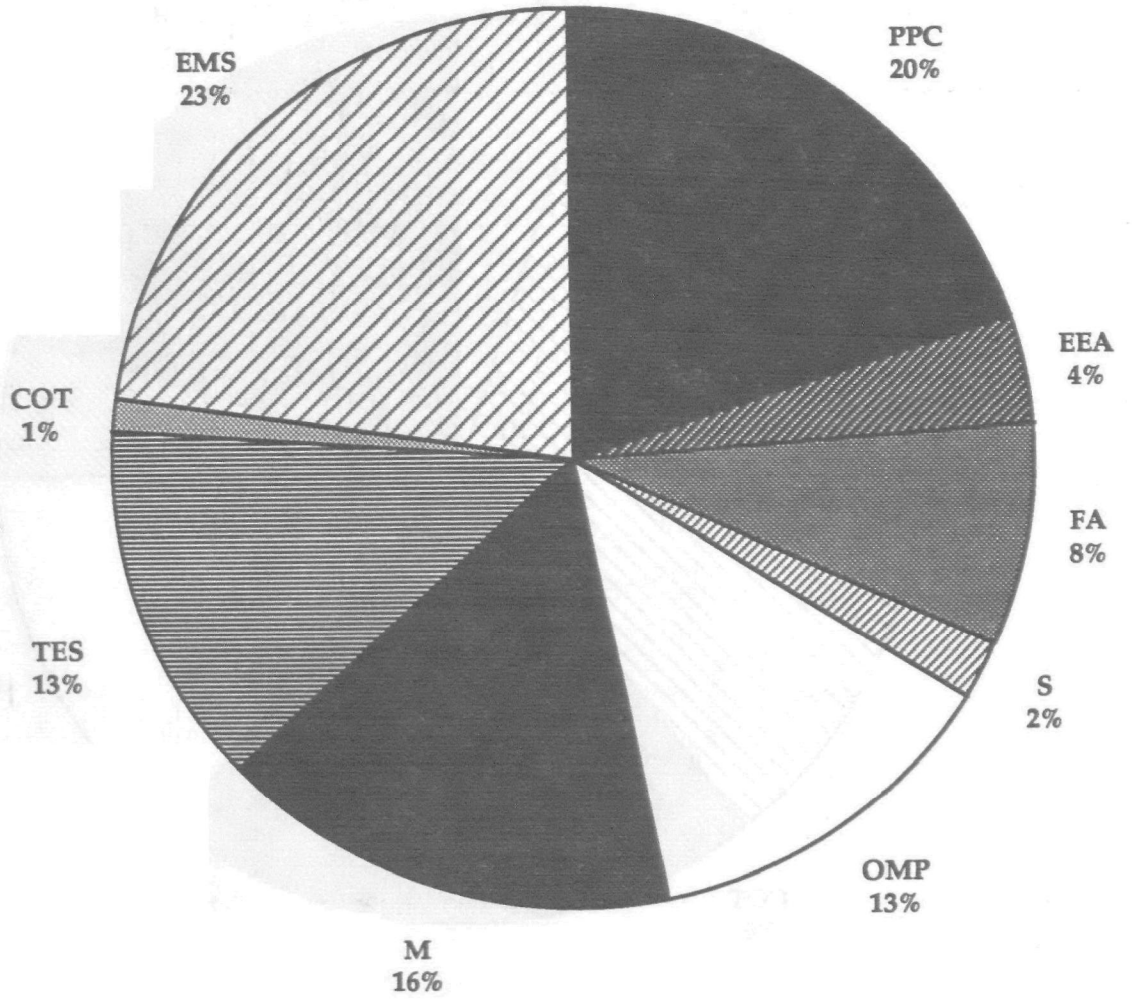
1637124b–3



KEY

PPC	Petroleum, Petroleum Products, Plastics, Chemicals
EEA	Electronic/Electric Equipment/Apparatus
FA	Food and Agricultural
S	Services
OMP	Other Manufactured Products
M	Metal Industries
TES	Transportation Equipment & Supplies
COT	Clothing and other Textiles
EMS	Electronic/Electric Materials & Supplies
MS	Medical Supplies

Figure B-3. Products produced by Mexican Border Industries as of 1991.



KEY

PPC	Petroleum, Petroleum Products, Plastics, Chemicals
EEA	Electronic/Electric Equipment/Apparatus
FA	Food and Agricultural
S	Services
OMP	Other Manufactured Products
M	Metal Industries
TES	Transportation Equipment & Supplies
COT	Clothing and other Textiles
EMS	Electronic/Electric Materials & Supplies

Figure B-4. Products produced by U.S. Border Industries as of 1989.

TABLE B-6. U.S. INDUSTRIAL FACILITIES AND TOXIC RELEASES IN THE U.S. BORDER AREA

State and County	Number of Facilities	Fugitive or non-point emissions	Stack or point air emissions	Discharges to water	Releases to land	Discharge to POTW	Transfers to other off-site locations	Total Release/ Transfer
Arizona								
Pima	25	666,120	218,764	0	8,398	9,243	407,288	1,309,813
Yuma	2	0	49,525	0	0	0	1,849	51,375
State total	27	666,120	268,289	0	8,398	9,243	409,137	1,361,187
California								
Imperial	2	31,505	1,750	0	0	0	0	33,255
San Diego	74	1,663,023	4,203,664	1,000	1,000	650,678	394,875	6,914,240
State Total	76	1,694,528	4,205,414	1,000	1,000	650,678	394,875	6,947,495
New Mexico								
Dona Ana	1	0	0	0	0	0	35	
Hidalgo	1	6,900	487,250	0	20,353,549	0	0	20,847,699
State Total	2	6,935	487,250	0	20,353,549	0	0	20,847,734
Texas								
Cameron	9	218,150	95,709	250	3,238	41	953,988	1,271,376
El Paso	24	790,421	695,722	0	23,350	273,304	180,949	1,963,746
Hidalgo	6	39,375	113,560	0	0	250	16,343	169,528
Webb	1	1,500	17,000	250	750	0	0	19,500
State Total	40	1,049,466	921,991	500	27,338	273,595	1,151,280	3,424,150
ALL	**145**	**3,417,029**	**5,882,944**	**1,500**	**20,390,285**	**933,516**	**1,955,292**	**32,580,566**

TABLE B-7. POTABLE WATER SUPPLIES IN MEXICAN BORDER COMMUNITIES**

Population	Volume*	Source
Tijuana, B.C.	70.0	Colorado River
Tecate, B.C.	3.6	Ground Water
Mexicali, B.C.	81.2	Colorado River
San Luis Rio Colorado, Son.	21.4	Ground Water
Nogales, Son.	15.3	Ground Water
Naco, Son.	1.7	Ground Water
Agua Prieta, Son.	7.53	Ground Water
Ciudad Juarez, Chih.	120.0	Ground Water
Ciudad Acuna, Coah.	3.6	Rio Bravo/Rio Grande
Piedras Negras, Coah.	10.3	Rio Bravo/Rio Grande
Nuevo Laredo, Tam.	25.6	Rio Bravo/Rio Grande
Nva. Ciudad Guerrero, Tam.	0.7	Rio Bravo/Rio Grande
Ciudad Mier, Tam.	0.6	Rio Bravo/Rio Grande
Cd. Miguel Aleman, Tam.	2.4	Rio Bravo/Rio Grande

Source: IBWC, Mexican section.
*In millions cubic meters, 1991.
**Records of the IBWC contain no information for Reynosa, Tam. and Matamoros, Tam.

ANNEX C

NAMES AND AFFILIATIONS OF THOSE WHO TESTIFIED OR SUBMITTED COMMENTS TO EPA ON THE BORDER ENVIRONMENTAL PLAN DURING ITS FORMATION

LAST NAME	FIRST NAME	ORGANIZATION	TITLE
BENTSEN	LLOYD M.	U.S. SENATE, TEXAS	SENATOR
BINGAMAN	JEFF	U.S. SENATE, NEW MEXICO	SENATOR
DECONCINI	DENNIS	U.S. SENATE, ARIZONA	SENATOR
DOMENICI	PETE V.	U.S. SENATE, NEW MEXICO	SENATOR
BUSTAMANTE	ALBERT G.	CONGRESS OF THE UNITED STATES, TEXAS - 23RD DISTRICT	CONGRESSMAN
COLEMAN	RONALD D.	CONGRESS OF THE UNITED STATES, TEXAS - 16TH DISTRICT	CONGRESSMAN
CUNNINGHAM	RANDY	CONGRESS OF THE UNITED STATES,CALIFORNIA - 44TH DISTRICT	CONGRESSMAN
DE LA GARZA	KIKA	CONGRESS OF THE UNITED STATES, TEXAS - 15TH DISTRICT	CONGRESSMAN
KOLBE	JIM	CONGRESS OF THE UNITED STATES, ARIZONA - 5TH DISTRICT	CONGRESSMAN
SKEEN	JOE	CONGRESS OF UNITED STATES, NEW MEXICO - 26TH DISTRICT	CONGRESSMAN
SHANE	JEFFREY N.	U.S. DEPARTMENT OF TRANSPORTATION	ASSISTANT SECRETARY
SIRMON	JEFF M.	U.S. DEPARTMENT OF AGRICULTURE	DEPUTY CHIEF
WATKINS	JAMES D.	DEPARTMENT OF ENERGY	SECRETARY
KING	BRUCE	STATE OF NEW MEXICO	GOVERNOR
RICHARDS	ANNE W.	STATE OF TEXAS	GOVERNOR
LUCIO	EDDIE	THE SENATE OF THE STATE OF TEXAS	STATE SENATOR
ROSSON	PEGGY	THE SENATE OF THE STATE OF TEXAS	STATE SENATOR
TRUAN	CARLOS F.	THE SENATE OF THE STATE OF TEXAS	STATE SENATOR
ZAFFIRINI	JUDITH	THE SENATE OF THE STATE OF TEXAS	SENIOR STATE SENATOR
MCDONALD	NANCY	TEXAS HOUSE OF REPRESENTATIVES	STATE REPRESENTATIVE
ALTUMADA	CAMILO	CITY COUNCIL OF NOGALES, AZ	COUNTY COUNCILMAN
COTA	GENE	CITY COUNCIL OF NOGALES, AZ	COUNCILMAN
JUAREZ	JACINTO	CITY COUNCIL OF LAREDO, TX	COUNCILMAN
KARAM	GEORGE	CITY COUNCIL OF NOGALES, AZ	COUNCILMAN
RIVERA	MARCO	CITY COUNCIL OF NOGALES, AZ	COUNCILMAN
RIVERA	EDUARDO	CITY COUNCIL OF CALEXICO, CA	COUNCILMAN
SESTEAGA	VICTOR M.	CITY COUNCIL OF NOGALES, AZ	COUNCILMAN
SILVA	MARCOS	CITY COUNCIL OF NOGALES, AZ	COUNCILMAN
TIDWELL	JACK N.	CITY COUNCIL OF NOGALES, AZ	COUNCILMAN
TIRADO	ANTONIO	CITY COUNCIL OF CALEXICO, CA	COUNCILMAN
GARZA	IGNACIO	CITY OF BROWNSVILLE, TX	MAYOR
GIL	LEONARDO	CITY OF NOGALES/SONORA, MEXICO	MAYOR
HERNDON	J.B.	CITY OF SPOFFORD, TX	MAYOR
MACIAS	MARY P.	CITY OF NOGALES, AZ	MAYOR
MOLINA	VENTURA	CITY OF SUNLAND PARK, NM	MAYOR
RAMIREZ	SAUL N.	CITY OF LAREDO, TX	MAYOR
TILNEY	WILLIAM S.	CITY OF EL PASO, TX	MAYOR
CHACON	ALICIA	COUNTY OF EL PASO, TX	JUDGE
COVACEVICH	ANTHONY	HIDALGO COUNTY, TX	JUDGE
GUEVARA	JOSE	COUNTY OF ZAPATA, TX	JUDGE

LAST NAME	FIRST NAME	ORGANIZATION	TITLE
RUIZ	J. EDGAR	HIDALGO COUNTY, TX	JUDGE
BEARL	DONALD	CITY OF CALEXICO, CA	CITY MANAGER
RODRIGUEZ	OSCAR	CITY OF EAGLE PASS, TX	CITY MANAGER
ACOSTA	GILDANDO	ENLACE ECOLOGICO AGUA PRIETA	
ADAMS	JEANNE	CONCERNED CITIZEN	
AGUIRRE	MANUEL	TEXAS AIR CONTROL BOARD	REGIONAL DIRECTOR
AIBEL	HOWARD J.	ITT CORPORATION	EXECUTIVE VICE PRESIDENT
ALLEN	ANN	CITIZEN ENVIRONMENTAL ADVISORY COMMITTEE	
ALLMAN	RONALD J.	LAREDO MANUFACTURERS ASSOCIATION	CHAIRMAN
ALMANZA	SUSANA	PEOPLE ORGANIZED IN DEFENSE OF EARTH	
ALTOMARE	JOHN	THE COALITION FOR BORDER BIOSPHERE	
ANAYA	EDDIE	THE VALLEY INTERFAITH EXECUTIVE COMMITTEE	
ANCKER-JOHNSON	BETSY	GENERAL MOTORS CORPORATION	VICE PRESIDENT
ANDREW	NICHOLS	UNIVERSITY OF ARIZONA RURAL HEALTH OFFICE	DIRECTOR
ARCHULETA	EDMUND G.	EL PASO WATER UTILITIES PUBLIC SERVICES	GENERAL MANAGER
ARIZPE	GUADALUPE	FEMAP	PRESIDENT
ASBURY	MARVIN	ASOCIACION DE MAQUILADORAS DE MATAMOROS	
BAKER	ANNE	SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS	DIRECTOR, ENVIRONMENTAL PLANNING
BANE	MARY	LA CLINICA DE FAMILIA	
BARR	RONALD E.	ARIZONA STATE UNIVERSITY	ASSOCIATE VICE PRESIDENT, RESEARCH
BATES	JAMES E.	ENVIRONMENTAL ADVISORY COMMITTEE, PHILIPS INC.	
BAUER	JUDITH L.	DEPARTMENT OF LEGISLATIVE SERVICES, CITY OF SAN DIEGO	ENVIRONMENTAL PROJECT COORD.
BEAN	KEVIN	NEW MEXICO PUBLIC INTEREST RESEARCH	ENVIRONMENTAL PROJECT COORD.
BEARDEN	DAVID	CHEMICAL WASTE MANAGEMENT INC.	
BECKWITH	SIDNEY A.	BROWNSVILLE NAVIGATION DISTRICT	
BEIER	MAX G.	CONCERNED CITIZEN	CHAIRMAN
BEITEL	TIM	BINATIONAL SUBCOMMITTEE ON ENVIRONMENTAL HEALTH	PRESIDENT
BELCHER	MADGE ELIZABETH	CARE OF KINNEY COUNTY	PRESIDENT
BELZE	ALAN	ALLIED-SIGNAL INC.	PRESIDENT
BENSON	E.	CONCERNED CITIZEN	
BERRIER	LARRY	CAMERON CO. LEPC	DIRECTOR
BIRDSALL	STEVE	AIR POLLUTION CONTROL DISTRICT	
BOCCELLA	CLAIRE M.	UNION PACIFIC CORPORATION	ASSISTANT GENERAL COUNSEL
BOUDREAUX	RONALD	CITIZEN ADVISORY COMMITTEE	
BRIGHT	JAMES M.	CORPUS CHRISTI, TEXAS	
BRIGHT	ANN	SOUTH TEXAS COALITION FOR PEACE	
BRODECKY	JUANITA	CONCERNED CITIZEN	
BROOKS	ELAINE R.	CONCERNED CITIZEN	
BRUNNICK	MARY LOU	OFFICE OF CONGRESSMAN RONALD D. COLEMAN	
BUCHER	JAMES	IMPERIAL COUNTY BOARD OF SUPERVISORS	CHAIRMAN
BURGER	BOB	SIERRA CLUB	
BUSSARD	DAVID	EPA (OSW)	DIRECTOR

LAST NAME	FIRST NAME	ORGANIZATION	TITLE
BUSTOS	ADRIAN	TBD INTERNATIONAL BEJAR & ASSOC.	
CALAPA	JOE	BROWNSVILLE DOWNTOWN DEVELOPMENT	
CALDERO	RICARDO E.	CITY OF EAGLE PASS	CITY ATTORNEY
CAMACHO	LUIS	CONCERNED CITIZEN	
CAMPBELL	MARY LOU	SIERRA CLUB	CITY ATTORNEY
CAMPOS	NATIVIDAD	CITY OF EL PASO	DIRECTOR OF PLANNING
CAROTHERS	LESLIE	UNITED TECHNOLOGIES (HUMAN & NATURAL RESOURCES PROTECTION)	VICE PRESIDENT
CARTER	RICHARD H.	SOUTHERN ARIZONA ENVIRONMENTAL MANAGEMENT SOCIETY	FOUNDING PRESIDENT
CARTWRIGHT	JANICE	TEXAS WATER DEVELOPMENT BOARD	EXECUTIVE ASSISTANT
CASTILLO	ENRIQUETA	THE BORDER ORGANIZATION	
CERVANTES	CHARLES	MALONEY & BURCH	LAWYER
CHAPMAN	JIM	SIERRA CLUB	
CHAVEZ	EVERARDO L.	BOARD OF COUNTY COMMISSIONERS	CHAIRMAN
CHAVEZ	NORMA	TEXAS VEHICLE INSPECTORS ASSN.	PRESIDENT
CHAVEZ	ROBERT	CONCERNED CITIZEN	
CHITICK	DAVID	AT&T(ENVIRONMENTAL & SAFETY ENGINEERING DIVISION)	VICE PRESIDENT
CLEMAN	ELDON	NATIONAL PARK SERVICES	
COMELLA	PHILIP L.	CHEMICAL WASTE MANAGEMENT, INC.	SENIOR COUNSEL
COMIEZ	MAYNARD S.	OFFICE OF POLICY ANALYSIS (DEPARTMENT OF TRANSPORTATION)	DIRECTOR
CONTRERAS	SALVADOR	UNIVERSITY OF NUEVO LEON	PROFESSOR
COWEN	RALPH	MAYORAL CANDIDATE, BROWNSVILLE, TX	ADMINISTRATIVE ASSISTANT
COXING	GORDON	TEXAS DEPARTMENT OF HEALTH	EMPLOYEE
CROWNSON	NANCY	CONCERNED CITIZEN	REGIONAL DIRECTOR
CSIDER	LOUIS J.	CONCERNED CITIZEN	
CULBERTSON	WARREN	GROUNDWATER USERS ADVISORY COUNCIL	
DANIEL	ROBERT F.	UNITED TECHNOLOGIES	
DE ANDA	RICARDO	LAW OFFICE OF RICARDO DE ANDA	CHAIRMAN
DE LA ROSA	GUSTAVO	CONCERNED CITIZEN	ATTORNEY
DE TREVILLE	SUSAN	COALITION FOR BORDER BIOSPHERE RESERVE	
DELECH	EDWARD	ENVIRONMENTAL LITERACY PROJECT	
DENMAN	CATALINA	COLEGIO SONORA	
DIBONITO	TONY	CONCERNED CITIZEN	
DODIER	JOSE O.	CONCERNED CITIZEN	LEGISLATIVE AIDE
DOMINGUEZ	PATRICIA	OFFICE OF CONGRESSMAN JOE SKEEN (NEW MEXICO 26TH DISTRICT)	LEGISLATIVE AIDE
DRYDEN	EDWARD J.	CONCERNED CITIZEN	
DRYDEN	BENILDE	CONCERNED CITIZEN	
DUBOVE	FERNANDO	EL PASO REGIONAL SIERRA CLUB	
DUNCAN	JOAN	CONCERNED CITIZEN	DEPUTY DIRECTOR FOR OPERATIONS
EDWARDS	PAUL	MIDDLE RIO GRANDE DEVELOPMENT COUNCIL	
ESCANDON	IGNACIO	EL PASO INTERRELIGIOUS SPONSORING ORGANIZATION	
ESCARCEGA	FERNANDO	DISTRESSED AREAS PROGRAM (TEXAS WATER DEVELOPMENT BOARD)	ASST TO THE PROJECT DIRECTOR

LAST NAME	FIRST NAME	ORGANIZATION	TITLE
ESPINOSA	JUDITH	ENVIRONMENTAL DEPARTMENT OF NEW MEXICO	SECRETARY
ESTRADA	HENRY	THE RIVER PIERCE FOUNDATION	PROGRAM DIRECTOR
FAIN	TYRUS	TEXAS GENERAL LAND OFFICE	SPECIAL ASST TO COMMISSIONER
FARMER	ROSE	NATIONAL AUDUBON SOCIETY	MANAGER
FARMER	MIKE	NATIONAL AUDUBON SOCIETY	MANAGER
FELBLUM	MARY	NEW MEXICO CONSERVATION VOTERS' ALLIANCE	REPRESENTATIVE
FERGUSON	MERRIWOOD	FRONTERA AUDUBON SOCIETY	CONSERVATION CHAIR
FIGUEROA	BEN	CITY COMMISSION OF THE CITY OF KINGSVILLE	
FLORES	REBECCA	UNITED FARM WORKERS OF AMERICA AFL-CIO	
FONTES	VICTOR	NOGALES SCHOOL BOARD	
FOX	EDWARD Z.	ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY	DIRECTOR
FRICKS	BONNIE	OFFICE OF SENATOR PETE V. DOMENICI, NM	LEGISLATIVE AIDE
FRIEDLAND	PETER	NATIONAL COALITION FOR THE HOMELESS	CHAIRMAN
FUENTES	H. R.	THE UNIVERSITY OF TEXAS AT EL PASO	PROFESSOR
FUENTES	AL	CONCERNED CITIZEN	
GALINDO	JIMMY	COMMUNITY RESOURCE GROUP	
GANSTER	PAUL	INSTITUTE FOR REGIONAL STUDIES OF THE CALIFORNIAS, SDSO	
GARCIA	DARLENE	OFFICE OF SENATOR PETE V. DOMENICI, NM	LEGISLATIVE AIDE
GARCIA	ALFONSO	CONCERNED CITIZEN	
GARCIA DE ANDA	ROSA MARIA	CONCERNED CITIZEN	
GARZA	ANTONIO O.	CONCERNED CITIZEN	
GARZA	ESTELLA	VALLEY INTERFAITH	
GIERMANSKI	JIM	DIVISION OF INTERNATIONAL TRADE OF LAREDO UNIVERSITY	CHAIRMAN
GODINES	REYNALDO	CONCERNED CITIZEN	
GOLDMAN	JOSEPH L.	THE INT'L CENTER FOR SOLUTION OF ENVIRONMENTAL PROBLEMS	TECHNICAL DIRECTOR
GONZALEZ	DOMINGO	TEXAS CENTER FOR POLICY STUDIES	
GONZALEZ	JOSE	CONCERNED CITIZEN	
GREGORY	MICHAEL	ARIZONA TOXICS INFORMATION CENTER	DIRECTOR
GUERRA	LUIS M.	CONCERNED CITIZEN	
GUTIERREZ	MARIO	MATAMOROS MAQUILA ASSOCIATION	REPRESENTATIVE
HALL	JOHN	TEXAS WATER COMMISSION	COMMISSION CHAIRMAN
HAMMOND	JACK	RIO GRANDE COMPACT COMMISSION, EL PASO	COMMISSIONER
HANAWA	DAVID	CAMERON CO. LEPC	
HANEY	MARU BELL	ENVIRONMENTAL RISK MANAGEMENT	VICE PRESIDENT
HASS	MAURIE	CONCERNED CITIZEN	
HATHAWAY-MCKEITHHA	MELISSA	BAKER & MCKENZIE	PARTNER
WES	AMANDA	SANTA CLARA CENTER FOR OCCUPATIONAL SAFETY AND HEALTH	DIRECTOR
HERNANDEZ	ROSARIO	CONCERNED CITIZEN	
HIGGINS	THOMAS R.	ASOCIACION DE MAQUILADORAS DE SONORA	
HOLGUIN	ESPERANZA	ADMINISTRATIVE/CITY CLERK CITY OF SUNLAND PARK, NM	PRESIDENT
HOLUB	HUGH	CITY OF NOGALES	REPRESENTATIVE
HOUGEN	JAMES	THE BORDER ORGANIZATION	CITY ATTORNEY

LAST NAME	FIRST NAME	ORGANIZATION	TITLE
JACOBS	KATHARINE	ARIZONA DEPARTMENT OF WATER RESOURCES	DIRECTOR
JACQUEZ	RICARDO	WASTE MANAGEMENT EDUCATION & RESEARCH	
JANSEN	LILA M.	CONCERNED CITIZEN	
JARDINES	JOEL	EDUCATION DEPARTMENT, MONTERREY, MEXICO	DIRECTOR
JARMON	LESLIE	SMALL ENTERPRISE DEVELOPMENT U.S PEACE CORPS	FORMER COORDINATOR (SEDIA)
JENKINS	DON	THE EUREKA COMPANY	ENVIRONMENTAL ENGINEER
JIRON	GILLERMO A.	INTEC	PRESIDENT
JOFFROY	WILLIAM F.	BORDER TRADE ALLIANCE	CHAIRMAN
JONES	C. ALLAN	TEXAS AGRICULTURAL EXPERIMENT STATION	DIRECTOR
JUAREZ	RUMALDO Z.	VALLEY/HEALTH COORDINATOR'S OFFICE, UNIVERSITY OF TEXAS	DIRECTOR
JUAREZ	DAVID	TEXAS WATER DEVELOPMENT BOARD	MEMBER
KAMP	RICHARD	BORDER ECOLOGY PROJECT	DIRECTOR
KELLY	MARY E.	TEXAS CENTER FOR POLICY STUDIES	EXECUTIVE DIRECTOR
KHERA	A.K.	GMA, INC.	PRESIDENT
KJOS	KAARE S.	ENVIRONMENTAL COMMITTEE OF TIJUANA-SAN DIEGO REGION	CHAIRPERSON
KUNZ	SUSAN	ARIZONA-MEXICO BORDER HEALTH FOUNDATION	
KYD	MARGOT	SAN DIEGO GAS AND ELECTRIC CORPORATION	VICE PRESIDENT OF ADM. SERVICES
LA DREW	JUDITH	ENVIRONMENTAL GOVERNMENT AFFAIRS (UNITED TECHNOLOGIES CORP)	DIRECTOR
LACHMAN	MARIANNE	COALITION FOR BORDER BIOSPHERE RESERVE	
LANDFORD	ROBERT A.	TEXAS DEPARTMENT OF PUBLIC SAFETY	STATE COORDINATOR
LANGMAN	LAURA	CONCERNED CITIZEN	
LAUREL	ERNIE	ASOCIACION REGIONAL DE MAQUILADORAS DE REYNOSA, A.C.	
LEAL	TERESA	PROYECTO COMADRES	
LEDEZMA	DAVID	CONCERNED CITIZEN	
LEON CANTY	SARA	CONCERNED CITIZEN	
LEVY	TOM	COACHELLA VALLEY WATER DISTRICT	GENERAL MANAGER CHIEF ENGINEER
LIEB	CARL	CONCERNED CITIZEN	
LOCKETT	JACKIE	CONCERNED CITIZEN	
LOCKWOOD	WILLIAM	ARIZONA DIVISION OF EMERGENCY SERVICE	DIRECTOR
LOPEZ	GENARO	UNIVERSITY OF TEXAS BROWNSVILLE	PROFESSOR
LOPEZ	POLLY	THE BORDER ORGANIZATION	
LOPEZ	MARCOS	ESCUELA SUPERIOR DE AGRICULTURA	
LOZO	FRED	CONCERNED CITIZEN	
LUCAS	JOE	EL PASO COUNTY, TEXAS	CITY ATTORNEY
MAEZ	JAMES	SOUTHWEST CENTER FOR ENVIRONMENTAL RESEARCH AND POLICY	
MALEY	MARY HELEN	ATTORNEY AT LAW	
MARCHBANKS	PERCY	CAMERON COUNTY, TX	ENGINEER
MARCIL	ANTHONY G.	WORLD ENVIRONMENT CENTER	PRESIDENT AND CEO
MARIN	CARLOS M.	AMBIOTEC ENVIRONMENTAL CONSULTANT INC.	
MARSTON	JIM	ENVIRONMENTAL DEFENSE FUND	DIRECTOR
MARTINEZ	SANDRA	OFFICE OF TEXAS GOVERNOR, ANNE RICHARDS	SPECIAL ASSISTANT
MATTSON	FREDERIC E.	POWER SUPPLY DIVISION	VICE PRESIDENT

LAST NAME	FIRST NAME	ORGANIZATION	TITLE
MATZ	JAMES	HARLINGEN CITY COMMISSION	
MAURO	GARY	TEXAS LAND COMMISSION	TEXAS LAND COMMISSIONER
MCCLOSKEY	PETER F.	ELECTRONIC INDUSTRIES ASSOCIATION	PRESIDENT
MCCLOSKEY	MICHAEL	SIERRA CLUB	CHAIRMAN
MCDONALD	JAMES O.	CONCERNED CITIZEN	
MCKINNEY	LARRY D.	TEXAS PARKS AND WILDLIFE DEPARTMENT	DIRECTOR RESOURCE PROTECTION
MCLERRAN	DANNY	EL PASO COUNTY LOCAL EMERGENCY PLAN OFFICE	CHAIRMAN
MEDINA	ENRIQUE	INDUSTRIAL ECOLOGY INTERNATIONAL	PRINCIPAL
MEISTER	CARY W.	YUMA AUDUBON SOCIETY	PRESIDENT
MENDEZ	MARIA T.	CONCERNED MEXICAN CITIZEN	
MERRILEES	CRAIG	FAIR TRADE CAMPAIGN	DIRECTOR
METZNER	CLIFTON G.	INSTITUTE FOR REGIONAL STUDIES OF THE CALIFORNIAS, SASO	DIRECTOR
MEYERS	JOSEPH H.	MILITARY HIGHWAY WATER SUPPLY CORP.	
MICHIL	DOCTOR	INSTITUTE FOR MANUFACTURING & MATERIAL MANAGEMENT	
MIKA	SUSAN	COALITION FOR JUSTICE IN THE MAQUILADORA	
MILLAR	FRED	FRIENDS OF THE EARTH	DIRECTOR, TOXIC PROJECT
MILLER	RON	DEPARTMENT OF ENVIRONMENTAL QUALITY	ASSISTANT DIRECTOR
MOCK	C.R.	AQUACULTURE CONSULTANTS	CONSULTANT
MOLINAR	GEORGE	CONCERNED CITIZEN	
MONJE	JOSEPH	CONCERNED CITIZEN	
MONLEY	MARTHA	UNIVERSITY OF ARIZONA RURAL HEALTH OFFICE	
MONTAG	THOMAS C.	ENVIRONMENTAL HEALTH AND SAFETY DIVISION, HONEYWELL INC.	CORPORATE DIRECTOR
MORA	AURORA	CONCERNED CITIZEN	
MORALES	NICK	SIERRA CLUB	
MORALES	ROBERT	CONCERNED CITIZEN	
MORENO	ROBERTO	THE BORDER ORGANIZATION	
MORENO	JOSE L.	COLEGIO SONORA	
MORRISS	RONALD R.	SANTA CRUZ COUNTY BOARD OF SUPERVISORS, AZ	CHAIRMAN
MOYERS	KARL O.	SOUTHEAST ARIZONA GOVERNMENT ORGANIZATION	ENVIRONMENTAL & COMM. DEV.
MULLINS	M.L.	CHEMICAL MANUFACTURERS ASSOCIATION	VICE PRESIDENT-REGIONAL AFFAIRS
MUNOZ	RAUL V.	EL PASO-CITY COUNTY HEALTH DISTRICT	CHIEF OF STAFF SERVICES
NAKAGAWA	CRAIG	CONCERNED CITIZEN	
NAREL	TRACY	THE RIVER PIERCE FOUNDATION	ENVIRONMENTAL PROJECTS DIRECTOR
NECCO	FRED	CONCERNED CITIZEN	
NICHOLS	ANDREW	RURAL HEALTH OFFICE	
NICKEY	LAURENCE N.	EL PASO CITY COUNTY HEALTH DISTRICT	DIRECTOR
NIXON	SHERRIE	CONCERNED CITIZEN	
O'BRIEN	JOSEPH	VALLEY INTERFAITH	REVEREND
OJEDA	DAVID	THE BORDER ORGANIZATION	
OLIVER	ARNOLD W.	STATE DEPARTMENT OF HIGHWAY AND PUBLIC TRANSPORTATION	ENGINEER-DIRECTOR

LAST NAME	FIRST NAME	ORGANIZATION	TITLE
OLIVEROS	VICTOR M.	CITY OF LAREDO HEALTH DEPARTMENT	CHIEF ENVIRONMENTAL HEALTH
ORANTES	TEODORO	CONCERNED CITIZEN	
ORTEGA	HERBERT	PAN AMERICAN HEALTH ORGANIZATION	CHIEF, FIELD OFFICE
OSTERMAN	TAMAR	OFFICE OF SENATOR JEFF BINGAMAN (NEW MEXICO)	LEGISLATIVE AIDE
PALACIOS	NICK	U.S.BUREAU OF LAND RECLAMATION	PLANNING OFFICER
PARRA	JAVIER	VALLEY INTERFAITH	
PARRA	ANTONIO	TRINITY CHICANO COALITION	
PEARCY	RICHARD	WILDLIFE CORRIDOR TASK FORCE	
PEGG	DANIEL O.	SAN DIEGO ECONOMIC DEVELOPMENT CORP.	PRESIDENT
PEREZ	MIKE	FIRE DEPARTMENT OF LAREDO, TX	CHIEF
PETTIS	RONALD	GRAY, CARY, AMES & FRYE	PARTNER
PINE	ARTHUR L.	MAVERICK COUNTY DEVELOPMENT CORPORATION	EXECUTIVE DIRECTOR
PLARRIS	MICHAEL A.	TEAMSTERS LOCAL 952	
PREWETT	RAY	TEXAS CITRUS MUTUAL	EXECUTIVE VICE-PRESIDENT
PRICE	JUDITH	DONA ANA COUNTY	DIRECTOR OF PLANNING
QUIROZ	JOSEPH	NATURE CONSERVANCY	MEXICO COUNTY PLANNING
RAMIREZ	ROBERTO	COMMUNITY RESOURCE GROUP INC.	DIRECTOR
RAMIREZ	ANTONIO	CONCERNED CITIZEN	
RAMOS	ANDRES	CONCERNED CITIZEN	
RANDALL	ALBERT	TEXAS DEPARTMENT OF HEALTH	ASSOCIATE COMMISSIONER
RANGER	EDWARD M.	LAFFAN, MUES & KAYE	ENVIRONMENTAL LAWYER
RAY	ROBERT	FEDERATED METALS	GENERAL MANAGER
RICHARDS	CATHERINE M.	CONCERNED CITIZEN	
RIORDON	ELIZABETH E.	CONCERNED CITIZEN	
RITTGERS	MATEELE	LEAGUE OF WOMEN VOTERS OF TEXAS	
ROBERSON	DON	CALIFORNIA/NEVADA SECTION OF AMERICAN WATER WORKS	DIRECTOR
ROBINSON	JERRY R.	CITY OF LAREDO HEALTH DEPARTMENT	DIRECTOR
RODEN-LUCERO	EDWARD O.	CATHOLIC DIOCESE OF EL PASO	REVEREND
RODRIGUEZ	GEORGE	OFFICE OF ATTORNEY GENERAL, STATE OF TEXAS	SPECIAL ASST ATTORNEY GENERAL
RODRIGUEZ	EMERENCIO	CONCERNED MEXICAN CITIZEN	
ROGERS	C. GREGORY	CHEMICAL RECLAMATION SERVICES, INC	
RUIZ	JOHN	RIO GRANDE DEVELOPMENT COUNSEL GOVERNMENT	
RUTLEDGE	WILLIE M.	CONCERNED CITIZEN	
SALAS	PATRICIA	CASA DE COLORES	DIRECTOR
SALDANA	DINA	CONCERNED CITIZEN	
SANCHEZ	ROBERTO A.	DEPARTMENT OF URBAN AND ENVIRONMENTAL STUDIES	DIRECTOR/COLEGIO DE LA FRONTERA
SANCHEZ	AMELIA	CONCERNED CITIZEN	
SANCHEZ	MARY E.	LA CLINICA DE FAMILIA	
SASS	SHERRY L.	FRIENDS OF THE SANTA CRUZ RIVER	
SAUCEDA	FLORENCIO	CONCERNED CITIZEN	

LAST NAME	FIRST NAME	ORGANIZATION	TITLE
SCHMANDT	JURGEN	CENTER OF GLOBAL STUDIES	DIRECTOR
SCOTT	LORETTA A.	CONCERNED CITIZEN	SOCIAL ENTREPRENEUR
SHAKELFORD	GORDON	CONCERNED CITIZEN	
SHAW	JOHN R.	ASARCO	PLANT MANAGER
SHERWOOD	EDWARD C.	LAREDO DEVELOPMENT FOUNDATION	PRESIDENT
SIRES	EARL	CITY OF NOGALES	ASSISTANT ADMINISTRATOR
SMITH	EDELMIRA	THE BORDER ORGANIZATION	
SOLORZANO	RAFAEL	CONCERNED CITIZEN	
STECKHAN	RAINER B.	THE WORLD BANK	U.S. ALTERNATE EXECUTIVE DIR.
STEVENS	ERNESTINA	CONCERNED CITIZEN	
STOCKER	RANDALL K.	IMPERIAL IRRIGATION DISTRICT	MANAGER
STROCK	JAMES M.	CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY	SECRETARY
SULZER	KENNETH E.	SAN DIEGO ASSOCIATION OF GOVERNMENTS	EXECUTIVE DIRECTOR
SUTER	PATRICIA H.	INDIVIDUAL CITIZEN	RETIRED CHEMISTRY PROFESSOR
TAFFY	LEE	INTERNATIONAL GOOD NEIGHBOR COUNCIL	
TAKVORIAN	DIANE	ENVIRONMENTAL HEALTH COALITION	EXECUTIVE DIRECTOR
TAYLOR	LYNDA	SOUTHWEST RESEARCH AND INFORMATION CENTER	DIRECTOR
THOMAS-RAMIREZ	SUSAN	CONCERNED CITIZEN	
THOMPSON	STEVEN P.	DEPARTMENT OF INTERIOR (FISH AND WILDLIFE SERVICE DIVISION)	PROJECT LEADER
THUNER	KATHELEEN A.	DEPARTMENT OF AGRICULTURE - COUNTY OF SAN DIEGO	AGRICULTURAL COMMISSIONER
THURMAN	L.D.	TEXAS DEPARTMENT OF HEALTH	ASSOCIATE COMMISSIONER
TIMMONS	JEFF	CONCERNED CITIZEN	
TINSMAN	STEWART	INTERNATIONAL AND TERRITORIAL AFFAIRS STAFF	DIRECTOR
TISDALE	DONNA	BACKCOUNTRY AGAINST DUMPS	DIRECTOR
TITTLE	KENNETH	IMPERIAL COUNTY HEALTH DEPARTMENT	HEALTH OFFICE
TODD	LEO	THE HEGAR GROUP	
TORREZ	LOU	CONCERNED CITIZEN	RETIRED ENVIRONMENTAL ENGINEER
TORREZ	GUADALUPE	COMITE FRONTERIZO DE OBRERAS	
TOWERS	WILLIAM D.	PUBLIC UTILITIES BOARD	
TURNER	KAY H.	HOMEOWNERS TAXPAYER ASSOCIATION	CHAIRPERSON
UHLHORN	TUDOR G.	HARLINGEN AREA CHAMBER OF COMMERCE	CHAIRMAN
UMPHERS	NANCY	ZAPATA COUNTY NATURE CONSERVATION SOCIETY	VICE PRESIDENT
VALE	SAM	MEXICO-TEXAS BRIDGE OWNERS ASSOCIATION	PRESIDENT
VALENCIA	NESTOR A.	EL PASO COMMUNITY FOUNDATION	VICE PRESIDENT FOR PLANNING
VARADY	ROBERT	UDALL CENTER FOR STUDIES IN PUBLIC POLICY	ASSOCIATE DIRECTOR
VAZQUEZ	LETICIA	OFFICE OF TEXAS GOVERNOR, ANNE RICHARDS	
VELARDE	RODRIGO	MOVIMIENTO ECOLOGISTA DE MONTERREY, A.C.	PRESIDENT
VILLAREAL	SIMON	WATER COMMITTEE	CHAIRMAN
WALES	SISTER VINCENT	ST. VINCENT DE PAUL	
WARD	JUSTIN R.	NATURAL RESOURCES DEFENSE COUNCIL	SENIOR RESOURCE SPECIALIST
WARD	PAT	OFFICE OF CONGRESSMAN JIM KOLBE (5TH DISTRICT, AZ)	ASSISTANT TO CONGRESSMAN
WATKINS	BARBARA	CONCERNED CITIZEN	

LAST NAME	FIRST NAME	ORGANIZATION	TITLE
WEISBERG	LEON	BROWNSVILLE DOWNTOWN DEVELOPMENT CORPORATION	
WELLHOUSE	MARIE	CONCERNED CITIZEN	
WELLS DIAZ	MARGARET R.	CONCERNED CITIZEN	
WESSTROM	BETTY	CONCERNED CITIZEN	
WHITE	CHARLES A.	CHEMICAL WASTE MANAGEMENT, INC.	MANAGER OF REGIONAL AFFAIRS
WHITMORE	KAY R.	EASTMAN KODAK COMPANY	CHAIRMAN
WILLIAMSON	KAY	CONCERNED CITIZEN	
WOOTTEN	ELEANOR G.	MESILLA VALLEY AUDUBON SOCIETY	DEPUTY REGIONAL ADMINISTRATOR
WORLEY	J.W.	CONCERNED CITIZEN	
ZURICK	PATRICK	SANTA CRUZ COUNTY HEALTH DEPARTMENT	DEPUTY DIRECTOR

ANNEX D

NAMES AND AFFILIATIONS OF THOSE WHO TESTIFIED OR SUBMITTED COMMENTS TO SEDUE ON THE BORDER ENVIRONMENTAL PLAN DURING ITS FORMATION

NAME	ORGANIZATION
SR. VICTOR ACEVEDO	INDUSTRIAS MADERERA ACEVEDO
ING. GILDARDO ACTOSTA	GRUPO ENLACE ECOLOGICO, A.C.
LIC. ANGEL ACOSTA LEYVA	PRESIDENTE, CONGRESO DEL ESTADO
GRAL. GONZALO ADALID MIER	COMANDANTE GUARNIC DE LA PLAZA
ING. LEOCADIO AGUAYO	U.G.R.S.
CORL. RENE CARLOS AGUILAR P.	COMMANDANTE DEL 89 BATALLON DE INFANTERIA
C. JAVIER AGUILAR RANGEL	CONSUL, PHOENIX, ARIZONA
C. THOMAS ALBERT	MOVIMIENTO ECOLOGISTA DE COAHUILA
C.P. ROBERTO ALCIDE BELTRONES	I.M.S.S.
ARQ. RENE ALTAMIRANO PEREZ	SEDUE
ING. ALEJANDRO ALVARADO REYES	GRUPO SONOTRONIES
C. JUAN ANDRADE NEQUIZ	PRESIDENTE MUNICIPAL PLUTARCO ELIAS CALLES
ING. CARLOS ANGULO	SERVICIOS COORDINADOS DE SALUD PUBLICA
C. HUMBERTO ARVIZU A.	C.R.O.C.
LIC. BELEM AVENDANO RUIZ	SECOFI
C. CRISTINA AVILA HERNANDEZ	REGIDORA, CIUDAD ACUNA
LIC. FERNANDO BAEZA MELENDEZ	GOBERNADOR CONTITUCIONAL DEL ESTADO DE CHIHUAHUA
C. MARIA ELENA BARAJAS	MOVIMIENTO ECOLOGISTA DE SONORA
DR. EDUARDO BARRERA HERRERA	EL COLEGIO DE LA FRONTERA NORTE
C. ROBERTO BARRIENTOS	MAYOR DE EAGLE PASS, TEXAS
PROF. FEDERICO BARRIENTOS DE LA TORRE	COMPLEJO MAREMOTRIZ DEL MAR DE CORTES
ARQ. MIGUEL BENAVIDES C.	CUIDADANO MATAMORENSE
INV. FANCISCO A. BERNAL RODRIGUEZ	COLEGIO DE LA FRONTERA NORTE
C. LEOCADIO BEYTIA	CONSUL DE MEXICO EN EAGLE PASS, TEXAS
ING. EMILIO BRUNA	ASOCIACION FRONTERIZA DE MANEJO DE DESECHOS
LIC. MARIO BUCIO	SRE
LIC. LEOPOLDO BURGUETE	ABOGADOS BRYAN GONZALEZ VARGAS Y GONZALEZ BASS
DR. JORGE BUSTAMANTE	EL COLEGIO FRONTERA NORTE
LIC. CARLOS BUSTAMTNE ACEVEDO	PROYECTO MATRIX
ING. JESUS BUSTAMANTE SALCIDO	PRESIDENTE MUNICIPAL, SAN LUIS RIO COLORADO, SONORA
ARQ. GUILLERMO CABALLERO HERRERA	AIRE SANO
ARQ. IGNACIO CABRERA FERNANDEZ	PRESIDENTE MESON
LIC. RICARDO E. CALDERON	ABOGADO, EAGLE PASS, TEXAS
ING. JESUS ROMAN CALLEROS	EL COLEGIO DE LA FRONTERA NORTE
LIC. WILFRIDO CAMPBELL SAAVEDRA	U.A.C.J.
PROF. ENRIQUE CAMPOS ARAGON	C.B.T.I.S. #54, CIUDAD ACUNA
C. FELIX CAMPOS CORONA	CONGRESO DEL ESTADO
C. JORGE CARDENAS GONZALEZ	PRESIDENTE MUNICIPAL DE H. MATAMOROS, TAMAULIPAS
ING. ELIDA CARRASCO	
C. RICHARD CARTER	COMISION SONORA ARIZONA
C. RON CASTEL	CANACO, EAGLE PASS, TEXAS
LIC. MILTON CASTELLANOS GOUT	PRESIDENTE MUNICIPAL DE MEXICALI

NAME	ORGANIZATION
LIC. MARIO A. CASTILLO GARZA	CANACO, PIEDRAS NEDRAS, CHIHUAHUA
ING. EVA CASTILLO ZAYAVEDRA	CORET
C. LUIS E. CASTRESANA R.	CONSUL TUCSON, ARIZONA
C. JESUS CASTRO	ASOCIACION DE MAQUILAS SAN LUIS RIO COLORADO, S.L.R.C.
ARQ. RUBEN CASTRO BUJORQUEZ	DELEGADO DE SEDUE EN B.C.
DR. HERNAN CAVAZOS	DIRECCION DE INVESTIGACION Y POSTGRADO UABC
C.P. MARIA GPE. CENTENO	GRUPO ECOLOGICO DE NOGALES
C. BENITO CERVANTES SANCHEZ	UNIVERSIDAD DE SONORA
LIC. PATRICIO CHIRINOS CALERO	SECRETARIO DE DESARROLLO URBANO Y ECOLOGIA
SR. FELIPE CHON MENCHACA	CLUB ROTARIO, PIEDRAS NEGRAS
LIC. LUIS DONALDO COLOSIO MURRIETA	S E N A D O R
GRAL. EDGAR CONDE PEREA	COMANDANTE DE LA GUARNICION
ING. JORGE CONTRERAS FORNELLI	CENTRO EMPRESARIAL DE CIUDAD JUAREZ
LIC. JOSE MANUEL CORONA ESTRADA	CANACO, TIJUANA
C. SYLVIA CORREA	E.P.A.
DR. LEONEL COTA ARAIZA	INSTITUTO DE FISICA - UNAM
LIC. CARLOS V. CRUZ MARTINEZ	CANAL 3, PIEDRAS NEGRAS, COAHUILA
SR. EDWIN CUBBIFON	CONSUL GENERAL DE E.U.A. EN TIJUANA, B.C.
C. ANDRES CUELLAR	COMISION DE DERECHOS HUMANOS DE MATAMOROS
ARQ. INOCENCIO CUELLAR LOPEZ	COLEGIO DE ARQUITECTOS DE MEXICALI
M.C. CARLOS R. DE ALBA PEREZ	CAMARA NACIONAL DE LA INDUSTRIA PESQUERA
ING. CARLOS DE LA PARRA	COLEGIO FRONTERA NORTE, TIJUANA
C. FRANCISCO DE LA PENA DAVILA	SISTEMA DE AGUA POTABLE Y ALCANTARILLADO
SRA. GUADALUPE DE LA VEGA	FEMAP
C. MANUEL DE LAS PIEDRAS	ASOCIACION DE SEGURIDAD E HIGIENE DE B.C.
C. SARA DE LEON DE CANTO	AFECTADOS POR LAS EMPRESAS QUIMICAS
C. CATALINA DENMAN	EL COLEGIO DE SONORA
LIC. ROSARIO DIAZ ARELLANO	U.B.C.J.
LIC. FRANCISCO DOMINGUEZ	PRI
C. LAURA DURAZO	PROYECTO FRONTERIZO AMBIENTAL
LIC. LUIS ELIZONDO	COMITE PARA EL DESARROLLO INDUSTRIAL DE MATAMOROS
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